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NEW KWANGTUNG PLANTS

By E. D. Merrill
Administrator of Botanical Collections, Harvard University, Cambridge, Massachusetts
and
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Curator of Herbarium, Lingnan Natural History Survey and Museum, Lingnan University, Canton.



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NEW KWANGTUNG PLANTS

By E. D. Merrill
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F. P. Metcalf
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The material on which this paper is based was collected for Lingnan University, on various expeditions within Kwangtung Province, two of which (Nos. 2 and 3 below) were financed jointly by the University and the Arnold Arboretum of Harvard University. Most of the species mentioned were collected in the northern tier of districts in Kwangtung Province; the regions can be more clearly understood by consulting figure 1. A summary of collections follows.

1. Yang-shan District, south of Lin-hsien (Linchow) along the Kwangsi border. *T. M. Tsui, Nos. 422-839*, July to September, 1932.

2. Wung-yuen District, southwest of Shiu-chow, along the Kiangsi border. *S. K. Lau, Nos. 608-1000*, November 1932 to January 1933.

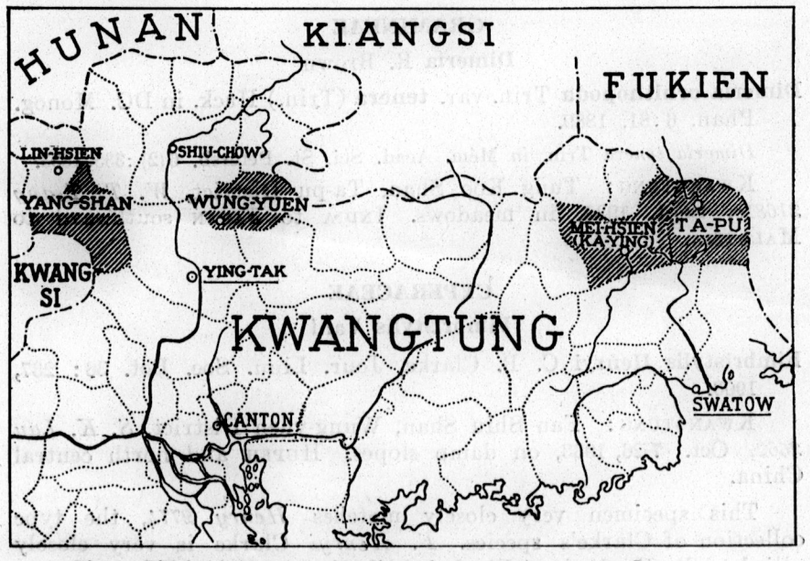

Fig. 1. Districts in Kwangtung Province where collections were made.

3. Ta-pu and Mei (Ka-ying) Districts, north of Swatow, along the Fukien border. *W. T. Tsang, Nos. 21,000-21,775,* June to October.

4. Wung-yuen District, southeast of Shiu-chow, along the Kiangsi border, *S. K. Lau, Nos. 1965-2799;* August to November, 1933.

In the present paper 11 species and 2 varieties are described as new while 20 previously described species are for the first time recorded from Kwangtung.

The types of the new species described in this paper are preserved in the New York Botanical Garden, and the herbarium of the Lingnan Natural History Survey and Museum, Lingnan University. In some cases duplicate types are located in the herbarium of the Arnold Arboretum, Harvard University.

ALISMACEAE

Sagittaria Linnaeus

Sagittaria pygmaea Miq., Ann. Mus. Bot. Lugd.-Bat. 2:138, 1865; Dandy, Jour. Bot. (London) 71:44, 1933.

Sagittaria sagittaefolia Linn. var. *oligocarpa* Micheli *in* DC. Monog. Phan. 3:68, 1881.

Hydrolirion coreanum Lév., Repert. Sp. Nov. 11:67, 1912.

KWANGTUNG: Fan Shiu Shan, Wung-yuen District, *S. K. Lau 2431,* Oct. 7, 1933, submerged in shallow water. JAPAN and KOREA. Known in China from HUPEH, FUKIEN, KWANGSI, KIANGSI, SZECHWAN, KWEICHOW, and HAINAN.

GRAMINEAE

Dimeria R. Brown

Dimeria ornithopoda Trin. var. **tenera** (Trin.) Hack. in DC. Monog. Phan. 6:81, 1889.

Dimeria tenera Trin. *in* Mém. Acad. Sci. St. Petersb. 6(2):335, 1833.

KWANGTUNG: Tung Koo Shan, Ta-pu District, *W. T. Tsang 21681c,* Sept. 1932, in meadows. INDIA to JAPAN southward to MALAYSIA.

CYPERACEAE

Fimbristylis Vahl

Fimbristylis Henryi C. B. Clarke, Jour. Linn. Soc. Bot. 36: 237, 1903.

KWANGTUNG: Fan Shiu Shan, Wung-yuen District, *S. K. Lau 2662,* Oct. 7-26, 1933, on damp slopes. HUPEH and north central China.

This specimen very closely matches *Henry 2774,* the type collection of Clarke's species. *F. Henryi* Clarke is very closely allied to *F. Hookeriana* Boeck. which also occurs in Kwangtung.

Rynchospora Vahl

Rynchospora Faberi C. B. Clarke, *in* Forbes & Hemsl. Jour. Linn. Soc. Bot. 36:259, 1903.

KWANGTUNG: Tung Koo Shan, Ta-pu District *W. T. Tsang 21681,* Sept. 8-29, 1932, in open damp meadows. CHEKIANG.

The identification has been made from Clarke's description, as we have seen no authentic material representing the species.

ERIOCAULONACEAE

Eriocaulon Linnaeus

Eriocaulon nipponicum Maxim., Diagn. Pl. Nov. Asiat. 8:9, 1893; Ruhl. Pflanzenfam. 13 (IV. 30): 38, 1903.

KWANGTUNG: Tung Koo Shan, Ta-pu District, *W. T. Tsang 26181b,* Sept. 8-29, in damp meadows. JAPAN, CHEKIANG.

This Japanese species has been recorded from Ningpo, Chekiang. Mixed with Tsang's collection is another *Eriocaulon* (No. *21681a*) which may possibly represent *E. pachypetalum* Hayata.

LILACEAE

Smilax Linnaeus

Smilax flaccida Wright, Kew Bull. p. 118, 1895.

KWANGTUNG: Yam Na Shan, Mei District, *W. T. Tsang 21338,* Aug. 4-31, 1932. HUPEH.

MORACEAE

Ficus Linnaeus

Ficus glaberrima Blume, Bijdr. p. 451, 1825; Merr. & Chun, Sunyatsenia 2:216, 1935.

KWANGTUNG: Shek Mang Tai Shan (Shap Man Tai Shan), Fang-ch'eng District, *C. L. Tso 23655,* Aug. 15, 1933, a large tree in open places. INDIA to INDO-CHINA and HAINAN southward to JAVA.

URTICACEAE

Parietaria Linnaeus

Parietaria debilis Forst. f., Prodr. p. 73, 1786, var.

KWANGTUNG: Tsing Wan Shan, Wung-yuen District, *S. K. Lau 2119,* Aug. 16-31, 1933, on slopes, rare.

As currently interpreted this species is considered to be of very wide distribution in the warmer parts of both hemispheres but the Kwangtung form is far from typical; it is Forster's species only *sensu latissimo.* Superficially it resembles forms placed under *P. vulgaris* Mill., *P. judaica* Linn., and even *P. officinalis* Linn., more closely than it resembles some forms currently placed under *P. debilis* Forst. f. The group is badly in need of a critical revision. The genus is new to Kwangtung.

LARDIZABALACEAE

Stauntonia de Candolle

Stauntonia glauca sp. nov. (see fig. 2)

Frutex scandens, ad 3 m. altus, ramulis glabris, sicco nigris; foliis 3-5-foliolatis, petiolis usque ad 12 cm. longis, petiolulis 3-5 cm. longis, laminis coriaceis, ellipticis, 10-14 cm. longis, ad 8 cm. latis, margine revolutis, apice breviter abrupteque acuminatis, basi rotundato-subcordatulis, utrinque 3-5-nerviis, nervis subtus conspicuis, distantibus, patulis, arcuato-anastomosantibus, supra flavido-viridibus, subtus glaucis, reticulatis; inflorescentiis axilaribus,

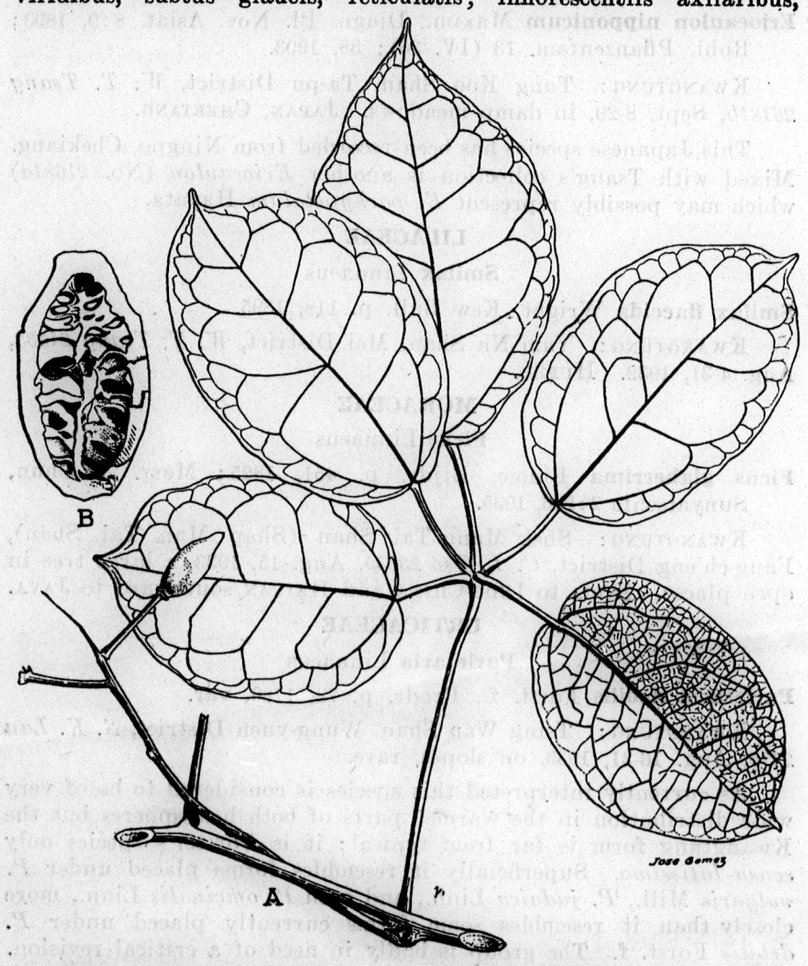

Fig. 2. *Stauntonia glauca* sp. nov. (A) leafy branch with inflorescence, × $\frac{5}{12}$; (B) longitudinal section of fruit, natural size.

solitariis, racemosus, 2-3-floris. Fructibus ellipsoideis, 3-4 cm. longis, nigris, minute subpapillulosis, apice subrostratis.

A scandent shrub up to 3 m. high with blackish, glabrous, delicately and shallowly ridged branches. Leaves 3- to 5-foliolate, long petioled, the petioles up to 12 cm. long; leaflets coriaceous, shining and yellowish-green above, pale and glaucous beneath, glabrous, broadly elliptic, 10-14 cm. long, about 8 cm. wide, apex abruptly short acuminate, base rounded to subcordate, primary veins, 3 or 4 on each side of the midrib, arched-anastomosing at a considerable distance from the margin, distant, spreading, the reticulations rather distinct; margin entire, revolute; petiolules 3-5 cm. long. Inflorescence (only one available) axillary, racemose, 2- or 3-flowered (see fig. 2). Fruit woody ellipsoid with narrowed and curved conical apex, minutely papillose-scabrous, but still fairly smooth, 3-4 cm. long, with numerous immature seeds.

KWANGTUNG: Tai Mo Shan, Ta-pu District, *W. T. Tsang 21082*, July 5, 1932.

In appearance somewhat resembling *Stauntonia alata* Merrill, but easily distinguished from that species by the absence of winged petioles and branchlets, the consistently broader elliptic leaflets, the racemose inflorescences, and larger fruit. This is a very distinct species and represents the fourth new species of this genus recently collected by W. T. Tsang in Kwangtung

Akebia Decaisne

Akebia trifoliata (Thunb.) Koidz. var. **australis** (Diels) Rehd., Jour. Arnold Arb. 10:189, 1929.

Akebia lobata Decne. var. *australis* Diels, Bot. Jahrb. 29:344, 1900.

KWANGTUNG: Yeung-shan and vicinity south of Lin-hsien, Yang-shan District, *T. M. Tsui 799*, July-Sept., 1932. The species is widely distributed in JAPAN, northern and central China; the variety is found in HUPEH, KIANGSI, KWEICHOW, SZECHWAN, YUNNAN, and south-eastern TIBET.

Dunn and Tutcher record *Akebia lobata* Decne. (=*A. trifoliata* Koidz.) from Phoenix Mountain, Swatow, and from Lin-hsien. It is suspected that what they had is really the variety *australis*. The more northern form has thinner and distinctly lobed leaflets, while the southern form has coriaceous to subcoriaceus, entire leaflets.

LAURACEAE

Litsea Lamarck

Litsea verticillata Hance* var. **brevipes** var. nov.

A type differt fructibus subsessilibus vel breviter pedunculatis.

In the type the peduncles are 1 to 2.5 cm. long.

KWANGTUNG: K'ei Lau Tsz, Wung-yuen Districts, *S. K. Lau 899*, Dec. 27, 1932 and Lantau Island, *CCC 16602* (*W. T. Tsang*).

* Jour. Bot. (London) 21:356, 1883.

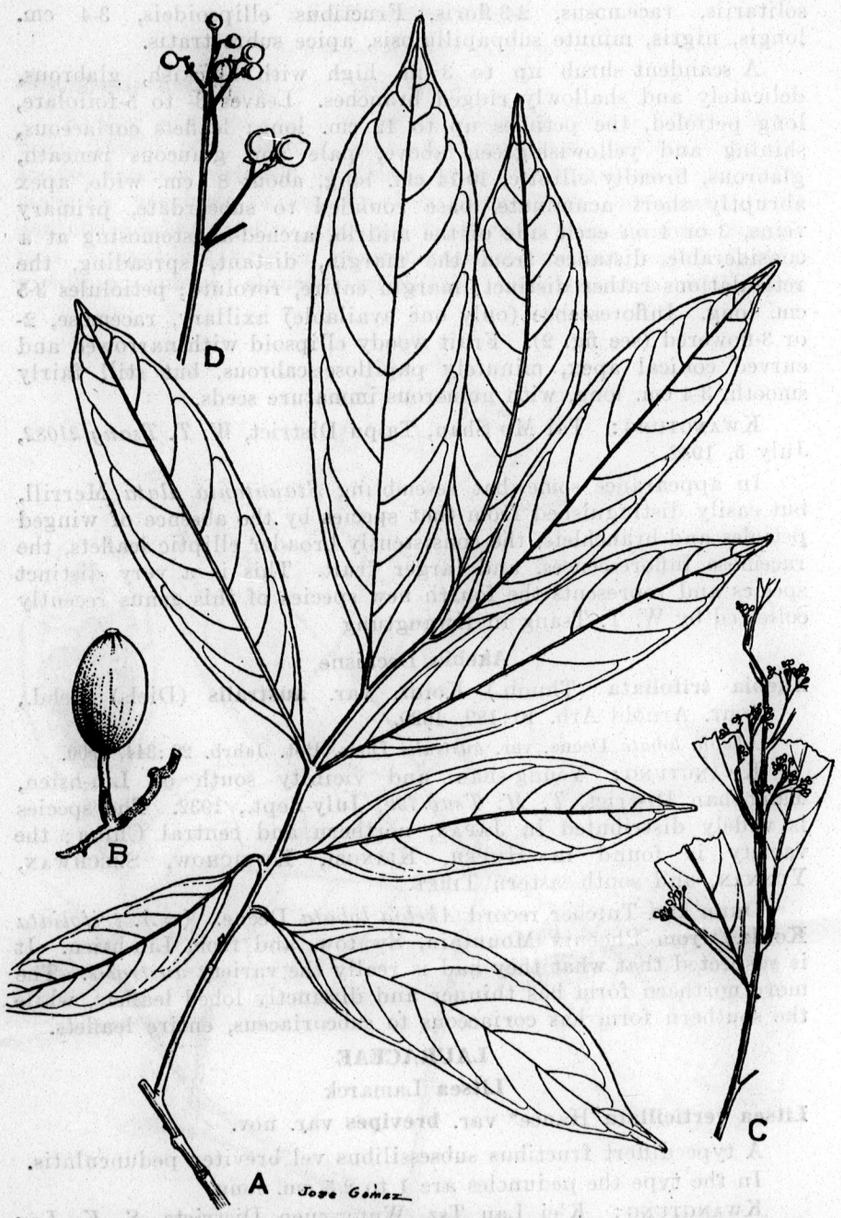

Fig. 3. *Cryptocarya Laui* sp. nov. (A) leafy branch, × ½; (B) inflorescence and mature fruit, × ⅔; (C) inflorescence with young leaves, × ½; (D) inflorescence with young fruit, × ½.

Cryptocarya Brown

Cryptocarya Laui sp. nov. (see fig. 3)

Frutex circiter 7 m. altus, ramis glabris, ramulis pubescentibus; foliis subcoriaceis, oblongis vel oblongo-lanceolatis, 11-16 cm. longis, 3.5 cm. latis, supra glabris, subtus distincte pallioribus, subglaucescentibus minute pubescentibus; petiolo pubescenti 5-8 mm. longo; inflorescentiis paniculatis, axillaribus terminalibusque, pubescentibus; fructibus ellipsoideis, circiter 19 mm. longis et 9 mm. latis, nigris, glabris, laevibus, haud longitudinaliter sulcatis.

A small tree to 7 m. high. Branches glabrous, branchlets puberulent. Leaves somewhat coriaceous, oblong to oblong-lanceolate, 11-16 cm. long, 3-5 cm. wide, glabrous, dull or shining and olivaceous above, distinctly paler and subglaucescent beneath, shortly appressed puberulent, the indumentum slightly longer on the nerves and on the younger leaves; primary lateral nerves 5-9 pairs, only slightly curved; petiole 5-8 mm. long, puberulent when young. Inflorescences in loose axillary or terminal puberulent panicles. Flowers minute, perianth lobes ovate, puberulent. Young fruit globose the mature fruit ellipsoid, about 17 mm. long and 9 mm. wide, black, glabrous, smooth, not at all longitudinally sulcate.

KWANGTUNG: Vicinity of Yung-yun, Wung-yuen District, *S. K. Lau 922*, Dec. 29, 1932 (fruit) in forests. Lung T'au Shan, K'uh-kiang District, *CCC 12637* and *12793* (*To & Tsang*), July 2 and 10, 1924, in villages, (flowers and young fruit) undoubtedly represent the same species.

This species is manifestly related to *C. concinna* Hance but is distinguished from that species by the much longer and wide leaves.

CAPPARIDACEAE

Bauhinia Linnaeus

Bauhinia apertilobata sp. nov. (see fig. 4)

Frutex scandens, saltem 3 m. altus, ramulis et petiolis et inflorescentiis pubescentibus; foliis ovatis vel late ellipticis vel suborbicularibus, 8-10 cm. longis, 8 cm. latis, apice breviter 2-lobatis, lobis acutis, apertis, basi 9-nerviis, chartaceis, olivaceis, supra subglabris vel sparse pubescentibus, subtus consperse subferrugineo-pubescentibus, glabrescentibus; petiolo 2.5-3.5 cm. longo. Inflorescentiis terminalibus, racemosis, racemis solitariis vel binis, 4-6 cm. longis, pubescentibus; floribus albidis, sepalis 5, lanceolatis, extus pubescentibus; petalis 5, 3-4 mm. longis, subspatulatis, extus in partibus medianis pubescentibus, intus glabris; ovario stipitato, ad marginem pubescenti: fructibus oblanceolatis compressis, 7-9 cm. longis, 3 cm. latis, glabris.

A woody climber at least 3 m. high with somewhat pubescent branchlets, petioles and inflorescences. Leaves alternate, ovate to broadly elliptic to suborbicular, shallowly and broadly 2-lobed, the

lobes usually widely separated, acute, short (see fig. 4). Blades 8-10 cm. long and up to 8 cm. wide, usually 9-nerved, shining, subglabrous to sparsely puberulent above, more abundantly reddish, somewhat appressed pubescent beneath, becoming glabrous. Petioles 2.5-3.5

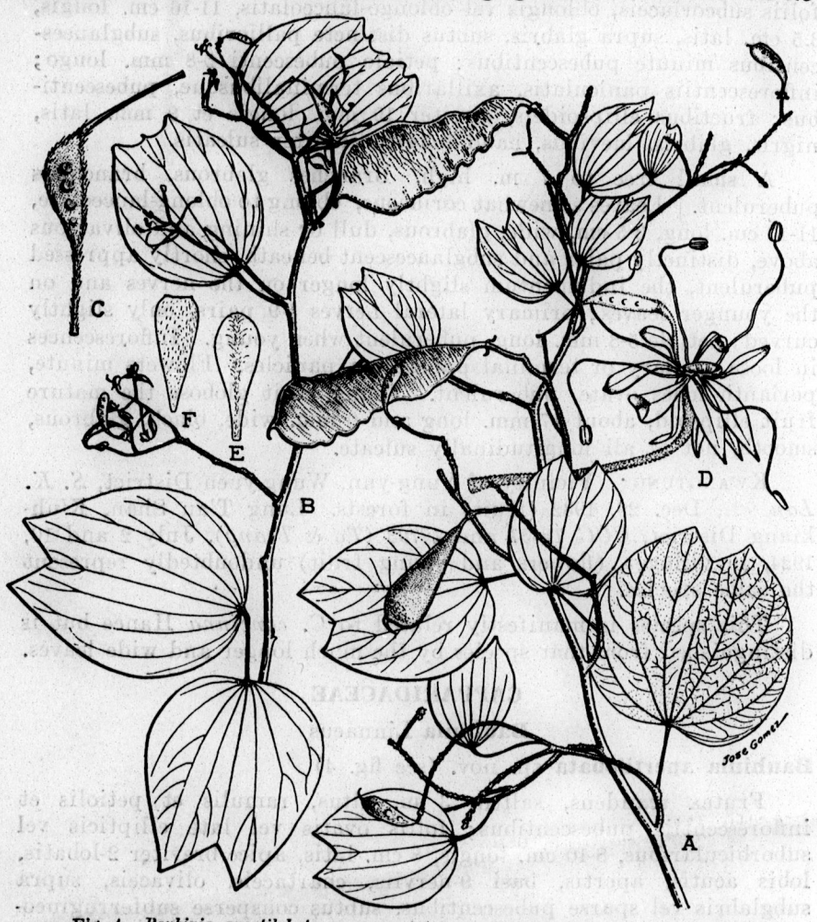

Fig. 4. *Bauhinia apertilobata* sp. nov. (A) leafy branch with young and old fruit, × $\frac{5}{12}$; (B) leafy branch with young fruit and old flowers, × $\frac{5}{12}$; (C) young fruit, × 4; (D) flower, × 3; (E) petal, greatly enlarged; (F) sepal, greatly enlarged.

cm. long, slender. Inflorescence terminal, of single or paired short, few-flowered pubescent racemes 4-6 cm. long. Flowers white, odorless; pedicels 1-1.5 cm. long, pubescent, the bracteoles linear 3-6.5 mm. long, pubescent; sepals 5, lanceolate, 3-4 mm. long, pubescent, especially on outside, somewhat persistent, the tube obconic, pubescent, shorter than the lobes; petals 3-4 mm. long, somewhat strap-shaped or spatulate with narrow bases, the median portion

outside pubescent, stamens 5; ovary stipitate, the stipe pubescent, the oblong ovary pubescent only on the margins. Pods oblanceolate, compressed, glabrous, 7-9 cm. long and 3 cm. wide at the widest part, obscurely apiculate, abruptly narrowing to an acute or cuneate base.

KWANGTUNG: Tai Mo Shan, Ta-pu District, *W. T. Tsang 21137*, July 10, 1932, fruit, and same locality, *W. T. Tsang 21042* (type), July 1, 1932, flower and young fruit.

This seems to be related to *B. Championi* Benth., but in the latter species the racemes are much longer, 10 to 20 cm. in length, and the narrower leaves are usually entire and acuminate or if lobed, then with narrow approximate lobes.

The plant collected in early July in flower, has more shallowly lobed leaves than the one collected later in the same month. The leaves of the two are rather dissimilar. We believe, however, that they represent the same species. Branches from both have been illustrated.

Bauhinia yingtakensis sp. nov. (see fig. 5)

Frutex scandens, ramis subglabris, foliis ambitu ovatis vel suborbicularis, 2-lobatis, supra glabris, subtus obscure pubescentibus vel subglabris, paullo pallidioribus, utrinque reticulatis, 4.5 cm. longis, usque ad 4 cm. latis, lobis ovatis, plerumque obtusis, rariter acutis; petiolo 2-3 cm. longo. Inflorescentiis racemosis, sparse puberulis; fructibus coriaceis, glabris, lanceolatis, 4-8 cm. longis, usque ad 2 cm. latis, apiculatis, glabris, margine incrassatis, pedicellis 1.5 cm. longis, consperse breviter pubescentibus; sepalis persistentibus, ovatis, acutis vel obtusis, pubescentibus, circiter 2 mm. longis.

A woody vine with subglabrous branches and tendrils, the older branches rather densely lenticellate; leaves ovate to suborbicular in outline, 2-lobed, glabrous above, subglabrous or obscurely pubescent beneath, reticulate on both sides, 4.5 cm. long and up to 4 cm. wide, base shallowly cordate, usually 9-nerved, apices 2-lobed, lobes ovate, obtuse or subacute, approximate, extending to the middle of the leaf; petioles slender, 2-3 cm. long. Inflorescences racemose, sparsely pubescent, terminating short lateral branchlets and with a pair of tendrils at the base of each; fruit coriaceous, glabrous, compressed, lanceolate, margin entire or undulate, 4-8 cm. long, 2 cm. wide, apiculate, base acute; pedicels 15 mm. long, sparingly pubescent, the persistent calyx lobes ovate, acute or obtuse, slightly pubescent, about 2 mm. long.

KWANGTUNG: Pat Tang Shek, Ying-teh District, *S. Y. Lau 20721*, Jan., 1935.

A species apparently closely related to *B. saxatilis* Craib (photograph of holotype available for comparison), but distinguish-

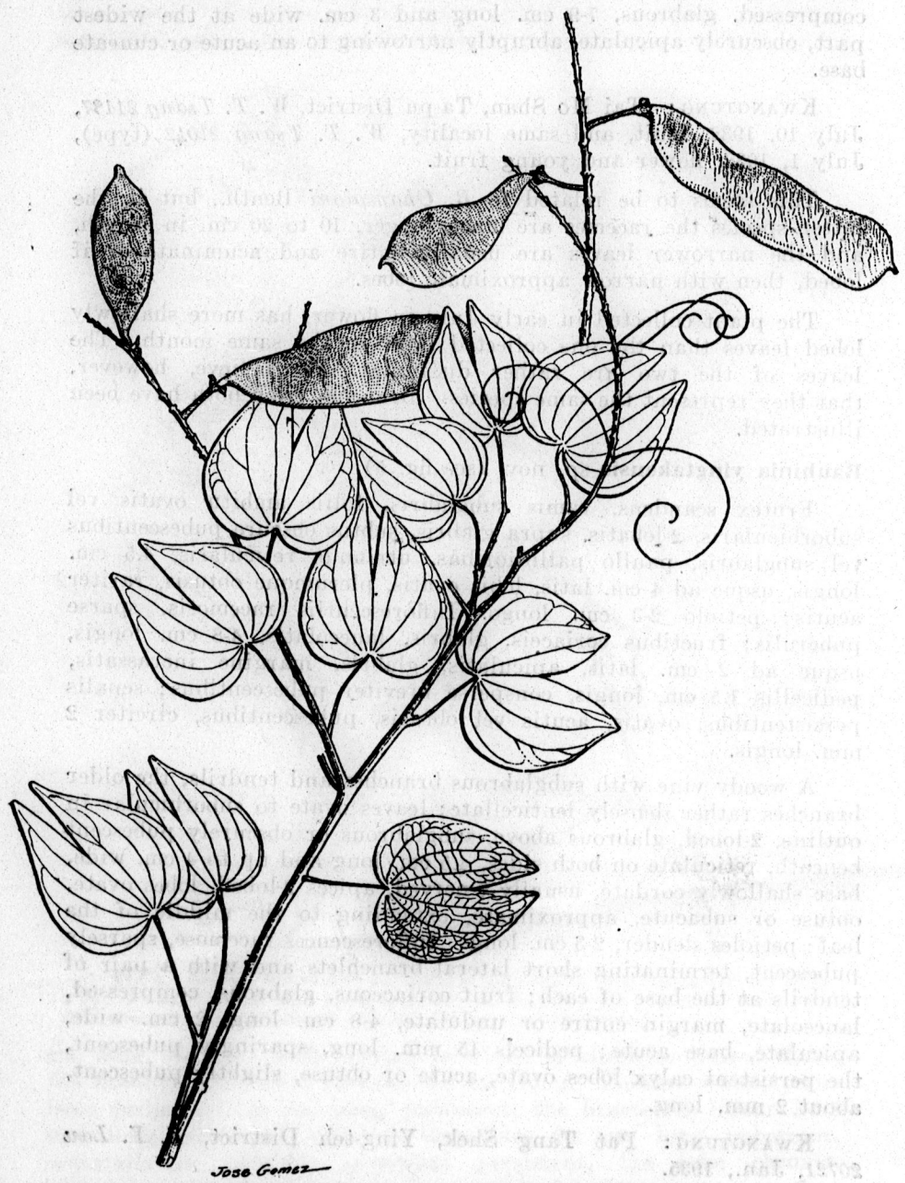

Fig. 5. *Bauhinia yingtakensis* sp. nov. Leafy branch with fruit, x ½.

ed from that species by the longer pedicels (15 mm.) and wider fruit (2 cm.), and with the lobes of the leaves not so widely divergent. In *B. saxatilis* Craib the pedicels are only 3 mm. long, the fruit 1.7 cm. wide, or less, and the leaves have distinctly divergent lobes.

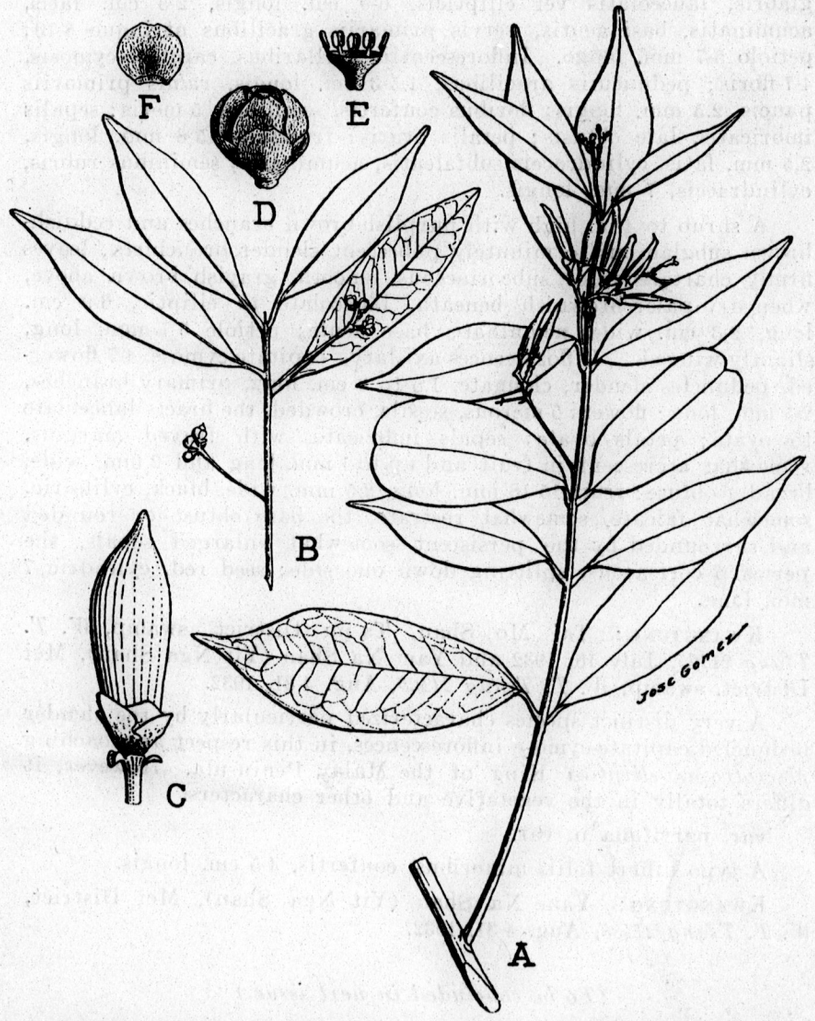

Fig. 6. *Microtropis gracilipes* sp. nov. (A) leafy branch with young and old fruit, showing upper surface of leaves only, approx. x ½; (B) leafy branch with young buds, showing lower surface of leaves, approx. x ½; (C) mature fruit, x 2; (D) opening flower bud, x 5; (E) stamens, x 5; (F) petal, x 5.

GELASTRACEAE

Microtropis Wallich

Microtropis gracilipes sp. nov. (see fig. 6)

Frutex ad 3 m. altus; ramis purpureo-brunneis, ramulis rubro-bruneis, glabris vel minute pubescentibus; foliis chartaceis, utrinque glabris, lanceolatis vel ellipticis, 6-9 cm. longis, 2-3 cm. latis, acuminatis, basi acutis, nervis primariis gracilibus utrinque 8-10; petiolo 5-7 mm. longo. Inflorescentiis axillaribus, capitato-cymosis, 4-7-floris; pedunculis gracilibus, 1.5-3 cm. longis, ramis primariis paucis, 2.5 mm. longis; floribus coufertis, sessilibus, 5-meris; sepalis imbricatis, late obtusis; petalis ovatis; fructibus 15-8 mm. longis, 2.5 mm. latis, cylindraceis subfalcatis, acuminatis; seminibus rubris, cylindraceis, 7 mm. longis.

A shrub to 4 m. high with purplish-brown branches and reddish-brown subglabrous to minutely pubescent slender branchlets; leaves firmly chartaceous or subcoriaceous, smooth, grayish brown above, when dry paler brownish beneath, lanceolate to elliptic, 6-9 cm. long, 2-3 cm. wide, acuminate, base acute; petiole 5-7 mm. long, slightly winged. Inflorescences axillary, capitate-cymose, 4-7-flowered, peduncles slender, elongate, 1.5 to 3 cm. long, primary branches, 2-5 mm. long; flowers 5-merous, sessile, crowded, the bracts lanceolate to ovate; petals ovate; sepals imbricate, with frayed margins, somewhat accrescent in fruit and up to 1 mm. long and 2 mm. wide, broadly obtuse; fruit 15-18 mm. long, 2.5 mm. wide, black, cylindric, somewhat falcate, somewhat rostrate, the base obtuse or rounded and surrounded by the persistent somewhat enlarged sepals, the pericarp coricaeous, splitting down one side; seed red, cylindric 7 mm. long.

KWANGTUNG: Tai Mo Shan, Ta-pu District, swamp, *W. T. Tsang 21195*, July 16, 1932 and Yam Na Shan (Yit Nga Shan), Mei District, swamp, *W. T. Tsang 21425*, Aug. 4-31, 1932.

A very distinct species characterized particularly by the slender peduncled capitate-cymose inflorescences, in this respect approaching *Microtropis elliptica* King of the Malay Peninsula. However, it differs totally in the vegetative and other characters.

var. **parvifolia** n. var.

A typo differt foliis minoribus, confertis, 4-5 cm. longis.

KWANGTUNG: Yam Na Shan (Yit Nga Shan), Mei District, *W. T. Tsang 21488*, Aug. 4-31, 1932.

(To be concluded in next issue.)

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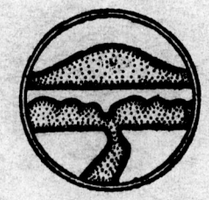

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EVELYN C. WELLS, ACTING EDITOR

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Introduction

The present study is based largely on the Cerambycidae from Kwangtung Province, south China, in the collection of the Lingnan Natural History Survey and Museum of Lingnan University, Canton. The remainder of the material considered was largely collected by the writer in the eastern part of the province on a trip[3] during the summer of 1936. The latter have already been reported upon,[4] together with material from southeastern Kiangsi and southwestern Fukien Provinces. In addition, are included a few specimens from Musée Heude (Université l'Aurore, Shanghai) the California Academy of Sciences, the British Museum, and the University of Hong Kong. All the species thought to be authoritatively recorded in the literature from Kwangtung Province, as well as from Hong Kong Island, are also included. The material studied comes from only the region about Canton, in the south central part of the province, the northwestern portion, and the eastern end of the province, besides Hong Kong and Lantau Island. The material from Hainan Island, which is politically part of Kwangtung Province, has been studied separately, and forms the basis for another report[5].

The species seen by me, or noticed in the literature, from mainland Kwangtung Province, total one hundred and forty-three, representing

[3] See Gressitt, J. L.: Note on a Collecting Trip to Southeastern China. *Lingnan Science Journal* 16 (3): 439-445, *1 map*, 1937.

[4] See Gressitt, J. L.: New Longicorn Beetles from China, III. *Lingnan Science Journal* 16 (3): 447-456, pl. 4, 1937 (Spondylinae and Cerambycinae); IV, op.c. 16 (4): 595-621, pls. 19 and 20, 1937 (Lamiinae).

[5] Gressitt, J. L.: The Longicorn Beetles of Hainan Island. *Philippine Journal of Science*, in press.

eighty-three genera, thirty-five tribes and five subfamilies. Keys are given for the members of all the different groupings, and brief descriptions of the previously known species are presented. Since the collections studied are few, and large parts of the province, particularly the western half, including the Luichow Peninsula, have hardly been collected over at all, this study can in no way be considered complete, but only as a stepping-stone toward a better knowledge of the family from this region. As yet, no list of species or report has appeared, and in fact, few species have been actually recorded from Kwangtung. At least sixty species are newly recorded from the province, and of these, forty-one are new to China. Thirty of the species are described as new to science, and two of these are made the types of new genera. The other species were largely described originally from Hong Kong, Burma, Formosa, Tongking and central or southern China. Of the one hundred and forty-three species, only twenty-five are known to me to occur also on the Island of Hainan, and thirty-eight are in common with the Island of Formosa, which latter is more nearly of the same latitude as the parts of Kwangtung represented by the material studied. Only about eighteen of the species have their ranges extending north of the Yangtze River or into Japan, with a single species reaching Europe, and but five range as far south as the East Indies. These relationships confirm the conception of Kwangtung Province as belonging to the upper part of the Indo-Chinese Subregion of the Oriental Zoogeographical Region, with apparently meager relationship with the Palearctic fauna.

The types of the new species are to be deposited in the Lingnan Natural History Survey and Museum, Lingnan University, Canton, or on loan deposit in the California Academy of Sciences in San Francisco (Gressitt collection). I wish to express my deep appreciation to Professor William E. Hoffmann, Director of the Lingnan Natural History Survey and Museum, for the privilege of making this study, and also to Rev. Père O. Piel of Musée Heude, Université l'Aurore, Shanghai, Dr. K. G. Blair of the British Museum, and Dr. E. C. Van Dyke, Dr. W. B. Herms, and Dr. E. Gorton Linsley of the University of California at Berkeley, for their kind aid and cooperation.

CERAMBYCIDAE (LONGICORNIA)

Form usually narrow and depressed-cylindrical. Antennae generally long, often much longer than body, longer in male than in female, almost always of eleven segments; head oblique or vertical in front, with fairly strong mandibles; prothorax more or less cylindrical, sometimes tuberculate, margined or toothed laterally; elytra generally entirely covering abdomen, rounded or truncate apically, occasionally abbreviated or strongly narrowed; first ventral abdominal segment entirely visible; legs long, tarsi apparently of four segments, actually of five, the fourth minute and often hidden by the two lobes of the third segment.

Biology

The longicorn beetles are of economic importance as wood-borers, being of particular significance in forests and orchards, as well as vineyards and parks. Many species attack only dead or dying timber, but a fair proportion feed in branches, trunks or sapwood of living trees, shrubs, vines and even certain larger herbs, such as hemp, *Chrysanthemum* and others. At least one species is very destructive as a borer in wooden houses in south China. A number of species are very destructive to living fig trees (*Ficus*), mulberry (*Morus*), and fruit trees of the genera *Citrus*, *Prunus* and others.

The life cycle in these latitudes generally occupies one year, but may last for a considerably longer, or a shorter, period. The eggs are generally deposited in crevices or slits made in the bark. The larvae normally remain concealed in their galleries within the wood throughout their existence, though their presence is often evidenced by swellings of stems or branches, disfigurement of trunks, and openings in the bark from which frass is extruded or sap or fermentation products exude. The latter process is often aided by secondary invasion by other insects, fungi and bacteria, until a distinct biotic community is built up, with the result of severe disfigurement, if not death, to the tree.

Key to Kwangtung Subfamilies of Cerambycidae

1. Head generally directed obliquely forward; anterior tibiae not grooved internally; apical palpal segments blunt 2
   Front of head vertical or directed obliquely inward below; anterior tibiae grooved internally; apical palpal segments acute .....**Lamiinae**
2. Prothorax not margined at sides; inner maxillary lobe well developed; anterior coxae not strongly transverse 3
   Prothorax margined laterally; inner maxillary lobe obsolete or small; anterior coxae strongly transverse .....**Prioninae**
3. Head more or less elongate, strongly constricted behind eyes; anterior coxae conical and prominent; mandibles often with ligamentous fringe .....**Lepturinae**
   Head seldom narrowed behind eyes; anterior coxae not strongly conical and prominent; mandibles without a ligamentous fringe 4
4. Antennae hardly reaching beyond base of prothorax, third to tenth segments subequal; fourth tarsal segment distinctly visible; wings with vein Cu_2 branching; eyes practically entire, placed behind antennal insertions; anterior tibia dentate externally, with a large tooth at apex .....**Spondylinae**
   Antennae reaching beyond base of prothorax, third segment generally much longer than second; fourth tarsal segment minute; wings with vein Cu_2 unbranched; eyes generally emarginate, partly surrounding antennal insertions .....**Cerambycinae**

Subfamily **Spondylinae**

Genus **Spondylis** Fabricius, 1775

Spondylis Fabr., 1775, Syst. Entom. : 159 (type : *Attelabus buprestoides* Linn.).
Pseudoclerus Voet, 1806, Cat. Col. 2 : 57.

1. **Spondylis buprestoides** (Linnaeus)

Attelabus buprestoides Linnaeus, 1758, Syst. Nat., ed. 10 : 388 (Europe).
Spondylis buprestoides Fabricius, 1775, Syst. Entom. : 159.
Spondylis sinensis Nonfried, 1892, Ent. Nachrichtenbl. 18 : 92 (Yunnan, SW. China).

Entirely black; ventral surface clothed with auburn hairs. Body rectangular, subparallel; head narrower than prothorax; mandibles large, oblique; vertex broad; eyes distant; neck broad; antennae barely reaching to base of prothorax, third to tenth segments flattened, similar in size; prothorax as wide as elytra, broader than long, rounded laterally, unmargined, closely punctured; elytra slightly narrowed posteriorly, costate, finely rugulose; legs short and stout. Length 19-21 mm.; breadth 6.5 mm.

One specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung Prov., June 14, 1934, by F. K. To; a female (Gressitt collection) was collected at Tsin-leong Shan, alt. 850 meters, Mei District, E. Kwangtung, June 3, 1936, by J. L. Gressitt. New to Kwangtung.

Distribution.—Europe; Siberia; Japan; China.

Subfamily **Prioninae**

Key to Kwangtung Tribes of Prioninae

1. Prothorax evenly and narrowly margined laterally; antennae tapering, segments more or less cylindrical; metathoracic episterna narrowed posteriorly 2
   Prothorax with flattened and toothed lateral margins; antennae broad and serrate; metathoracic episterna parallel-sided .....**Prionini**
2. Prothorax transverse, narrower at apex than at base; third tarsal segment cleft to base; vein Cu_1 of hind wing simple, not joined to Cu_2.....**Callipogonini**
   Prothorax subcylindrical; third tarsal segment cleft only to a little beyond middle; vein Cu_1 of hind wing branched, joined to Cu_2 by a cross-vein .....**Philini**

Tribe **Prionini**

Prionini Gahan, 1906, Fauna Brit. India, Col. 1 : 4; Lameere, 1912, Mem. Soc. Ent. Belg. 21 : 182.

Genus **Priotyrranus** Thomson, 1857

Priotyrranus Thomson, 1857, Archiv. Ent. 1 : 120 (type : *Prionus mordax* White); Gahan, 1906, Fauna Brit. India, Col. 1 : 21.

Subgenus **Chollides** Thomson, 1877

Chollides Thomson, 1877, Rev. Mag. Zool. : 264 (type : *Ch. closteroides* Thoms.).
Cnethocerus Bates, 1878, Ent. Monthly Mag. 14 : 273 (*Cn. messi* B.).
Prionacus Fairmaire, 1897, Notes Leyden Mus. 18 : 127 (type : *P. strigicornis* Frm.).

2. **Priotyrranus (Chollides) closteroides** (Thomson)

Chollides closteroides Thomson, 1877, Rev. Mag. Zool. : 264 (China).
Cnethocerus messi Bates, 1878, Ent. Monthly Mag. 14 : 273 (Hong Kong).
Prionacus strigicornis Fairmaire, 1897, Notes Leyden Mus. 18 : 127 (Kiangsi).
Priotyrranus (*Chollides*) *closteroides* Lameere, 1919, Gen. Ins. 172 : 114.

Male.—Dull brown; antennae dark red; shorter than body; mandibles narrow, projecting forward; eyes nearly touching above; antennae subcylindrical, striated, segments acutely produced at apices; prothorax rugose-punctate; elytra finely punctured. Length 28-37 mm.

Female.—Reddish; antennae slender, each segment spined at both inner and outer apical angles. Length 41-52 mm.

A male in Ling. Nat. Hist. Surv. Mus. from N. Kwangtung, 1934, F. K. To, collector. New to Kwangtung Province.

Distribution.—S. China; Tongking; Formosa.

Tribe **Callipogonini**

Aegosomides Lacordaire, 1869, Gen. Coleopt. 8 : 153.
Callipogonines Lameere, 1904, Ann. Soc. Ent. Belg. 48 : 7.
Aegosomini Gahan, 1906, Fauna Brit. India, Col. 1 : 41.

Genus **Megopis** Serville, 1832

Megopis Serville, 1832, Ann. Soc. Ent. France 1 : 161 (type : *M. mutica* Serv.).
Aegosoma Serville, 1832, l.c. 1 : 162 (type : *Cerambyx scabricornis* Scopoli); Gahan, 1906, Fauna Brit. India, Col. 1 : 44.
Pachypleura White, 1853, Cat. Col. Brit. Mus. 7 : 27 (type : *P. modesta* White).

3. **Megopis marginalis** (Fabricius)

Cerambyx marginalis Fabricius, 1775, Syst. Ent. 2 : 169 ("Cape of Good Hope").
Aegosoma marginale White, 1853, Cat. Col. Brit. Mus. 7 : 31 (China); Gahan, 1900, Ann. Mag. Nat. His., ser. 7, 5 : 347 (Hainan).
Aegosoma javanica Redtenbacher, 1868, Reise Novara 2 : 102 (Java).
Megopis (*Baralipton*) *marginalis* Lameere, 1909, Ann. Soc. Ent. Belg. 53 : 152.

Form slender, narrowed and rounded behind; neck long; eyes distant; antennae longer than body, segments cylindrical, scabrous, with brief hairs internally; prothorax rounded laterally, its surface moderately convex and micro-granulose; elytra long, tapering, sparsely granulose. Length 17-33 mm.; breadth 6.5-9 mm.

A male specimen (Ling. Nat. Hist. Surv. Mus.) was taken on Honam Island, Canton, P'an-yu District, Kwangtung.

Distribution.—Burma; S. China; Formosa; Hainan I., peninsula of southeastern Asia; Sunda Is.; Celebes.

Tribe **Philini**

Philini Gahan, 1906, Fauna Brit. India, Col. 1 : 54; Boppe, 1922, Gen. Ins. 178 : 13, 25.

Genus **Philus** Saunders, 1853

Philus Saunders, 1853, Trans. Ent. Soc. London, ser. 2, 2 : 110 (type : *P. inconspicua* S. = *Stenocorus antennatus* Gyllenh.); Gahan, 1906, Fauna Brit. India, Col. 1 : 57.

4. **Philus pallescens** Bates

Philus pallescens Bates, 1866, Proc. Zool. Soc. London : 350 (Formosa); Gressitt, 1938, Ling. Sci. Jour. 17 : 151 (Szechwan, W. China).

Male.—Light reddish-brown to dark brown; antennae reddish-brown; elytra pale brownish testaceous, slightly reddish basally. Form slender; head broader than prothorax; eyes large, moderately close above; frons small, depressed; antennae one-third longer than body, broad, segments angulate apically; prothorax a little broader than long, slightly rounded at sides, micropunctulate; elytra long, closely punctate.

Female.—Elytra paler; antennae two-thirds as long as body, slender, hardly toothed.

Length 17-22 mm.; breadth 5-6.5 mm.

Several male specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt collection) were taken at Canton, in April 1933, by T. P. Lau and, in the summer of 1935, by Wm. E. Hoffmann; a female also from Canton, 1931-32, K. C. Maack. New to Kwangtung Province.

Distribution.—Formosa; Szechwan; Kwangtung.

Subfamily **Lepturinae**

Tribe **Lepturini**

Lepturini Aurivillius, 1912, Col. Cat. 39 : 157 (part); Boppe, 1922, Gen. Ins. 178 : 14.

Key to Kwangtung Genera of Lepturini

Form moderately broad; elytra not greatly constricted nor strongly dehiscent; antennae moderately thick, less than three-fourths as long as body, segments widened apically and lacking flattened, granular areas ectoapically; apical segment of labial palpus about twice as long as broad, truncate apically ..... **Leptura** Linn.

Form slender, elytra strongly narrowed beyond basal quarter, dehiscent apically, exposing apex of abdomen; antennae slender, nearly as long as body, their apical segments with apices obliquely flattened and granular, externally; apical segment of labial palpus three or four times as long as broad, narrowed apically ..... **Strangalia** Serville

Genus **Leptura** Linnaeus, 1758

Leptura Linnaeus, 1758, Syst. Nat., ed. 10: 397 (type: *L. quadrifasciata* L.).
Stenura Dejean, 1837, Dejean's Cat., ed. 3 : 381 (nomen nudem).
Strangalia Aurivillius, 1912, Col. Cat. 39 : 228 (part).

Key to Kwangtung Species of Leptura

Body black or reddish-brown clothed with green-gold hairs; antennae piceous or orange apically; elytra black, crossed by four transverse orange bands, sometimes confluent close to suture, but medially divided by black suture; legs ochraceous to largely black; femora swollen..... **aurosericans** (Fairmaire)

Body black, briefly and sparsely clothed with pale hairs; elytra entirely dull red ..... **rubripennis** Pic

5. **Leptura aurosericans** (Fairmaire) (pl. 1, fig. 1)

Strangalia aurosericans Fairmaire, 1895, Ann. Soc. Ent. Belg. 39 : 177 (Tongking).

Male.—Antennae largely black, piceous apically; legs black with outer parts of femoral bases orange; pronotum largely black; elytral

bands separate; antennae nearly three-fourths as long as body, apices of third and fourth segments hairy internally; frons broader than long, finely punctulate; prothorax hardly rounded at sides, strongly swollen and closely punctulate above; scutellum narrow; elytra gradually narrowed, obliquely emarginate apically.

Female.—Antennae reddish-brown basally, piceous at middle and ochraceous apically, two-thirds as long as body, pronotum golden-green; elytral bands confluent; legs largely reddish; tarsi black.

Length 17-21 mm.; breadth 4.8-6 mm.

Several specimens were taken at Taam-yuen-tung, Lien District, N. Kwangtung, May 25-27, 1934, by F. K. To. New to China.

Distribution.—Tongking; Kwangtung.

6. **Leptura rubripennis** Pic (pl. 1, fig. 2)

Leptura rubripennis Pic, 1927, Echange 43 : 8 (Tongking).

Black, with elytra deep reddish; body moderately narrow, subparallel; head and prothorax minutely and closely punctulate; antennae two-thirds as long as body, fifth segment a little longer than fourth, and three-fourths as long as third; prothorax subcampanulate, constricted, but hardly collared apically, disk feebly raised, with three impressed, impunctate lines, converging between center and base, anterior line short, basal margin sinuate; scutellum small, almost equilaterally triangular; elytra long, feebly narrowed, apices emarginate and broadly toothed externally, surface finely and evenly punctured, each puncture giving rise to a short black hair. Length 19 mm.; breadth 4.3 mm.

A single example (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung, May 29-30, 1934, by F. K. To. New to China.

Distribution.—Tongking and Kwangtung.

Genus **Strangalia** Serville, 1835

Strangalia Serville, 1835, Ann. Soc. Ent. France 4 : 220 (type : *Leptura luteicornis* Fabr.).

Strangalina Aurivillius, 1912, Col. Cat. 39 : 240, 245 (type : *Leptura attenuata* L.)

Key to Kwangtung Species of Strangalia

Ground color of body black; elytra with three ochraceous bands; femora and apical antennal segments largely yellowish ochraceous ..... **castaneonigra** (Gressitt)

Body largely pale reddish-brown; antennae, last abdominal segment, hind tibiae, apices of hind femora, and two lateral spots and extreme apices on elytra black ..... **kwangtungense** n.sp.

7. **Strangalia castaneonigra** (Gressitt)

Leptura castaneonigra Gressitt, 1935, Ling. Sci. Jour. 14(4) : 565 (Yenping, Fukien Province, southeast China).

Male.—Body black; eyes dark golden brown; antennae with sixth and following segments ochraceous on basal half or two-thirds; elytra

with three ochraceous bands, each divided at suture, not touching margins, except for first before humeri, first widest, on extreme bases, second close behind it, third placed a little behind middle; femora yellowish castaneous except for apical quarter or so; tibiae reddish-brown on undersides; ventral surface of body densely clothed with adpressed golden hairs. Head strongly constricted behind the large swollen eyes; frons squarish with a triangular, impunctate area in middle; occiput much more finely punctured than clypeus; antennae as long as body, third segment one-third again as long as scape, slender, apical segments depressed and roughened externally at apices; prothorax long, slightly broadened before middle, and narrowed to apex, closely punctate; elytra strongly narrowed, dehiscent and obliquely truncate apically; legs long, first segment of hind tarsus as long as following two segments united.

Female.—Last five antennal segments entirely ochraceous, subcylindrical, depressed areas indistinct, sixth partly reddish; elytra gradually narrowed; femora more extensively ochraceous, first pair entirely so. Length 18-20 mm.; breadth 4.5-4.8 mm.

A series of specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt collection) was collected at Taam-yuen-tung, Lien District, N. Kwangtung, June 4-6, 1935, by F. K. To. New to Kwangtung.

Distribution.—Fukien and Kwangtung Provinces, S. China.

8. **Strangalia kwangtungense** n. sp.

Male.—Moderately large, slender, narrowed posteriorly. Ground color brownish ochraceous; eyes blackish mottled with amber; antennae pitchy black, clothed with short auburn hairs, basal three segments brownish beneath, fourth and fifth partly reddish-brown on undersides; elytra with an internally rounded lateral spot on each a little before middle, followed by a less distinct brownish spot, sides brownish on apical three-fifths, apices piceous; last abdominal segment black, sides of second to fourth segments black at bases; posterior femora black on apical two-fifths; hind tibiae entirely pitchy black; middle tibiae and tarsi partly piceous. Body largely clothed with short, golden or brownish pubescence.

Head long and narrow, produced anteriorly; eyes greatly swollen, nearly round; clypeus sparsely punctured; frons longer than broad, densely micropunctulate above triangular impunctate area; genae long, finely punctulate; occiput flattened, finely grooved medially, just perceptably punctulate. Antennae practically reaching to elytral apices, slender, post-median segments but slightly thickened, nearly cylindrical, with apical depressed areas small and indistinct; third segment one-fourth longer than scape; fifth segment slightly longer than third and one-third longer than fourth. Prothorax distinctly longer than broad, strongly narrowed at apex, only slightly broadened at base and slightly rounded at sides before middle; disk moderately swollen, micropunctulate, with a narrow,

glabrous, impunctate, piceous stripe on mid-line, ending some distance from apex and base. Scutellum triangular, subacute posteriorly. Elytra long, strongly narrowed beyond basal third, dehiscent and bent outward in apical third; apices slightly narrowed and subobliquely truncate; surface finely punctured throughout. Ventral surface minutely punctulate; metasternum short; metepisternum broad, slightly narrowed behind; abdomen slender, last segment strongly narrowed behind; abdomen slender, last segment strongly emarginate apically below; posterior femora slender, almost parallel-sided; posterior tibiae slightly arched. Length 19 mm.; breadth 3.5 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Lung-t'au Shan, K'uh-kiang District, Kwangtung Province, S. China, July 19, 1924, W. T. Tsang.

Differs from *S. castaneonigra* (Gressitt) in being largely dull orange instead of black with yellowish-chestnut markings, and in having the head much longer anteriorly, the pronotum much more finely punctured, the scutellum more narrowed behind, the elytra distinctly truncate apically and more finely punctured, etc. Differs from *S. longicorne* (Gressitt) in having head, prothorax and ventral surface orange-brown instead of black, eighth to tenth antennal segments black instead of white, punctuation finer, etc.

Subfamily **Cerambycinae**

Key to Kwangtung Tribes of Cerambycinae

1. Eyes coarsely facetted 2
   Eyes finely facetted 5
2. Middle coxal cavities open to epimera exteriorly 3
   Middle coxal cavities closed to epimera exteriorly 4
3. Anterior coxal cavities angulate exteriorly, open posteriorly; intercoxal process of prosternum not dilated posteriorly; antennae hairy internally, fourth segment distinctly longer than scape.....**Hesperophanini**
   Anterior coxal cavities rounded externally, open posteriorly; intercoxal process of prosternum dilated behind; fourth antennal segment subequal in length to scape .....**Cerambycini**
4. First abdominal segment not particularly longer than following; prothorax not strongly constricted basally .....**Callidiopsini**
   First abdominal segment generally at least as long as remaining united, following segments abnormal, second with a fringe of hairs; prothorax constricted basally .....**Obriini**
5. Anterior coxal cavities angulate externally; femora pedunculate-clavate; elytra often abbreviated .....**Molorchini**
   Anterior coxal cavities rounded externally 6
6. Scent pores visible near postero-lateral angles of metasternum; prothorax generally swollen or tuberculate laterally; scutellum moderately large, acute behind; middle coxal cavities open to epimera externally..... 7
   Scent pores lacking; prothorax generally rounded or subcylindrical and non-tuberculate laterally; scutellum small, or broad and rounded behind 8
7. Anterior coxal cavities closed, or nearly closed, posteriorly; body elongate, often narrowed posteriorly .....**Callichromini**

   Anterior coxal cavities open posteriorly; prothorax generally broader than long, often swollen or tuberculate above; body moderately broad, parallel .....**Stenaspini**
8. Anterior coxal cavities closed posteriorly; middle coxal cavities open externally to epimera; head obliquely inclined anteriorly; antennae generally serrate or bead-like 9
   Anterior coxal cavities open or closed posteriorly; if closed, middle coxal cavities closed externally to epimera; head vertical in front; antennal segments generally cylindrical or short and flattened 10
9. Posterior femora extending beyond elytral apices; antennae generally slender .....**Prothemini**
   Posterior femora not nearly reaching elytral apices; antennae generally broad .....**Pyrestini**
10. Anterior coxal cavities open anteriorly; middle coxal cavities open externally to epimera .....**Clytini**
    Anterior coxal cavities closed or nearly closed posteriorly; middle coxal cavities closed externally to epimera .....**Tillomorphini**

Tribe **Hesperophanini**

Hesperophanides Lacordaire, 1869, Gen. Col. 8 : 273.
Hesperophaninae Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 528.
Hesperophanini Gahan, 1906, Fauna Brit. India, Col. 1 : 109.

Genus **Stromatium** Serville, 1834

Stromatium Serville, 1834, Ann. Soc. Ent. France : 80 (type : *Callidium barbatum* Fabr.); Lacordaire, 1869, Gen. Col. 8 : 282; Gahan, 1906, Fauna Brit. India, Col. 1 : 114

9. Stromatium longicorne (Newman)

Arhopalus longicornis Newman, 1842, Entomologist : 246 (Philippine Is.).
Stromatium longicorne White, 1855, Cat. Col. Brit. Mus. 8 : 300.
Stromatium asperulum White, 1855, Cat. Col. Brit. Mus. 8 : 300 (Hong Kong).

Rusty brown; antennae and legs lighter reddish-brown. Body oblong, parallel; head abbreviated anteriorly; frons very short and depressed; eyes deeply emarginate, closely approaching bases of mandibles; antennae slender, twice as long as body in male, coarsely rugulose, with five feeble swellings on disk; scutellum short, rounded behind; elytra parallel, conjointly rounded apically, irregularly asperate-punctate, clothed with a thin, adpressed, buffy pile and sparse, suberect, reddish bristles; femora flattened and punctulate. Length 14-27 mm.; breadth 3.3-8 mm. (Description based on Hainan specimens.)

No specimens are contained in the present collections, but the species is included since the type of *S. asperulum* came from Hong Kong.

This species tunnels in the timber in houses, causing considerable damage to dwellings in the Riukiu (Loochoo) Is. and Formosa.

Distribution.—Philippines; Malay Peninsula and Archipelago; Siam; Burma; Assam; Hainan I.; Hong Kong; Formosa; Riukiu (Loochoo) Is.

Tribe **Cerambycini**

Cerambycides vrais Lacordaire, 1869, Gen. Col. 8 : 246.
Cerambycinae Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 507.
Cerambycini Gahan, 1906, Fauna Brit. India, Col. 1 : 119.

Key to Kwangtung Genera of Cerambycini

1. Prothorax rounded or bluntly swollen laterally; anterior coxal cavities rounded or only feebly angulate externally; head carinate, plane, or only partly grooved between upper lobes of eyes 2
   Prothorax sharply toothed laterally; anterior coxal cavities strongly angulate externally; head deeply grooved from vertex to middle of occiput; pronotum coarsely vermiculose .....**Nadhezdiella** Plavilst.
2. Antennae not strongly flattened and expanded anteriorly beyond fourth segment, third and fourth segments strongly thickened apically; pronotum somewhat depressed above; scutellum broader than long... 3
   Antennae distinctly flattened and expanded anteriorly beyond fourth segment, fourth segment much shorter than fifth; prothorax with a double constriction apically, convex on disk; scutellum as long as broad..... 4
3. Occiput partly carinate, partly sulcate, between eyes; antennae about twice as long as body in male; pronotum with a subcentral, smoothish, raised area; elytra truncate apically, densely and irregularly pubescent..... .....**Aeolesthes** Gahan
   Occiput nearly plane between eyes; antennae slightly longer than body in male; pronotum lacking a subcentral, raised area; elytra rounded apically, thinly and evenly pubescent .....**Margites** Gahan
4. Intercoxal process of prosternum bearing a prominent, laterally compressed protuberance; occiput grooved in middle; fourth antennal segment at least twice as long as broad; prothorax broader than long, narrower than elytra .....**Trachylophus** Gahan
   Intercoxal process of prosternum feebly raised, evenly arched; occiput with a median raised line; fourth antennal segment nearly as broad as long; prothorax longer than broad, about as wide as elytra..... .....**Rhytidodera** White

Genus **Nadhezdiella** Plavilstshikov, 1931

Nadhezdiella Plavilst., 1931, Bestim. Tabell. europ. Coleopt. 100 : 71 (type: *Cerambyx cantori* Hope); Gressitt, 1937, Ling. Sci. Jour. 16:91.

10. Nadhezdiella cantori (Hope)

Cerambyx Cantori Hope, 1845, Trans. Ent. Soc. London 4 : 11 (Chusan Is., E. China); Lacordaire, 1869, Gen. Col. 8 : 251, note 2; Gahan, 1890, Ann. Mag. Nat. Hist., ser. 6, 6 : 249.
Cerambyx scabricollis Chevrolat, 1852, Rev. Zool., ser. 2, 4 : 416 (Hong Kong).
Cerambyx lucasi Brogniart, 1892, Nouv. Arch. Mus. Paris, ser. 3, 3 : 238, pl. 10, fig. 1 (Siam), n. syn.

Male.—Black, thinly clothed with silvery-gray pubescence. Antennal supports subacutely raised, overhanging vertex; occiput deeply grooved medially; antennae two-thirds again as long as body, scape rough, third segment longer than fourth and shorter than fifth; prothorax nearly as long as broad, acutely spined at each side,

coarsely and irregularly vermiculate above; elytra long, parallel and smooth, rounded apically with a small tooth at sutural angle; first hind tarsal segment hardly as long as following two together.

Female.—Antennae not quite as long as body, fifth and following segments toothed ectoapically. Length 44-50 mm.; breadth 12-13.5 mm. (Description based on Formosan material.)

Specimens in Ling. Nat. Hist. Surv. Mus. from Canton, Kwangtung Prov.

Distribution.—Kiangsu; Chusan Is. (Chekiang); Kwangtung; Hong Kong; Formosa; Siam.

Genus **Aeolesthes** Gahan, 1890

Aeolesthes Gahan, 1890, Ann. Mag. Nat. Hist., ser. 6, 6 : 250 (type : *Hammaticherus aurifaber* White); 1906, Fauna Brit. India, Col. 1 : 126.

11. Aeolesthes induta (Newman)

Hammaticherus indutus Newman, 1842, Entomologist 1 : 245 (Manila, Philippines).
Aeolesthes induta Gahan, 1890, Ann. Mag. Nat. Hist., ser. 6, 6 : 253; 1906, Fauna Brit. India, Col. 1 : 128.

Brownish-black, entirely clothed with moderately dense, adpressed pubescence of a pale golden brown color, lying in different directions on elytra so as to give a varying pattern, according to the light. Body parallel, head slightly produced anteriorly, with a deep depression on either side of middle of frons; eyes triangular below, deeply emarginate, and narrow above; neck coarsely granulose; antennae two-thirds again as long as body in male, slightly longer in female, scape roughly corrugated transversely, nearly as long as third segment, fifth shorter than third and longer than fourth; prothorax about as broad as long, irregularly rounded laterally, constricted anteriorly, disk with a median raised area edged with depressed areas crossed by transverse corrugations, remainder of pronotum coarsely vermiculose; scutellum short, obtuse behind; elytra parallel, their apices suddenly narrowed and subobliquely truncate with angles briefly toothed, surfaces finely punctured on basal two-thirds; underside of head with a deep, arcuate depression between genae. Length 26 mm.; breadth 7 mm.

A female (Ling. Nat. Hist. Surv. Mus.) was taken on Honam Island, Canton, on April 20, 1935, by Prof. Wm. E. Hoffmann; a male (Gressitt collection) was collected on the Lingnan University campus, Honam Island, Canton, in May 1933.

Distribution.—Philippines; Borneo; Java; Sumatra; Siam; Burma; Ceylon; Annam; Kwangtung; Formosa.

Genus **Margites** Gahan, 1891

Margites Gahan, 1891, Ann. Mag. Nat. Hist., ser. 6, 7 : 26; 1906, Fauna Brit. India, Col. 1 : 137.

12. **Margites egenus** (Pascoe) (pl. 1, fig. 3)

Cerambyx egenus Pascoe, 1857, Trans. Ent. Soc. London, ser. 2, 4 : 236 (N. China).[6]

Margites egenus Gahan, 1891, Ann. Mag. Nat. Hist., ser. 6, 7 : 26.

Male.—Moderate sized, subparallel, strongly compressed dorso-ventrally. Body dark brown, nearly black on pronotum, thinly clothed with pale grayish pubescence, somewhat goldish on metasternum; spots on sides of prothorax, and scutellum, clothed with dense golden pubescence. Head abbreviated anteriorly, closely and finely punctured on frons and vertex and granulose on occiput; antennae one-fourth longer than body, with scape, third, and fourth segments swollen and rounded at apices, third a little longer than scape; prothorax slightly longer than broad, constricted at apex and base, irregularly rugulose on disk; elytra rounded apically, densely and finely rugulose-punctate. Length 21 mm.; breadth 5.6 mm.

A single specimen (Ling. Nat. Hist. Surv. Mus.) was collected at Sing-tsz-chan, Lien District, N. Kwangtung Prov., May 22-23, 1934, by F. K. To. New to Kwangtung.

Distribution.—"N. China"; N. Kwangtung.

Genus **Trachylophus** Gahan, 1888

Trachylophus Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 2 : 59 (type : *T. sinensis* Gahan); 1906, Fauna Brit. India, Col. 1 : 145.

13. **Trachylophus sinensis** Gahan

Trachylophus sinensis Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 2 : 60 (S. China); 1906, Fauna Brit. India, Col. 1 : 146, fig. 58; Gressitt, 1937, Ling. Sci. Jour. 16 : 447.

Elongate, parallel-sided, depressed-cylindrical. Ground color blackish on head and prothorax, dark reddish-brown on antennae and legs, reddish-brown on elytra, and dull reddish or piceous on ventral surfaces; body entirely clothed with thin, but close, adpressed pale golden hairs, those on undersurface of thorax obliquely raised. Head a little longer than broad; eyes large and strongly swollen, closely approximate above; frons transverse, with a deep impression on either side of middle; occiput grooved behind middle; neck covered with transverse or oblique granules; antennae one-fourth longer than body in male, subequal to body in female; scape narrow, parallel, closely punctured, nearly as long as third segment; fourth two-thirds as long as third segment; fifth longer than third; prothorax a little broader than long, constricted anteriorly, obtusely swollen at sides; surface coarsely rugulose, with a raised subhexagonal figure on middle of disk; elytra long, truncate apically with sutural angle spined; surface micropunctulate. Length 34 mm.; breadth 9 mm.

[6] It is more likely that those species described from "North China" by Pascoe and White in the 1850's, many of them collected by Robert Fortune, were from around Shanghai and Chekiang, in east central China, rather than from northern China.

A single female (Gressitt collection) was taken at Yim-na Shan, alt. 630 meters, Mei District, E. Kwangtung Prov., June 11, 1936, by J. L. Gressitt.

Distribution.—Burma; Kwangtung; Formosa.

Genus **Rhytidodera** White, 1853

Rhytidodera White, 1853, Cat. Col. Brit. Mus. 7 : 132 (type : *R. Bowringii* White); Lacordaire, 1860, Gen. Col. 8 : 267; Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 524; Gahan, 1906, Fauna Brit. India, Col. 1 : 146.

14. **Rhytidodera bowringii** White

Rhytidodera Bowringii White, 1853, Cat. Col. Brit. Mus. 7 : 133, pl. 4, fig. 1 (Hong Kong).

"R. fusca, elytris singulis plurimis maculis ochraceis lineatim ordinatis, corpore subtus pedibusque pilis cinereis tectis.

"Head above the labrum punctured, between the antennae ridged and hairy; behind the eyes roughly punctured, the punctures running together. The thorax in front and behind transversely ridged, between these ridges and the numerous longitudinal ridges of the middle portion are several scattered yellowish hairs. Scutellum covered closely with yellowish hairs. Elytra closely punctured, the punctures often running together, and with many scattered greyish-yellow hairs and linear spots of yellowish hairs arranged in five longitudinal lines, the spots near the base often wanting, and from the middle to the tip arranged as it were in four transverse bands. Antennae covered with a close brownish pubescence; under side of body and legs covered with adpressed grey hairs. Length 13 lines." (Copy of original description.)

There is a specimen in the Ling. Nat. Hist. Surv. Mus. collected on Honam Island, Canton, Kwangtung Prov.

Distribution.—Hong Kong; Kwangtung.

Tribe **Callidiopsini**

Callidiopsides Lacordaire, 1869, Gen. Col. 8 : 340.

Callidiopsini Gahan, 1906, Fauna Brit. India, Col. 1 : 154.

Callidiopini Aurivillius, 1912, Col. Cat. 39 : 115.

Genus **Ceresium** Newman, 1842

Ceresium Newman, 1842, Entomogist 1 : 322 (type : *C. raripilum* Newm.); Lacordaire, 1869, Gen. Col. 8 : 353; Gahan, 1906, Fauna Brit. India, Col. 1 : 156.

Diatomocephala Blanchar, 1853, Voy. Pole Sud, 4 : 266 (type : *Stenocorus simplex*).

Pneumida Thomson, 1864, Syst. Ceramb. : 191 (type : *P. argenteofasciata* Th.).

Rhaphidera Perr., 1855, Ann. Soc. Linn. Lyons, ser. 2, 2 : 336.

15. **Ceresium sinicum** White

Ceresium Sinicum White, 1855, Cat. Col. Brit. Mus. 8 : 245 ("N. China").

Moderately slender; reddish testaceous, antennae and elytra slightly paler; body sparsely clothed with pale buffy hairs, densest

on scutellum and sides of pronotum. Head depressed; mandibles projecting anteriorly; vertex broad, feebly depressed and rugulose-punctate; antennae little longer than body, slender; scape punctate, barely longer than third segment; third slightly longer than fourth, and a little shorter than fifth to seventh segments; prothorax one-fourth longer than broad, cylindrical, nearly parallel-sided, feebly convex above, foveate-punctate with a smooth median line; scutellum triangular; elytra narrow, entirely punctured, subtruncate apically; femora pedunculate-clavate. Length 11 mm.; breadth 2.8 mm.

A single specimen (Ling. Nat. Hist. Surv. Mus.) was taken from a camphor tree (*Cinnamomum Camphora* (L.) Nees & Ebrm.) at Canton, Nov. 29, 1928. New to Kwangtung.

Distribution.—N. China; Peking; Shanghai; Chekiang; Kwangtung.

Tribe **Obriini**

Obrionides Lacordaire, 1869, Gen. Col. 8 : 360.
Obriinae Pascoe, Trans. Ent. Soc. London, ser. 3, 3 : 556.
Obriini Gahan, 1906, Fauna Brit. India, Col. 1 : 164; Gressitt, 1935, Insecta Matsumurana 9 : 144.

Genus **Stenhomalus** White, 1855

Stenhomalus White, 1855, Cat. Col. 8 : 243 (type : *S. fenestratus* Wh.); Lacordaire, 1869, Gen. Col. 8 : 362; Gahan, 1906, Fauna Brit. India, Col. 1 : 166; Gressitt, 1935, Insecta Matsumurana 9 : 146.

16. **Stenhomalus fenestratus** White

Stenhomalus fenestratus White, 1855, Cat. Col. Brit. Mus. 8 : 243, pl. 8, fig. 2 (N. China); Gahan, 1906, Fauna Brit. India, Col. 1 : 166, fig. 65; Gressitt, 1935, Insecta Matsumurana 9 : 147.

Female.—Small, constricted before middle; reddish-brown, antennae testaceous beyond bases, elytra dusky brown, reddish testaceous basally, each with a roundish pale testaceous spot near suture just before middle and another smaller spot at beginning of apical quarter; body sparsely clothed with erect hairs, antennae with a long bristle at inner apices of third, fourth and fifth segments. Head broad, constricted behind eyes; frons short, narrowed anteriorly, medially grooved; eyes very large, closely approximate above; antennae tapering, third and fourth segments subequal, each about two-thirds as long as scape, and three-fifths as long as fifth segment; prothorax strongly constricted basally, obtusely tuberculate laterally, sparsely and minutely punctulate; elytra closely punctured basally, sparsely so posteriorly; first abdominal segment as long as remaining combined, second segment edged posteriorly with long hairs. Length 7.2 mm.; breadth 2 mm.

A single female (Gressitt collection) was taken at Tsin-leong Shan, alt. 850 meters, Mei District, E. Kwangtung, June 3, 1936, J. L. Gressitt.

Distribution.—"N. China"; Kwangtung; Formosa; N. India.

Tribe **Molorchini**

Molorchides Lacordaire, 1869, Gen. Col. 8 : 482.
Necydalinae Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 565.
Stenopteri Leconte, 1873, Smiths. Misc. Coll. 9 :265.
Molorchini Gahan, 1906, Fauna Brit. India, Col. 1 : 169.

Key to Kwangtung Genera of Molorchini

Elytra very much abbreviated; antennae and legs long and slender; femora suddenly clavate; prothorax strongly constricted basally..... .....**Molorchus** Fabricius

Elytra entire, narrowed in middle; antennae and legs short, not very slender; femora gradually swollen; prothorax not strongly constricted basally... .....**Microdebilissa** Pic

Genus **Molorchus** Fabricius, 1792

Molorchus Fabricius, 1792, Ent. Syst. 1, 2 : 356 (type : *Necydalus minor* Linn.).
Heliomanes Newman, 1840, Ann. Mag. Nat. Hist. 5 : 17.
Glaphyra Newman, 1842, Entomol. 1 : 19 (type : *G. seminsta* Newm.).
Laphyra Newman, 1842, Entomol. 1 : 418 (new name for *Glaphyra*).
Caenoptera Bedel, 1889, Faune Col. Seine 5 : 18.

17. **Molorchus insularis** (White)

Heliomanes insularis White, 1855, Cat. Col. Brit. Mus. 8:179 (Hong Kong).
Molorchus insularis Aurivillius, 1912, Col. Cat. 39 : 267.

I quote the original description, as I have seen no material:

"H. niger, thorace punctato-reticulato, lateribus parallelis; elytris medio pallidis apice piceis; antennis rufiusculis; pedibus piceis.

"Black, the antennae reddish; thorax somewhat elongated; sides nearly parallel, the upper surface covered with reticulations formed of large shallow punctures. Elytra pale in the middle, pitch-coloured at the tip. Legs pitchy, tibiae paler; abdomen blackish-brown, segments punctured on the under side.

"*Hab.* China (Hong Kong). J. C. Bowring, Esq.

"This small species is of the same size as *H. umbellatarum*, to which it is nearly allied."

Genus **Microdebilissa** Pic, 1925

Microdebilissa Pic, 1925, Mel. Exot. Ent. 44 : 16 (type : *M. bipartita* Pic).
Microdebilia Liu, 1934, Ling. Sci. Jour. 13 : 120.

18. **Microdebilissa serratipenne** Gressitt

Microdebilissa serratipenne Gressitt, 1937, Ling. Sci. Jour. 16 : 450, pl. 4, fig. 3 (Yim-na Shan, E. Kwangtung, S. China).

Reddish-brown: anterior portion of body, with bases of first six, and apex of last, antennal segments, and bases of middle and hind femora reddish testaceous; scutellum, elytra, and remainder of antennae dull reddish-brown; middle and hind legs very dark reddish-brown; apical tarsal segments reddish; metathorax dark reddish-brown, abdomen brownish-black, last two segments lighter. Antennae, dorsal surface and posterior femora nearly glabrous; hind

thorax and abdomen clothed with very fine pale pubescence. Head gradually narrowed behind eyes; frons short; vertex horizontal; eyes prominent, divided; antennae four-fifths as long as body, third segment shorter than scape, fourth and following segments; prothorax as long as broad, weakly rounded laterally, minutely granular; scutellum rounded; elytra constricted medially, separately rounded apically, margins finely serrated, surfaces densely punctured; first abdominal segments nearly as long as remaining combined; first hind tarsal segment slightly longer than following two segments united. Length 5 mm.; breadth .5 mm.

Known only from the type, collected by the writer at Yim-na Shan, E. Kwangtung, on June 15, 1936, and placed on loan deposit in the California Academy of Sciences.

Distribution.—E. Kwangtung.

Tribe **Callichromini**

Callichromides Lacordaire, 1869, Gen. Col. 9 : 1.

Callichromini Gahan, 1906, Fauna Brit. India, Col. 1 : 189.

Key to Kwangtung Genera of Callichromini

1. Antennae much longer than body in male; scape angulate externally at apex; prothorax more or less sharply tuberculate laterally..... 2
   Antennae barely longer, or shorter, than body in male; scape not distinctly produced externally at apex; prothorax bluntly tuberculate laterally. 3
2. Pronotum more or less flat, with fine vermiculate striolation and sometimes minute granulation in middle; posterior femora distinctly exceeding elytral apices in male; first segment of hind tarsus generally longer than remaining segments combined.....**Chloridolum** Thomson
   Pronotum with four or five rounded swellings; surface smooth, punctuate or rugulose; posterior femora not, or barely, exceeding elytral apices in male; first hind tarsal segment generally shorter than remaining segments combined .....**Aromia** Serville
3. Prothorax distinctly broader than long, with four or five more or less distinct swellings on disk; generally black or violet 4
   Prothorax about as long as, or longer than, broad, without swellings on central portion of dorsal disk; generally metallic green 5
4. Pronotum with feeble swellings and coarse rugae; first hind tarsal segment less than twice as wide as thick; elytra clothed with thin pubescence.....**Embrik-Strandia** Plavilst.
   Pronotum with five distinct swellings on disk; first hind tarsal segment at least three times as wide as thick; elytra nearly glabrous.....**Asiodiphrum** Plavilst.
5. Prothorax about as long as broad, or slightly broader than long, transversely grooved at apex and base; body less than four times as long as broad; elytra narrowed posteriorly 6
   Prothorax longer than broad, not grooved transversely at apex and base; body nearly five times as long as broad; elytra nearly parallel.....**Polyzonus** Castelnau
6. Posterior femora not reaching elytral apices in either sex; prothorax slightly broader than long; scape subangulate ectoapically.....**Aphrodisium** Thomson
   Posterior femora reaching, or exceeding, elytral apices in female, and extending beyond them in male; prothorax generally about as long as broad; scape rounded apically .....**Chelidonium** Thomson

Genus **Embrik-Strandia** Plavilstshikov, 1931

Embrik-Strandia Plavilst., 1931, Folia zool. hydrobiol. 3 : 278 (type : *Callichroma bimaculatum* White).

19. **Embrik-Strandia bimaculata** (White)

Callichroma bimaculatum White, 1853, Cat. Col. Brit. Mus. 7 : 165 ("N. China").

Callichroma? davidis Deyrolle, 1878, Ann. Soc. Ent. France, ser. 5, 8 : 132, pl. 3, fig. 8 (central China); Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 2 : 60.

Embrik-Strandia bimaculata Plavilstshikov, 1931, Folia zool. hydrobiol. 3 : 278.

Male.—Body black, crossed by a broad orange-yellow transverse band on second quarter of elytra, last six antennal segments and apex of fifth segment of the same color; clothed with very short suberect hairs corresponding in color to surfaces. Head slightly produced anteriorly; frons nearly square; vertex shallowly concave, narrowly grooved medially, occiput finely rugulose; antennae barely longer than body; scape hardly more than one-half as long as third segment, and three-fourths as long as fourth, basal segments slender, apical segment thickened and briefly toothed ectoapically; prothorax broader than long, bluntly tuberculate laterally, constricted near base and at extreme apex, coarsely rugulose, with feeble swellings on dorsal surface; scutellum triangular, narrowed apically, concave; elytra gradually narrowed, incompletely rounded apically; posterior femora slightly exceeding elytral apices; first hind tarsal segment somewhat longer than following two segments united.

Female.—Antennae not quite as long as body; posterior femora not reaching apices of elytra.

Length 22-31 mm.; breadth 6.3-10 mm.

Two specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected on Lantau Island, near Hong Kong, by Y. W. Djou, in 1934: a male at Tungchung, August 16, and a female at Lin-wa-toi, August 10. New to Kwangtung.

Distribution.—Kiangsu; Kiangsi; central China; Szechwan; Kwangtung (Lantau I.); Formosa.

Genus **Asiodiphrum** Plavilstshikov, 1934

Asiodiphrum Plavilst., 1934, Sbornik entom. odd. Nar. Musea v. Praze 12 (107) : 221 (type : *A. nigrofasciatum* Plav.).

20. **Asiodiphrum nigrofasciatum** Plavilstshikov

Asiodiphrum nigrofasciatum Plavilst., 1934, l.c. : 222 (Guifu Shank, Szechwan, W. China).

Male.—Body black, with steel-blue or violet reflections; elytra testaceous yellow with a broad, irregularly bordered black band across central portion, slightly closer to base than apex and occupying nearly one-half elytral area, legs dark greenish on femora, greenish-blue or steely blue on tibiae and tarsi; head and prothorax

clothed in part with velvety pubescence; elytra with very short adpressed hairs. Head abbreviated anteriorly; clypeus and genae short; frons squarish; vertex swollen laterally, concave in middle; occiput carinate medially between upper eye-lobes; antennae a little longer than body, scape two-thirds as long as third segment and three-fourths as long as fifth, third and following segment, slightly produced at apices; prothorax broader than long, strongly and bluntly tuberculate laterally, constricted basally, with a strong swelling at each side just before apex; pronotal disk with fine rounded swellings, forming an inverted W; scutellum narrowly triangular, grooved; elytra narrowed posteriorly; posterior femora slender, slightly exceeding elytral apices; first hind tarsal segment nearly as long as remaining combined, very strongly compressed laterally. Length 22 mm.; breadth 7 mm.

A single male specimen (Ling. Nat. Hist. Surv. Mus.) was collected on flowers at Big Pool, alt. 2,600 feet, Loh-fau Shan, near Canton, south central Kwangtung, on Aug. 22, 1933, by E. R. Tinkham. New to Kwangtung Province.

Distribution.—Western and southern China: Szechwan; Kwangtung.

Genus **Aromia** Serville, 1833

Aromia Serville, 1833, Ann. Soc. Ent. France 2 : 559 (type : *Cerambyx moschatus* Fabr.); Lacordaire, 1869, Gen. Col. 9 : 14; Reitter, 1906, Wien Ent. Zeit. 25 : 275.

21. **Aromia cyanicornis** subsp. **ruficollis** Redtenbacher

Aromia cyanicornis subsp. *ruficollis* Redt., 1868, Reise Novara, Col. : 194 (Hong Kong).

Shining black with a slight bluish tinge; prothorax bright red except for apical and basal constricted portions and ventral surface; antennae and legs steel-blue to violet or blackish; body nearly glabrous above, clothed with sparse black adpressed hairs beneath, undersides of antennal segments with suberect black bristles. Head slightly produced; genae prominent; vertex strongly raised at sides; occiput rugulose-punctate; antennae two-thirds again as long as body in male, a little longer than body in female, segments flattened or grooved above, carinate externally, apical segments briefly toothed ectoapically, fifth segment a little longer than fourth and nearly as long as third segment; prothorax a little longer than breadth at base, strongly and subacutely spined laterally, constricted and transversely corrugated apically and basally, feebly rugulose and with five swellings on disk, outer basal ones transverse and prominent; scutellum elongate-triangular, blunt; elytra smooth, sparsely punctured, narrowed and subangulate at apices. Length 33-35 mm.; breadth 9.8-10.5 mm.

Some specimens in Ling. Nat. Hist. Surv. Mus., from Canton.

This species attacks living fruit trees of the genus *Prunus*.

Distribution.—Hong Kong; Kwangtung.

Genus **Chloridolum** Thomson, 1864

Chloridolum Thomson, 1864, Syst. Ceramb : 174, 420; (type : *Callichroma bivittatum* White); Lacordaire, 1869, Gen. Col. 9 : 18; Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 583; Gahan, 1906, Fauna Brit. India, Col. 1 : 190, 198.

Key to Kwangtung Species of Chloridolum

1. Elytra with a shining, sparsely punctured, transversely corrugated area along suture near base; pronotum bluish or violet on middle of disk; elytra dull green 2
   Elytra finely and closely punctured up to suture on basal portion; pronotum entirely green; scutellum black; elytra brilliant golden green..... **scutellatum** n. sp.
2. Middle of pronotum, and scutellum, greenish-blue, pubescent, partially granulose; scape acutely produced ectoapically..... **cyaneonotatum** Pic ?
   Middle of pronotum violet, glabrous, entirely vermiculate; scutellum green, glabrous, longitudinally striolate; scape barely produced ectoapically ..... **loochooanum kwangtungum** n. subsp.

22. **Chloridolum cyaneonotatum** Pic ?

Chloridolum cyaneonotatum Pic, 1925, Mel. Exot. Ent. 44 : 18 (Tongking).

Female.—Dull green head, sides of prothorax and basal portion of suture shining golden-green or blue-green; scutellum and middle of pronotal disk bluish-violet, pubescent; antennae and legs dark steel blue or violet to black, scape and middle femora blue-green; ventral surface of body golden green clothed with thin silvery pubescence; undersides of antennal segments with short bristles. Head moderately rugulose-punctate in front, finely granulose-punctate on occiput, slightly concave and medially grooved at vertex; antennae one-fifth longer than body, with scape coarsely punctured and about two-thirds as long as third segment, and fifth a little longer than fourth and nearly equal to third; prothorax about as long as broad, briefly tuberculate laterally, subtransversely plicate on sides of pronotum, feebly so on apical and basal constricted portions, finely granulose and partly rugulose on disk; scutellum subtriangular, granulose, pubescent; elytra evenly narrowed, finely and closely punctured except along suture near base, where it is nearly impunctate and feebly corrugated transversely; anterior and middle femora coarsely punctured, posterior pair finely so; first hind tarsal segment as long as remaining united. Length 23 mm.; breadth 5.2 mm.

A single female (Ling. Nat. Hist. Surv. Mus.) was taken at Lung-t'au Shan, K'uh-kiang District, Kwangtung, July 20, 1924, by W. T. Tsang. New to China.

Distribution.—Tongking (Indo-China); Kwangtung.

23. **Chloridolum loochooanum kwangtungum** n. subsp. (pl. 1, fig. 4)

Female.—Dull frosted green, slightly shining on ventral surfaces; prothoracic disk bluish-purple; occiput and antennal scapes purplish-blue; remainder of antennae purplish-black; legs bluish-purple,

antennae and middle femora greenish apically. Ventral surfaces thinly clothed with silvery pubescence; undersides of first few antennal segments and inner sides of tibiae with short black bristles.

Head deeply and sparsely punctured on occiput, corrugated at vertex, irregularly punctured and sculptured on frons, finely punctured on clypeus and genae, irregularly vermiculose below eyes and on gular region; vertex shallowly concave; frons slightly higher than wide. Antennae one-third again as long as body; scape rugulose-punctate and grooved above near base; third and following segments thickened at apices or briefly expanded ectoapically; third segment a little longer than fourth, slightly shorter than fifth; fifth to tenth gradually decreasing in length. Prothorax about as long as broad; each side with an obtuse swelling surmounted by a small subacute tubercle; surface irregularly vermiculate, sublongitudinally so along middle of disk, obliquely or sinuately so at sides, and transversely at apex and base. Scutellum rounded-triangular, hardly concave, longitudinally ridged. Elytra gradually narrowed, closely punctured, somewhat glossy on humeri and along basal portion of suture. Hind femora feebly swollen, considerably exceeding elytral apices; hind tibiae strongly compressed, feebly sinuate, first segment of hind tarsus longer than remaining segments united. Length 18 mm.; breadth 4 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Lung-ping-hui, Lien District, N. Kwangtung, May 16, 1934, F. K. To, collector.

Differs from *C. loochooanum* Gressitt (*Pan-Pacific Entomol.* 9: 163, 1934) in being more slender, with the elytra greener, the prothorax bluer, the pronotal disk vermiculate instead of punctate, the scutellum ridged instead of punctate, the elytra less finely punctured, etc., and from *C. loochooanum taiwanum* Gressitt in having the occiput ungrooved, the antennal segments more cylindrical, the prothorax less regularly striolate, the scutellum rougher, etc.

24. **Chloridolum scutellatum** n. sp.

Male.—Large; body bright green above, slightly bluish on mandibles, genae, prothoracic disk and along elytral suture, scutellum black, clothed with black pubescence; ventral surface iridescent greenish-blue to lavendar, clothed with silvery pubescence; prosternum brownish-purple, inter-coxal process tinged with bluish-green; antennae dark purplish steel blue basally, becoming black apically, legs dark purplish-blue, tarsi nearly black. A sparse fringe of oblique hairs on undersides of basal antennal segments; pronotum with some very short erect dark hairs on middle of disk; scutellum clothed with blackish hairs; elytra clothed with very short oblique black hairs; legs with longer, more erect hairs.

Head short, as broad as base of prothorax, feebly concave between antennal supports, narrowly grooved along middle of frons and vertex, genae very short; eyes large, inferior lobes obliquely transverse. Antennae twice as long as body; scape a little more than

one-half as long as third segment, bluntly angulate ectoapically; third to fifth segments distinctly grooved, following ones flattened, above; third to eleventh segments subequal in length, last longest, fourth shortest, third a little shorter than fifth. Prothorax a little longer than breadth at base, breadth at tubercles not quite as wide as shoulders; tubercles broad-based, suddenly acuminate, placed a little behind middle of sides; surface transversely plicated on apical and basal constricted portions and sides of disk, longitudinally and somewhat vermiculately rugulose along middle of disk; bases of tubercles smooth and feebly and sparsely punctulate. Scutellum longer than broad, gradually narrowed and acuminate apically; surface finely punctulate. Elytra long, gradually narrowed from shoulders to the conjointly rounded apices; entire surface densely punctured, a feeble mid-longitudinal raised line and a less distinct one between latter and suture, on each. Ventral surface of body sparsely punctured. Legs large; femora rugulose-punctate, hind femora exceeding elytral apices by about one-fourth their respective lengths; first hind tarsal segment three-fifths again as long as following two united. Length 31.5 mm.; breadth 7.7 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Fong-tong-ping, Lien District, N. Kwangtung Prov., July 2-3, 1934, F. K. To.

Differs from *C. thaliodes* Bates, of Japan, in being slightly larger and greener and in having the occiput sparsely punctured instead of plicate-rugulose, the prothorax longer and longtudinally plicate medially, the scutellum longer, more acute and purplish-black, the elytra more coarsely punctulate, the femora much rougher, etc.

Genus **Aphrodisium** Thomson, 1864

Aphrodisium Thomson, 1864, Syst. Cer.: 173 (type: *Callichroma cantori* Hope); Lacordaire, 1869, Gen. Col. 9: 11; Gahan, 1906, Fauna Brit. India, Col. 1: 205.

Key to Kwangtung Species of Aphrodisium

Prothorax about as long as broad; elytra bronzy green, distinctly narrowed, apices obtusely produced near suture; occiput grooved medially..... .....**sinicum** (White)

Prothorax distinctly broader than long; elytra blue green, subparallel, rounded-truncate apically; occiput smooth along middle...**crassum** n.sp.

25. **Aphrodisium sinicum** (White), n. comb.

Callichroma Sinicum White, 1853, Cat. Col. Brit. Mus. 7: 159 ("N. China").

Chelidonium sinicum Aurivillius, 1912, Col. Cat. 39: 316.

Male.—Elongate, narrowed posteriorly. Bronzy green, varied with other shades of green; antennae greenish on scape, violet on following segments and blackish apically; tibiae steely blue; tarsi blackish, base of first hind tarsal segment reddish; head golden-green; prothorax golden bronze at sides, bluish-green on central portion of disk with midline golden-green; scutellum golden-green; elytra dull green, bronzy on outer halves and bright green along

basal portion of suture; ventral surfaces golden-green to blue-green, clothed with thin silvery-white pubescence.

Head slightly abbreviated anteriorly; frons uneven, finely rugulose-punctate, depressed on either side and swollen in central portion with a median groove; vertex concave, swollen on each side near antennal insertions; occiput rugulose-punctate, medially grooved. Antennae one-fourth longer than body, moderately slender; scape and third to tenth segments briefly toothed ectoapically; scape densely punctured, three-fifths as long as third segment, three-fourths as long as fourth; fourth to tenth subequal in length. Prothorax as long as broad, slightly narrowed apically, briefly tuberculate laterally; surface irregularly rugulose-plicate in a more or less transverse direction, mid-line of disk traversed by a smooth stripe, depressed anteriorly. Scutellum triangular, blunt apically, shallowly concave, feebly corrugated near margins. Elytra elongate, gradually narrowed; apices bluntly produced near suture; surfaces finely vermiculate-punctate except along basal portion of suture where there is a narrow strip of transverse corrugations. Ventral surface micropunctulate; prosternum coarsely rugulose; metasternum with sparse, shallow punctures; fifth abdominal sternite feebly and obtusely emarginate apically; sixth sternite narrow, subacutely emarginate. Posterior femora more finely punctured than anterior pairs; first hind tarsal segment as long as remaining combined. Length 23-25 mm.; breadth 5-5.5 mm.

Female.—Antennae five-sixths as long as body; fifth abdominal sternite rounded-truncate apically; elytra purplish-bronzy externally. Length 27 mm.; breadth 6.2 mm.

A male (Ling. Nat. Hist. Surv. Mus.), was taken at Taam-yuen-tung, Lien District, N. Kwangtung Prov., May 26-27, 1934, F. K. To; a female (Gressitt collection), same data; three male specimens (Ling. Nat. Hist. Surv. Mus.), May 25 to June 6, 1934. New to Kwangtung.

26. **Aphrodisium crassum** n. sp.

Male.—Broad, abbreviated, subparallel. Largely of a rich, slightly bluish-green above; head and prothorax partly golden-green; labrum largely testaceous; antennae dark purplish-violet, blackish apically; femora purplish-violet; tibiae blackish-violet; tarsi black; ventral surface of body light blue-green or golden-green, clothed with a thin but close silvery-white pubescence; some very short and indistinct erect black hairs on each side of middle of pronotal disk.

Head moderately produced anteriorly, feebly concave and grooved between antennal insertions; occiput finely rugulose-punctate behind, smooth in middle, and subtransversely corrugated between superior lobes of eyes; frons finely rugulose-punctate above; clypeus more sparsely so. Antennae four-fifths as long as body, moderately thick; scape and sixth to tenth segments angulate ectoapically; scape closely punctured, three-fifths as long as third segment and slightly

longer than fourth; fourth to tenth gradually decreasing in length. Prothorax a little broader than long, bluntly tuberculate at middle of each side; pronotal disk raised, fairly even, constricted anteriorly and posteriorly by transverse grooves, marked by three longitudinal golden-green stripes of irregular subtransverse corrugations, two intervening oblong areas finely punctulate and subvermiculate, darker blue-green with short erect black hairs. Scutellum subtriangular, blunt apically, nearly impunctate. Elytra relatively short, subparallel, rounded apically; surface microvermiculose-punctate, more finely so on inner portion, but coarsely rugulose along suture in basal half. Ventral surface of body micropunctulate, coarsely rugulose-punctate on prosternum; fifth abdominal sternite broadly emarginate, sixth feebly emarginate. Legs with femoral clubs equally coarsely punctured; first hind tarsal segment a little longer than following two united. Length 24 mm.; breadth 6 mm.

Female.—Antennae not quite three-fourths as long as body; fifth abdominal sternite strongly emarginate at middle of apical margin. Length 37 mm.; breadth 7.4 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Cheung-t'ong-ts'uen, Sheung-shui-heung, Lien District, N. Kwangtung Prov., August 21, 1934, F. K. To; allotopotype, female (Gressitt collection), same data.

Differs from *A. neoxenum* (White) in being much shorter, with the pronotum more even and largely punctulate instead of transversely striolate, the posterior portion of disk not strongly raised, the elytra closely punctulate instead of feebly rugulose, the anterior and middle femora without red, the posterior femora thicker, the hind tarsi shorter, etc.

Genus **Chelidonium** Thomson, 1864

Chelidonium Thomson, 1864, Syst. Ceramb: 175, 420 (type: *Cerambyx argentatum* Dalm.); Gahan, 1906, Fauna Brit. India, Col. 1: 210.

Leontium Lacordaire, 1869, Gen. Col. 9: 19; Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3: 595 (not of Thomson).

Key to Kwangtung Species of Chelidonium

1. Scutellum punctured and clothed with fine dark hairs; occiput largely rough or rugulose-punctate; antennal segments not acuminately produced ectoapically 2
   Scutellum shiny, impunctate and glabrous; occiput smooth or grooved and impunctate in center; fifth and following antennal segments acutely toothed ectoapically 3
2. Pronotal disk somewhat irregular, coarsely rugulose, with small punctures in the interstices; femora strongly swollen; scape and femoral clubs brilliant purple .....**purpureipes** n. sp.
   Pronotal disk largely even above, medially grooved anteriorly, finely rugulose on either side of mid-line, suddenly becoming coarsely rugulose; antennae and legs greenish-violet.....**sinense** (Hope)?
3. Pronotum distinctly striolated transversely, raised on each side near posterior border of disk .....**gibbicolle** (White)
   Pronotum finely rugulose-punctate on each side of midline, which latter, as well as sides, is coarsely rugulose; antennal segments strongly spined .....**argentatum** (Dalman)

27. **Chelidonium argentatum** (Dalman)

Cerambyx argentatum Dalman, 1817, Schönherr Sys. Ins., append. : 151 (China).

Chelidonium argentatum Thomson, 1864, Syst. Ceramb.: 176; Gahan, 1906, Fauna Brit. India, Col. 1 : 211.

Male.—Elongate, slightly narrowed posteriorly; dark green above; head blue-green to golden green; antennae and legs purplish-violet; anterior and middle femora bluish-green and tarsi blackish; ventral surfaces golden green, clothed with a close, thin, silvery pubescence. Head closely punctured on vertex and upper portion of frons, smooth and impunctate on central portion of occiput and a transverse band across lower part of frons; antennae a little longer than body, strongly spined; prothorax transversely rugulose-punctate above, with an incomplete, shining median stripe; scutellum smooth and glabrous; elytra finely rugulose-punctate, more coarsely rugulose near suture. Length 24-27 mm.; breadth 5.8-6 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected on Australian lemon (*Citrus limonia* var.) on Honam Island, Canton, P'an-yu District, Kwangtung Prov., in 1931 and June 1932, by Prof. Wm. E. Hoffmann.

Distribution.—"China"; Kwangtung; Burma; Assam; S. India.

28. **Chelidonium gibbicolle** (White)

Callichroma gibbicolle White, 1853, Cat. Col. Brit. Mus. 8 : 160 ("N. China").

Chelidonium gibbicolle Gahan, 1906, Fauna Brit. India, Col. 1 : 213, fig. 80.

Male.—Dark green, head and prothorax tinged with golden blue; elytra bronzy or blackish; antennae and legs violet to greenish, purplish or black. Head finely punctulate on frons and vertex, smoothish and longitudinally ribbed or grooved; antennae slightly longer than body, briefly toothed; prothorax slightly longer than breadth at base, transversely plicate above except at posterior and anterior raised diskal areas, where plications recurve; scutellum smooth, concave; elytra long, narrowed and rounded apically, microvermiculose-punctulate, coarsely so at suture and base; fifth and sixth abdominal sternites rounded-emarginate apically; middle femora finely punctured; first hind tarsal segment fully as long as remaining combined. Length 23-26 mm.; breadth 5.2-5.8 mm.

Female.—Antennae four-fifths as long as body; fourth abdominal sternite with an arcuate depression at apex, fifth sternite barely emarginate. Length 27 mm.; breadth 7 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Taam-yuen-tung, Lien District, N. Kwangtung, June 2-19, 1934, by F. K. To. New to Kwangtung Province.

Distribution.—Kwangtung; "N. China"; Formosa; Assam; Sylhet.

29. **Chelidonium purpureipes** n. sp.

Male.—Bright green, appendages purple; head and prothorax golden green, tinged with purplish on mandibles, labrum, clypeus, genae, vertex and sides of prothorax; antennae purplish, apical portions blackish; scutellum bluish; elytra dark green, slightly goldish towards margin and bluish near suture; ventral surface golden green clothed with silvery-white pubescence, pro- and meso-sterna bluish-green with purplish and golden tints; tarsi purplish, violet or blackish, base of first hind tarsal segment reddish.

Head finely punctulate, sparsely so on genae and densely so on frons and occiput; clypeus rugose-punctate, with longitudinal ridges anteriorly and transverse ones on raised posterior portion; vertex shallowly concave and narrowly grooved. Antennae not quite as long as body, fourth and following segments distinctly toothed ectoapically; scape rounded apically, densely micropunctulate, barely three-fifths as long as third segment; fourth subequal in length to scape and fifth and sixth segments; following slightly shorter. Prothorax as broad as long, narrower at apex than at base, constricted near each end, obtusely tuberculate at each side; disk irregularly vermiculate, with four feeble swellings. Scutellum triangular, micropunctulate, more coarsely so near scutellum. Ventral surfaces and legs micropunctulate; prosternum sparsely and shallowly punctured; fifth and sixth abdominal sternites feebly emarginate apically; first hind tarsal segment barely as long as remaining segments united. Length 23 mm.; breadth 6.2 mm.

Female.—Antennae three-fourths as long as body; fifth abdominal sternite rounded-truncate apically. Length 24.5 mm.; breadth 6.8 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, May 28, 1934, F. K. To; allotopotype, female (Gressitt collection), June 4-6, 1934.

Differs from *C. argentatum* (Dalman) in being more narrowed posteriorly, of a brighter green, with the pronotum glabrous, more golden and less bluish and more coarsely rugulose throughout, the scutellum punctulate and hairy instead of smooth and shining, the femora much more strongly swollen and purple instead of bluish or purplish-violet.

Distribution.—N. Kwangtung, S. China.

30. **Chelidonium sinense** (Hope) ?

Promeces sinense Hope, 1841, Proc. Ent. Soc. London : 63; 1845, Trans. Ent. Soc. London 4 : 17.

Leontium sinense Gahan, 1894, Ann. Mus. Civ. Genova 34 : 17.

Chelidonium sinense Gahan, 1906, Fauna Brit. India, Col. 1 : 212.

Male.—Bright green above, tinged with golden on head and sides of prothorax; antennae purplish-violet basally, blackish apically; legs steel-blue with greenish and purplish tinges, base of first hind tarsal segment reddish; ventral surface of body golden-green, partly

tinged with blue-green, thinly clothed with silvery pubescence. Head closely punctured, carinate along middle of occiput; antennae slightly longer than body, slender, moderately toothed, scape a little shorter than fourth segment; prothorax as long as broad, briefly and obtusely tuberculate laterally, finely rugulose-punctate above, with the sides and mid-dorsal line coarsely ruguiose; scutellum attenuated apically, finely punctulate; elytra densely punctured, slightly rugulose along suture in basal portion; sixth abdominal sternite deeply and arcuately emarginate apically.

Female.—Antennae slightly shorter than body; fifth abdominal sternite broadly rounded apically. Length 21-24 mm.; breadth 4.8-6 mm.

A large series of specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) was collected at Taam-yuen-tung, Lien District, N. Kwangtung Prov., May 28-June 14, 1934, by F. K. To.

Distribution.—"China"; Kwangtung; Burma; Sikkim; Manipur.

Genus **Polyzonus** Castelnau, 1840

Polyzonus Castel., 1840, Hist. Nat. Col. 2: 438; Lacordaire, 1869, Gen. Col. 9: 21; Gahan, 1906, Fauna Brit. India, Col. 1: 213.

Key to Kwangtung Species of Polyzonus

Elytra with two transverse yellow bands; pronotum coarsely punctate..... .....**meridionalis** Bates

Dorsal surface of body entirely green; pronotum minutely punctate, with a median smooth line .....**subtruncatus** (Bates)

31. Polyzonus meridionalis Bates

Polyzonus meridionalis Bates, 1879, Cist. Ent. 2: 413 (Hong Kong).

"Much larger and broader than *Polyzonus bicinctus* (Oliv.) (*P. fasciatus* (Fabr.)); obscurely cyaneous, opaque, elytra with two broad, squarish yellow bands; head scabrous-punctate; prothorax strongly and confluently punctate; elytra thinly clotted with recumbent hairs, irregularly and finely punctulate, each obsoletely bicostate, yellow bands each half as wide as cyaneous band between them; ventral surface of body densely clothed with grayish hairs. Length 16-20 mm.

"*Male.*—Fifth abdominal sternite arcuately emarginate; sixth narrow and deeply emarginate; pygidium strongly convex, subovate. Hong Kong." (Translation of original description. I have seen no additional material.)

Distribution.—Hong Kong.

32. Polyzonus subtruncatus (Bates)

Leontium subtruncatum Bates, 1879, Cist. Ent. 2: 408 (Hong Kong).
Polyzonus subtruncatus Auriv., 1912, Col. Cat. 39: 317.

"Resembling, at first glance, *Leontium argentatum* (Dalm.), but differing in having antennae simple and elytra obtusely truncate apically. Cylindrical, entirely shining green, nearly opaque above, shining green clothed with silvery pubescence beneath, antennae and

legs steel-blue; head (with mandibles) elongate, frons rugose-punctate; prothorax elongate, base constricted and transversely sulcate, sides with conical tubercles, disk closely and minutely punctulate with a median shiny, impressed line; elytra closely and minutely rugulose, apices truncate with sutural angles produced, disk of each with obsolete ridges, posterior tarsi slightly larger than in *C. argentatum*, elongate and compressed; antennae (female) distinctly shorter than body, scape not produced at apex, fourth to seventh segments nearly equal, not produced apically, eighth to eleventh slightly shorter. Length 27 mm. Hong Kong.

"From its resemblance to *L.* (*Chelidoneum*) *argentatum* this species cannot well be removed from the genus, but its simple antennae do not fit with the generic character. In structure it fits better with *Polyzonus*, but the absence of yellow bands or spots render it incongruous there." (Translation of original description.)

Distribution.—Hong Kong.

Tribe **Prothemini**

Prothemides Lacordaire, 1869, Gen. Col. 8: 524.
Prothemini Gahan, 1906, Fauna Brit. India, Col. 1: 232.

Genus **Prothema** Pascoe, 1856

Prothema Pascoe, 1856, Trans. Ent. Soc. London, ser. 2, 4: 43 (type: *P. signata* Pasc.); Lacordaire, 1869, Gen. Col. 8: 526; Gahan, 1906, Fauna Brit. India, Col. 1: 235.

Sigeum Pascoe, 1866, Proc. Zool. Soc. London: 523 (type: *Blemmya humerale* Pasc.).

Key to Kwangtung Species of Prothema

Elytra with a broad golden yellow area on each side of suture at base and apex; scape with distinct carinae; prothorax partly pubescent above... .....**cariniscapa** Gressitt

Elytra entirely black or with a narrow sulphury margin by scutellum and an incomplete, arched band behind middle; scape not distinctly carinate; pronotum glabrous .....**signata** Pascoe

33. Prothema cariniscapa Gressitt

Prothema cariniscapa Gressitt, 1937, Ling. Sci. Jour. 16 (3): 451, pl. 4, fig. 4.

Male.—"Flattened-cylindrical, oblong-oval, subparallel. Black; clothed with pubescence which is largely sulphur-yellow, as follows: head sparsely clothed, most densely around eyes; antennae with very thin pale pubescence; prothorax largely clothed below, whitish on middle of sternum and coxae, sides glabrous above middle, disk with a narrow median stripe and its sides thinly pubescent; scutellum densely clothed; elytra with a longitudinal, posteriorly narrowing and subsinuous stripe from middle of base to before middle of each elytron, and a subsutural stripe extending from just behind middle to apex above the lateral carina, and bearing a posteriorly arcuate lateral extension from the anterior end which disappears before reaching lateral carina, suture and external margin black except at

apices and below humeri; sides of hind thorax and abdomen completely clothed with dense sulphur-yellow, their ventral surfaces whitish, glabrous along middle; legs finely clothed with pale pubescence."

One specimen (loan deposit, Calif. Acad. Sci.) was taken at Yimna Shan (Yam Na Shan), alt. 750 meters, Mei District, E. Kwangtung Prov., June 16, 1936, by J. L. Gressitt.

Distribution.—E. Kwangtung, South China.

34. **Prothema signata** Pascoe

Prothema signata Pascoe, 1856, Trans. Ent. Soc. London, ser. 2, 4 : 43, pl. 16, fig. 5 ("N. China").
Prothema funerea Pascoe, 1856, l.c. : 43 ("N. China"), n. syn.

These two species must be united, as the differences are not specific, and are probably sexual. Among three Kwangtung specimens, two are pure black above (*funerea*) and have longer antennae, seeming to be males, and the third has the typical ochraceous parasutural markings and post-median transverse fascia on the elytra of *signata*, and seems to be a female. The coloration of the ochraceous pubescence on the sides of thorax and abdomen is identical in the female and one of the males, barely paler in the other male. The alleged narrower elytra of *funerea* are hardly evident, and that is, of course, a common sexual character. Length, male 12-13.5 mm., female 14 mm.; breadth 3.5-4 mm.

Three specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Taam-yuen-tung, Lien District, N. Kwangtung Prov., May 25-June 6, 1934, by F. K. To. New to Kwangtung.

Distribution.—"N. China"; Kwangtung, S. China.

Tribe **Pyrestini**

Pyresthides Lacordaire, 1869, Gen. Col. 9 :518.
Pyrestini Gahan, 1906, Fauna Brit. India, Col. 1 : 224.

Key to Kwangtung Genera of Pyrestini

1. Fourth antennal segment slender, not angulate apically; pronotum not strongly carinate medially; body lacking close woolly pubescence on dorsal surface 2
   Fourth antennal segment angulate ectoapically like fifth and following segments; prothorax ovate, carinate medially on disk; dorsal surface with woolly pubescence : .....**Erythresthes** Thomson
2. Sides of elytra strongly emarginate just behind humerus; elytra glossy, clothed with fine erect hairs; prothorax longer than broad, cylindrical or subovate .....**Pyrestes** Pascoe
   Margins of elytra convex immediately behind humeri; elytra dull, nearly glabrous; prothorax hardly longer than broad, swollen posteriorly..... .....**Erythrus** White

Genus **Pyrestes** Pascoe, 1857

Pyrestes Pascoe, 1857, Trans. Ent. Soc., London, ser. 2, 4 : 96 (type : *P. eximius* Pascoe); Gahan, 1906, Fauna Brit. India, Col. 1 : 227.
Pyresthes Thomson, 1864, Syst. Ceramb. : 415; Lacordaire, 1869, Gen. Col. 8 : 520.

Key to Kwangtung Species of Pyrestes

Humeri rounded, impunctate; antennae and legs reddish; fifth antennal segment blunt ectoapically : .....**haematica** Pascoe
Humeri bluntly tuberculate above, punctured externally; antennae and legs blackish; fifth antennal segment acute ectoapically...**pascoei** n.sp.

35. **Pyrestes haematica** Pascoe

Pyrestes haematicus Pascoe, 1857, Trans. Ent. Soc., London, ser. 2, 4 : 97 ("North China").
Pyrestes cardinalis Pascoe, 1863, Jour. Entom. 2 :50 (Hong Kong), new syn.

Robust, narrow, subparallel. Dark red, slightly lighter towards apices of elytra; black or reddish-black on eyes, anterior and posterior borders of prothorax, scutellum and apical portions of distal antennal segments; ventral surfaces dark reddish to pitchy, lighter towards apex of abdomen; legs with femora shining, red to reddish castaneous, dark red to piceous on tibiae and tarsi. Body clothed with fine erect or curved reddish-black hairs, those on posterior portion of abdomen orange-brown, prothorax and first four antennal segments most heavily clothed. Head finely and closely punctured anteriorly, longitudinally ridged between eyes, and with transverse granules on posterior portion of occiput and on neck; antennae three-fourths as long as body, fairly thick, fifth and following segments broadly expanded; prothorax subcylindrical, slightly smaller in middle, coarsely rugulose, scutellum minute, slightly punctured; elytra feebly constricted behind base, coarsely punctured on basal half, more finely and sparsely so towards apices. Length, male 13 mm., female 17-17.5 mm.; breadth, male 3 mm., female 3.7-4 mm.

The middle antennal segments in the female are hardly twice as long as broad, in the male nearly three times as long as broad. Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Taam-yuen-tung, Lien District, N. Kwangtung, May 26-30, 1934, by F. K. To.

Distribution.—"N. China"; Japan; Kwangtung; Hong Kong.

36. **Pyrestes pascoei** n. sp.

Moderately small, narrow, subparallel, bright red above; head and thoracic sterna black; antennae, scutellum, anterior and posterior border of pronotum and legs dull pitchy red to blackish; abdomen reddish, duller basally and lighter apically. Body clothed with fine, suberect hairs, reddish-black on dorsal surfaces and tawny brown on ventral surfaces and legs; antennae with short hairs on first two segments, the remainder glabrous.

Head narrower than prothorax, rugulose- punctate in front, with a small smooth swelling on either side of middle of frons; vertex narrowly grooved, subacutely raised at each side; occiput with four feeble ridges between eyes, closely punctured posteriorly; eyes large, subapproximate above, antennae relatively slender, as long as body; fifth segment broadened and acute ectoapically; fifth and following

segments expanded and nearly parallel-sided, slightly produced at apices; first four segments slender and cylindrical, rounded apically and closely punctured. Prothorax nearly cylindrical, two-thirds again as long as broad, slightly constricted before apex; disk of pronotum coarsely rugose-punctate, with an incomplete median fairly smooth strip. Scutellum small, oval, impunctate. Elytra narrow basally, slightly broadened posteriorly; humeri slightly expanded, each bearing a rounded tubercle; apices conjointly rounded; suture slightly raised; surfaces shining, very coarsely punctured basally, more finely and less closely so on apical third. Ventral surfaces rugulose-punctate on metasternum, closely and regularly punctured on metepisternum, which is obtusely carinate longitudinally; abdomen densely punctured on first segment, more sparsely so posteriorly. Legs slender; femora pedunculate-clavate, nearly impunctate; tarsi long, first segment of hind pair fully as long as following two segments combined. Length 11-12.5 mm.; breadth 2.7-2.9 mm.

Holotype (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung, May 28, 1934, F. K. To, collector; paratopotypes (Ling. Nat. Hist. Surv. Mus. and Gressitt collection), May 26-30, 1934.

Differs from *P. haematica* Pascoe in being smaller and more slender, with the humeri distinctly tuberculate above, the antennae more slender, less hairy, with the fifth segment suddenly broadened and acute ectoapically, the following segments less broadly expanded, the antennae and legs blackish instead of reddish, the elytra more closely punctured apically, etc.

Distribution.—N. Kwangtung, S. China.

Genus **Erythrus** White, 1853

Erythrus White, 1853, Cat. Col. Brit. Mus. 7 : 142 (type : *E. championi* White); Lacordaire, 1869, Gen. Col. 8 : 521; Gahan, 1906, Fauna Brit. India, Col. 1 : 229.

Disidema Thomson, 1860, Classif. Ceramb. : 147.

Key to Kwangtung Species of Erythrus

1. Head and scutellum black; middle antennal segments at least twice as long as broad; suture moderately or weakly raised near apex; elytral apices subtruncate; body slender 2

   Head and scutellum reddish; middle antennal segments about two-thirds as broad as long; suture strongly raised near apex; elytral apices rounded; body stout; pronotum with four or six black spots..... ..... **championi** White

2. Pronotum with a round black hairy tubercle on either side of middle; sides of prothorax and elytral suture black; suture hardly raised posteriorly; apices of elytra and basal portion of disk, with black hairs ..... **blairi** n. sp.

   Pronotum with a pair of parentheses-like black markings, besides some other more or less black spots or swellings; sides of prothorax and elytral suture red; suture strongly raised posteriorly; elytra without black hairs ..... **fortunei** White

37. **Erythrus blairi** n. sp.

Male.—Moderately small, slender, parallel; head, antennae, scutellum, ventral surfaces, including sides of prothorax and legs, black; femora pitchy red; pronotum with a round, hairy black raised spot on each side of middle of disk; elytral suture blackish or pitchy red. Head sparsely clothed with short reddish-brown bristles; antennae nearly glabrous; elytra with a few black bristles on disk and on apices and posterior portion of suture, bristles on lateral margins sparse, reddish; ventral surfaces with a few scattered tawny bristles. Head slender, finely punctured anteriorly, granulose on neck; frons depressed on each side, with a raised, coarsely punctured area in middle; vertex deeply grooved; occiput feebly concave between upper eye-lobes; eyes subtriangular below, strongly emarginate. Antennae nearly as long as body, slender; third segment one-half again as long as fourth, latter feebly thickened apically; fifth to tenth segments slightly expanded externally, each four or five times as long as broad; seventh to tenth acutely produced ectoapically. Prothorax nearly as wide as elytra, barely longer than broad, widest behind middle, narrowed apically; disk satiny with sparse shallow punctures except for pair of hairy black swellings, three feeble narrow swollen areas in a transverse row behind middle; base constricted. Scutellum transverse, slightly rounded posteriorly. Elytra narrow, feebly rugulose-punctate basally and granulose posteriorly, each with a submedian, slightly raised line; suture feebly raised; apices subtruncate, armed with small tooth-like tubercles. Ventral surfaces coarsely punctured on metasternum, finely and closely punctured on metepisternum and abdomen. Legs slender; hind femora not perceptibly swollen; hind tibiae straight; tarsi fully as long as tibiae, first segment of hind pair longer than following two segments combined. Length 13.5-14 mm.; breadth 2.4-2.8 mm.

Female.—Body broader; antennae three-fourths as long as body, fifth to tenth segments about three times as long as broad. Length 17.5-19 mm.; breadth 3.4-4.2 mm.

Holotype male (Ling. Nat. Hist. Surv. Mus.), Yao Shan, Lien District, N. Kwangtung Prov., S. China, May 1, 1934, F. K. To, collector; allotopotype, female (Gressitt collection) May 4; paratopotypes (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.), April 29-May 5; paratypes (Lingnan), Taam-yuen-tung, Lien District, May 23, 1934, F. K. To; paratype, female (Calif. Acad. Sci.), Tung-lu, China, April 27, 1926, Mrs. Dora E. Wright, collector.

Differs from *E. fortunei* White in being smaller and narrower with more slender antennae, the pronotum with a single pair of round black spots, the elytra with the suture darker and less strongly raised and the disks and apices clothed with some black bristles, and the sides of the prothorax black instead of red. Named in honor of Dr. K. G. Blair of the British Museum as a slight token for many favors.

38. **Erythrus championi** White

Erythrus Championi White, 1853, Ent. Col. Brit. Mus. 7 : 142, pl. 4, fig. 4 (Hong Kong).

Female.—Body broad, slightly wider posteriorly. Head, prothroax, scutellum, elytra and mesosternum red, pronotal disk with a pair of parenthesis-shaped black spots anteriorly and a pair of more widely separated piceous spots near base; eyes, antennae, mesopleura, metathorax, abdomen and legs black. Head, scape, pronotum, and scutellum briefly and sparsely clothed with golden hairs; pro- and meso-sterna and inner sides of anterior femora with thin whitish hairs, coxae and trochanters with golden brown pubescence. Head moderately punctured anteriorly, granulose on neck, vertex narrowly grooved, occiput with a groove between upper eye-lobes; antennae two-thirds as long as body, fairly thick, fifth to tenth segments less than twice as long as broad; prothorax as broad as long, narrowed anteriorly, swollen on disk, with a tubercle on each side of central ridge; elytra broad, with suture strongly raised and swollen posteriorly, a median strongly raised line and rounded apices, surfaces rugulose basally and sparsely granulose apically; metasternum closely punctured, abdomen more finely so; first hind tarsal segment no longer than following two segments combined. Length 21 mm.; breadth 5.8 mm.

There is one specimen in the collection of the California Academy of Sciences collected on Hong Kong Island in November 1909.

Distribution.—Hong Kong.

39. **Erythrus fortunei** White

Erythrus Fortunei White, 1853, Cat. Col. Brit. Mus. 7 : 142 ("N. China"); Thomson, 1860, Classif. Ceram. : 148; Gressitt, 1937, Ling. Sci. Jour. 16 (3) : 421.

Moderately slender, hardly broadened posteriorly. Head, antennae, scutellum, ventral surfaces and legs black, pronotum and elytra red, disk of former with a pair of parenthesis-shaped black spots before middle and four to seven additional black or piceous spots. Head and external margins and suture of elytra clothed with golden brown hairs; thoracic sterna and apex of abdomen with pale tawny hairs. Head produced anteriorly, closely punctured on frons, occiput with some ridges and granules between upper eye lobes; antennae three-fourths as long as body, fifth to tenth segments nearly four times as long as broad; prothorax narrowed and constricted anteriorly, median diskal ridge behind central pair of tubercles, a pair of feeble swellings near base; elytra with suture distinctly raised posteriorly and apices rounded-truncate, slightly toothed at sutural angles; metasternum and basal portion of first abdominal segment strongly punctured; legs slender, first hind tarsal segment as long as following two segments combined. Length 17.5 mm.; breadth 3.8 mm.

Female.—Antennae two-thirds as long as body, fifth to tenth segments two to three times as long as broad. Length 19-20 mm.; breadth 4.2 mm.

Some specimens (Ling. Nat. Hist. Surv. Mus.) were collected at Taam-yuen-tung, Lien District, N. Kwangtung, June 4-6, 1934, by F. K. To; three specimens (Gressitt collection) were taken at Tsin-leong Shan, alt. 850 meters, Mei District, E. Kwangtung, June 3-5, 1936, by J. L. Gressitt.

Distribution.—"N. China"; Fukien; Kwangtung; Formosa.

Genus **Erythresthes** Thomson, 1864

Erythresthes Thomson, 1864, Syst. Ceramb. : 160 (type: *Erythrus? Bowringii* Pasc.); Lacordaire, 1869, Gen. Col. 8 : 522; Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 577.

40. **Erythresthes bowringii** (Pascoe)

Erythrus? Bowringii Pascoe, 1863, Jour. Entom. 2 : 52 (Hong Kong).
Erythresthes Bowringii Thomson, 1864, Syst. Ceramb. : 159; Waterhouse, 1890, Aid Identif. Ins. 2 : pl. 188, fig. 1.

"Narrow and elongate, brick-red, covered with a fine silky pubescence; head roughly punctured, the muzzle rather short; antennae black, longer than the body in the male, about three-quarters of its length in the female, the serration beginning with the fourth joint; prothorax ovate, a long linear carina in the middle, two black spots anteriorly on the disk, marking the nearly obsolete tubercles; scutellum triangular; elytra elongate, scarcely wider than the prothorax, the sides incurved and expanding very slightly posteriorly, the apex truncate, a broadly elevated line extending from the shoulder to near the apex; body beneath black, closely covered with a short greyish-white pubescence; legs black, slightly pubescent, femora of the intermediate pair produced beneath, and fringed at the deepest part of the border with short stiff hairs. Length (male) 18 mm., (female) 22 mm." (Original description.)

Distribution.—Hong Kong.

Tribe **Clytini**

Clytides Mulsant, 1839, Col. France, Longic. : 70; Lacordaire, 1869, Gen. Col. 9 : 57.
Anaglyptides Lacordaire, 1869, Gen. Col. 9 : 84.
Clytinae Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 597.
Clytini Gahan, 1906, Fauna Brit. India, Col. 1 : 239.

Key to Kwangtung Genera of Clytini

1. Third antennal segment no longer than first 2
   Third antennal segment distinctly longer than first 3
2. Antennal insertions widely separated; frons and vertex carinate; antennae moderately thick .....**Xylotrechus** Chevrolat
   Antennal insertions fairly close; frons and vertex not carinate; antennae fairly slender .....**Chlorophorus** Chevrolat
3. Antennal segments without internal spines .....**Rhaphuma** Pascoe
   Antennae with internal apical spines or spurs on third and fourth, or third to sixth, segments .....**Demonax** Thomson

Genus **Xylotrechus** Chevrolat, 1860

Xylotrechus Chevrolat, 1860, Ann. Soc. Ent. France : 456 (type : *X. Sartorii* Chevr.); Lacordaire, 1869, Gen. Col. 9 : 77; Gahan, 1906, Fauna Brit. India, Col. 1 : 241.

Amauresthes Chevrolat, 1863, Mem. Soc. R. Sci. Liege 18 : 327 (part).

Key to Kwangtung Species of Xylotrechus

1. Elytra largely brown with thin white pubescence, at least on basal portion; antennae whitish distally; pronotum with yellowish-white spots..... 2
   Elytra largely black, with basal yellowish, or whitish, X-like marking and a post-median fascia of similar color 3
2. Elytra black on apical two-fifths; pronotum with four small light spots, one at each corner; scutellum black .....**dominula** (White)
   Elytra entirely brown, with fine white fasciae; pronotum with eight or ten light spots; scutellum clothed with yellowish-white posteriorly..... .....**grayii** (White)
3. Pronotum gray with a black spot on each side of disk before middle; elytral apices clothed with silvery pubescence, postmedian fascia anteriorly .....**binotaticollis** n. sp.
   Pronotum entirely brick-red; elytral apices black; postmedian fascia transverse .....**pyrrhoderus nigrosternus** n. subsp.

41. Xylotrechus binotaticollis n. sp. (pl. 2, fig. 3)

Female.—Short, oblong, subparallel. Black; legs and antennae dark reddish-brown; prothorax clothed with silvery-gray pubescence except for a round black spot on each side of disk before middle; elytra with a testaceous basal X-like mark and a postmedian subtransverse fascia, apices obliquely silver-pubescent, and a pubescent, inverted V extending forward on suture from postmedian fascia, basal testaceous marking of each elytron, commencing on base near humerus, extending to scutellum, posteriorly along suture nearly to end of first third, then diverging obliquely to side and recurving anteriorly to external margin; body largely clothed with pale hairs, denser on metepisterna and posterior portions of abdominal segments.

Head short, feebly tricarinate in front, the median carina extending onto vertex, the outer ones diverging and ending between antennal insertions; frons broad; surface granulose-punctate. Antennae reaching slightly beyond bases of elytra, thickened posteriorly; scape slightly longer than third segment. Prothorax as broad as long, broadest behind middle, granulose-punctate. Scutellum short, broadly rounded behind. Elytra subparallel, transversely truncate apically, densely and finely punctured. Metasternum and abdomen finely punctured. Posterior femora exceeding elytral apices; first segment of hind tarsus longer than remaining segments combined. Length 10 mm.; breadth 2.7 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Loh-fau Shan, Poh-lo District, Kwangtung Prov., S. China, April 6-8, 1934, K. C. Yeung, collector.

Differs from *X. basalis* Schwarzer, of Formosa, in not having the frontal carinae largely fused, in having the frons broader, the

antennae thicker, the elytra less testaceous basally, the first postbasal fascia more oblique and both median fasciae testaceous below the pale pubescence.

Distribution.—Kwangtung, S. China.

42. Xylotrechus dominula (White)

Clytus Dominula White, 1855, Cat. Col. Brit. Mus. 8 : 261 ("N. China").
Xylotrechus dominula Waterhouse, 1874, Proc. Ent. Soc. London : 29.

Female.—Small; elytra short, narrowed posteriorly. Body black; elytra and legs largely castaneous; partially clothed with white pubescence: head black, a few white hairs on genae, mouthparts and between antennal insertion and eye; antennae black, third to fifth segments slightly reddish-brown, median segments densely clothed with white hairs; prothorax black, with six spots of white pubescence, one at each corner of dorsal surface and one on each side above coxal cavities; scutellum black; elytra chestnut brown on basal three-fifths, except for black humeri, apical portions blackish-brown with apices interno-obliquely silvery pubescent, brown portion with scattered white hairs, separated from black portion by an oblique line of white pubescence; ventral surface black to brownish-black; metasternum anteriorly and posteriorly, metepisternum posteriorly, and posterior portions of sides of first two abdominal segments, white-pubescent; legs reddish-brown, apices of hind femora black. Head granulose, weakly unicarinate along middle of frons and vertex, a feeble, sinuous carina near each side; antennae not quite one-half as long as body, scape subequal to third segment, apical segments thick and short; prothorax barely longer than broad, weakly rounded at sides, as broad as elytra, granulose-punctate; scutellum squarish, rounded-truncate behind; elytra truncate apically, finely punctured; posterior femora not quite reaching elytral apices; first segments of hind tarsus longer than remaining segments combined. Length 9 mm.; breadth 2.2 mm.

A female (Ling. Nat. Hist. Surv. Mus.) was taken at Lung-ping-hui, Lien District, Kwangtung Prov., May 16, 1934, by F. K. To. New to Kwangtung.

Distribution.—"N. China"; Kwangtung, S. China.

43. Xylotrechus grayii (White)

Clytus Grayii White, 1855, Cat. Col. Brit. Mus. 8 : 261, pl. 6, fig. 4 ("N. China," Fortune coll.).
Xylotrechus Grayii Chevrolat, 1863, Mem. Soc. R. Sci. Liége 18 : 325; Kano, 1926, Trans. Nat. Hist. Soc. Formosa 16 : 104.

Robust, narrowed posteriorly. Head and prothorax black, former with creamy white pubescence above and below eyes, and latter with six free spots of same color on disk, a larger one at each corner and one above coxa on each side; antennae black with silvery white pubescence on distal half; scutellum black, clothed with creamy pubescence apically; elytra chestnut brown with scattered white

pubescence on base and along suture and two very narrow, strongly zig-zag fasciae near middle; hind-thorax and abdomen dark pitchy red beneath and blackish at sides, marked with large spots of cream-colored pubescence on pleura; legs reddish castaneous, with tarsi and apices of femora and tibiae blackish. Body largely clothed with whitish hairs; elytra with recumbent black hairs where white pubescence is lacking. Head rugulose on occiput, finely carinate from anterior portion of frons to between upper eye-lobes; antennae barely one-half as long as body, slightly thickened posteriorly, with bristles on inner sides of third to fifth segments, fused to simulate spines; prothorax subglobose, disk coarsely granulose, with three feeble spines near center; scutellum truncate; elytra strongly narrowed, truncate, finely punctured; abdomen sparsely punctured; first hind tarsal segment three times as long as following two segments combined. Length 12-17 mm.; breadth 3-4.2 mm.

One specimen (Gressitt coll.) was taken at Yim-na Shan, alt. 600 meters, E. Kwangtung Prov., on June 15, 1936.

Distribution.—"North China"; Kwangtung; Kiangsu; Formosa.

44. **Xylotrechus pyrrhoderus nigrosternus** n. subsp. (pl. 2, fig. 2)

Female.—Somewhat abbreviated, narrowed posteriorly, wedge-shaped. Head, prosternum, mesosternum, metathorax, and abdomen black; disk and sides or prothorax and mesopleura bright brick red, anterior margin of prothorax black; antennae, scutellum and tarsi reddish-black; elytra black with inner portion of bases connected with a subtransverse band at end of basal quarter, and a transverse band behind middle, yellowish testaceous. Body clothed with tawny hairs on head, prothorax and sternites; elytral markings clothed with golden hairs; four bands of pale sulphur pubescence across ventral surfaces at mesosternum, posterior end of metathorax and posterior borders of first and second abdominal segments. Head short, densely punctured; frons feebly constricted in middle, carinate medially with an irregular accessory ridge on each side; vertex plane; occiput swollen; eyes transversely oval, strongly emarginate; genae rounded. Antennae barely reaching beyond humeri, thickened in apical two-thirds, some spine-like bristles on second to fourth segments; scape a little longer and thicker than third segment; fifth one-fourth longer than fourth, subequal to third. Prothorax rounded-oblong, a little longer than broad, constricted basally and apically, more narrowly so at apex; disk evenly swollen, densely punctured. Scutellum as long as broad, rounded posteriorly, finely punctured. Elytra only two-thirds again as long as head and prothorax combined, distinctly narrowed posteriorly; apices sinuate-truncate, briefly dentate at external angles; sides straight; surfaces raised near scutellum, densely and finely punctured. Ventral surfaces coarsely punctured on metasternum, closely punctured on metepisternum, deeply and sparsely punctured on first two abdominal segments, much more closely punctured on third to fifth segments. Legs long; femora

coarsely punctured, hind pair hardly swollen, exceeding elytral apices; hind tibiae each with two subequal apical spurs; first hind tarsal segment compressed, two and one-half times as long as following two segments combined. Length 11.7 mm.; breadth 3 mm.

Holotype, unique (Ling. Nat. Hist. Surv. Mus.), Naam-kong-paai, Yao Shan, Yang Shan District, N. Kwangtung Prov., S. China, October 13, 1934, F. K. To, collector.

Differs from the typical form, from Japan, in being larger, with the scutellum black instead of red, the antennae less reddish, the pronotum more finely punctured, the elytra more angulate posteriorly, the legs longer and the thoracic sterna black. The ventral pubescent bands are more yellowish and the elytral markings are duller, with the basal spots broader.

Genus **Rhaphuma** Pascoe, 1858

Rhaphuma Pascoe, 1858, Trans. Ent. Soc. London, ser. 2, 4 : 240 (type : *R. placida* Pascoe); Lacordaire, 1869, Gen. Col. 9 : 72; Gahan, 1906, Fauna Brit. India, Col. 1 : 271.

Raphuma Thomson, 1860, Classif. Ceramb. : 221.

Arcyphorus Chevrolat, 1863, Mem. Soc. R. Sci. Liege 18 : 287 (type : *A. hystrio* Chevr.).

Key to Kwangtung Species of Rhaphuma

Dorsal surface grayish; pronotum with two small black spots; elytra with two broad transverse black bands, the former crossed by a narrow biarcuate white stripe ..... **curvofasciata** n. sp.

Dorsal surface reddish-orange; elytra with a small postmedian, and a large apical, black spot, the former edged anteriorly, and the latter posteriorly, with white pubescence; suture white basally..... ..... **pictiventris** n. sp.

45. **Rhaphuma curvofasciata** n. sp.

Small, cylindrical, parallel. Black, clothed with pale gray pubescence; antennae and tarsi reddish-black apically; head thinly clothed, bearing some long erect hairs on labrum, genae and gular region; antennae sparsely clothed with pale hairs, a few projecting ones on undersides of basal segments; prothorax moderately clothed, except for a faint black spot on either side of middle of disk; scutellum sparsely clothed; elytra grayish pubescent except for three black bands, the first incomplete, in the form of a transverse, crescent-shaped mark before end of first quarter, the second fairly broad, from first quarter to just beyond middle, concave anteriorly and extending obliquely to margin behind, the third moderate, transverse, from beginning of apical third to that of last seventh; ventral surface fairly densely clothed on sides of hind-thorax and apical halves of abdominal segments.

Head short, narrower than prothorax; eyes with ventral lobe nearly round; frons slightly higher than wide. Antennae as long as body; scape two-thirds as long as third segment; fourth equal to scape and three-fourths as long as fifth; fifth to last subequal. Pro-

thorax longer than broad, meagerly swollen at sides, finely granulose. Scutellum broadly rounded behind. Elytra parallel, more than twice as long as prothorax; margins nearly straight; apices transversely truncate. Posterior tarsi with first segment as long as remaining segments combined. Length 8 mm.; breadth 2 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Yao Shan range, Lien District, N. Kwangtung Prov., S. China, May 4-5, 1934, F. K. To, collector; allotopotype, female (Gressitt collection) April 29, 1934.

Similar in size and markings to *Demonax sauteri* Matsushita and *D. matsushitai* Gressitt, but lacking the antennal spines; the third segment is longer, the first elytral fascia transversely crescentic, and the body wider, etc.

46. **Rhaphuma pictiventris** n. sp. (pl. 2, fig. 1)

Female.—Subelongate, cylindrical, parallel. Dorsal surface and appendages largely red, ventral surface blackish-brown; body clothed with orange, creamy white and black pubescence. Head black, reddish in middle of front, labrum and palpi testaceous, surface clothed with pale pubescence, moderately dense and yellowish on frons and vertex; antennae orange brown, slightly dull at apices of distal segments, clothed with fine orange pubescence; prothorax reddish-orange, sparsely clothed with golden hairs, sternum and posterior margins of sides in part densely clothed with creamy pubescence; scutellum reddish-brown, finely clothed; elytra ochraceous, a moderate dull brown spot on each side of suture at middle and a large, round black spot occupying most of apical quarter of each; middle of bases, basal third of suture, a small spot before each of median dark spots, and extreme apices clothed with creamy pubescence; mesosternal process, mesepisternum, metepisternum, base and apex of metasternum and apical margins and posterio-lateral portions of abdominal segments densely clothed with creamy pubescence; legs reddish-orange, enlarged portion of posterior femora blackish.

Head moderately deep; genae parallel; eyes nearly round; frons one-half again as high as wide, bearing an apically broadened median ridge. Antennae three-fourths as long as body; third segment but slightly longer than scape; fourth shorter than fifth, which latter is equal to scape; distal segments subangulate apically. Prothorax longer than broad, narrower at apex, moderately swollen above and at sides; granulose-punctate. Scutellum short, rounded behind. Elytra three times as long as prothorax, parallel; apices narrowed and subobliquely truncate; external margin strongly emarginate. Legs long; first segment of posterior tarsus longer than following two segments combined. Length 20 mm.; breadth 4 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Chui-nam, Kwangtung Prov., S. China, June 3-4, 1932, Prof. Wm. E. Hoffmann, collector.

Related to *R. bimaculata* Schwarzer, of N. India, but the latter is more yellow instead of ochraceous, has pronotal maculations, lacks the median elytral white spot followed by a black one, and has the apex yellow instead of white and the ventral surface black banded with yellow instead of dark brown banded with creamy white pubescence.

Distribution.—Kwangtung, S. China.

Genus **Demonax** Thomson, 1860

Demonax Thomson, 1860, Classif. Ceramb.: 226 (type: *D. nigrofascuatus* Thoms.); Chevrolat, 1863, Mem. Soc. R. Sci. Liege 18: 268; Gahan, 1906, Fauna Brit. India, Col. 1: 280.

Grammographus Chevrolat, 1863, Mem. Soc. R. Sci. Liege 18: 285 (type: *G. lineatus* Chevr.); Lacordaire, 1860, Gen. Col. 9: 71.

Elezira Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3: 637 (type: *Clytus Balyi* Pascoe).

Key to Kwangtung Species of Demonax

Pronotum grayish with two small round black spots; scutellum gray; elytra with a black lunule on base of each, besides a premedian chevron-shaped band and a postmedian transverse band; tarsi piceous ..... **bowringii** (Pascoe)

Pronotum brownish, its basal margin white; scutellum black; elytra with a short basal band and three spots of white: first median, oblique, second transverse, subtriangular and third apical; tarsi reddish..... ..... **luridicornis** Chevrolat

47. **Demonax bowringii** (Pascoe)

Clytus Bowringii Pascoe, 1859, Trans. Ent. Soc. London, ser. 2, 5: 28 (Hong Kong).

Demonax Bowringii Aurivillius, 1912, Col. Cat. 39: 409; Gressitt, 1937, Ling. Sci. Jour. 16 (3): 455.

Male.—Slender, parallel, cylindrical. Body black, largely clothed with thin grayish pubescence: head sparsely clothed in front; antennae thinly clothed with silvery-gray pubescence and a few short suberect hairs beneath; prothorax clothed with greenish-gray, a faint black spot on each side of center of disk; scutellum and elytra clothed with gray, the latter with an anteriorly open black lunule on base of each, followed by a chevron-shaped fascia, broadened towards margins, and a broad transverse black band behind middle; ventral surfaces clothed with lighter gray, whitish on mesepimera, metepisterna and posterior portion of first two abdominal segments; legs thinly clothed with gray, with a few scattered tawny bristles; tarsi reddish-brown apically. Head slightly concave and nearly impunctate in front, occiput with a few large punctures on each side; antennae very slender, four-fifths as long as body, third and fourth segments each with a long acuminate internal apical spine, fourth segments four-fifths as long as third, slightly longer than scape; prothorax longer than broad, moderately rounded laterally, widest before middle, surface reticulate-punctate; scutellum narrowly triangular; elytra narrow, obliquely sinuate-truncate apically,

micropunctulate; legs long, slender; posterior femora hardly swollen, sparsely punctured; first hind tarsal segment twice as long as following two segments combined. Length 9.3 mm.; breadth 2.2 mm.

A single specimen (Gressitt collection) was taken at Tsin-leong Shan, alt. 850 meters, Mei District, E. Kwangtung, June 5, 1936, by J. L. Gressitt. New to Kwangtung mainland.

Distribution.—Hong Kong; Kwangtung; Kiangsi; Formosa.

48. **Demonax luridicornis** Chevrolat

Demonax luridicornis Chevr., 1863, Mem. Soc. R. Sci. Liége 18 : 270 (Hong Kong).

"Elongate, black; head ashy gray with a black band posteriorly; antennae pale yellowish, third and fourth segment each with a spine; prothorax globose, fawn-colored, apex and base narrowly reflexed, posterior margin whitish; scutellum black, triangular; each elytron with a basal band, arched and suddenly terminated in a curved point, and three spots, of white: first oblong, placed obliquely in middle, second subtriangular and transverse, third oblique, at internal apical angle; sides of chest with two white spots; metasternum whitish; abdomen with a white band each on first two segments; legs ashy gray, tarsi reddish. Length 10 mm.; breadth 3.3 mm. China (Hong Kong)." (Translation of part of original description. No additional material seen.)

Distribution.—Hong Kong.

Genus **Chlorophorus** Chevrolat, 1863

Chlorophorus Chevrolat, 1863, Mem. Soc. R. Sci. Liege 18 : 290 (type : *Clytus annularis* Fabr.); Aurivillius, 1912, Col. Cat. 39 : 395.
Anthoboscus Mulsant, 1863, Col. France Longic., ed. 2 : 166.
Clytanthus Thomson, 1864, Systs. Ceramb. : 190 (type : *Anthoboscus tricolor* Chevr.).
Caloclytus Gahan, 1906, Fauna Brit. India, Col. 1 : 260 ("type : *C. speciosus* Schn.").

Key to Kwangtung Species of Chlorophorus

1. Pubescence on dorsal surface of body yellowish or greenish-yellow; legs reddish or clothed with greenish pubescence 2
   Pubescence on dorsal surface of body grayish or whitish-gray; legs black clothed with gray pubescence 3
2. Antennae and legs reddish-brown; basal portion of each elytral disk with a complete oval black ring .....**annularis** (Fabricius)
   Antennae with whitish-gray pubescence; legs clothed with greenish pubescence; basal portion of each elytral disk with an externally open C-shaped black mark .....**miwai** Gressitt
3. Pubescence of scutellum and elytra grayish, no whitish spots on basal portion of elytra 4
   Pubescence of scutellum and three markings on basal portion of each elytron whitish; middle transverse black band continued anteriorly along suture to a short distance behind scutellum .....**macaumensis** (Chevrolat)

4. Pronotum lacking distinct black spots; elytra with a basal subtransverse black band which curves posteriorly near suture and obliquely outward a short distance .....**reductus** Pic
   Pronotum with a pair of adjacent triangular black spots at center, and a smaller spot on each side, a little farther forward; basal portion of each elytron with three angulate black spots .....**taiwanus** Matsushita

49. **Chlorophorus annularis** (Fabricius)

Callidium annulare Fabr., 1787, Mant. Ins. 1 : 156 (E. Indies).
Clytus annularis Fabr., 1901, Syst. Eleuth. 2 : 352; Castelnau et Gory, 1841, Monogr. Genre *Clytus* : 102, pl. 19, fig. 121; White, 1855, Cat. Col. Brit. Mus. 8 : 283.
Caloclytus annularis Gahan, 1906, Fauna Brit. India, Col. 1 : 261.
Chlorophorus annularis Chevrolat, 1863, Mem. Soc. R. Sci. Liege, 18: 290.

Body largely brown or blackish clothed with yellow pubescence; head black, clothed with pale yellowish green pubescence; antennae ochraceous basally and dull brown apically, thinly clothed with goldish pubescence; prothorax black, clothed with yellow pubescence above except for five more or less confluent black spots: an anterior sublateral oblique pair, a wide, anterio-median one branching posteriorly into a pair, one on each side of disk just behind center; scutellum dark brown, densely clothed with pale yellow; elytra dark brown except at base and along lateral margins, which are ochraceous, surfaces clothed with greenish-yellow pubescence, except for following blackish-brown markings on each elytron: (1) an oval basal ring, joined posterio-laterally with (2) a median transverse band which extends anteriorly along suture to basal quarter and posteriorly a moderate distance along external margin, and (3) a large subrounded spot in middle of apical third, touching external margin but not suture; ventral surface dark brown to black, largely clothed with pale yellow pubescence, whitish in part; legs dull ochraceous to brown, thinly clothed with pale hairs. Length 10-16 mm.; breadth 2.6-4 mm.

Specimens in Ling. Nat. Hist. Surv. Mus. from various localities, including Canton; a specimen (Gressitt collection) was collected at Mei-hsien city, Mei District, E. Kwangtung, July 18, 1936, by J. L. Gressitt.

Distribution.—India; peninsula of southeastern Asia; Malay Archipelago; Hainan; S. China; Formosa; Japan.

50. **Chlorophorus macaumensis** (Chevrolat)

Clytus macaumensis Chevr., 1845, Revue Zool. : 98 (Macao).
Anthoboscus macausnensis Chevr., 1863, Mem. Soc. R. Sci. Liege 18 : 297.
Anthoboscus macaonensis Dunning, 1868, Trans. Ent. Soc. London : 128.
Chlorophorus macaumensis Aurivillius, 1912, Col. Cat. 39 : 403.

Male.—Robust, slightly narrowed posteriorly. Body black, clothed with cinereous and whitish pubescence; head evenly clothed with grayish white; antennae thinly clothed with pale gray pubescence, some suberect tawny bristles on inner side of second to seventh segments; prothorax clothed with grayish pubescence above and whitish

beneath, a pair of fused black spots behind center of disk and a small round spot above middle of each side; scutellum clothed with white; elytra partially clothed with pale gray, a large black area from near base to beyond middle marked with two white spots, and a curved white stripe extending obliquely backwards from behind scutellum, a broad transverse black band at beginning of apical third; ventral surfaces clothed with white, tawny gray on third to fifth abdominal segments; legs whitish-gray; tarsi reddish-brown. Head narrowly bicarinate from anterior portion of frons to middle of occiput, sides of occiput sparsely punctured; neck closely punctulate; antennae two-thirds as long as body, scape hardly longer than third segment, fourth to seventh subequal, slightly shorter than third; prothorax subglobose, broad basally, nearly as wide as elytra, irregularly granulose-punctate; scutellum rounded behind; elytra obliquely truncate apically; hind femora distinctly carinate externally; first hind tarsal segment one-third longer than following two segments combined. Length 13.5-14.5 mm.; breadth 3.2-3.7 mm.

A number of specimens were collected on Hong Kong Island in 1925 by Dr. D. T. Fullaway. New to Hong Kong.

Distribution.—Macao; Hong Kong.

51. **Chlorophorus miwai** Gressitt

Chlorophorus miwai Gressitt, 1936, Philippine Jour. Sci. 61 : 100 (N. and central Formosa; Hunan Prov., S. China); 1937, Ling. Sci. Jour. 16 (3) : 455.

Cylindrical, parallel-sided. Body black, largely clothed with dense green pubescence; head and antennae green; prothorax green, with a black spot on each side, and a wide, inverted Y-shaped black marking on disk; scutellum and elytra green, the latter marked with three sets of fasciae: (1) an oval ring on basal portion, free from suture, barely touching base, and with a short extension along external margin, (2) a wide, transverse band at middle, nearly straight behind, extending anteriorly some distance along suture, another anterior extension joining hind part of basal ring at side, and (3) a large, squarish spot in apical third, free from suture and apex, but touching margin; ventral surfaces clothed with paler green, nearly white on pleura. Head with frons squarish and occiput heavily punctured on sides; antennae slightly more than one-half as long as body, fourth segment shorter than third; prothorax subglobular, a little longer than broad; elytra obliquely truncate apically; first hind tarsal segment as long as remaining segments combined. Length 12-15 mm.; breadth 3.3-4 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Yao Shan, May 4-5, 1934, and Fong-tong-ping, Hoh-kai-hong, July 6-7, Lien District, N. Kwangtung, by F. K. To. New to Kwangtung Province.

52. **Chlorophorus reductus** Pic

Chlorophorus reductus Pic, 1922, Mel. Exot. Ent. 37 : 13 (Tongking).

Black, clothed with ashy gray pubescence, whitish on mes- and metepisterna and first two abdominal segments; prothorax only slightly darker on upper part of sides and middle of disk; scutellum thickly clothed with fairly pale pubescence; elytra with a basal arcuate black mark on each side, open exteriorly, reaching external margin anteriorly and terminating near mid-line of elytra posteriorly, and a broad, transverse black band at middle and another similar one at beginning of apical quarter; ventral surfaces clothed with pale cinereous, the pubescence white on mesepimera, metepisterna and posterior portions of sides of first and second abdominal segments. Head narrow, frons constricted, subcarinate and micropunctulate; antennae three-fifths as long as body, scape slender, barely longer than third segment, which is one-third longer than fourth; prothorax subovate, narrowed anteriorly and basally, widest behind middle, surface granulose-punctate; scutellum convex, rounded posteriorly; elytra parallel, subobliquely truncate apically; femora nearly reaching elytral apices; first hind tarsal segment one-third longer than folllowing two segments combined. Length 8.7 mm.; breadth 2.3 mm.

A single female (Ling. Nat. Hist. Surv. Mus.) was taken at Naam-kong-paai, Yao Shan, Yang Shan District, N. Kwangtung, November 1-3, 1934, by F. K. To. New to China.

Distribution.—Tongking; Kwangtung.

53. **Chlorophorus taiwanus** Matsushita

Chlorophorus taiwanus Matsush., 1933, Jour. Fac. Agr. Hokkaido Imp. Univ. 34 : 285, pl. 2, fig. 2 (Hori, Formosa); Gressitt, 1937, Ling. Sci. Jour. 16 (3) : 455.

Female.—Small, slender, parallel. Body black, partially clothed above with ashy gray pubescence and entirely clothed beneath with whitish; antennae and legs thinly clothed with pale gray; pronotum with a pair of oval black spots behind center and a small round spot above middle of each side; elytra with three angular black spots on basal third followed by a broad suboblique band at middle and another broad band at beginning of apical third, the latter widest at external margin. Head small, narrowed anteriorly, frons finely and closely punctured with a median impunctate line, occiput grooved in middle and sparsely punctured on each side; antennae slender, reaching slightly beyond middle of body, scape no longer than third segment, third barely longer than fourth; prothorax oval, broadest at middle, distinctly punctured; scutellum longer than broad, narrowed and rounded apically; elytra narrowed posteriorly, obliquely truncate; ventral surfaces finely punctulate; legs slender, hind femora not carinate externally; first hind tarsal segment one-half again as long as following two segments combined. Length 8.5 mm.; breadth 2 mm.

One specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung, June 7-9, 1934, by F. K. To; another specimen (Gressitt collection) was taken at Tsin-leong Shan, alt. 850 meters, E. Kwangtung, June 5, 1936, by J. L. Gressitt.

Distribution.—Formosa; Kwangtung.

Tribe **Tillomorphini**

Tillomorpnides Lacordaire, 1869, Gen. Col. 9 : 88.
Tillomorphinae Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 640.
Epipedocerini Gahan, 1906, Fauna Brit. India, Col. 1 : 305.

Genus **Clytellus** Westwood, 1853

Clytellus Westwood, 1853, Trans. Ent. Soc. London, ser. 2, 2 : 240 (type : *C. methocoides* Westw.); Lacordaire, 1869, Gen. Col. 9 : 94; Gahan, 1906, Fauna Brit. India, Col. 1 : 312.

54. **Clytellus methocoides** Westwood

Clytellus methocoides Westwood, 1853, Trans. Ent. Soc. London, ser. 2, 2 : 240, pl. 12, fig. 6 (Hong Kong); Lacordaire, 1860, Gen. Col. 9 : pl. 92, fig. 5.

"Head short, transverse, a vertical line of fine punctures below antennae, lower portion semicircularly rounded, including the short, thick mandibles; labrum finely ciliate; antennae nearly as long as body, slender and unarmed, black; prothorax elongate, strongly constricted near base, anterior portion ovate, strongly swollen, impressed with fine rows of elongate punctures, sparsely clothed with gray hairs, portion behind constriction transversely elevated in form of a segment; elytra slightly longer than head and prothorax combined, base wider than broadest part of prothorax, strongly broadened and ovate in middle, strongly convex, glabrous, basal portion reddish-brown, coarsely oblong-punctate, each with a large raised tubercle and apex acutely reflexed, beyond basal portion impressed with oval punctures, strongly convex, glabrous, bluish-black, impunctate, apices with white hairs; legs bluish-black; ventral surface of body black, thoracic sterna with dense grayish pubescence. Length 4-6 mm." (Translation of original description.)

Distribution.—Hong Kong.

Tribe **Stenaspini**

Stenaspides Lacordaire, 1869, Gen. Col., 9 : 166.
Stenaspinae Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 553, 365.
Purpuricenini Gahan, 1906, Fauna Brit. India, Col. 1 : 183.
Stenaspini Aurivillius, 1912, Col. Cat. 39 : 457.

Key to Kwangtung Genera of Stenaspini

Head broad, plane in front, obliquely inclined forwards; antennal insertions distant, only slightly raised; genae acute below..... .....**Euryphagus** Thomson

Head normal, not plane in front; antennal insertions moderately close, subacutely raised at each side and with a transverse raised area between them .....**Sternoplistes** Guerin-Meneville

Genus **Euryphagus** Thomson, 1864

Eurycephalus Castelnau, 1840, Hist. Nat. Col. 2 : 430 (not of Gray).
Euryphagus Thomson, 1864, Syst. Ceramb. : 196 (type : *Cerambyx maxillosus* Oliv.); Lacordaire, 1869, Gen. Col. 9 : 174.

55. **Euryphagus chinensis** n. sp. (pl. 1, fig. 5)

Female.—Oblong, parallel, broader than deep. Pale orange-red, antennae (beyond second segment), legs, meso- and metasterna and a transverse, oblong-oval, subapical elytral spot, black; middle portion of elytra yellowish-white for an area similar to, and immediately preceding, black spot; second antennal segment reddish-black; tips of mandibles black. Body glabrous above, sparsely hairy beneath.

Head as broad as a single elytron; frons twice as broad as long, concave; genae short, parallel, prominent; vertex and occiput rugulose-punctate; eyes small, deeply emarginate, ventral lobe rounded-triangular. Antennae three-fourths as long as body, post-median segments moderately dilated and subacute apically; scape not quite as long as third segment; fourth and fifth subequal, slightly shorter than scape. Prothorax broader than long; sides rounded anteriorly, bearing a subacute tubercle behind middle; disk with three prominent smooth tubercles, one on each side of middle, the other just behind center, besides a weaker one on each side near base; surface for the most part densely punctured. Scutellum narrow, acute behind. Elytra parallel, rounded behind, finely and densely punctured, the black area vermiculate-punctate. Pro- and meso-sternal processes with prominent vertical tubercles; abdomen irregularly punctured; first segment of hind tarsus shorter than following two combined. Length 22.5 mm.; breadth 7.2 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Canton (?), Kwangtung Prov., S. China, April 1931.

Differs from *Euryphagus pictus* Voet (*maxillosus* Oliv.), female, from Luzon, in being paler red, in having the head glabrous (except for labrum), the head, scape, prothorax and scutellum entirely orange, the prothorax less heavily punctured and more strongly tuberculate, the elytra finely punctured and non-pubescent and the abdomen and apices of elytra red instead of black. Differs from *E. lundii* (Fabr.), female, from Nias, in having the frons less projecting apically, the scape longer, the apical antennal segments narrower, the prothorax more finely punctured and more strongly tuberculate, the scutellum narrowed, the elytra glabrous and the abdomen, elytral apices and scutellum orange instead of black. The female of *chinensis* is larger than females of *pictus* and *lundii*.

Genus **Sternoplistes** Guerin-Meneville, 1844

Sternoplistes Guerin, 1844, Icon. Regne Anim. Ins. : 224 (type : *S. temminkii* Guer.); Thomson, 1864, Syst. Ceramb. : 429; Lacordaire, 1869, Gen. Col. 9 : 179.

56. **Sternoplistes temminkii** Guerin-Meneville

Sternoplistes temminkii Guerin, 1844, Icon. Regne Anim. Ins. : 224 (Shanghai, China); Lacordaire, 1869, Gen. Col. 9 : 179, pl. 94, fig. 3.
Purpuricenus Sinensis White, 1853, Cat. Col. Brit. Mus. 7 :139 (Shanghai).
Purpuricenus japanus Motschulsky, 1857, Etudes Ent. 6 : 37 (Japan).

Male.—Body depressed, parallel-sided, suboblong. Head, antennae, ventral surfaces and legs black, abdomen pitchy red on apical margins of segments; pronotum and elytra dull red, the latter more orange posteriorly, the former with a median, subbasal black spot, and a pair of larger, rounded, obliquely placed black spots on each side of disk; scutellum pitchy black. Body nearly glabrous above, except on head and scutellum; ventral surfaces well clothed with tawny pubescence. Head short, abbreviated anteriorly; frons transverse, subvertical; vertex raised much above occiput, which latter is coarsely punctured at sides and posteriorly, fairly smooth in middle; antennae one-half again as long as body, moderately slender, each segment slightly broadened at apex, third a little longer than scape and fourth, which are subequal; prothorax nearly twice as broad as long, subacutely tuberculate at each side behind middle, swollen before tubercles, narrower at base than at apex; disk rugulose-punctate, with a strongly raised swelling behind center; scutellum small, raised, subacutely triangular; elytra parallel, conjointly rounded apically, coarsely punctured basally, more finely and closely so posteriorly; ventral surfaces finely punctured; legs fairly slender; first hind tarsal segment shorter than following two combined. Length 16 mm.; breadth 5.7 mm.

A single specimen (Musée Heude, Shanghai) was collected at Tseng-tscheng, Canton. New to Kwangtung Province.

This specimen differs from Japanese material in being of a darker red on pronotum and basal half of elytra, and in having the scutellum broader and the elytra more coarsely punctured. This species attacks the larger species of bamboos.

Distribution.—Kiangsu; Hopei; Fukien; Kwangtung; Japan.

Subfamily **Lamiinae**

Key to Kwangtung Tribes of Lamiinae

1. Tarsal claws simple, lacking basal teeth or plates 2
   Tarsal claws toothed or appendiculate basally 18
2. Antennal scape with a cicatrix at apex 3
   Antennal scape lacking a true cicatrix at apex 5
3. Cicatrix of scape incomplete, open internally 4
   Cicatrix of scape generally completely closed (except in *Dihammus*).....
   .....**Monochamini**
4. Middle tibiae with a preapical oblique groove externally; head not touching coxae in repose .....**Batocerini**
   Middle tibiae generally lacking a preapical groove; head touching coxae in repose .....**Mesosini**
5. Middle coxal cavities open externally to epimera 6
   Middle coxal cavities closed to epimera externally 16

6. Tarsal claws divergent, forming an angle of less than ninety degrees..... 7
   Tarsal claws divaricate, forming an angle of about one hundred eighty degrees 11
7. Middle tibiae with a preapical oblique groove externally 8
   Middle tibiae generally lacking a preapical oblique groove.....**Niphonini**
8. Front of head more or less rectangular 9
   Front of head trapeziform, broader below than above; antennae with long hairs 10
9. Anterior coxae very prominent, produced posteriorly, conical or cylindrical .....**Xylorhizini**
   Anterior coxae not prominent, projecting but slightly above level of intercoxal process .....**Apomecynini**
10. Antennae very slender, much longer than body; head moderately angulate .....**Hippopsini**
    Antennae hardly longer than body; head strongly produced at vertex, frons forming an acute angle with top of head .....**Spalacopsini**
11. Middle tibiae with a preapical oblique groove externally 12
    Middle tibiae lacking a preapical oblique groove externally 13
12. Scape club-shaped, granulose; elytra never carinate .....**Dorcaschematini**
    Scape slender, gradually thickened; elytra generally carinate laterally.....
    .....**Gleneini**
13. Antennal scape club-shaped; head resting on coxae in repose.....14
    Antennal scape slender or subcylindrical; head not touching coxae in repose 15
14. Antennae with external fosettes and large tufts of hairs; antennal supports strongly raised .....**Ceroplesini**
    Antennae without external fosettes and conspicuous tufts of hairs; antennal supports feebly raised .....**Hecyrini**
15. Metepisternum narrow, subparallel-sided .....**Apodasyini**
    Metepisternum triangular, very broad anteriorly; elytra sometimes carinate laterally .....**Saperdini**
16. Tarsal claws divaricate, forming strongly obtuse angle 17
    Tarsal claws divergent, forming an acute angle .....**Ptericoptini**
17. Antennal scape club-shaped, bearing a false granular cicatrix before apex; antennal insertions moderately close .....**Xenoleini**
    Antennal scape slender, subcylindrical, simple; antennal insertions widely separated .....**Acanthocinini**
18. Eyes simply emarginate, not divided 19
    Eyes completely divided, middle three abdominal segments shorter than first and last segments .....**Tetraopini**
19. Elytra generally carinate laterally; middle three abominal segments shorter than first and last .....**Gleneini**
    Elytra rarely carinate along edge of lateral declivity; first four abdominal segments subequal in length .....**Phytoeciini**

Tribe **Monochamini**

Monohammides Lacordaire, 1869, Gen. Col. 9 : 299.
Monochamini Aurivillius, 1922, Col. Cat. 73 : 73.

Key to Kwangtung Genera of Monochamini

1. Mesosternal intercoxal process plane or only feebly swollen..... 2
   Mesosternal intercoxal process very strongly tuberculate 6
2. Middle tibiae without a distinct oblique subapical groove externally..... 3
   Middle tibiae with a distinct oblique subapical groove externally..... 4

3. Scape reaching nearly to base of pronotum; pronotal disk flat; posterior femora reaching nearly to apex of abdomen ...**Perihammus** Aurivillius
Scape hardly reaching to middle of pronotum; pronotal disk nodose; posterior femora barely reaching beyond middle of abdomen.....**Blepephaeus** Pascoe

4. Inferior lobes of eyes at least slightly deeper than wide 5
Inferior lobes of eyes transverse, wider than deep; anterior coxal cavities open posteriorly .....**Eutaenia** Thomson

5. Cicatrix of antennal scape completely closed .....**Monochamus** Guerin-Meneville
Cicatrix of antennal scape open interiorly .....**Dihammus** Thomson

6. Antennae lacking spines and tufts of hairs .....**Melanauster** Thomson
Antennae with spines and tufts of hairs at apices of third, or third to fifth segments .....**Aristobia** Thomson

Genus **Perihammus** Aurivillius, 1924

Perihammus Aurivillius, 1924, Arkiv f. Zoologi 15 (25) : 21 (type : *P. bifasciatus* Aur.).

57. **Perihammus bifasciatus** Aurivillius (pl. 1, fig. 8)

Perihammus bifasciatus Aurivillius, 1934, Arkiv f. Zoologi 15 (25) : 21 (Kiukiang and Mt. Omei, central and western China).

Male.—Grayish-brown, somewhat tawny brown on elytra; antennae dark brown, bases of third and fifth segments slightly pale. Moderately narrow, subcylindrical; frons parallel; inferior lobes of eyes deeper than wide; vertex narrowly concave between antennal insertions; antennae twice as long as body; scape slender, nearly as long as third segment; prothorax broader than long, moderately tuberculate laterally, moderately punctured; scutellum triangular; elytra narrowed apically, emarginate-truncate, finely, but deeply, punctured basally; ventral surface nearly impunctate; first hind tarsal segment as long as following two segments united. Length 15 mm.; breadth 5 mm.

A single male specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung Prov., May 26, 1934, by F. K. To. New to Kwangtung.

Distribution.—Kiangsi; Szechwan; Kwangtung.

Genus **Monochamus** Guerin-Meneville, 1926

Monochamus Guerin, 1826, Dict. Class. d'Hist. Nat. 9 : 186 (type : *Lamia sutor* Fabr.); Aurivillius, 1922, Col. Cat. 73 : 85; Matsushita, 1933, Jour. Fac. Agr. Hokkaido Imp. Univ. 34 : 320, 323.

Monachamus, Monohammus, Monachammus, Monochammus, Monohamus, of authors.

Key to Kwangtung Species of Monochamus

1. Elytra entirely, though irregularly, punctured; color rusty or blackish with irregular spots of pubescence; antennae at least one-half longer than body in female, much longer in male 2
Elytra covered with raised, punctured, bristle-bearing vermiculations interspersed with green pubescence; prothorax at least twice as broad as long; antennae not much longer than body in female.....**guerryi** Pic

2. Body rusty brown, marked with spots of blackish and whitish pubescence; length over 18 mm. .....**tesserula** White
Body black, marked with small spots of tawny pubescence; length under 16 mm. .....**dubius** Gahan

58. **Monochamus dubius** Gahan

Monohammus dubius Gahan, 1895, Ann. Mus. Civ. Genova 34 : 35 (Burma); Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 595 (E. Kwangtung).

Male.—Small, subabbreviated, barely widened, and broadly rounded, posteriorly. Body black, somewhat reddish-brown on femora and tibiae; elytra irregularly marked with small spots of tawny brown pubescence, intermixed with a few grayish ones; pronotum marked with a longitudinal stripe of tawny pubescence on each side of disk and some irregular tawny pubescence along sides. Head narrow, medially grooved, swollen above, finely granulose in front; antennae nearly three times as long as body, very slender; prothorax broader than long, feebly tuberculate laterally, finely and irregularly granulose; elytra convex, finely, and in part subregularly, punctured. Length 9 mm.; breadth 3.2 mm.

Female.—Antennae a litttle more than twice as long as body; elytra distinctly broadened posteriorly. Length 13-15.7 mm.; breadth 5-6 mm.

Five females and a male (Gressitt coll. and Ling. Nat. Hist. Surv. Mus.) were collected at Yim-na Shan, alt. 700 meters, June 16, and one female at Tsin-leong Shan, alt. 850 meters, June 2, E. Kwangtung Prov. 1936, J. L. Gressitt.

Distribution.—Burma; Kwangtung.

59. **Monochamus guerryi** Pic (pl. 1, fig. 7)

Monohammus Guerryi Pic, 1903, Echange 18 : 121; 1903, Longic. 4 (2) : 21 (Yunnan).

Female.—Broad, nearly parallel. Body black, largely clothed with scaly blue-green pubescence above and with thick, grayish-white pubescence beneath; legs with greenish-white pubescence; antennae with gray-green pubescence, third and following segments black at tips and brownish preapically; pronotum with small glabrous spots and elytra with many glabrous vermiculations. Head broad, finely and sparsely punctured; frons rectangular, broader than high; antennae one-fourth longer than body, scape short, thick apically; prothorax more than twice as broad as long, nearly as broad as elytra, acutely tuberculate at middle of each side, subtransversely rugose in middle of disk, remainder sparsely foveate-punctate; scutellum short, rounded; elytra broad, conjointly rounded apically, entirely covered with feebly raised, sparsely punctured vermiculations, somewhat nodose on basal portions; ventral surfaces feebly punctured. Length 24 mm.; breadth 8.3 mm.

A female (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung, May 25, 1934, by F. K. To. New to Kwangtung.

Distribution.—Yunnan; Kwangtung.

60. **Monochamus tesserula** White

Monohammus tesserula White, 1858, Proc. Zool. Soc. London 26 : 408 (Hong Kong).

Male.—Body rusty red, darker reddish-brown on ventral surfaces; body largely clothed with orange-brown pubescence, very dense on a pair of broad, longitudinal pronotal stripes; reddish pubescence of elytra subordinated by stripes of whitish pubescence interrupted at intervals with longitudinal black spots; ventral surfaces clothed with rusty brown at sides and tawny along middle. Head closely rugulose-punctate, broadly concave between antennal insertions, with frons convex, a little higher than wide, and inferior lobe of eye occupying one-half distance between antennal tubercle and genal margin; antennae more than twice as long as body, with scape subcylindrical, irregularly punctured and two-thirds as long as third segment; prothorax a little broader than long, with a strong broad-based tubercle at middle of each side; pronotal disk slightly raised on midline behind center and on each side before middle, constricted near base and apex, coarsely rugulose-punctate; elytra deeply punctured, coarsely and subasperately so on basal portion, more finely and sparsely so posteriorly, conjointly rounded apically; ventral surfaces rather smooth, sparsely punctured. Length 22-24 mm.; breadth 7-7.5 mm.

Female.—Antennae one-half to two-thirds longer than body. Length 24-30 mm.; breadth 8.5-10.5 mm.

Some specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected on Honam Island, Canton, P'an-yu District, Kwangtung, in August 1920.

Distribution.—Hong Kong; Kwangtung; Fukien; N. China; Formosa; Japan.

Genus **Dihammus** Thomson, 1864

Dihammus Thomson, 1864, Syst. Ceramb. : 80, 381 (type : *Monochamus longicornis* Thomson); Pascoe, 1866, Trans. Ent. Soc. London, ser. 3, 3 : 290.

Haplohammus Bates, 1884, Jour. Linn. Soc. Zool. London 18 : 239 (type : *Monohammus luxuriosus* Bates).

Key to Kwangtung Species of Dihammus

1. Pubescence of elytra variegated or of more than one shade, giving different patterns according to angle of light 2
   Pubescence of elytra uniform fawn-colored, satiny; scutellum buffy; antennal segments grayish basally; vertex broadly concave ..... **cervinus** (Hope)
2. Pubescence of elytra highly variegated, dull golden; frons and scape deeply and sparsely punctured; antennae gray ..... **permutans** (Pascoe)
   Pubescence of elytra golden brown along middle, golden green on external portions; antennae reddish-brown; frons and scape not distinctly punctured ..... **speciosus** (Gahan)

61. **Dihammus cervinus** (Hope)

Lamia cervina Hope, 1831, Gray's Zool. Misc. : 27 (N. India).
Monohammus fraudator Bates, 1873, Ann. Mag. Nat. Hist., ser. 4, 12 : 309 (Japan).
Haplohammus fraudator Bates, 1884, Jour. Linn. Soc. London, 18 : 240.
Haplohammus cervinus Gahan, 1895, Ann. Mus. Civ. Genova 34 : 36.
Dihammus cervinus Aurivillius, 1922, Col. Cat. 73 : 97.

Female.—Body dull reddish-brown, blackish-brown on head, antennal scape and prothorax; entirely covered with smooth, satiny pubescence, of a dark fawn-color on dorsal surface, except for tawny scutellum, and grayish-brown on ventral surfaces; antennae with basal halves of third and following segments pale grayish and apical halves reddish-brown, duller brown at distal ends. Head moderately broad, nearly impunctate, frons a little higher than wide, vertex broadly concave; antennae two-fifths longer than body, scape cylindrical in apical half, two-thirds as long as third segment; prothorax a little broader than long, strongly tuberculate at middle of each side, sparsely punctured, and nearly plane, on pronotal disk; scutellum rounded; elytra deeply, but sparsely, punctured on basal half, narrowed and rounded apically; ventral surfaces nearly impunctate. Length 24 mm.; breadth 7 mm.

One specimen (Gressitt collection) was taken at Yim-na Shan, alt. 700 meters, E. Kwangtung, June 15, 1936, by J. L. Gressitt.

Distribution.—N. India; Burma; Assam; China; Japan.

62. **Dihammus permutans** (Pascoe)

Monohammus permutans Pascoe, 1857, Trans. Ent. Soc. London, ser. 2, 4 : 103 ("N. China").
Monochamus permutans Aurivillius, 1922, Col. Cat. 73 : 96.
Dihammus permutans Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 596.

Male.—Body black, dark reddish-brown on antennae, ventral surfaces and tarsi; entirely clothed with close pubescence; greenish-gold above, lying in different directions to give a broken pattern of bright and dull, varying according to the light or angle of vision; tawny brown on scutellum; greenish-gray on antennae, with apical halves of third and following segments brownish; dull golden on ventral surfaces, slightly variegated, and with small glabrous areas, at sides; golden-gray on legs. Head higher than wide in front, deeply but sparsely punctured on front and behind eyes, nearly impunctate above, deeply concave between antennal tubercles; antennae two and one-third times as long as body, with scape deeply and sparsely punctured and three-fourths as long as third segment; prothorax barely broader than long, briefly tuberculate laterally, irregularly punctured on each side of disk; elytra asperate-punctate basally, narrowed apically. Length 18 mm.; breadth 5.6 mm.

Female.—Antennae two-thirds again as long as body; elytra less strongly narrowed posteriorly than in male. Length 30 mm.; breadth 10 mm.

A male (Ling. Nat. Hist. Surv. Mus.) was taken at Yim-na Shan, E. Kwangtung, September 1, 1933, by F. K. To; another male (Gressitt collection) was taken at Taam-yuen-tung, Lien District, N. Kwangtung, June 15, 1934, by F. K. To.

Distribution.—"N. China"; Kiangsi; Kwangtung.

63. **Dihammus speciosus** (Gahan)

Haplohammus speciosus Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 1 : 274 (China and Hong Kong).
Dihammus speciosus Aurivillius, 1922, Col. Cat., 73 : 99.

Male.—Fairly slender, slightly narrowed posteriorly. Body largely blackish-brown, reddish-brown on antennae (beyond scape), elytral margins (including base and suture), and legs; entirely clothed with smooth silky pubescence, for the most part dull golden, paler on ventral surfaces, and reddish-golden brown on sutural two-fifths of each elytron, top of head, and pronotum; elytral pubescence lying somewhat in different directions, giving a few varying patterns according to angle of light; antennae with pale buff pubescence, segments dark brown at apices. Head impunctate, with antennal tubercles large and widely divergent and inferior lobes of eyes large, hardly deeper than wide; antennae three times as long as body, slender, with scape slightly thickened before apex and barely two-thirds as long as third segment; prothorax broader than long, moderately tuberculate at each side, somewhat uneven, though nearly impunctate, with a feeble longitudinal swelling behind center and a rounded one on each side of mid-line before center; scutellum semicircular; elytra narrowed and separately rounded apically, indistinctly and subseriately punctured on basal two-thirds.

Female.—Antennae nearly twice as long as body; elytra nearly parallel-sided. Length 17.5-21 mm.; breadth 4.5-6 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were taken at Taam-yuen-tung, Lien District, N. Kwangtung, June 2-3, 1934, by F. K. To.

Distribution.—Kiangsi; Kwangtung; Hong Kong.

Genus **Melanauster** Thomson, 1868

Melanauster Thomson, 1868, Physis 2 : 181 (type : *Cerambyx chinensis* Förster); Lacordaire, 1869, Gen. Col. 9 : 301, 326.

Key to Kwangtung Species of Melanauster

1. Elytral bases and pronotum not distinctly punctured, smooth or nodose; elytra largely glabrous with spots of white or yellow pubescence..... 2
   Elytral bases and pronotum deeply punctured, a few nodes on former; elytra clothed with grayish-blue pubescence marked by glabrous bands. .....**bowringii** (White)
2. Elytral spots distinct, rounded, five large ones along middle of each side; extreme apices and bases of third and following antennal segments with white pubescence; pronotum rough at each side; elytra nearly smooth on basal portion ....**pirouletii** Fairmaire

   Elytral spots small, irregular, partly arranged in incomplete transverse bands; about basal half of each of third and following antennal segments clothed with bluish-white pubescence; pronotum moderately smooth at sides; elytra coarsely nodose on basal portion..... .....**chinensis** (Förster)

64. **Melanauster bowringii** (White)

Monohammus Bowringii White, 1858, Proc. Zool. Soc. London 26 : 398, pl. 53, fig. 1 (Hong Kong); Proc. Ent. Soc. London, ser. 2, 4 : 19.
Melanauster Bowringii Aurivillius, 1922, Col. Cat. 73 : 108.

Male.—Relatively small, abbreviated, slightly narrowed posteriorly. Body black, slightly tinged with metallic green on elytra; largely clothed with pubescence; pale blue-green above and paler whitish blue-green beneath, with glabrous areas forming the following markings: a basal spot on occiput, an oval area on middle of pronotum and a small fairly round spot on each side, above, and slightly behind, lateral tubercle, six subtransverse elytral bands formed of small rather square spots, those of second to fourth bands larger and subconfluent, and lastly a small rounded spot on each side of metasternum; antennae with scape, basal half of third segment, and successively lesser portions of following segments clothed with pale bluish-green pubescence, remainders clothed with black hairs. Head finely and sparsely punctured, broad in front, with inferior lobes of eyes small and deeper than wide; antennae nearly twice as long as body, with scape broad apically and two-thirds as long as third segment; prothorax twice as broad as long, with a fairly strong, slightly backward directed tubercle at each side, sparsely punctured on pubescent areas; elytra deeply punctured on basal two-thirds, bases subasperate and with a nodose swelling at middle of each; ventral surfaces nearly impunctate. Length 16-17 mm.; breadth 6 mm.

Female.—Antennae one-third longer than body; elytra parallel basally. Length 17 mm.; breadth 6.5 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Taam-yuen-tung, and Sing-tsz-chan, Lien District, N. Kwangtung, May 22-28, 1934, by F. K. To. New to Kwangtung mainland.

Distribution.—Hong Kong; Kwangtung; Kiangsi; Yunnan.

65. **Melanauster chinensis** (Förster)

Cerambyx farinosus Houttuyn, 1766, Natuurl. Hist. 1 (9) : 536, pl. 75, fig. 2 (not of Linnaeus); Donovan, 1798, Ins. China, pl. 6.
Cerambyx chinensis Förster, 1771, Nov. Spec. Ins. : 39 (China).
Lamia punctator Fabricius, 1776, Gen. Ins. : 230.
Cerambyx punctator Olivier, 1795, Ent. 4 (67) : 69, pl. 8, fig. 50.
Cerambyx pulchricornis Voet, 1778, Cat. Col. 2 : 22, pl. 20, fig. 95.
Calloplophora Macularia Thomson, 1865, Syst. Ceramb. : 553 (N. China).
Melanauster chinensis Aurivillius, 1922, Col. Cat. 73 : 106.

Male.—Body shining black, very glossy on elytra; the latter marked with white pubescence as follows: five more or less incomplete

and irregular subtransverse bands composed of square or rounded spots with some irregular ones along suture in apical half and at apical margins; antennae thinly clothed with pale blue pubescence on inner side of scape and basal quarter, and third, respectively, of third and fourth segments, and with white pubescence with a slight bluish tinge on basal two-thirds each, of fifth and following segments; head and ventral surface thinly and sparsely clothed with pale gray pubescence; scutellum, a small spot on base of each elytron, and tarsi clothed with bluish pubescence. Head sparsely and finely punctured; antennae three-fourths again as long as body; prothorax one-third broader than long, strongly tuberculate at sides, sparsely asperate-punctate at each side behind middle; elytra largely impunctate, coarsely nodose basally, with some nodose ridges on basal fifth. Length 26-32 mm.; breadth 9.5-11.5 mm.

Female.—Elytral spots fewer; antennae one-fourth longer than body. Length 31-35 mm.; breadth 12-14 mm.

Numerous specimens in Ling. Nat. Hist. Surv. Mus. from Canton and other Kwangtung localities; specimens in Gressitt collection taken at Mei-hsien city and Yim-na Shan, E. Kwangtung, June 1-11, 1936, by J. L. Gressitt.

Distribution.—Northern to southern China; Hainan; Formosa; Riukiu Islands; Japan.

66. **Melanauster pirouletii** Fairmaire

Melanauster Pirouletii Fairmaire, 1889, Ann. Soc. Ent. France, ser. 6, 9 : 66 (Koui-Tscheou); Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 597.

Female.—Large and broad, slightly narrowed posteriorly. Body shining black, partly clothed with thick yellowish, whitish-yellow, or thin bluish pubescence: head with yellowish pubescence on genae and sides of frons; antennae with whitish pubescence on extreme bases and apices of third and following segments; prothorax with a narrow yellowish stripe on each side between middle and lateral tubercle, slightly closer at posterior, than at anterior, margin, lower portions of sides similarly clothed; scutellum with thin whitish pubescence; elytra with five moderately large rounded spots of yellow pubescence in a subsinuate line along middle of disk of each side, as well as some smaller rounded spots along external margins and suture; ventral surfaces densely clothed on pleura, except for sides of metasternum, nearly glabrous along middle of sternites; legs thinly clothed with bluish or grayish pubescence. Head finely and sparsely punctured, squared in front; antennae one-fourth longer than body, with scape three-fourths as long as third segment; prothorax a little broader than long, strongly tuberculate, with five strong swellings on disk, two at each side oblique and adjacent, and a few asperate punctures on each side behind middle; elytra practically impunctate, with a few feeble nodes on base of each. Length 42 mm.; breadth 14.5 mm.

A female specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Fong-tong-ping, Lien District, N. Kwangtung, July 1, 1934, by F. K. To. New to Kwangtung.

Distribution.—Kweichow; Kiangsi; Kwangtung.

Genus **Aristobia** Thomson, 1868

Aristobia Thomson, 1868, Physis 2 : 178 (type : *Cerosterna hispida* Saunders); Lacordaire, 1869, Gen. Col. 9 : 301, 327.
Eunithera Pascoe, 1875, Ann. Mag. Nat. Hist., ser. 4, 15 : 65 (type : *Thysia viduata* Pascoe).

Key to Kwangtung Species of Aristobia

Antennae and dorsal surface of body largely clothed with dense orange pubescence, elytra with blackish-brown reticulations; prothorax with short and blunt lateral tubercles; frons broad .....**testudo** (Voet)
Antennae gray with apices of segments black; elytra pale gray with black bases and scattered spots; prothorax with long, acuminate lateral tubercles; frons very narrow .....**voeti** Thomson

67. **Aristobia testudo** (Voet)

Cerambyx testudo Voet, 1778, Cat. Col. 2 : 12, pl. 10, fig. 39 (China).
Lamia reticulator Fabricius, 1781, Spec. Ins. 1 : 219.
Cerambyx reticulator Donovan, 1798, Ins. China, pl. 6.
Aristobia reticulator Lacordaire, 1869, Gen. Col. 9 : 327.
Aristobia testudo Aurivillius, 1922, Col. Cat. 73 : 110.

Body blackish-brown, elytra dull reddish-brown; antennae bright orange beyond second segment; largely clothed with orange pubescence above and with brownish and grayish hairs beneath: head clothed with recumbent and erect blackish and brownish hairs; antennae with a large tuft of black hairs on apical portion of third segment, and a much smaller tuft on inner sides of apices of fourth and fifth segments; prothorax clothed with orange above, except for a sublongitudinal black stripe on each side of middle of disk; scutellum and elytra clothed with orange pubescence, the latter with broad reticulations of blackish pubescence on brown background; legs reddish on tibiae and tarsi, clothed with reddish-brown hairs. Head sparsely punctured, swollen in front; antennae one-fifth longer than body; prothorax broader than long, with a stout blunt tubercle at each side, and disk swollen, somewhat uneven laterally; elytra deeply seriate-punctate on basal portion and outer half of each to apex. Length 25 mm.; breadth 8.8 mm.

Some specimens (Ling. Nat. Hist. Surv. Mus.) were collected on *Litchi sinensis* Sonn. on Honam Island, Canton, July 13, 1931.

Distribution.—Kwangtung; Fukien.

68. **Aristobia voeti** Thomson

Aristobia Voeti Thomson, 1878, Revue Zool., ser. 3, 6 : 51 (China).
Aristobia angustifrons Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 1:276, 1931.

Female.—Broad, subparallel-sided. Body black, largely clothed with yellowish or whitish gray, or blackish, pubescence; head black

with a little pale pubescence behind eyes; antennae black with bases of third and following segments grayish-white, third segment with a large tuft of black hairs on underside of apical half; prothorax and scutellum thinly and irregularly clothed with grayish pubescence; elytra largely clothed with pale yellowish-gray, with black bases, and a number of squared black spots of irregular size, the largest at middle of each side and along suture. Head sparsely punctured, with frons strongly constricted by eyes; antennae one-fifth longer than body, with scape thick and nearly as long as third segment; prothorax nearly one-half again as broad as long, with long, slender lateral tubercles, disk raised and moderately even in central portion; elytra long, parallel, deeply and sparsely punctured, and nodose, basally. Length 35.5 mm.; breadth 13 mm.

A female specimen (Ling. Nat. Hist. Surv. Mus.) was taken on Honam Island, Canton, P'an-yu District, Kwangtung, July 18, 1934, by Prof. Wm. E. Hoffmann.

Distribution.—S. China (Kwangtung); Siam.

Genus **Eutaenia** Thomson, 1857

Eutaenia Thomson, 1857, Archives Ent. 1 : 184 (type : *Ceroplesis Javeti* Th.); 1860, Classif. Ceramb. : 81; 1864, Syst. Ceramb. : 376.
Eutaeniopsis Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 1 : 277 (type : *trifasciella* White); 1895, Ann. Mus. Civ. Genova 34: 45 (=*Eutaenia*).

69. **Eutaenia trifasciella** (White)

Lamia (*Celosterna*) *trifasciella* White, 1850, Proc. Zool. Soc. London : 13, pl. 13, fig. 1 (Hong Kong).
Ceroplesis Javeti Thomson, 1857, Archiv. Ent. 1 : 125 (Penang).
Eutaenia trifasciata Thomson, 1864, Syst. Ceramb. : 72.
Eutaeniopsis trifasciella Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 1 : 278.
Eutaenia trifasciella Aurivillius, 1922, Col. Cat. 73 : 116.

Largely clothed with yellow pubescence, marked with black on the following parts: a narrow line along middle of head, first two, last four, and apices of intervening five antennal segments, an irregular transverse band across middle of pronotum onto lateral tubercles, base of scutellum, humeri, and inner parts of bases of elytra and two suboblique bands on each, one before and the other behind, middle, posterior faces of middle and hind femora, and all the tarsi. Length 24 mm.; breadth 7.5 mm.

Distribution.—Hong Kong; N. India; Penang; Formosa.

Genus **Blepephaeus** Pascoe, 1866

Blepephaeus Pascoe, 1866, Proc. Zool. Soc. London: 249 (type: *Monohammus succinctor* Chevrolat); 1866, Trans. Ent. Soc. London, ser. 3, 3:291.

Key to Kwangtung Species of Blepephaeus

Elytra subemarginate-truncate apically, with external angles toothed; prothoracic tubercles slightly recurved .....**subcruciatus** (White)
Elytral apices narrowly emarginate near suture, rounded externally; prothoracic tubercles short, not curved .....**succinctor** (Chevrolat)

70. **Blepephaeus subcruciatus** (White)

Monohammus subcruciatus White, 1858, Proc. Zool. Soc. London 26 : 410 (Hong Kong).
Blepephaeus subcruciatus Aurivillius, 1922, Col. Cat. 73 : 114.

Male.—Dark brown, elytra reddish-brown; entire surface densely clothed with pubescence: largely reddish-fawn color above, with a grayish-white Y-like mark on elytra, covering posterior three-fifths of suture, the forks originating behind humeri, the base broadening before apices, making the mark nearly X-shaped; scutellum whitish; head, antennae, ventral surface and legs grayish-fawn colored; antennae slightly reddish beyond base. Head with antennal supports fairly prominent, and frons broader above than below; antennae three-fourths again as long as body; scape subcylindrical, three-fourths as long as third antennal segment; prothorax broader than long, strongly spined at each side, pronotal disk with six weak swellings arranged in two transverse rows, and some irregular, deep punctures, mostly behind middle; elytra long, narrowed posteriorly; apices subemarginate-truncate with outer angles more produced. Length 17-19.5 mm.; breadth 5.7-6.5 mm. (Description based on Hainan material.)

Distribution.—Hong Kong; Hainan I.

71. **Blepephaeus succinctor** (Chevrolat)

Monohammus succinctor Chevr., Revue Zool., ser. 2, 4 : 417 (Shanghai).
Monohammus sublineatus White, 1858, Proc. Zool. Soc. London 26 : 410 (Sylhet).
Monohammus obfuscatus White, 1858, Proc. Zool. Soc. London 26 : 410 (Sylhet).
Blepephaeus succinctor Pascoe, 1866, Proc. Zool. Soc. London : 250.

Brownish-black, densely clothed with pubescence as follows: head and scape grayish-brown, following antennal segments gray basally and dull brown apically; prothorax grayish-brown, nearly black along either side of disk and grayish-white along post-median portion of disk; scutellum dull tawny brown; elytra largely whitish-gray, finely spotted or streaked with brown, a large blackish-brown spot on each near scutellum and a variable sublateral area of similar color just behind middle, a smaller dark spot on each humerus and some fine dots at beginning of apical fifth; ventral surface clothed with mixed gray and brown hairs. Head obtusely concave between antennal insertions; inferior eye-lobes one-half again as deep as wide; antennae one-half again as long as body in male and one-third longer in female, third segment hardly longer than scape; prothorax strongly tuberculate laterally, disk with a swelling at each side before middle and one on midline behind center; scutellum rounded triangular; elytra parallel for basal two-thirds, subseriate-punctate, apices rounded and slightly emarginate near suture. Length 19-25 mm.; breadth 7-9 mm.

Some specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were taken at Canton in 1931 and 1932 by P. S. Lau, and on the Lingnan University campus, Honam Island, Canton, in May 1933.

Distribution.—Szechwan; Kwangtung; Hong Kong; Formosa; Tongking; Assam; E. India; Tenasserim; Siam; Malacca.

Tribe **Batocerini**

Batocerides Lacordaire, 1869, Gen. Col. 9 : 353.
Batocerini Aurivillius, 1922, Col. Cat. 73 : 123.

Key to Kwangtung Genera of Batocerini

Antennae strongly asperate or spiny basally .....**Batocera** Castelnau
Antennae smooth and unarmed throughout .....**Apriona** Chevrolat

Genus **Batocera** Castelnau, 1840

Batocera Cast., 1840, Hist. Nat. Col. 2 : 470 (type : *Cerambyx rubus* Linn.); Thomson, 1864, Syst. Ceramb. 74, 378; Kriesche, 1915, Archiv. f. Naturg. 80, A (11) : 111.

Key to Kwangtung Species of Batocera

Antennae reddish distally, with many thorn-like spines on inner side of third segment and an inward projection at apex of each of third to tenth segments; spots reddish to yellowish .....**davidis** Deyrolle
Antennae black, third segment feebly asperate, no internal projections at apices of segments; dorsal spots whitish .....**lineolata** Chevrolat

72. Batocera davidis Deyrolle

Batocera Davidis Deyrolle, 1878, Ann. Soc. Ent. France, ser. 5, 8 : 131 (central China).
Batocera henrietta Kriesche, 1915, Archiv. f. Naturg. 80, A (11) : 138, fig. 20 (Formosa).

Male.—Large, somewhat narrowed posteriorly. Body black; antennae reddish-brown beyond middle of third segment; dorsal surfaces largely clothed with tawny brown pubescence, pronotum with an oval orange spot on each side of center, elytra with about seven oval or rounded yellow or red-orange spots on disk of each; scutellum and a broad stripe on each side of lower portions from behind eye to apex of abdomen densely clothed with white pubescence; sternites clothed with dull grayish-brown; legs thinly clothed with lighter grayish-brown. Head sparsely punctured in front, more finely so above; antennae one-half longer than body, armed with many spines along inner sides of segments and an internal projection at apex of each; prothorax much broader than long, practically impunctate, with feeble transverse ridges anteriorly and posteriorly; elytra nodose on basal fifth, with a short upward projecting spine on front of each humerus. Length 65 mm.; breadth 21.5 mm.

One specimen (Musée Heude, Shanghai) was collected at Shui-chow, Kwangtung, May 3, 1937; another (Gressitt collection) was taken at Yim-na Shan, E. Kwangtung, June 16, 1936, by J. L. Gressitt.

Distribution.—Central China; Chusan Is.; Kwangtung; Formosa.

73. Batocera lineolata Chevrolat

Batocera lineolata Chevr., 1852, Revue Zool., ser. 2, 4 : 417 (N. China); Kriesche, 1915, Archiv. f. Naturg. 80, A (11) : 22, 23a.

Male.—Fairly large, narrowed posteriorly. Body black, thinly clothed above with pale gray pubescence and beneath with dark grayish-brown; marked with areas of thick white pubescence as follows: a narrowly oval oblique spot on each side of middle of pronotum, scutellum entirely clothed, two long, suboblique areas slightly external to midline of each elytron, one just before middle, the other on apical two-fifths, besides some irregular spots on sutural half of second and third fifths of each, and, lastly, a broad stripe of white pubescence along pleura from behind eye to apex of abdomen, narrowed after first abdominal segment. Head shallowly foveate-punctate in front, sparsely punctured above, with inferior lobes of eyes large, broader than deep, constricting frons; antennae one-half again as long as body, third segment moderately asperate and briefly toothed internally; prothorax with an acute, somewhat posteriorly curved tubercle at each side, a few asperate punctures on basal half, and some feeble swellings on each side of disk; elytra nearly impunctate, with many low, smooth nodes on basal quarter. Length 55 mm.; breadth 17 mm.

Female.—Antennae one-sixth longer than body; elytra feebly narrowed. Length 52-60 mm.; breadth 17-20 mm.

A number of specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) have been collected at Lingnan University, Honam Island, Canton, and other Kwangtung localities. This species attacks *Ficus*, *Morus*, and other trees, including *Quercus*. The adults may be found from May to August.

Distribution.—Hopei; Kiangsu; Szechwan; Kwangsi; Kwangtung; Kiangsi; Fukien; Japan; Formosa.

Genus **Apriona** Chevrolat, 1852

Apriona Chevr., 1852, Revue Zool., ser. 2, 4 : 414 (type : *Lamia Germari* Hope); Lacordaire, 1869, Gen. Col. 9 : 354, 356.

74. Apriona germari (Hope)

Lamia Germari Hope, in Gray, Zool. Miscell. 1 : 28 (Sylhet).
Apriona Germari Chevrolat, 1852, Revue Zool., ser. 2, 4 : 415.
Apriona rugicollis Chevrolat, 1852, l. c. : 418 (China).
Apriona (*rugicollis* var.?) *japonica* Thomson, 1878, Revue Zool., ser. 3, 6 : 59 (Japan).

Male.—Moderately large, nearly parallel-sided. Body black to brownish-black, almost entirely clothed with even, smooth brownish-green pubescence; antennae black with basal two-fifths of third and following segments clothed with grayish-white; elytral bases with shiny black, glabrous swellings; metasternum with longer, oblique hairs; legs clothed with greenish-gray. Head sparsely punctured, broadly excavated at vertex, with eyes broad, constricting frons; antennae one-third longer than body, scape slightly thickened apically, two-thirds as long as third segment; prothorax distinctly transverse, briefly but sharply tuberculate laterally, transversely

ridged on disk, with some asperate punctures on basal half; scutellum slightly narrowed, rounded-truncate; elytra long, smooth, except for many smooth, low nodes on basal quarter, narrowly emarginate and bidentate at sutural angles. Length 29 mm.; breadth 12 mm.

Female.—Antennae one-sixth longer than body; elytra parallel. Length 30-45 mm.; breadth 13-15 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus.) were collected on Honam Island, Canton; a female (Gressitt collection) was taken at Swatow, E. Kwangtung, in July 1936.

Distribution.—N. India; China: Kwangtung, Fukien, Chekiang, Kiangsi, Szechwan, Kiangsu, Hopei; Formosa; Japan.

Tribe **Mesosini**

Mesositae Thomson, 1860, Classif. Ceramb.: 35 (part).
Mesosinae Pascoe, 1866, Trans. Ent. Soc. London, ser. 3, 3: 7, 94 (part).
Mesosides Lacordaire, 1869, Gen. Col. 9: 367.
Mesosini Aurivillius, 1922, Col. Cat. 73: 135.

Key to Kwangtung Genera of Mesosini

Antennae with tufts of hairs internally and fourth segment but slightly longer than fifth; inferior lobes of eyes wider than deep; mesosternal process vertical in front ..... **Cacia** Newman

Antennae without tufts of hairs internally, fourth segment about twice as long as fifth; interior lobes of eyes small, deeper than wide; mesosternal process gradually declivitous in front.... **Falsomesosella** Pic

Genus **Cacia** Newman, 1842

Cacia Newman, 1842, Entomologist 1: 290 (type: *Cacia spinigera* Newm.); Lacordaire, 1869, Gen. Col. 9: 369, 374.
Corethrophora Blanchard, 1853, Voy. Pole Sud, Zool. 4: 301.

Key to Kwangtung Species of Cacia

Blackish-brown, marked with many small spots of rusty red pubescence and scattered pale hairs; elytra without a distinct fascia..... ..... **cretifera macularia** n. subsp.

Ashy brown, suture and margin spotted with brown; elytra at middle with a wavy gray band margined with brown ..... **grisella** White

75. **Cacia cretifera macularia** n. subsp. (pl. 2, fig. 4)

Female.—Broad, abbreviated, rounded posteriorly. Brownish-black above, dark brown beneath; clothed in part with small irregular spots of rusty red pubescence and scattered pale hairs; head with small scattered areas of orange-red pubescence; antennae blackish-brown with very thin pale pubescence on bases of third and following segments and long bristles on inner sides of basal half, crowded in feeble tufts at apices of third and fourth segments; prothorax with a faint midlongitudinal stripe, and a broken band above, and irregular spots below, middle of each side, remainder with sparse brownish and whitish hairs and a few long fine flying hairs; scutellum sparsely clothed with brownish pubescence, a minute reddish spot at base; elytra with scattered whitish hairs and numerous small spots of

ferrugineous pubescence, concentrated in a broad transverse band centered slightly before middle and some more sparsely arranged spots on apical two-fifths, only a few on basal portion; ventral surfaces with irregular spots of ferrugineous pubescence on thoracic pleura, remainder irregularly clothed with grayish or golden brown; legs with scattered white hairs and spots of grayish or reddish pubescence.

Head narrower than prothorax, squared in front, sparsely punctured; vertex shallowly concave; inferior lobes of eyes small, subrectangular, a little broader than deep. Antennae one-fourth longer than body, attenuated apically; scape gradually broadened to apex, prominent at ectoapical angle, deeply punctured basally; third and fourth segments thickened apically, third barely longer than scape; fourth one-third longer than fifth. Prothorax one-third broader than long, feebly swollen at middle of sides, with a tubercle at each side near apex; pronotal disk moderately punctured. Scutellum squared, emarginate behind. Elytra short, conjointly rounded apically; base subasperate; deep punctures on basal two-thirds. Ventral surfaces not distinctly punctured. Length 9.6 mm.; breadth 4.2 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Yao Shan, Lien District, N. Kwangtung Prov., S. China, May 3, 1934, F. K. To, collector.

Differs from typical *Cacia cretifera* (Hope), of N. India, in being less strikingly marked, with the median reddish band reduced to small isolated spots, lacking white margins, the antennae less densely clothed, the pronotum more closely and finely punctured, the elytra more sparsely punctured basally, etc.

Distribution.—N. Kwangtung, S. China.

76. **Cacia grisella** White

Cacia grisella White, 1858, Proc. Zool. Soc. London 26: 401 (Hong Kong).

"C. cinereo-fusca punctata, sutura et margine elytorum punctulatis, fascia grisea undata mediana antice et postice fusco marginata.

"Of an ashy-brown, thickly punctured, the suture and margin of the elytra punctulated with brown; across the middle of the elytra there is a greyish waved band, in front and behind margined with brown. Head, in front and on the crown down the middle with an impressed line; legs and antennae brownish, base of the joints of the latter greyish, the former with short greyish hairs." (Original description.) Length 9.5 mm.

Distribution.—Hong Kong.

Genus **Falsomesosella** Pic, 1925

Falsomesosella Pic, 1925, Mel. Exot. Ent. 44: 27 (type: *F. albofasciata* Pic).

77. **Falsomesosella hakka** Gressitt (pl. 2, fig. 5)

Falsomesosella hakka Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 597 (E. and N. Kwangtung).

"Small, abbreviated, broadened behind. Ground color dark brown to reddish-brown or black, largely clothed with pubescence as follows: head largely tawny, mottled with dark brown; antennae rusty, third and fourth segments clothed with pale tawny hairs except for apices and some small scattered brown spots, all the segments with a fairly close fringe of hairs internally; prothorax dark brown mottled with tawny; scutellum non-pubescent, dark brown; elytra with most of the basal fifth, and another transverse band of equal width centered just behind middle, largely white, dotted with black, remainder, including region behind scutellum, largely rusty brown dotted with black, which predominates immediately behind each of the two white bands, a little white pubescence along suture before apices; ventral surface and legs largely grayish-tawny, irregularly blotched with dark; tarsal claws reddish.

"Head not quite as wide as prothorax, weakly concave between antennal insertions, finely punctured; frons slightly wider than high, broader above than below, convex, finely grooved medially; eyes small, inferior lobe barely occupying one-half distance from antennal insertions to base of mandibles. Antennae one-fourth longer than body, moderately thick; scape broad, heavily rugose-punctate, weakly arched, expanded externally at apex, nearly as long as third, and subequal to fourth, segment; fifth one-half as long as third; following decreasing in length. Prothorax two-thirds as broad as elytra, slightly broader than long, moderately rounded at sides, evenly convex and fairly densely and finely punctured above. Scutellum small, rounded behind. Elytra half as broad as long, broadest behind middle; apices conjointly rounded and very briefly emarginate-trunctate; entire surface quite heavily subseriate-punctate. Sides of hind-thorax with some large shallow punctures; first abdominal segment widely fringed on apical margin, second segment with a large depression occupying all but apical margins of each side. Posterior femora not reaching end of fourth abdominal segment, flattened-clavate. Length 6.8-7 mm.; breadth 2.7-2.8 mm."

Specimens in Ling. Nat. Hist. Surv. Mus. and Gressitt coll. from Yim-na Shan, E. Kwangtung, June 11, 1936, J. L. Gressitt, and Fong-tong-ping, Hoh-kai-hon, Lien District, N. Kwangtung, July 4, 1934, F. K. To. Type (Yim-na Shan) in United States National Museum.

Distribution.—E. and N. Kwangtung.

Tribe **Ceroplesini**

Ceroplesitae Thomson, 1860, Classif. Ceramb. : 93, 95.
Ceroplesides Lacordaire, 1872, Gen. Col. 9 : 415, 425.
Ceroplesini Aurivillius, 1922, Col. Cat. 73 : 183.

Genus **Diastocera** Thomson, 1857

Diastocera Thomson, 1857, Archives Ent. 1 : 183 (type : *Lamia tricincta* Duncan ?).
Thysia Thomson, 1860, Classif. Ceramb. : 93, 96 (type : *Lamia Wallichi* Hope).
Thysiotes Thomson, 1868, Physis 2 : 201.

78. **Diastocera wallichi tonkinensis** Kriesche

Diastocera wallichi tonkinensis Kriesche, 1924, Deutsche Ent. Zeits. : 289 (Tongking).
Diastocera wallichii ab. *disjuncta* Plavilstshikov, 1927, Ent. Blätter 23 : 108 (Yunnan).
Diastocera savioi Yen, 1933, Peking Nat. Hist. Bull. 7: 165, fig. (Kwangsi).

Moderately large, subelongate, slightly broadened in middle. Body black, largely clothed above with green, and below with bright red, pubescence; head and antennae clothed with thin bluish-green scale hairs, latter somewhat lavendar distally and bearing large tufts of fine black hairs at apices of third to fifth segments, mainly on inner side, and to a lesser degree on following segments; pronotum clothed with slightly bluish-green, anterior and posterior margins and a minute postmedian spot clothed with bright red; scutellum clothed with thin lazuli pubescence; elytra evenly covered with minute green scale-like hairs and crossed by three transverse bands of black pubescence, none touching suture or external margins, the first nearly divided in middle and with long hairs on inner portion; ventral surfaces clothed with long, bright red pubescence, lower portion of metepisternum blue-green, and base of each abdominal segment brownish with a few blue-green scales. Head nearly impunctate, deeply concave between antennal tubercles; antennae one-fifth longer than body; pronotum swollen on disk, briefly tuberculate at each side; elytra moderately punctured throughout, rounded apically. Length 27.5 mm.; breadth 9.5 mm.

A large series (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) was taken at Yao Shan, Lien District, N. Kwangtung, May 6-8, 1934, by F. K. To.

Distribution.—Tongking; Kwangsi; Kwangtung; Yunnan.

Tribe **Xylorhizini**

Xylorhizides Lacordaire, 1872, Gen. Col. 9 : 443.
Xylorhizini Aurivillius, 1922, Col. Cat. 73 : 208.

Key to Kwangtung Genera of Xylorhizini

1. Prothorax not tuberculate laterally, feebly swollen at sides; vertex broadly and shallowly concave; antennal supports without distinct projections. 2
   Prothorax strongly tuberculate laterally; vertex broadly, but deeply, concave; antennal supports strongly raised internally.....**Thylactus** Pascoe
2. Elytra gradually declivitous, produced apically at sutural angles; dorsal surface of body clothed with long, fine, erect hairs, and thick pubescence, forming a wide fringe at elytral apices.....**Xylorhiza** Castelnau
   Elytra rounded and strongly declivitous apically; dorsal surface of body with thin pubescence, lacking erect hairs .....**Cyrtogrammus** n. gen.

Genus **Xylorhiza** Castelnau, 1840

Xylorhiza Castelnau, 1840, Hist. Nat. Col. 2 : 476 (type : *X. venosa* Cast. =*adusta* Wied.); Lacordaire, 1872, Gen. Col. 9 : 445.

79. **Xylorhiza adusta** (Wiedemann)

Lamia adusta Wied., 1819, Zool. Mag. 1 (3); 182 (Bengalia).
Xylorhiza venosa Castelnau, 1840, Hist. Nat. Col. 2 : 476.
Xylorhiza adusta Gahan, 1895, Ann. Mus. Civ. Genova 34 : 58.

Female.—Large, elongate, parallel-sided. Body black to brownish-black above and dark brown beneath, almost entirely clothed with thick pubescence with many fine stripes of light tan to brownish-black; head pale buff along central portion, darker on sides of frons and genae; antennae with pale, mixed with dark, buff on first three segments, following very briefly and sparsely clothed with grayish-brown; prothorax dark brown, rusty brown at base, with a double median pale buff stripe narrowing to a point at basal margin, and two narrower, oblique stripes of the same on each side above middle; scutellum reddish golden with a fine median buff stripe; elytra largely buff of different shades arranged in narrow longitudinal stripes, with blackish or dark brown stripes on base, along mid-line, near suture and external margin and less distinctly on apical third; ventral surfaces and legs dark brown streaked with buff. Head with a glabrous line along middle, broadly concave on vertex, with inferior lobes of eyes small and deeper than wide; antennae five-sixths as long as body; prothorax nearly as long as broad, feebly swollen at sides, uneven on disk with some very deep and large punctures; elytra long, obliquely truncate apically, with sutural angles bluntly produced, bases sparsely punctured. Length 40 mm.; breadth 11.8 mm.

A specimen (Gressitt collection) from Ap-li-chow, Hong Kong Island, December 20, 1932, was presented to the writer by Mr. Y. C. Ng of the University of Hong Kong. New to China.

Distribution.—Bengal; Burma; peninsula of southeastern Asia; Hong Kong; Formosa.

Genus **Thylactus** Pascoe, 1866

Thylactus Pascoe, 1866, Proc. Zool. Soc. London : 242 (type : *T. angularis* Pascoe); Lacordaire, 1872, Gen. Col. 9 : 445.

80. **Thylactus chinensis** Kriesche

Thylactus chinensis Kriesche, 1924, Deutsche Ent. Zeits. : 289 (Canton).

Brownish-black to reddish-brown; latter color predominating on antennae, legs, and median portions of sternites; body largely clothed with thick pubescence; head thinly clothed with reddish-brown hairs, an obliquely transverse line of pale buff pubescence on each side of upper part of frons; antennae with dark reddish-brown pubescence basally and pale tawny distally; prothorax dark brown with three narrow stripes of buff, one median, other two lateral; elytra clothed with stripes of pale, or darker buff on outer two-thirds, and blackish-brown on sutural portions; ventral surfaces clothed with pale buff,

abdominal segments partly glabrous. Head rough, with transverse ridges in front and longitudinal ones on occiput; antennae slender, slightly longer than body; prothorax with a nipple-like tubercle at each side, coarsely rugose-punctate, ridged medially; elytra seriate-punctate, apices slightly expanded, emarginate, with sutural angles dehiscent and produced. Length 25.5 mm.; breadth 7 mm. (Description based on a specimen from Szechwan in the United States National Museum.)

Distribution.—Kwangtung; Szechwan.

Cyrtogrammus new genus

Antennal scape without a cicatrix; tarsal claws divergent; middle coxal cavities open externally to epimera; middle tibiae obliquely grooved externally before apices; frons subrectangular. Form depressed-cylindrical, nearly parallel-sided, bluntly rounded posteriorly. Head as broad as prothorax; frons wider than deep; vertex shallowly concave; antennal supports distant, feebly raised; inferior lobes of eyes oblique, deeper than wide. Antennae (male) about as long as body; scape slightly thickened apically, nearly as long as third segment; fourth as long as third; following shorter, subequal. Prothorax transverse, feebly rounded at sides. Scutellum short. Elytra slightly narrowed behind base, feebly expanded preapically, rounded posteriorly; surface with parallel curved rows of deep punctures. Anterior coxae prominent, subconical, angulate externally; intercoxal process of mesosternum narrow, concave anteriorly; metepisternum very narrow; first abdominal segment as long as following two combined; third to fifth abdominal segments each with a deep oblique concavity on each side near lateral margins; fifth segment rounded-truncate. Legs moderately short; first tarsal segment shorter than following three combined.

Genotype.—Cyrtogrammus lateripictus n. sp.

This genus differs from *Xylorhiza* Castelnau in having the elytra abruptly rounded and suddenly declivitous apically, with curved rows of deep punctures and without long erect hairs and apical fringe of pubescence, and the pronotum lacking median groove and ridges. It differs from *Thylactus* Pascoe in lacking lateral tubercles on the prothorax and tuberculate antennal supports, and in having the elytra rounded and declivitous apically.

81. **Cyrtogrammus lateripictus** n. sp. (pl. 1, fig. 9)

Male.—Body dark brown to blackish-brown; reddish-brown on antennae beyond third segment and on coxae, sides of apical abdominal segments and tarsal claws; largely clothed with thin pale buff to dark brown pubescence, a large silvery white area on side of each elytron before middle; head clothed with dark brown in front, with four lines of tawny hairs, inner two continued onto occiput, genae with pale tawny hairs; antennae thinly clothed with tawny brown and scattered white hairs basally and buffy gray pubescence distally;

prothorax nearly glabrous above with a narrow tawny median stripe, sides clothed with pale tawny pubescence; scutellum with a few brown hairs; elytra with an arched dark brown area bordering lateral white spot, and arcuate buff and tawny stripes above this, sutural portion of basal half dark brown, nearly glabrous, an inverted "V" of pale buff pubescence behind middle; ventral surfaces clothed with tawny brown, with many small glabrous spots; legs with pinkish pubescence and white hairs arising from glabrous spots.

Head deeply punctured, shallowly grooved medially from anterior margin of frons to neck; inferior lobes of eyes oblique, occupying two-thirds distance from antennal insertion to genal margin. Antennae barely longer than than body, slightly tapering; scape coarsely punctured, rounded apically, shorter than third and fourth segments, which are subequal, fifth segment two-thirds as long as fourth. Prothorax deeply and coarsely punctured, one-fourth broader than long, feebly swollen at each side. Elytra deeply punctured in arcuate rows in central portion, slightly swollen at each side at beginning of apical quarter. Ventral surfaces finely punctulate and with a few large punctures surrounded by smooth areas; posterior femora barely reaching to third abdominal segment. Length 15.6 mm.; breadth 5 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, June 4-6, 1934, F. K. To, collector.

Though *Cyrtogrammus* appears to be related to *Xylorhiza*, this new species is very different in appearance from *X. adusta*. The former is less than one-half as long, is more convex, much less pubescent and without erect hairs, and is strikingly marked with a large white spot at each side.

Distribution.—Kwangtung Prov.

Tribe **Dorcaschematini**

Dorcaschemitae Thomson, 1860, Classif. Ceramb. : 104, 107; 1864, Syst. Ceramb. : 90, 340.
Dorcaschemides Lacordaire, 1872, Gen. Col. 9 : 415, 456.
Dorcaschematini Aurivillius, 1922, Col. Cat. 73 : 213.

Genus **Olenocamptus** Chevrolat, 1835

Olenocamptus Chevr., 1835, Mag. Zool. 5 : Ins. pl. 134 (type : *O. serratus* Chevr. = *bilobus* Fabr.); Lacordaire, 1872, Gen. Col. 9 : 458.
Authades Thomson, 1857, Archives Ent. 1 : 191 (type : *A. indianus* Thomson).
Ibidimorphum Motschulsky, 1860, Schrenck's Reisen Amurl. Col. : 153 (type : *I. octopustulatum* Motsch.).

82. **Olenocamptus biocellatus** Schwarzer (pl. 2, fig. 7)

Olenocamptus biocellatus Schwarzer, 1925, Ent. Blätter 21 : 63 (Formosa).
Dorcaschema biocellatum Matsushita, 1933, Jour. Fac. Agr. Hokkaido Imp. Univ. 34 : 353, pl. 3, fig. 6.

Male.—Body black, clothed with pale greenish-gray pubescence, except for certain black markings; head thinly clothed, a glabrous

spot on posterior portion of occiput and one on each side behind eye; antennae sparsely clothed, reddish-brown beyond third segment; prothorax closely pubescent with a black stripe along mid-line and an incomplete one along middle of each side; scutellum clothed with more whitish pubescence; elytra clothed with grayish except for four sets of black markings on each: (1) a spot on humerus, (2) two spots at end of basal quarter, one near mid-line, other at external margin, (3) a rounded ring on outer two-thirds, at middle, and (4) two black spots at beginning of apical quarter, one near mid-line, other near external margin; ventral surfaces and legs clothed with paler pubescence. Head swollen on posterior portion of occiput, moderately concave between antennal insertions; antennae very slender, three times as long as body, scape club-shaped, granulose on outer part of swollen portion; prothorax a little longer than broad, subcylindrical, slightly constricted near base, feebly granulose; elytra moderately punctured, subrounded apically. Length 11 mm.; breadth 2.8 mm.

One male (Ling. Nat. Hist. Surv. Mus.) was collected at Sing-tsz-chan, Lien District, N. Kwangtung, May 22, 1934, by F. K. To. New to China.

Distribution.—Formosa; Kwangtung, S. China.

Tribe **Xenoleini**

Xenoleides Lacordaire, 1872, Gen. Col. 9 : 460.
Xenoleini Aurivillius, 1922, Col. Cat. 73 : 216.

Genus **Xenolea** Thomson, 1864

Xenolea Thomson, 1864, Syst. Ceramb. : 91 (type : *X. collaris* Thoms.); Lacordaire, 1872, Gen. Col. 9 : 460.
Aeschopalaea Pascoe, 1864, Trans. Ent. Soc. London, ser. 3, 3 : 10, 24 (type : *A. agraria* Pascoe).

83. **Xenolea tomentosa asiatica** (Pic) n. comb.

Aeschopalea asiatica Pic, 1925, Echange (40) 41 : 16 (Tongking).
Xenolea asiatica Gressitt, 1938, Ling. Sci. Jour. 17 (2) : 158.

Male.—Dull reddish-brown, lighter brown on antennae and darker brown on ventral surfaces of body; irregularly clothed with tawny buff pubescence; head largely clothed, sparsely so in front; antennae thinly clothed on scape and bases of following segments; prothorax evenly clothed except for many small glabrous punctures; elytra with irregular spots and areas of tawny pubescence covering over one-half of surface, remainder glabrous; ventral surfaces and legs evenly clothed with grayish-buff. Head convex, finely punctured, narrowed at antennal insertions; antennae slender, nearly twice as long as body, scape swollen distally, with a granulose area on outer side; prothorax as long as broad, briefly tuberculate laterally, finely punctured; elytra narrowed and subrounded apically, finely and closely punctured. Length 6.8-8.5 mm.; breadth 1.7-2 mm.

Female.—Antennae three-fifths again as long as body; last abdominal segment longer than two preceding combined. Length 6-7 mm.; breadth 1.6-2.2 mm.

Many specimens (Ling. Nat. Hist. Surv. Mus.) were collected on mulberry (*Morus*) on Honam Island, Canton, Kwangtung, December 12, 1934, by Prof. Wm. E. Hoffmann. New to Kwangtung.

Distribution.—Indo-China; Kwangtung; Szechwan; Formosa.

Tribe **Hecyrini**

Hecyrididēs Lacordaire, 1872, Gen. Col. 9 : 416, 517.
Hecyrini Aurivillius, 1922, Col. Cat. 73 : 243.

Genus **Moechotypa** Thomson, 1864

Moechotypa Thomson, 1864, Syst. Ceramb.: 55, 368 (type: *M. arida* Thoms.).
Scotinauges Pascoe, 1871, Ann. Mag. Nat. Hist., ser. 4, 8 : 277 (type : *S. diphysis* Pascoe).
Tylophorus Blessig, 1873, Horae Soc. Ent. Ross. 9: 213 (type: *T. Wulffiusi* Bless.).

84. **Moechotypa delicatula** (White) (pl. 1, fig. 6)

Nyphona delicatula White, 1858, Ann. Mag. Nat. Hist., ser. 3, 2 : 268 (Sylhet).
Moechotypa delicatula Gahan, 1895, Ann. Mus. Civ. Genova 34 : 60.

Male.—Moderately slender, parallel-sided. Body blackish-brown above, dull brown to reddish-brown beneath, largely clothed with grayish, marked with areas of brownish or brick-red pubescence; head with pale gray pubescence, with reddish on labrum, clypeus, genae, sides of vertex and on each side of base of occiput; antennae largely clothed with chocolate-brown, scape largely, and basal two-fifths of third segment, clothed with brick-red; bases of fourth and following segments with pale gray hairs; prothorax thinly clothed with whitish-gray, bases, and two narrow zig-zag bands, one at middle, other at beginning of last quarter, of dark brown pubescence, four longitudinal stripes on basal quarter, and an anteriorly twice dichotomously dividing line near apex on each of reddish pubescence; ventral surfaces incompletely clothed with buffy gray, with reddish hairs on sides of metasternum and middle of last abdominal segment; legs clothed with reddish, banded with brown, externally, and grayish internally; tarsus brown, first segment red. Head deeply grooved medially, frons higher than wide, deeply, but sparsely, punctured; antennae one-third longer than body, slender, scape cylindrical-oval; prothorax transverse, with a blunt tubercle behind middle of each side and another between latter and anterior margin and slightly higher, disk with two feeble swellings on each side; elytra moderately punctured, rounded apically, with three longitudinal ridges on base. Length 19.5 mm.; breadth 6.7 mm.

One specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Iu-ling-paai, Yao Shan, Lien District, N. Kwangtung. October 1, 1934. by F. K. To. New to China.

Distribution.—Assam; Burma; Laos; Kwangtung; Formosa.

Tribe **Niphonini**

Niphoninae Pascoe, 1864, Trans. Ent. Soc. London, ser. 3, 3 : 7, 56.
Niphonides Lacordaire, 1872, Gen. Col. 9 : 414, 519.
Niphonini Aurivillius, 1922, Col. Cat. 73 : 245.

Key to Kwangtung Genera of Niphonini

1. Eyes deeply emarginate, but not divided 2
   Eyes completely divided 3
2. Prothorax and elytra unarmed; scape gradually thickened....**Desisa** Pascoe
   Prothorax with a pair of large dorsal hooks and small lateral tubercles; elytra with a conical tubercle on base of each; scape fusiform..... .....**Yimnashana** Gressitt
3. Metathorax greatly shortened, no longer than first abdominal segment.... 4
   Metathorax not shortened, generally one-half as long as abdomen, or at least longer than first abdominal segment 5
4. Pronotum with a pair of sharp hooks near middle; base of elytra with a pair of conical tubercles .....**Tinkhamia** Gressitt
   Pronotum and elytra without hooks or tubercles, both strongly convex..... .....**Microleropsis** Gressitt
5. Elytra not declivitous posteriorly; pronotum coarsely vermiculate and more or less ridged .....**Niphona** Mulsant
   Elytra declivitous posteriorly; pronotum fairly even...**Pterolophia** Newman

Genus **Niphona** Mulsant, 1839

Niphona Muls., 1839, Col. France, Long., ed 1 : 169 (type : *N. picticornis* Muls.); Lacordaire, 1872, Gen. Col. 9 : 530.
Ocheutes Thomson, 1864, Syst. Ceramb. : 54 (type : *Niphona scopulifera* Thoms.).
Aelara Thomson, 1864, Syst. Ceramb. : 55 (type : *Niphonia Regis-Ferdinandi* Paiva).

Key to Kwangtung Species of Niphona

Length under 12 mm.; elytral bases even, without ridges; pronotum closely punctured, lacking ridges or coarse vermiculations; elytral apices obliquely emarginate-truncate .....**cantonensis** n. sp.
Length over 18 mm.; elytral bases with a strongly raised ridge on each side of suture, and a lesser one externally; pronotum with a median ridge and coarse lateral vermiculations; elytral apices subobliquely truncate .....**hookeri** Gahan

85. **Niphona cantonensis** n. sp. (pl. 2, fig. 8)

Female.—Small, slender, nearly parallel-sided, depressed-cylindrical. Body reddish-brown to piceous on head, prothorax, ventral surfaces and legs; elytra buffy castaneous on apical two-thirds, dark pitchy brown obliquely on basal third from humeral angles to suture, reddish-brown at sides of basal portion; antennae pitchy brown on scape, following few segments light reddish-brown with their apices piceous, distal segments darker reddish-brown, becoming piceous towards apices; middle abdominal segments nearly black; coxae light reddish; tibiae and tarsi dull rufo-piceous. Body largely clothed with tawny buff pubescence, some irregular white pubescence on sides of second and third fifths of elytra, with a transverse band of the

same in last part of basal third; antennae with some sparse white and buff pubescence and a row of fine oblique hairs internally; elytral apices moderately hairy.

Head fully as broad as prothorax, distinctly and quite evenly punctured, a little more sparsely so on vertex; mandibles broad and flat; genal angles prominent; frons transversely oblong, nearly twice as wide as high, feebly swollen; vertex broad, nearly horizontal between antennal insertions; occiput strongly and evenly convex; inferior lobes of eyes slightly wider than deep, occupying a little more than one-half distance between antennal insertions and genal margins. Antennae one-fifth longer than body, slender; scape slightly broadened apically, a little longer than third segment; fourth slightly longer than, and fifth subequal in length to, scape; fifth and following gradually shorter. Prothorax a little broader than long, feebly swollen at sides, hardly swollen above, slightly constricted near apex and base; surface rather closely punctured, more sparsely so on anterior portions of middle of disk, nearly impunctate on anterior marginal area. Scutellum short, bluntly rounded. Elytra narrow, slightly attenuated posteriorly; apices obliquely, and slightly emarginately, truncate; surfaces even, feebly swollen, and with a few granules at middle of each, remainer deeply, and in part seriately, punctured. Ventral surfaces not distinctly punctured. Legs short; tibiae shorter than tarsi. Length 19.5 mm.; breadth 2.8 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), taken at Canton, south central Kwangtung Prov., May 8, 1932, by Prof. Wm. E. Hoffmann.

Differs from *N. hookeri* Gahan in being barely one-half as long, more parallel-sided, much more plane above, with the pronotum lacking ridges and vermiculations and the elytra without basal crests. The head and mandibles of *cantonensis* are very broad, with the frons strongly transverse and the inferior lobes of the eyes rather small; the elytral apices are subacutely produced externally.

Distribution.—Kwangtung, S. China.

86. **Niphona hookeri** Gahan

Niphona hookeri Gahan, 1900, Ann. Mag. Nat. Hist., ser. 8, 5 : 351 (Hainan; N. India; China).

Female.—Moderately large, parallel-sided in central portion, narrowed posteriorly. Body reddish-brown to blackish-brown, largely clothed with tawny buff pubescence; head and porthorax entirely clothed, except for a few punctures on former; antennae sparsely clothed with grayish-brown, mixed with whitish; elytra buffy externally, parasutural area on basal three-fourths subglabrous, reddish-brown to blackish; ventral surfaces clothed with whitish-gray on sternites and brownish-buff at sides and on apical margins of abdominal segments. Head feebly punctured; antennae four-fifths as long as body; pronotum with a median ridge and the sides very

coarsely vermiculate-rugulose; elytra narrowed in apical quarter, subtransversely truncate at apices, surfaces sparsely punctured, with a broad, nodose ridge near suture on each in basal quarter. Length 20-22.5 mm.; breadth 6.4-7 mm.

Some female specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were taken on Honam Island, Canton, January 5, 1918, and at Yao Shan, Lien District, May 12, 1934, by F. K. To, collector. New to mainland of Kwangtung.

Distribution.—Hainan I.; Hong Kong; Kwangtung; Sikkim; Andaman Is.

Genus **Pterolophia** Newman, 1842

Pterolophia Newman, 1842, Entomolog. 1 : 370 (type : *Pt. vitticollis* Newm.).
Prioneta Blanchard, 1853, Voy. Pole Sud, Zool. 4 : 292.
Praonetha Pascoe, 1862, Jour. Ent. 1 : 348.

Key to Kwangtung Species of Pterolophia

1. Antennae regularly annulated with white pubescence beyond fourth segment; length over 9 mm.; at least one-half of elytral surface clothed with grayish-white or pale buff pubescence 2
   Antennae not regularly annulated; white pubescence on scape, bases of third, fourth, seventh and eighth, and apices of sixth and seventh, segments; length under 7.5 mm.; elytra largely dull brown or reddish-brown, with a narrow postmedian transverse band ..... **subexternefasciata** Pic?
2. Elytra with a very wide whitish band across middle of elytra, occupying about one-half elytral area; inferior lobe of eye occupying at least one-half distance between antennal insertion and genal margin..... **annulata** (Chevrolat)
   Elytra largely clothed with pale buff pubescence, a suturally narrowed postmedian band and two concentric, posteriorly convex, narrow arcuate bands on basal half, of dark brown; inferior lobe of eye barely occupying one-third distance between antennal insertion and genal margin ..... **cervina** n. sp.

87. **Pterolophia annulata** (Chevrolat)

Coptops annulata Chev., 1845, Revue Zool. 8 : 99 (Macao I., near Hong Kong).
Praonetha Bowringii Pascoe, 1865, Trans. Ent. Soc. London, ser. 3, 3 :170 (Hong Kong), n. syn.
Pterolophia annulata Gahan, 1894, Ann. Mus. Civ. Genova 34 : 69.
Pterolophia bowringii Matsushita, 1933, Jour. Fac. Agri. Hokkaido Imp. Univ. 34 : 260.

Dull reddish-brown to dark brown; body almost entirely clothed with close pubescence; head clothed with tawny brown pubescence; antennae clothed with reddish-brown on scape, and grayish-brown on following segments, with fourth segment almost entirely, and following segments at extreme apices and bases, clothed with whitish pubescence; prothorax largely clothed with tawny brown to reddish-brown, with central, postmedian portion of disk clothed with whitish, and sides of base and lower parts of sides clothed with dark brown pubescence; scutellum (except apex) and a trapezoidal area on base

of elytra clothed with pinkish-buff pubescence, remainder of basal fifth, and apical third, of elytra clothed with dark brown mixed with reddish-brown, remaining central portion whitish with spots and small areas of grayish-brown or dull brown; ventral surfaces and legs clothed with tawny brown pubescence, dark brown on last abdominal segment. Head moderately punctured, shallowly concave between antennal insertions; prothorax a little broader than long, feebly swollen in central portions, moderately punctured; elytra distinctly narrowed, feebly carinate basally and preapically, coarsely punctured. Length 10-12 mm.; breadth 3.4-3.8 mm.

Specimens in Ling. Nat. Hist. Surv. Mus. from Canton, and some in California Acad. Sci. from Hong Kong.

Distribution.—Hong Kong; Kwangtung; Hainan; Kiangsu; Formosa; Riukiu Is.; Japan.

88. **Pterolophia cervina** n. sp. (pl. 2, fig. 6)

Female.—Moderately stout, deep, distinctly narrowed posteriorly. Body dull reddish-brown to blackish-brown; largely clothed with buffy, and light brown, pubescence, as follows: head and prothorax largely clothed with pale tawny brown pubescence with minute scattered dots of whitish, frons, occiput, and middle of pronotum with paler, buffy brown, a pair of blackish-brown stripes on occiput; antennae clothed with buffy brown externally and whitish internally as far as beginning of apical third of fourth segment, remaining portion blackish-brown with extreme bases and apices of segments clothed with whitish; scutellum tawny brown with a median dark brown stripe; elytra light grayish-brown, with most of basal two-fifths and apical third clothed with tawny yellow, a basal, semicircular area on the latter edged in part with white, some blackish spots along suture and on postmedian brown band, entire surface with occasional white hairs arising from punctures which are often marked by small blackish brown spots; ventral surfaces tawny, spotted with dark brown.

Head deeper than wide, not quite as broad as prothorax, with fine, scattered punctures on frons and central portion of vertex; inferior lobes of eyes barely wider than deep, occupying one-third distance from antennal insertions to genal margins; frons feebly convex, slightly wider than deep; vertex broadly and shallowly concave. Antennae three-fourths as long as body; scape slightly arched, hardly thickened apically, barely longer than third segment; fourth slightly arched, about as long as third, nearly twice as long as fifth; following more slender and slightly shorter. Prothorax one-fourth broader than long, feebly swollen at sides and on each side of disk before middle; surface with a few scattered punctures, particularly along median portion of disk and near anterior margin. Scutellum somewhat rounded-triangular, subtransverse and blunt behind. Elytra narrowed and rounded-truncate posteriorly, with prominent humeri and a strong, elongate-oval tubercle on each near

base; surfaces fairly deeply punctured, more finely and closely so laterally, with three or four feeble and subserrate oblique ridges in interstices in median portions; apical declivity not very abrupt and evenly arched. Length 9.5-12 mm.; breadth 3.8-4.2 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.) Hoi-hong, Hai-k'ang District, Lui-chow Peninsula, S. Kwangtung Prov., S. China, July 20-24, 1932, Prof. Wm. E. Hoffmann, collector; allotype, male (California Academy of Sciences), Nan-ning, Kwangsi Prov., SW. China, 1932, Van Dyke collection; paratypes from Nan-ning in Calif. Acad. Sci. and Gressitt collection.

Differs from *P. binodosa* Bates in being paler and with a pair of dark brown stripes on occiput, and the middle of the scutellum darker, and in having the elytra much smoother and more even beyond basal tubercles.

Distribution.—Kwangtung; Kwangsi.

89. **Pterolophia subexternefasciata** Pic ?

Pterolophia subexternefasciata Pic, 1926, Mel. Exot. Ent. 45 : 29 (China).

Moderately narrow, depressed, gradually declivitous posteriorly. Body dark reddish-brown, pitchy brown on abdominal segments and along middle of thoracic sternites; irregularly clothed with brownish or grayish pubescence marked with spots or areas of grayish-white to brownish-black pubescence: head clothed with grayish-white mixed with reddish-brown and dark brown pubescence; antennae clothed with light reddish-brown spotted with white on first two segments; dark brown beyond, nearly black apically, with bases of third, seventh and eighth, and apices of sixth and seventh, segments clothed with white; prothorax clothed with tawny brown with irregular white areas and a few dark brown spots; elytra similarly clothed, but with basal tubercles black, and a transverse, suturally constricted and divided band of white pubescence behind middle; ventral surfaces thinly clothed with tawny brown; legs clothed with whitish-gray, with brown spots. Head and pronotum finely and rather closely punctured; elytra more coarsely and subseriately punctured, with a feeble basal tubercle and a weakly raised postmedian ridge on each; antennae five-sixths as long as body, with scape barely longer than third segment; sides of metasternum densely punctured. Length 7 mm.; breadth 2.7 mm.

One specimen (Ling. Nat. Hist. Surv. Mus.) was collected at Yao Shan, Lien District, N. Kwangtung, on May 9, 1934, by F. K. To. Unrecorded from Kwangtung Province.

Distribution.—Kwangtung; "China".

Genus **Desisa** Pascoe, 1865

Desisa Pascoe, 1865, Trans. Ent. Soc. London, ser. 3, 3 : 163, note (type : *Praonetha subfasciata* Pasc.); Lacordaire, 1872, Gen. Col. 9 : 551, 566.
Mesopenthia Schwarzer, 1925, Ent. Blätter 21 : 67 (type : *M. variabilis* Schw.).

90. **Desisa subfasciata** (Pascoe)

Praonetha subfasciata Pascoe, 1862, Jour. Ent. 2 : 348 (Cambodia).
Desisa subfasciata Pascoe, 1865, Trans. Ent. Soc. London, ser. 3, 3 : 163.

Male.—Dorso-ventrally compressed, moderately broad, subparallel, broadly rounded behind. Body dark brown, becoming reddish-brown on elytra beyond bases; almost entirely clothed with dense pubescence: head clothed with dark brown marked with small areas of tawny and some scattered white hairs; antennae with dark brown to reddish-brown pubescence, spotted on scape with tawny and ringed on basal portions of antennal segments with white; prothorax clothed with dark brown marked with many small whitish and tawny areas; elytra dark reddish-brown mixed with tawny, with a broad transverse band of white finely spotted with brown, occupying nearly one-third of elytral surface and centered slightly before middle; ventral surfaces clothed with grayish-white mixed with buff and darker brown. Head finely punctured, slightly concave at vertex; antennae one-fourth longer than body, with scape a little longer than, and fourth segment subequal to, third segment; prothorax distinctly broader than long, subcylindrical, feebly swollen in central portion, somewhat sparsely punctured; elytra coarsely subasperate-punctate basally, conjointly rounded apically; ventral surfaces nearly impunctate; second abdominal segment with a large tomentose depression at each side. Length 12 mm.; breadth 4.8 mm.

A specimen (Ling. Nat. Hist. Surv. Mus.) was collected in N. Kwangtung, 1934, F. K. To, collector. New to China.

Distribution.—Indo-China; Kwangtung.

Genus **Yimnashana** Gressitt, 1937

Yimnashana Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 604 (type : *Y. denticulata* Gressitt).

91. **Yimnashana denticulata** Gressitt

Yimnashana denticulata Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 604, pl. 19, figs. 1-3 (E. Kwangtung, S. China).

Dark brown, reddish-brown on bases of antennal segments, palpi, bases, suture and apices of elytra, coxae, tibiae, tarsi and bases of femora. Body clothed with long erect hairs, which are black on dorsal surface and pale testaceous on sides, ventral surface and legs; body hairs longest on dorsal surface of elytra; antennae with long flying hairs, longest on inner sides of first eight segments. Head densely and finely punctured; pronotum sparsely punctured anteriorly, densely so posteriorly, bearing a pair of strong, acute, posteriorly curved tubercles; antennae one-third longer than body; sides of prothorax briefly tuberculate; elytra heavily and sparsely seriate-punctate, with a pair of conical tubercles near base, blunt at tips and three-fourths as high as pronotal tubercles. Length 7 mm.; breadth 2.2 mm.

The type (loan deposit, California Academy of Sciences) was collected at Yim-na Shan, alt. 550 meters, E. Kwangtung, June 11, 1936, by J. L. Gressitt.

Distribution.—E. Kwangtung.

Genus **Tinkhamia** Gressitt, 1937

Tinkhamia Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 605 (type : *T. hamulata* Gress.).

92. **Tinkhamia hamulata lantauana** Gressitt

Tinkhamia hamulata lantauana Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 606 (Lantau Island, near Hong Kong).

"Dark brown; antennae, ventral surface and legs reddish; elytra with silvery pubescence at base, middle and apex, with brown pubescence on intervening two bands. Small, constricted ante-medially; vertex weakly concave: scape swollen; prothorax with a strong, curved, erect tooth on either side of middle of disk and a small one above middle at each side; elytra oviform, a sharp, suberect tooth near base of each and a low tubercle on each humerus; metasternum barely one-half as long as first abdominal segment; hind femora clavate, barely reaching to third abdominal segment. Length 6 mm.; breadth 1.8 mm."

The type (Ling. Nat. Hist. Surv. Mus.) was taken on Lantau Island, near Hong Kong, S. Kwangtung, on June 23, 1934, by Mr. Ernest R. Tinkham.

Distribution.—Lantau Island.

Genus **Microleropsis** Gressitt, 1937

Microleropsis Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 607 (type : *M. rufimembris* Gressitt).

93. **Microleropsis rufimembris** Gressitt

Microleropsis rufimembris Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 608, pl. 20, figs. 3-4 (SW. Fukien and E. Kwangtung, S. China).

"Black; mouthparts, antennae and legs (including coxae) reddish-brown; ventral surface blackish brown, abdomen slightly reddish; eyes brownish. Body largely clothed with very long, erect, flying hairs, black above, white and shorter on sides, ventral surface and legs, very short on upper surfaces of antennal segments and apices of antennae. Head sparsely clothed with thin, pale silvery-gray pubescence; prothorax moderately densely clothed on upper parts of sides, nearly devoid of pubescence on disk; scutellum thinly clothed; elytra with silvery gray pubescence arranged as follows: (1) a narrow, oblique band across each humerus to middle of base of each elytron, (2) a broader, arcuate band behind scutellum, extended posteriorly along suture and anteriorly along lateral margin, (3) a transverse band just behind middle, of about the same width as the preceding band, and (4) a small apical patch; non-pubescent portions shining black; ventral surface and legs thinly clothed with whitish pubescence.

"Head coarsely and deeply punctured, nearly as broad as prothorax; frons swollen, wider than high; inferior lobes of eyes sublongitudinal, rounded anteriorly, occupying less than one-half distance between antennal insertions and mandibles. Antennae thick, one-fifth longer than body; scape swollen externally, narrowed apically, very slightly longer than third segment, which is barely longer than fourth; fifth two-thirds as long as fourth; following segments decreasing in length. Prothorax swollen above, broader at apex than base, weakly swollen and just perceptibly tuberculate at sides; surface very grossly punctured. Elytra slightly broadened to behind middle, narrowed and rounded apically, strongly swollen above beyond base, a weak swelling on each near scutellum; surfaces heavily seriate-punctate on basal two-thirds. Metasternum shorter than first two abdominal segments combined. Femora swollen; tarsi nearly as long as tibiae. Length 4-4.8 mm.; breadth 1.3-1.6 mm."

The paratype (Gressitt collection) was collected at Tsin-leong Shan, alt. 820 meters, E. Kwangtung Prov., on June 5, 1936, by the writer; the holotype (United States National Museum) was taken at Shanghang, in SW. Fukien Prov., July 27, 1936.

Distribution.—E. Kwangtung; SW. Fukien.

Tribe **Apomecynini**

Apomecynides Lacordaire, 1872, Gen. Col. 9 : 413, 579.
Apomecynini Aurivillius, 1922, Col. Cat. 73 : 278.

Key to Kwangtung Genera of Apomecynini

Prothorax non-tuberculate laterally; elytra slightly swollen postmedially, somewhat abbreviated, separately rounded apically; antennae short, non-ciliate ..... **Ropica Pascoe**

Prothorax distinctly tuberculate laterally; elytra long and subparallel-sided, conjointly rounded apically; antennae long and slender, finely ciliate beneath ..... **Asaperda Bates**

Genus **Ropica** Pascoe, 1858

Ropica Pascoe, 1858, Trans. Ent. Soc. London, ser. 2, 4 : 247 (type : *R. piperata* Pascoe); Lacordaire, 1872, Gen. Col. 9 : 580, 590.

94. **Ropica formosana dorsalis** Schwarzer

Ropica formosana var. *dorsalis* Schw., 1925, Ent. Blätter 21 : 145 (S. Formosa).

Small, abbreviated, slightly broadened behind middle. Body largely reddish-brown; blackish-brown on front of head, pronotal disk and median portion of basal half of elytra; dark reddish-brown on vertex, occiput and legs; body thinly clothed with golden gray pubescence, somewhat irregular on elytra, and denser on antennae and legs. Head finely and regularly punctured, moderately convex in front, with inferior lobes of eyes a little deeper than wide; antennae barely longer than body, only slightly tapering, third and fourth segments subequal in length to each other and to scape; prothorax one-third broader than long, slightly swollen at middle, constricted basally, finely punctured, rather densely so at sides; elytra slightly broadened behind middle, narrowed and separately rounded apically, closely and deeply punctured, subseriately so in part; ventral surfaces deeply punctured on sides of metasternum and on episterna; legs short; tarsi with long claw-segments. Length 6 mm.; breadth 2.2 mm.

A specimen (Ling. Nat. Hist. Surv. Mus.) was collected on Honam Island, Canton, P'an-yu District, Kwangtung, on December 26, 1933, by Prof. Wm. E. Hoffmann. New to China.

Distribution.—Formosa; Kwangtung.

Genus **Asaperda** Bates, 1873

Asaperda Bates, 1873, Ann. Mag. Nat. Hist., ser. 4, 12 : 385 (type : *A. rufipes* Bates).

95. **Asaperda meridiana** Matsushita

Asaperda meridiana Matsushita, 1931, Trans. Sapporo Nat. Hist. Soc. 12 : 45 (Formosa).

Elongate, slender, cylindrical, slightly narrowed posteriorly. Body very dark brown above, blackish-brown beneath; antennae pale reddish-brown, slightly darker at apices of segments; legs dark brown on basal two-thirds of femora, preapical portion of tibiae and middle part of tarsi, remainder bright reddish-brown; surfaces irregularly clothed above with gray pubescence leaving a few brown spots on upper portion of head and pronotum and a number of subtransverse bands of largely coalesced brown spots on elytra; ventral surfaces, including most of frons, and genae, rather regularly clothed with whitish-gray pubescence; legs less regularly clothed with the same, middle portions of femora with brownish hairs; antennae with thin pubescence on basal portions of segments, first seven or eight segments finely ciliate beneath. Head finely and rather closely punctured, broad at antennal tubercles, evenly concave at vertex, with inferior lobes of eyes slightly deeper than wide; antennae two-thirds again as long as body, slender and tapering; prothorax a little broader than long, strongly tuberculate near middle of each side, closely punctured, moderately swollen in central portion; elytra three and one-half times as long as head and prothorax combined, deeply and subseriately punctured, narrowed and conjointly rounded at apices; sides of metathroax feebly punctured. Length 9 mm.; breadth 2.1 mm.

One specimen (Gressitt collection) was taken at Yim-na Shan, alt. 600 meters, E. Kwangtung, June 11, 1936, by the writer.

Distribution.—Formosa; Kwangtung.

Tribe **Ptericoptini**

Ptericoptides Lacordaire, 1872, Gen. Col. 9 : 416, 601.
Ptericoptini Aurivillius, 1922, Col. Cat. 73 : 294.

Genus **Sybra** Pascoe, 1865

Sybra Pascoe, 1865, Trans. Ent. Soc. London, ser. 3, 3 : 141, 198 (type : *Ropica stigmatica* Pascoe); Lacordaire, 1872, Gen. Col. 9 : 615.

96. **Sybra posticalis** (Pascoe)

Ropica posticalis Pascoe, 1858, Trans. Ent. Soc. London, ser. 2, 4 : 248, pl. 26, fig. 4 (Hong Kong).
Sybra posticalis Aurivillius, 1922, Col. Cat. 73 : 301.

Moderately small, depressed, subfusiform. Body blackish-brown in major part; reddish-brown on first two antennal segments, basal halves of following segments, sides of frons, humeri, margins and apices of elytra, legs and abdomen; femoral clubs dark brown; body moderately clothed with grayish pubescence above, with areas of denser, tawny pubescence as follows: an anterior median line, and some longer, more or less coalesced lateral ones on pronotum, some short, vague stripes on bases of elytra, and the apices and sutural half of apical two-fifths, comprising dorsal portion of apical declivity, clothed with same; ventral surfaces evenly clothed with buffy gray. Head much narrower than prothorax, deeply and sparsely punctured, frons a little broader below than above, feebly convex, vertex moderately concave, inferior lobes of eyes subtriangular, a little deeper than wide; antennae hardly as long as body, with scape fusiform, two-thirds as long as third segment, and with fourth segment subequal in length to third and one-third longer than fifth; prothorax a little broader than long, moderately swollen above and at sides, rather coarsely punctured; elytra deeply seriate-punctate above, somewhat irregularly punctured at sides, narrowed and subangulate apically; sides of metathorax deeply and sparsely punctured. Length 8.2 mm.; breadth 3 mm.

A specimen (Ling. Nat. Hist. Surv. Mus.) was collected at Tung-chung, Lantau Island, near Hong Kong, Kwangtung, on August 7, 1934, by Y. W. Djou.

Distribution.—Hong Kong; Lantau Island.

The figure given with the original description of this species does not seem to agree with the description, and does not represent the form here considered as *posticalis*. However, it is a small and rather poorly executed drawing.

Tribe **Apodasyini**

Apodasyides Lacordaire, 1872, Gen. Col. 9 : 416, 623.
Apodasyini Aurivillius, 1922, Col. Cat. 73 : 305.

Key to Kwangtung Genera of Apodasyini

Antennal scape strongly swollen; elytra tuberculate basally and truncate apically; antennae longer than body, slender, third to sixth segments subequal in length; prothorax with broad lateral tubercles.....**Rhopaloscelis** Blessig

Antennal scape subcylindrical; elytra non-tuberculate, rounded apically; antennae generally shorter than body, not very slender, fourth segment about as long as following two segments combined.....**Pseudanaesthetis** Pic

Genus **Rhopaloscelis** Blessig, 1873

Rhopaloscelis Blessig, 1873, Horae Soc. Ent. Ross. 9 : 205 (type : *R. unifasciatus* Blessig).

97. **Rhopaloscelis unifasciatus** Blessig

Rhopaloscelis unifasciatus Blessig, 1873, Horae Soc. Ent. Ross. 9 : 206, pl. 8, fig. 3 (Amur).

Depressed, subparallel-sided, truncate apically. Body largely black or brownish-black; antennae and elytra reddish-brown in the main; head brownish-black, slightly reddish at genal angles and mouthparts; antennae dull pitchy brown with bases of third and following segments reddish; prothorax shining brownish-black; scutellum pitchy; elytra reddish-brown, marked with blackish on humeri, basal tubercles, a broad transverse band centered a little before middle, and some irregular spots in apical quarter, besides numerous small dots surrounding punctures; ventral surfaces brownish-black; legs blackish-brown with bases of femora and tibiae, and tarsi for the most part, reddish-brown. Body sparsely clothed with thin silvery pubescence; dorsal surfaces with suberect blackish bristles; antennae sparsely ciliate internally. Head broad, nearly impunctate, strongly convex in front, moderately concave between antennal tubercles, inferior lobes of eyes a little deeper than wide; antennae one-third longer than body, slender, with scape swollen and nearly as long as third segment, third to sixth segments subequal in length; prothorax a little longer than breadth at base, broadened at middle, with a wide, obtuse tubercle at each side, surface finely and sparsely punctured; elytra subparallel, narrowed and sinuate-truncate apically, feebly tuberculate at base, smooth but deeply punctured, rather sparsely so on apical half; ventral surfaces practically impunctate. Length 8.2 mm.; breadth 2.5 mm.

One specimen (Gressitt collection) was collected at Yim-na Shan, E. Kwangtung, on June 16, 1936, by the writer.

Distribution.—Amur; Japan; Korea; Kwangtung.

Genus **Pseudanaesthetis** Pic, 1922

Pseudanaesthetis Pic, 1922, Mel. Exot. Ent. 37 : 15 (type : *P. langana* Pic).

98. **Pseudanaesthetis langana** Pic

Pseudanaesthetis langana Pic, 1922, Mel. Exot. Ent. 37 : 15 (Tongking).
Eupogonius rufipennis Matsushita, 1933, Jour. Fac. Agri. Hokkaido Imp. Univ. 34 : 377, pl. 5, fig. 3 (N. Formosa); Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 610 (Kwangtung); new syn.

Moderately slender, cylindrical, rounded posteriorly. Body reddish-brown above, somewhat piceous on pronotal disk, darker reddish-brown on ventral surfaces; legs brownish-black, with basal halves of femora reddish; antennae black. Body largely clothed with short, fine, subrecumbent whitish hairs, and longer, paler suberect hairs; antennae briefly clothed with grayish-white hairs at extreme bases of middle segments. Head about as broad as pro-

thorax, sparsely and finely punctured, plane between antennal insertions and on occiput, inferior lobes of eyes squared with rounded corners, a little deeper than wide, occupying three-fourths distance between antennal insertions and genal margins; antennae three-fourths as long as body, not very slender, with scape subcylindrical in apical half, nearly as long as third segment, fourth practically as long as third and nearly twice as long as fifth and following; prothorax as long as broad, slightly narrowed at apex, feebly swollen, with a small tubercle at each side just behind middle, surface somewhat closely punctured on central portion which is separated from apex and base of narrow transverse grooves; elytra parallel, rounded apically, rather evenly and subseriately punctured; ventral surfaces impunctate; femora moderately swollen. Length 8.6 mm.; breadth 2 mm.

Three specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Yim-na Shan, alt. 550 meters, E. Kwangtung, June 11 to 14, 1936, by the writer.

Distribution.—Formosa; Kwangtung; Tongking.

Tribe **Acanthocinini**

Acanthocinides Lacordaire, 1872, Gen. Col. 9 : 417, 757.
Acanthocininae and *Exocentrinae* Pascoe, 1869, Trans. Ent. Soc. London, ser. 3, 3 : 9, 26.
Acanthocinini Aurivillius, 1923, Col. Cat. 74 : 390.

Key to Kwangtung Genera of Acanthocinini

1. Prothorax more or less cylindrical, with a small tubercle on each side behind middle; body naked or with long, fine, erect hairs..... 2
   Prothorax either broadly expanded at each side or cylindrical and non-tuberculate; body clothed with strong bristles 3
2. Body lacking long hairs; antennae very slender, tapering....**Miaenia** Pascoe
   Body clothed with long, fine, erect hairs; antennae slightly thickened apically .....**Sphigmothorax** n. gen.
3. Prothorax cylindrical, non-tuberculate; body sparsely clothed with suberect bristles .....**Rondibilis** Thomson
   Prothorax strongly transverse at middle, with posteriorly directed lateral spines; body densely clothed with erect bristles ...**Exocentrus** Mulsant

Genus **Rondibilis** Thomson, 1857

Rondibilis Thomson, 1857, Archiv. Ent. 1 : 306 (type : *R. bispinosa* Thomson); Lacordaire, 1872, Gen. Col. 9 : 797.
Polimeta Pascoe, 1864, Trans. Ent. Soc. London, ser. 3, 3 : 10, 13 (type : *Ostedes spinosula* Pascoe).

Key to Kwangtung Species of Rondibilis

Elytra gray, marked with many rounded spots of brown; scape distinctly swollen; prothorax longer than broad, cylindrical...**multinotatus** n. sp.
Elytra dirty brown, unspotted; scape slender; prothorax no longer than broad, slightly swollen postmedially and constricted basally.....
.....**parcesetosus** n. sp.

99. **Rondibilis multinotatus** n. sp.

Blackish-brown, somewhat reddish-brown on mouth-parts, base and apex of prothorax, elytra in part, coxae, trochanters, and bases of abdominal segments; body largely clothed with pale gray pubescence, except for a number of irregularly placed, small, rounded, dark brown spots on elytra; scutellum slightly paler than surrounding surfaces; elytra sparsely beset with suberect bristles of moderate length; undersides of antennae with a row of slightly longer and finer bristles on second and following segments, the bristles becoming very sparse after sixth segment.

Head fully as broad as prothorax, finely granulose; frons broad, rectangular; vertex finely grooved, feebly concave; eyes with inferior lobes as wide as deep, reaching three-fourths the distance from antennal insertions to bases of mandibles. Antennae one-half again as long as body, slender; scape fusiform, cylindrical, about as long as third segment; fourth slightly longer than third; fifth equal to third. Prothorax longer than broad, subcylindrical, constricted before and behind middle and at extreme apex; slightly swollen at middle; surface micropunctulate; scutellum rounded behind. Elytra narrow, cylindical, narrowed and subobliquely truncated apically; surface finely and somewhat densely punctured, partly in irregular longitudinal rows, the punctures disappearing before elytral apices. Legs slender, posterior femora reaching to apical quarter of elytra, feebly swollen; hind tarsi with first segment longer than following two united. Length 5.7 mm.; breadth 1.5 mm.

Holotype, male (?) (Ling. Nat. Hist. Surv. Mus.), Chung Hang, Honam Island, near Canton, Kwangtung Prov., S. China.

Differs from *Rondibilis horiensis* Kano in having the frons broader, the vertex less concave, the scape more fusiform, the prothorax narrower and more constricted, the elytra less asperate, less regularly punctate, and less densely clothed with bristles, the spots larger, etc.

Distribution.—Kwangtung.

100. **Rondibilis parcesetosus** n. sp.

Brown; head, antennae, prothorax, and scutellum reddish; elytra dirty brown; thoracic sterna and legs reddish-brown; abdomen darker, bases of segments reddish. Body very thinly clothed with pale pubescence; elytra with very sparse and short oblique bristles; antennae with some sparse finer and longer bristles on inner side from apex of fifth segment.

Head wider than deep, broader than prothorax; frons transverse, emarginate at sides; vertex very finely grooved and barely concave between antennal insertions; eyes coarsely facetted, deeply emarginate, inferior lobes wider than deep, occupying two-thirds distance from antennal insertions to bases of mandibles. Antennae about one-third longer than body, slender; scape cylindrical, very slightly fusiform,

barely longer than third segment; fourth a little longer than scape; fifth subequal to third, hardly longer than sixth. Prothorax practically as broad as long, constricted before base, broadest a little behind middle, narrowed towards apex, which is not quite as broad as base; surface microgranulose. Scutellum short, rounded-truncate. Elytra subparallel, subrounded apically, with a slight angle near outer side of each; surface deeply and finely punctured on basal three-fourths, partly in longitudinal rows. Ventral surface micropunctulate; legs slender. Length 5.5 mm.; breadth 1.6 mm.

Holotype (loan deposit, Calif. Acad. Sci.), Mei-hsien City, alt. 220 meters, Mei District, E. Kwangtung Prov., S. China, June 18, 1936, J. L. Gressitt.

Differs from *Rondibilis horiensis* Kano in having the prothorax shorter and less cylindrical, the elytra less bristly, the color more uniform, etc. Differs from *Rondibilis multinotatus* Gressitt in having the scape less swollen, the prothorax shorter and less cylindrical, the elytra unspotted and with far fewer bristles.

Distribution.—Kwangtung.

Genus **Miaenia** Pascoe, 1864

Miaenia Pascoe, 1864, Trans. Ent. Soc. London, ser. 3, 3 : 27, 38 (type : *M. marmorea* Pascoe); Lacordaire, 1872, Gen. Col. 9 : 813.

101. **Miaenia granulicollis** Gressitt

Miaenia granulicollis Gressitt, 1938, Phil. Jour. Sci. 65(3) : 166, pl. 1, fig. 5 (S. Formosa).

Male.—Dull reddish-brown; femora and tibiae brown; clypeus, labrum, bases of antennal segments, coxae, bases of femora, tarsi, and last abdominal segment, light reddish-brown; palpi reddish testaceous; eyes black. Body irregularly clothed with pale buff pubescence as follows: head thinly and sparsely clothed; antennae very thinly clothed; prothorax thinly clothed, subglabrous on either side of midline before center; scutellum sparsely clothed; elytra partially clothed with denser pubescence forming irregular blotches and confluent patches covering about one-half the surface and leaving three larger nude areas in the form of incomplete brown bands at base, before middle, and at beginning of apical quarter; antennae finely fringed internally to sixth segment; frons with a few fine erect hairs; ventral surface very thinly and sparsely clothed with pale pubescence, thoracic sterna, posterior borders of abdominal sterna, coxae and bases of femora clothed with short suberect pale hairs, those on the first abdominal segment forming a dense recumbent fringe.

Head as broad as prothorax at middle, finely granulose; frons transverse, feebly grooved, very slightly convex; vertex barely concave between antennal insertions; eyes with inferior lobes as wide as deep, extending two-thirds distance to bases of mandibles. Antennae slender, two-thirds again as long as body; scape cylindrical, slightly

longer than third segment; third two-thirds as long as fourth, subequal to fifth. Prothorax about as long as breadth at middle, slightly expanded and acutely spined just behind middle of left side; surface finely granulose. Elytra narrowly rounded apically, finely punctured in about fifteen, more or less irregular, longitudinal rows. Hind femora strongly swollen, only reaching elytral apices. Length 5-5.3 mm.; breadth 1.8-2 mm.

A male (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung Prov., June 10, 1934, by F. K. To and a female (Gressitt collection) on Hong Kong Island, August 1923, by Prof. Wm. E. Hoffmann.

Distribution.—Kwangtung; Hong Kong.

Sphigmothorax new genus

Scape without a cicatrix; middle coxal cavities slightly open externally to epimera; tarsal claws divaricate; middle tibiae notched externally. Head nearly as broad as prothorax; antennal insertions distant, hardly raised; vertex feebly concave; frons fully as wide as deep, broader above than below; eyes deeply emarginate, finely facetted, distant above; antennae as long as body, slender, sixth to ninth segments thicker than others, except scape, which is cylindrical and longer than third segment; prothorax slightly longer than broad, convex above and feebly swollen at sides, constricted at base, briefly toothed at each side behind middle, deelpy punctured; scutellum narrow and rounded-truncate; elytra more than twice as long as head and prothorax united, only a little broader than prothorax at tubercles, subcylindrical, feebly narrowed behind base, rounded apically, subseriate-punctate; anterior coxal cavities separate, closed behind, angulate externally; anterior and middle intercoxal processes feebly and gradually arched, subequal in width; legs short, femora modestly swollen, hind pair reaching barely more than one-half distance to elytral apices; tarsi small, first segment but slightly longer than second.

Genotype.—Sphigmothorax bicinctus n. sp.

Range.—S. China (N. Kwangtung).

This genus differs from *Miaenia* Pascoe in having the antennae shorter and slightly thickened apically, in having the prothorax more cylindrical and suddenly constricted basally, with small tubercles, the elytra more nearly parallel and blunt apically and the body clothed with long fine erect hairs. It differs from *Exocentrus* Mulsant in being more slender, with fine hairs instead of bristles, and in having the prothorax cylindrical and more briefly toothed at sides, etc.

102. **Sphigmothorax bicinctus** n. sp.

Female.—Black, shining; clothed with silvery white pubescence as follows: scutellum densely clothed; elytra crossed by two narrow,

transverse bands of dense white pubescence, the first one-eighth elytral length from base, the other just behind middle, both hardly touching suture or external margins, and bent slightly backwards from each side towards suture, apices with a small area thinly clothed with white; head and antennae thinly clothed; ventral surface and legs thinly clothed, most densely clothed on sides of thorax. Dorsal surface of body and inner sides of basal antennal segments clothed with long, erect black bristles, some slightly shorter and finer ones on front of head and outer side of antennal scape and tibiae; remainder of legs and thoracic and abdominal sterna with shorter, suberect palish hairs.

Head practically as broad as prothorax, broad and plane between antennal insertions; surface microgranulose and with irregular small but deep punctures, mostly on vertex and occiput, with a few on frons; eyes very deeply emarginate, inferior lobes one-half again as deep as wide, extending a little more than one-half distance from antennal insertion to base of mandible. Antennae as long as body; scape cylindrical, slightly longer than third segment; fourth segment practically as long as third segment, one-third longer than fifth. Prothorax a little longer than broad, constricted basally, briefly toothed behind middle of each side; surface closely punctured except on either side of base of disk. Scutellum rounded-truncate. Elytra subparallel, but slightly wider than prothorax, rounded apically, deeply punctured in about eleven longitudinal rows, the punctures very fine apically. Ventral surface micro-punctulate; femora moderately swollen; tarsi short, first segment of hind pair but slightly longer than second. Length 5.6 mm.; breadth 2 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, June 1, 1934, F. K. To, collector.

Distribution.—Kwangtung, S. China.

Genus **Exocentrus** Mulsant, 1839

Exocentrus Mulsant, 1839, Col. France, Longic. : 152 (type : *E. cinereus* Muls.); Lacordaire, 1872, Gen. Col. 9 :805.
Oligopsis Thomson, 1864, Syst. Ceramb. : 111, 596 (type: *O. Exocentroides* Thoms.).

103. **Exocentrus subbidentatus** Gressitt

Exocentrus subbidentatus Gressitt, 1937, Ling. Sci. Jour. 16 (4) :615 (E. Kwangtung and SW. Fukien).

"Chocolate brown, somewhat reddish-brown on mouthparts, pro- and meso-sterna, coxae, tarsi, bases of second to fourth antennal segments and apical and basal margins of prothorax. Body bristly and largely clothed with fine pale pubescence, denser on elytra, which are marked with two bands and many fine dots formed by glabrous spaces; head sparsely pubescent, the bristles fine and curved upwards; antennae loosely clothed with dark pubescence and bearing

moderately erect hairs internally and at apices; prothorax with sparse pubescence and a few short, inclined bristles; scutellum densely pubescent; elytra clothed with fairly dense, grayish-white pubescence, except for two subtransverse, glabrous bands, one before, and the other behind, middle, the extreme apices and numerous small round areas, each surrounding the base of a bristle, the latter long and thick, numerous dorsal bristles inclined posteriorly, lateral and apical ones perpendicular; ventral surface finely pubescent, lacking bristles; legs pubescent and moderately bristly.

"Head broad, swollen above, microgranulose-punctate; frons nearly twice as broad as high; vertex weakly concave and finely grooved; eyes with inferior lobes subrounded, occupying two-thirds distance between antennal insertions and bases of mandibles. Antennae one-third longer than body; scape weakly swollen, subfusiform, about as long as third or fourth segment; following gradually shorter. Prothorax nearly twice as broad as long, each side rounded and bearing a strong, posteriorly curved lateral tooth, with an obtuse, weaker tooth before it; surface finely punctulate, the bristles arising from larger punctures. Elytra broad, conjointly rounded posteriorly, finely seriate-punctate. Ventral surface micro-punctulate. Length 5-5.4 mm.; breadth 1.9-2.2 mm."

The type (United States National Museum) was collected at Tsin-leong Shan, Mei District, E. Kwangtung, June 5, 1936, by the writer.

Distribution.—E. Kwangtung.

Tribe **Hippopsini**

Hippopsitae Thomson, 1860, Classif. Ceramb. : 124 (part).
Hippopsinae Pascoe, 1866, Trans. Ent. Soc. London, ser. 3, 3 : 323.
Hippopsides Lacordaire, 1872, Gen. Col. 9 : 690.
Hippopsini Aurivillius, 1923, Col. Cat. 74 : 353.

Key to Kwangtung Genera of Hippopsini

Elytra tuberculate and obsoletely ridged at base; antennal scape reaching to about middle of prothorax; posterior femora nearly attaining apex of second abdominal segment .....**Aulaconotus** Thomson
Elytra smooth at base; antennal scape reaching well beyond middle of prothorax; posterior femora hardly reaching beyond posterior margin of first abdominal segment .....**Pothyne** Thomson

Genus **Aulaconotus** Thomson, 1864

Aulaconotus Thomson, 1864, Syst. Ceramb. : 99 (type : *A. Pachypezoides* Thoms.).

104. **Aulaconotus pachypezoides** Thomson

Aulaconotus pachypezoides Thomson, 1864, Syst. Ceramb. : 99 (Japan).

Large, cylindrical, feebly narrowed posteriorly. Body largely black, reddish brown on parts of basal half of elytra, on metasternum and on upper margins of femora; body almost entirely clothed with

thick pubescence of a whitish buff or tawny, with black markings; head partly glabrous in front, with tufts of tawny pubescence, upper part more completely clothed; antennae clothed with tawny pubescence on first few segments, except at segmental apices, fifth and following segments largely grayish-black with thin tawny gray pubescence at bases; prothorax clothed with tawny pubescence except on glabrous ridges; elytra whitish-buff on basal half with black lines in basal depressions, an incomplete, mottled black band at about middle, and posterior two-fifths pale tawny streaked with black; ventral surfaces densely clothed with whitish buff on thoracic sterna, and with tawny buff, marked with small glabrous spots, on abdomen. Head coarsely granulose on frons, narrowly concave at vertex, and with two feeble ridges on occiput; antennae two-thirds again as long as body, thick basally, tapering, with scape cylindrical and nearly as long as third segment; prothorax cylindrical, as long as broad, with a number of granulose or rugose longitudinal ridges; elytra each with a large, blunt tubercle preceded by a few low ridges, somewhat rugulose in basal half, sparsely punctured posteriorly. Length 24 mm.; breadth 7 mm.

One specimen, probably a male (Ling. Nat. Hist. Surv. Mus.) was taken at Fong-tong-ping, Hoh-kai-hon, Lien District, N. Kwangtung, July 6-7, 1934, by F. K. To.

Distribution.—Japan; Shanghai; Kiangsi; Kwangtung; Formosa.

Genus **Pothyne** Thomson, 1864

Pothyne Thomson, 1864, Syst. Ceramb.: 97 (type: *P. variegata* Thomson); Pascoe, 1866, Trans. Ent. Soc. London, ser. 3, 3: 326; Lacordaire, 1872, Gen. Col. 9: 694.

Key to Kwangtung Species of Pothyne

Elytra bluntly rounded apically, with six fine stripes, the diskal ones sometimes broken into narrow spots; prothorax hardly longer than broad; dorsal surface of body dark chocolate brown....**chocolata** n. sp.

Elytra obliquely subemarginate-truncate apically; with continuous pubescent stripes of different widths; prothorax distinctly longer than broad; dorsal surface of body reddish-brown.....**obliquetruncata** n. sp.

105. **Pothyne chocolata** n. sp.

Male.—Moderately large, cylindrical, parallel-sided, rounded posteriorly. Body chocolate brown, nearly reddish-brown on elytra and nearly black on ventral surfaces; antennae blackish-brown on scape, following segments reddish-brown with dark brown apices. Body largely clothed with tawny gray, or dirty yellowish pubescence of varying density: head irregularly clothed in front, with glabrous dots; antennae with very thin pubescence, and a fringe of long, very fine hairs beneath; prothorax sparsely pubescent throughout, with five narrow longitudinal dorsal stripes, and ventral portions clothed with dense tawny pubescence, a few fine long erect hairs on disk; scutellum densely clothed with tawny; elytra sparsely pubescent like pronotum, with a distinct sutural stripe, a narrow marginal stripe,

and three diskal stripes, of dense tawny pubescence; ventral surfaces moderately clothed with dirty yellow, more densely so along sides of abdominal segments, and very densely on mesopleura and metepisterna; legs thinly clothed with slightly golden-tawny.

Head nearly as wide as prothorax, coarsely asperate-punctate in front, sparsely punctured on genae and impunctate on occiput; frons deeper than wide, broader below, moderately convex; vertex narrowly but shallowly concave; occiput shallowly grooved medially; inferior lobes of eyes rounded-oblong, one-fourth deeper than wide. Antennae two and two-fifths times as long as body, very slender; scape cylindrical, finely punctulate, reaching nearly to base of prothorax, not quite as long as third antennal segment; third to tenth segments gradually shorter. Prothorax very slightly longer than broad, cylindrical, very feebly swollen on each side just behind middle, slightly constricted a short distance from base; surface sparsely and shallowly punctured. Scutellum as broad as long, rounded posteriorly. Elytra long, parallel till near apex; surface with moderately dense subfoveate punctures; apices somewhat rounded, narrowly subtruncate at sutural angles. Ventral surfaces nearly impunctate; metepisterna narrow and parallel-sided. Posterior femora swollen and compressed, as long as first abdominal segment; tarsi longer than tibiae. Length 12 mm.; breadth 2.8 mm.

Female.—Frons less coarsely asperate than in male; antennae slightly more than twice as long as body, with much shorter ventral ciliate hairs. Length 13-15 mm.; breadth 3.1-3.6 mm.

Holotype, male (United States National Museum), Tsin-leong Shan, alt. 850 meters, near Mei-hsien, E. Kwangtung Prov., S. China, June 2, 1936, J. L. Gressitt; allotype, and paratype, females (Gressitt collection), Yim-na Shan, alt. 600 meters, E. Kwangtung, June 12, 1936; two paratypes, males, Tai-au-hong, alt. 600 meters, SE. Kiangsi Prov., July 4, 1936; paratype, female (Ling. Nat. Hist. Surv. Mus.), Yao Shan, Lien District, N. Kwangtung, April 24-26, 1934, F. K. To, collector.

Differs from *P. formosana* Schwarzer in being less reddish-brown, more thinly pubescent, with paler stripes, and in having the elytra more coarsely punctured, the frons more strongly asperate, the scape longer, the following antennal segments more distinctly annulated, etc.

106. **Pothyne obliquetruncata** n. sp.

Male.—Slender, cylindrical, parallel-sided, emarginate posteriorly. Body reddish-brown, pitchy on frons, humeri, sides and apical margins of abdominal segments, apices of femora and tarsi in large part. Surfaces almost entirely clothed with grayish-white pubescence, sparser on frons, genae, occipital ridges, four longitudinal stripes on pronotum and three on each elytron and on middle portions of sternites, densest on mesopleura and metepisterna; antennae very thinly clothed with pale pubescence, bearing long, curved dark hairs on undersides of basal segments; legs sparsely

pubescent on outer portions of femora; hairs on tibiae and tarsi golden tawny.

Head nearly as wide as prothorax, with deep, moderately spaced punctures anteriorly, becoming subasperate on upper portion of frons and front of antennal tubercles; occiput moderately punctured; genae micropunctulate; inferior lobes of eyes about as wide as deep, subrounded, occupying about one-half distance from antennal insertions to genal margins; vertex not very deeply concave between antennal tubercles. Antennae a little more than three times as long as body, thread-like; scape depressed-cylindrical, finely vermiculose-punctate, nearly as long as third segment; third to tenth gradually decreasing in length. Prothorax cylindrical, longer than broad, hardly constricted at either end; disk sparsely punctured, with very feeble transverse rugae. Scutellum short, subtruncate behind. Elytra narrow, obliquely subemarginate-truncate apically; surfaces with moderately close, deep punctures. Ventral surfaces feebly punctured. Posterior femora barely extending beyond apex of first abdominal segment. Length 13.5 mm.; breadth 2.2 mm.

Female.—Antennae two and one-half times as long as body; fifth abdominal sternite emarginate at middle; antennal fringe much shorter than in male. Length 13.5 mm.; breadth 2.7 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Loh-fau Shan, alt. 450 meters, south central Kwangtung Prov., S. China, August 1, 1933, Ernest R. Tinkham, collector; allotopotype, female (Gressitt collection), alt. 800 meters (Big Pool), August 2; paratopotype, female, August 15; three paratypes, Sing-tsz-chan, Lien District, N. Kwangtung, June 27-28, 1934, F. K. To, collector; several paratypes, Hong Shan, alt. 650-900 meters, June 22-30, and Tai-au-hong, alt. 600 meters, July 4, SE. Kiangsi Prov., 1936, J. L. Gressitt, collector.

Differs from *P. albolineata* Matsushita, of Formosa, in having the elytra obliquely, instead of transversely, truncate, and in having the scutellum sparsely clothed, the dorsal surface finely tomentose between the longitudinal stripes, and the sides densely clothed with white. Range in length for entire series, 9-14 mm.; breadth 1.6-2.7 mm.

Tribe **Spalacopsini**

Spalacopsides Lacordaire, 1872, Gen. Col. 9 : 701.
Aprosopitae Thomson, 1864, Syst. Ceramb. : 95, 388 (part).

Genus **Tetraglenes** Newman, 1842

Tetraglenes Newman, 1842, Entomologist 1 : 300 (type : *T. insignis* Newman); Lacordaire, 1872, Gen. Col. 9 : 703.

107. **Tetraglenes insignis sublineatus** Gressitt

Tetraglenes sublineatus Gressitt, 1935, Ling. Sci. Jour. 14 (4) : 572 (Fukien).
Tetraglenes insignis sublineatus Gressitt, 1937, l.c. 16 (4) : 613.

"Elongate, very narrow, subfusiform, slightly laterally compressed; body entirely clothed with a fairly dense and well

adpressed pile varying from mouse gray to dull tawny brown; pale grayish-brown below, fringe on underside of base of scape and anterior portion of frons lighter, upper surface dull tawny brown, lighter at sides, with three fine longitudinal lines of grayish-black commencing on dorsal surface of head and continuing to base of pronotum on which they lie in longitudinal furrows, on elytra they merge into a broad common stripe which soon begins to disintegrate into a row of irregular, more or less connected, dark splotches, disappearing before apex; body rather regularly punctate, deeply on elytra and ventral surface, in longitudinal rows on the former, remainder of body more finely punctate, most obscurely on pronotum."

Head acutely produced anteriorly, nearly as long as prothorax; eyes divided; antennae about as long as body, bearing a fringe of very long fine hairs below, scape as long as following three segments combined; prothorax nearly one-half again as long as broad, with three shallow longitudinal grooves on disk; elytra slender, acutely divaricate apically, coarsely punctate. Length 10.3-14 mm.; breadth 1.2-1.8 mm.

Some specimens (Ling. Nat. Hist. Surv. Mus.) were collected at Iu-ling-paai, Yao Shan, Lien District, N. Kwangtung, September 17-18, 1934, by F. K. To; two examples were taken at Yim-na Shan, E. Kwangtung, June 14 and 16, 1936, by the writer.

Distribution.—Fukien; Kwangtung; Chekiang (Chusan Is.).

Tribe **Saperdini**

Saperdaires Mulsant, 1839, Col. France, Longic. : 181.
Saperdinae Pascoe, 1866, Trans. Ent. Soc. London, ser. 3, 3 : 327.
Saperdides Lacordaire, 1872, Gen. Col. 9 : 831.
Saperdini Aurivillius, 1923, Col. Cat. 74 : 468.

Key to Kwangtung Genera of Saperdini

1. Antennae hardly longer than body; scape reaching but slightly beyond anterior margin of pronotum; prothorax bluntly tuberculate laterally; length of body over 15 mm. 2
   Antennae much longer than body, slender; scape reaching beyond middle of pronotum; prothorax non-tuberculate laterally; length of body less than 10 mm. ..... **Neoserixia** Schwarzer
2. Prothorax with a small, blunt, node-like tubercle at each side before middle; elytra metallic, subglabrous ..... **Glenida** Gahan
   Prothorax with a strong, subacute tubercle at middle of each side; elytra non-metallic, pubescent, with bands ..... **Thermistis** Pascoe

Genus **Neoserixia** Schwarzer, 1925

Neoserixia Schwarzer, 1925, Ent. Blätter 21: 148 (type: *N. pulchra* Schw.).

108. **Neoserixia pulchra continentalis** n. subsp. (pl. 2, fig. 9)

Male.—Body largely blackish-brown, reddish on mouth-parts, last abdominal segment, under pubescent markings of elytra, legs and third to sixth antennal segments orange-testaceous, apical

antennal segments dull brown, clothed with sulphur-yellow to whitish pubescence as follows: head clothed with silvery-white pubescence except on occiput and post-genae; antenae very thinly clothed with silvery pubescence; prothorax clothed with yellowish-white pubescence, except on middle of disk, expanded onto apical and basal margins, and a round spot on each side, besides lower apical and basal margins and sternum; scutellum very thinly clothed; elytra with a basal spot from inner portion of humerus to suture, a very narrow sutural stripe extending a short distance posteriorly, and immediately behind it a spot at first quarter with an oblique extension along suture nearly to middle, a small lateral spot a little before middle, just behind middle a broad squared spot barely touching suture, behind which is an oblique fascia broadened at suture, and at apical angle a small spot extending anteriorly along suture a short distance; thoracic and abdominal pleura quite densely clothed with white pubescence; sterna, as well as rest of body and legs, clothed with erect pale hairs; antennae, beyond scape, very briefly and sparsely ciliate beneath.

Head hardly concave between antennal insertions, slightly convex in front, finely punctate; eyes deeply emarginate, inferior lobes deeper than wide; antennae slender, two and one-half times as long as body; scape gradually thickened, three-fifths as long as third segment, three-fourths as long as fourth, barely longer than fifth. Prothorax as long as broad, constricted before and behind middle, closely and finely punctured, longitudinally carinate behind middle. Scutellum short, emarginate-truncate, the punctures mostly separated longitudinally by distances less than their diameters. Legs long and slender; posterior femora nearly reaching elytral apices; last abdominal segment long, subemarginate.

Female.—Antennae barely twice as long as body, prothorax broader than long; middle of frons nearly black; sides of abdominal segments very thinly clothed; last abdominal segment fully as long as two preceding, rounded-truncate below, grooved basally.

Length 9-10.5 mm.; breadth 3-3.4 mm.

Holotye, male (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien Listrict, N. Kwangtung, May 26-27, 1934, F. K. To; allotopotype, female (Gressitt collection), June 7-9, 1934; four paratopotypes, males, May 25-June 9.

Differs from *N. pulchra* Schwarzer, from Formosa (1925, Ent. Blätter, 21: 148), in having the vertex less concave, the prothorax longer, the elytra more narrowed, the pubescent elytral spots larger and somewhat differently arranged.

Distribution.—N. Kwangtung.

Genus **Thermistis** Pascoe, 1867

Thermistis Pascoe, 1867, Trans. Ent. Soc. London, ser. 3, 3: 438 note (type: *Lamia croceocincta* Saunders).

109. **Thermistis croceocincta** (Saunders)

Lamia croceocincta Saunders, 1839, Trans. Ent. Soc. London 2: 178, pl. 16, fig. 6 (E. Indies).

Thermistis croceocincta Pascoe, 1867, Trans. Ent. Soc. London, ser. 3, 3 439, note; Lacordaire, 1872, Gen. Col. 9: 837.

A fairly large species, densely clothed with black and sulphur yellow pubescence, the latter covering the ventral surface of the body, most of the frons, the anterior portions of the sides of the prothorax, and forming three bands on the elytra, the first close to base, the second oblique, placed just behind the middle, and the last apical and oblique, the femora yellow except apically and along upper edges. Head broad, plane in front, horizontal between antennal tubercles; antennae moderately thick, about as long as body; prothorax broader than long, strongly tuberculate; elytra with prominent humeri, slightly narrowed behind latter, broadly rounded apically and subemarginate-truncate near sutural angles. Length 23 mm.; breadth 8 mm.

A male (Ling. Nat. Hist. Surv. Mus.) was taken in forest on Naam Kwan Shan, Lung-men District, Kwangtung, April-May, 1932, by W. T. Tsang; a male (Gressitt collection) was collected at Taam-yuen-tung, Lien District, N. Kwangtung, June 15-19, 1935, by F. K. To. New to Kwangtung Province.

Distribution.—India; Assam; Szechwan; Kwangtung.

Genus **Glenida** Gahan, 1888

Glenida Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 2: 65 (type: *G. suffusa* Gah.).

110. **Glenida cyaneipennis** Gahan

Glenida cyaneipennis Gahan, 1888, Ann. Mag. Nat. Hist., ser. 6, 2: 66 (China); Waterhouse, 1890, Aid Identif. Ins. 2: pl. 181, fig. 3.

Head, prothorax, antennae basally and scutellum ochraceous; elytra iridescent metallic greenish-blue; ventral surfaces, femora and bases of tibiae sulphur yellow clothed with golden pubescence; apical half of antennae and apices of third to fifth segments, prothoracic tubercles, tarsi and apical portions of tibiae, black; prothorax with thin golden pubescence and a few black hairs near center of disk; elytra clothed with short suberect black hairs. Head broad, prominent at genal angles; frons broad, plane, finely and sparsely punctured; antennae not quite as long as body, scape gradually thickened, two-thirds as long as third segment; prothorax broader than long, a blunt tubercle at each side before middle, surface of disk irregularly punctured, slightly swollen behind center; elytra metallic, rounded apically, deeply and sparsely punctured on basal two-thirds, carinate laterally to apical fifth; metasternum strongly swollen. Length 17-20 mm.; breadth 6-7.3 mm.

Three female specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Taam-yuen-tung, Lien District, N. Kwangtung, May 29 to June 19, 1934, by F. K. To. Unrecorded from Kwangtung Province.

Distribution.—Kwangtung; "China".

Tribe **Gleneini**

Gleneitae Thomson, 1864, Syst. Ceramb. : 123, 401.
Glénéides Lacordaire, 1872, Gen. Col. 9 : 841.
Gleneini Aurivillius, 1923, Col. Cat. 74 : 494.

Key to Kwangtung Genera of Gleneini

Tarsal claws toothed in male, untoothed in female; elytra truncate apically with external angles generally toothed .....**Glenea** Newman

Tarsal claws toothed in both sexes; elytra separately rounded apically, untoothed; body densely pubescent .....**Paraglenea** Bates

Genus **Glenea** Newman, 1842

Glenea Newman, 1842, Entomologist 1 : 301 (type : *G. lepida* Newman); Lacordaire, 1872, Gen. Col. 9 : 843.

Key to Kwangtung Species of Glenea

1. Antennal scape not carinate, or only feebly so (*Genea* s. str.)..... 2

   Antennal scape distinctly carinate for entire length (Subg. *Stiroglenea*); pronotum whitish with four black spots; elytra creamy tan, with apical black spots .....**cantor** (Fabricius)

2. Elytra blackish-blue with four silvery-white spots on each side; femora and tibiae red .....**rufipes** n. sp.

   Elytra black, with suture, base, apex and three subtransverse bands of green; legs with sparse green pubescence.....**suturata** n. sp.

Subgenus **Glenea** s. str.

111. **Glenea rufipes** n. sp. (pl. 1, fig. 11)

Male. — Elongate, laterally compressed, subparallel; brightly marked with red, white, purple and black. Head, antennae and prothorax black, slightly blue or purple; elytra blackish-blue, purplish at sides, legs bright red-brown, tarsi duller, hindthorax and abdomen slightly iridescent green to violet and black; body clothed with pubescence as follows: head somewhat whitish around eyes and on genae, sides of mandibles, clypeus and apex of frons, purplish-black on occiput and vertex; antennae slightly pale on undersurface; prothorax with a basally enlarged, fine mid-dorsal stripe and broad infra-lateral area of dense silvery-white, sternum slightly white, remaining portion with silvery-black pubescence; scutellum apically white; each elytron with a minute basal spot, a finely connected, longitudinally placed pair of small spots at middle of first quarter, a very fine, short streak behind, and external to, the latter, an irregular, moderate-sized spot just beyond middle

and near suture, and a slightly larger subapical spot, all of dense silvery-white pubescence, the last becoming sparse towards apex, remainder of upper surface with black pubescence, sides subglabrous; mesopleura largely densely white-pubescent, sternum and coxae palish; posterior portion of metepisternum, hind coxae and a spot on lower sides of posterior margins of first four abdominal segments densely white, remainder of metasternum and abdominal sterna sparsely whitish or silvery; femora sparsely, and tarsi moderately, white-pubescent; clypeus, labrum and adjacent portion of frons with long, erect black bristles, remainder of head, pronotum and basal three-fifths of elytra with shorter bristles.

Head no broader than prothorax, moderately punctured, most heavily between superior lobes of eyes; vertex slightly grooved between antennal insertions; frons strongly narrowed between inferior lobes of eyes, which reach three-quarters way from antennal insertions to bases of mandibles. Antennae slightly longer than body; scape subcylindrical, two-thirds as long as third segment and not quite as long as fourth; fourth to seventh subequal. Prothorax cylindrical, barely longer than broad, slightly constricted between base and middle; surface heavily punctured. Scutellum broadly rounded behind. Elytra three times as long as head and prothorax united, nearly parallel except for slightly projecting humeri; surface largely impressed with deep punctures. Length 16.3 mm.; breadth 4.4 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, June 15-19, 1934, F. K. To, collector.

Differs from *G. rubripes* Pic, of Laos, in having the antennae blackish-brown instead of red, and the sutural angle of elytra not appreciably toothed. Differs from *G. diana* Thomson in its smaller size and in having the tibiae entirely red, the elytral white spots smaller and not in transverse bands and in lacking the occipital white spots.

Distribution.—Kwangtung.

112. **Glenea suturata** n. sp. (pl. 1, fig. 10)

Female.—Subelongate, narrowed posteriorly. Black, marked with areas of green pubescence, the scales larger and more iridescent on ventral surface. Head densely green-pubescent on genae, sides of mandibles, base of clypeus, sides of frons and on either side of vertex between upper lobes of eyes, sparsely clothed on apical half of frons, clothed with fine black pubescence on upper portion of frons and neck; scape finely clothed with green; prothorax with a median dorsal, and on each side a lateral, longitudinal green stripe, the former constricted near base and apex, ventral surface and anterior and basal margins narrowly green, remaining portions with black pubescence; scutellum with only a fine median line black;

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elytra with base and suture narrowly green, disk of each with two obliquely transverse, largely free fasciae, and a post-median small oblong spot spaced so as to divide elytron into four subequal parts, apex with a pale green spot; mesopleura, sides of metathorax and posterior portions of sides of abdominal segments green, remaining portions, except glabrous lower half of metepisternum, finely green-pubescent; legs finely pale green-pubescent, bluish-green on upper surfaces of middle and hind tarsi. Long erect black hairs on sides and apex of frons and base of elytra, shorter ones on remainder of head and on prothorax.

Head no broader than prothorax, moderately densely punctured throughout; vertex shallowly concave; frons slightly higher than wide; inferior lobes of eyes reaching slightly more than half way to bases of mandibles. Prothorax subcylindrical, slightly broader than long and feebly swollen at middle of sides; disk moderately swollen; surface densely, though somewhat finely, punctured. Scutellum broadly rounded-truncate behind. Elytra long and narrowed; sides bicarinate and fairly straight; apices narrowed and slightly emarginate-truncate. Metepisternum broad and rounded anteriorly. Posterior tarsi with first segment as long as remaining segments combined. Length 13 mm.; breadth 4 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, May 29, 1934, F. K. To, collector.

Differs from *G. chrysomaculata* Schwarzer, of Formosa, in being larger, in having the femora black instead of red, the pubescence pale green instead of bright blue-green, and the elytra with bands, instead of spots, on basal half.

Distribution.—Kwangtung.

Subgenus **Stiroglenea** Aurivillius, 1920

Stiroglenea Aurivillius, 1920, Arkiv f. Zool. 13, 9 : 30 (type : *Lamia cantor* Fabr.).

113. **Glenea (Stiroglenea) cantor** (Fabricius)

Lamia cantor Fabr., 1787, Mant. Ins. 1 : 142 (China).
Saperda cantator Fabr., 1801, Syst. Eleuth 2 : 304.
Glenea cantor Gahan, 1894, Trans. Ent. Soc. London : 488.
Glenea (Stiroglenea) cantor Aurivillius, 1920, Arkiv. f. Zool. 13, 9 : 30.

Moderately broad, narrowed posteriorly; humeri prominent. Body largely black; elytra yellowish testaceous with humeral angles pitchy and apical fifth black, partly clothed with white pubescence; anterior and middle femora and tibiae reddish castaneous; black portions of body largely clothed with yellowish-white pubescence: head densely clothed with yellowish-white except for a small spot at apex of frons, another above middle, a median stripe on vertex and occiput and a spot behind each upper eye-lobe, which

are black; antennae black, very thinly clothed with pale pubescence, a few black bristles on under sides of basal segments; prothorax densely clothed with yellowish-white except for two transverse rows of six rounded or squared black spots in each, four on each side and four on pronotum, besides a narrow postmedian spot on disk; elytra very thinly pubescent on pale portion, with some long yellow hairs on base, black apices with a squared ring of white pubescence on each; ventral surfaces moderately clothed with yellowish-white, three glabrous spots on each side of metathorax and one on each side of first four abdominal segments. Eyes large; antennae one-third longer than body; pronotum swollen behind center; elytra deeply, and in part seriately, punctured, truncate apically with external angles produced. Length 13.5 mm.; breadth 4.5 mm.

Some specimens (Ling. Nat. Hist. Surv. Mus.) were collected at White Cloud Mountain, near Canton, Kwangtung, May 26, 1933, by Y. T. Feng.

Distribution.—S. China.

Genus **Paraglenea** Bates, 1866

Paraglenea Bates, 1866, Proc. Zool. Soc. London : 352 (type : *Glenea Fortunei* Saunders).

114. **Paraglenea fortunei** (Saunders)

Glenea Fortunei Saunders, 1853, Trans. Ent. Soc. London, ser. 2, 2 : 112, pl. 4, fig. 1 (N. China).
Paraglenea Fortunei Bates, 1866, Proc. Zool. Soc. London : 352.

Moderately broad, narrowed posteriorly, vertical at sides. Body black, densely clothed with black pubescence or golden-green scale-hairs: head largely clothed with green in front and black above and at sides; antennae black clothed with green scales on inner and lower surfaces of first and third segments; prothorax clothed with green scales on dorsal surface down to middle of each side, except for a rounded black pubescent spot on each side of center of disk; scutellum green; elytra green on central portion of disk, extreme apices, a narrow, incomplete transverse band near end of basal quarter, and narrowly on external margins; ventral surfaces green except for pro- and mesosterna and sides of first, and part of second, abdominal segment. Head and pronotum somewhat closely punctured, latter obtusely raised behind center; antennae slightly longer than body, with scape as long as third segment; elytra carinate laterally, rounded apically, deeply and sparsely punctured basally. Length 14 mm.; breadth 5 mm.

A number of examples (Gressitt collection) were collected at Mei-hsien City, June 8, 1936, and Yim-na Shan, June 12-14, E. Kwangtung Prov., by the writer.

Distribution.—Peiping; Shanghai; N. China; Nanking; Kiang-si; Kwangtung; S. Japan.

Tribe **Phytoeciini**

Phytoeciides vraies Lacordaire, 1872, Gen. Col. 9 : 849.
Obereitae Thomson, 1864, Syst. Ceramb. : 119, 399.
Phytoeciini Aurivillius, 1923, Col. Cat. 74 : 513.

Key to Kwangtung Genera of Phytoeciini

1. Elytra without lateral carinae or raised costae, sides feebly, or not, deflexed to near apices 2
   Elytra with more or less distinct lateral carinae and raised costae in some of punctural interstices, sides vertically deflexed to near apices..... .....**Nupserha** Thomson
2. Intercoxal process of mesosternum narrowed, but not acute posteriorly; body generally long and slender 3
   Intercoxal process of mesosternum acutely terminated posteriorly; body cylindrical, but rarely very long .....**Phytoecia** Mulsant
3. Prothorax more or less cylindrical or feebly rounded laterally; elytra generally slightly narrowed behind base .....**Oberea** Mulsant
   Prothorax with broad lateral and dorsal swellings; elytra nearly parallel in basal three-fourths .....**Linda** Thomson

Genus **Nupserha** Thomson, 1860

Nupserha Thomson, 1860, Classif. Ceramb. : 41; Lacordaire, 1872, Gen. Col. 9 : 854.

115. **Nupserha batesi** Gressitt

Nupserha batesi Gressitt, 1937, Ling. Sci. Jour. 16 (4) : 618 (S. Kiangsi and E. Kwangtung).

"Small, abbreviated, weakly narrowed posteriorly. Golden testaceous; head black, except for palpi; antennae black on first three segments, blackish-brown on fourth, the following largely testaceous-brown basally and brownish-black at their apices, last two largely dark; prothorax entirely testaceous, darker above; elytra largely testaceous, duller behind middle; sides of latter, from immediately behind base, and extreme apices, brownish-black, postbasal punctures black; ventral surface largely testaceous, duller on metathorax; apex of last abdominal segment black; legs largely testaceous, apices of middle tibiae, entire hind tibiae and first tarsal segment brownish-black, apical tarsal segment reddish-brown. Body largely clothed with very thin pubescence, silvery on head and pale golden on other parts, besides a few short erect hairs on sides of frons, pronotum, base of elytra, and abdomen."

Head broader than prothorax, sparsely punctured, evenly convex, plane between antennal insertions; antennae very slightly longer than body in male, about as long as body in female, scape feebly swollen, nearly as long as third segment, fourth subequal to third; prothorax about as long as broad, slightly narrowed towards apex, and feebly swollen at middle of each side; elytra slightly narrowed, regularly punctured with six longitudinal rows on each. Length 8.7-9.5 mm.; breadth 2-2.3 mm.

Specimens, in Ling. Nat. Hist. Surv. Mus, Gressitt collection and various museums, collected by the writer at Hong Shan, SE. Kiangsi Prov., June 23-29, and Yim-na Shan, E. Kwangtung, June 10-13, 1936. Type in United States National Museum.

Distribution.—Kiangsi; Kwangtung.

Genus **Oberea** Mulsant, 1839

Oberea Mulsant, 1839. Col. France. Longic. : 192, 194 (type : *Cerambyx oculatus* Linne); Lacordaire, 1872, Gen. Col. 9 : 864.
Isosceles Newman, 1842, Entomologist 1 : 318 (type : *I. macilenta* Newm.).

Key to Kwangtung Species of Oberea

1. Head black 2
   Head testaceous 7
2. Metasternum black 3
   Metasternum testaceous 4
3. Prothorax with four black spots; elytra black with silvery pubescence; abdomen largely testaceous .....**bisbipunctata** Pic ?
   Prothorax immaculate; elytra dark, disk dull brown; abdomen largely black .....**discipennis** Fairmaire
4. Elytra with surface largely testaceous or reddish 5
   Elytra largely black 6
5. Abdomen with sides of second segment largely black; elytra with humeri and punctures black; no scutellar row of punctures..... .....**distinctipennis lateriventris** n. subsp.
   Abdomen with only apical segment black; elytra reddish on basal two-thirds; a scutellar row of punctures present.....**nigriceps** (White)
6. Body very broad; antennae with middle segments dull brown; prothorax entirely testaceous; posterior tibiae only black apically...**latipenne** n.sp.
   Body narrow; antennae entirely black; prothorax black on anterior margin; posterior tibiae largely black .....**walkeri** Gahan
7. Prothorax longer than broad 8
   Prothorax shorter than broad, or at least no longer than broad.....11
8 Abdomen at least partly black 9
   Abdomen entirely testaceous .....**formosana** Pic ?
9. Abdomen only partly black 10
   Abdomen entirely black .....**nigriventris** Bates
10. Body reddish; elytra dark apically; first two abdominal segments with silvery pubescence; only second abdominal segment black ....**semiargentata** Pic
    Body testaceous; first two abdominal segments lacking dense silvery pubescence; second and third abdominal segments black.....**toi** n. sp.
11. Elytral punctures mostly less than one puncture-width apart behind middle of elytra; prothorax strongly swollen laterally; shoulders very broad; last abdominal segment largely black .....**humeralis** n. sp.
    Elytral punctures more than one puncture-width apart behind middle of elytra; prothorax subcylindrical; last abdominal segment black only at apex .....**holoxantha** Fairmaire

116. **Oberea bisbipunctata** Pic ? (pl. 3, figs. 11 male, 12 female)

Oberea bisbipunctata Pic, 1916, Longic. 10 (1) : 17 (Hanoi, Tongking).

Male.—Moderately narrow, parallel; antennae and prothorax short, body partly testaceous. Following parts black: head, first

two, and last few, antennal segments; four spots on prothorax, first two on disk just anterior to center, other two on each side of base, not touching margin. Scutellum, elytra, except for extreme base near scutellum, mesopleura, metathorax, except anterior end of sternum and hind coxae, sides of second, and apical half of last, abdominal segments, tibiae and tarsi, black, the last brownish apically; subapical antennal segments gradually changing from testaceous brown to black; palpi testaceous. Black portions of head, hind thorax and elytra, except humeri and apices, densely clothed with grayish-white pubescence, remainder of body, except pronotal black spots, clothed with fine golden pubescence; some pale erect hairs on head, pronotum and base of elytra.

Head slightly broader than prothorax; vertex horizontal, finely grooved medially; frons moderately swollen; eyes large, fairly closely approaching mandibles; surface rather densely, and somewhat finely, punctured. Antennae not quite reaching elytral apices; third segment subequal to scape and slightly longer than succeeding segments. Prothorax as broad as long, slightly swollen at sides behind middle and narrowed apically; disk strongly swollen above; surface irregularly and rather sparsely punctured. Scutellum short, raised and subemarginate apically. Elytra parallel, not quite three times as long as head and prothorax united; apices narrowed and obliquely subemarginate-truncate, with both angles subacute; surface slightly raised longitudinally on base of disk and concave next to suture near scutellum, punctures in six rows, fairly large, separated by one puncture-width or less. Sides of metathorax heavily punctured; sides of abdominal segments with dense punctures of varying sizes.

Female.—Antennae reaching to about last sixth of elytra.

Length 13.4-15.2 mm.; breadth 2.4-2.9 mm.

A male (Ling. Nat. Hist. Surv. Mus.) was taken at Lung-ping-hui, Lien District, N. Kwangtung, May 16-17, 1934; a pair was taken at Fong-tong-ping, Hoh-kai-hon, Lien District, July 4-5, 1934, and a male was taken at Taam-yuen-tung, Lien District, June 1, 1934, by F. K. To. A female (Gressitt collection) was taken at Yim-na Shan, E. Kwangtung, June 14, 1936, by the writer. New to China.

Distribution.—Tongking; Kwangtung.

117. **Oberea discipennis** Fairmaire (pl. 3, fig. 10)

Oberea discipennis Fairmaire, 1889, Ann. Soc. Ent. France, ser. 6, 9 : 68 (Kiangsi).

Female.—Narrow, subparallel, slightly constricted behind middle. Head black; palpi and clypeus testaceous; antennae black, slightly brownish beyond third segment; prothorax pale ochraceous; scutellum and extreme base of elytra near scutellum orange-testaceous; disks of elytra largely dull chestnut-brown except for black punctures; mesothorax and anterior end of metathorax orange-

testaceous; metathorax black, except for ochraceous coxae; abdomen black, slightly brownish on middle of sterna and base of first segment; legs testaceous, hind tibiae and tarsi brownish-black, those of anterior and middle pairs slightly dull. Body clothed with short, fine, pale hairs, some erect ones on bases of prothorax and elytra.

Head hardly broader than prothorax, nearly plane between antennal supports, swollen anteriorly, finely punctured, most densely so above, frons slightly broader than high, broader above than below. Antennae nearly as long as body; scape hardly as long as third segment; third to fifth subequal; following decreasing. Prothorax nearly as long as broad, slightly broader at base than at apex, swollen on each side behind middle, weakly swollen above; surface finely and irregularly punctured. Scutellum small, squarish, subemarginate-truncate behind. Elytra long, narrowed in middle; apices narrowed and emarginate-truncate, outer tooth slightly longer than inner; surface closely punctured in six rows for most of length. Sides of metathorax and basal abdominal segments densely punctured; hind femora not reaching apex of second abdominal segment. Length 13 mm.; breadth 2.2 mm.

A female (Ling. Nat. Hist. Surv. Mus.) was taken at Yao Shan, Lien District, N. Kwangtung, May 6-8, 1934, by F. K. To. New to Kwangtung Province.

Distribution.—Kiangsi; Kwangtung.

118. **Oberea distinctipennis lateriventris** n. subsp. (pl. 3, fig. 6)

Female.—Cylindrical, parallel, slightly narrowed beyond base of elytra, of moderate width; body pale testaceous; head and last abdominal segment black, except at their respective bases, antennae very dull reddish-brown to black; elytra testaceous, shoulders, external margins and apices black, disk marked with rows of black punctures; sides of second, and a spot on side of third, abdominal segment, apical two-thirds of hind tibiae, apices of fore and middle tibiae, and sides of tarsi dull brown to black. Head clothed with silvery pubescence and a few erect hairs; elytra moderately clothed basally with suberect pale hairs, prothorax and ventral surface clothed with short golden pubescence, except on last abdominal segment, where it is black and longer.

Head barely broader than prothorax, very slightly concave between antennal insertions, surface moderately densely punctured; frons squared, moderately swollen. Antennae not quite reaching elytral apices; scape subequal in length to third and fourth segments, following gradually diminishing. Prothorax slightly broader than long, raised anteriorly, disk and sides moderately swollen, the former carinate. Scutellum short, posterior margin emarginate. Elytra subparallel, impressed with six rows of deep, black punctures separated by one or two puncture-widths; apices acute externally and obliquely truncate, the sutural angle likewise

toothed. Metepisternum and sides of metasternum fairly densely punctured. Last abdominal sternite finely grooved longitudinally, concave before the slightly emarginate apex. First hind tarsal segment slightly shorter than following two segments combined.

Male.—Antennae barely exceeding elytral apices; last abdominal sternite concave nearly to base.

Length 14-16 mm.; breadth 2.2-2.8 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.) Yao Shan, Lien District, N. Kwangtung Prov., S. China, May 4-5, 1934; allotype, male, Lung-ping-hui, Lien District, and two paratypes, females, Taam-yuen-tung, Lien District, June 2-3, 1934, F. K. To, collector. A paratype, female (Gressitt collection), was taken at Mei-hsien city, E. Kwangtung, May 30, 1936, by the writer.

Differs from *O. distinctipennis* Pic (1902, L'Echange 18:2) in having the prothorax not longer than broad, the antennae very slightly reddish in middle, and the second and third abdominal segments dark laterally, instead of ventrally. Very closely related to *O. kiotensis* Pic, of Japan, differing with its anteriorly darker, shorter and more obliquely truncated, elytra and its darkened sides of abdomen and hind tibiae and tarsi.

Distribution.—Kwangtung.

119. **Oberea formosana** Pic ?

Oberea formosana Pic, 1911, Longic. 8 (1) : 20 (Formosa).
Oberea holoxantha var. *formosana* Plavilstshikov, 1916, Revue Russe d'Ent. 15 : 80.

Female.—Exceedingly slender; elytra slightly narrowed behind humeri. Body reddish testaceous, paler beneath; eyes and antennae black; elytra piceous along sides and at apices; body clothed with thin golden pubescence, except on sides of elytra and on antennae, ventral surfaces, pronotum and bases of elytra with sparse, suberect somewhat golden hairs. Head broader than prothorax, strongly convex anteriorly, nearly plane, with a shallow median groove, at vertex, surfaces finely and regularly punctured; antennae about as long as body, slender, scape fully as long as third, third shorter than fourth to tenth; prothorax longer than broad, nearly cylindrical, feebly swollen on center of disk, finely and irregularly punctured; scutellum narrowed posteriorly; elytra extremely attenuate, obliquely emarginate-truncate apically, deeply and regularly punctured in six longitudinal rows on basal two-thirds, less regularly towards apices. Length 13-16 mm.; breadth 1.4-1.8 mm.

A female specimen (Gressitt collection) was taken at Yim-na Shan, E. Kwangtung, June 14, 1936, by J. L. Gressitt.

Distribution.—Formosa; Kiangsi; Kwangtung.

120. **Oberea holoxantha** Fairmaire (pl. 3, figs. 1, 2)

Oberea holoxantha Fairmaire, 1888, Ann. Soc. Ent. Belg. 32 : 35 (Fukien).

Male.—Elongate, narrowed posteriorly; abdomen and hind femora very long. Ochraceous, thorax more testaceous below; antennae black, third segment brown below and fourth to eight segments dark brown, their apices black; abdomen black at extreme apex of last segment; hind tibiae blackish-brown, tarsi paler. Body clothed with short golden pubescence and some erect hairs on pronotum, base of elytra and undersurfaces of basal antennal segments. Head nearly as long as, and hardly broader than, prothorax, nearly level between antennal insertions, slightly swollen anteriorly; eyes very large, inferior lobes nearly reaching sides of clypeus, fully as broad as distance between them; frons deeply emarginate on each side; surface densely punctured. Antennae as long as body; scape shorter than third segment; third to fifth subequal. Prothorax nearly as long as broad; apical and basal margins slightly emarginate; sides rounded at middle, constricted before and behind; disk raised in middle, finely and densely punctured. Scutellum squared behind. Elytra nearly three and one-half times as long as head and prothorax combined, narrowed from behind base to apical quarter; apices punctured in six longitudinal series, punctures smaller than spaces between them. Metepisternum and sides of abdominal segments finely punctured. Hind femora reaching beyond second abdominal segment; hind tibiae twice as long as tarsi. Length 12.5-18 mm.; breadth 1.7-3 mm.

A number of specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were collected at Yao Shan, Lien District, N. Kwangtung, May 6-8, 1934, and Lung-ping-hui, Lien District, May 16-17, by F. K. To; White Cloud Mountain, near Canton, May 12, 1936, by E. R. Tinkham; and at Yim-na Shan, E. Kwangtung, June 11-14, 1936, by J. L. Gressitt. New to Kwangtung.

Distribution.—Fukien; Kwangtung.

121. **Oberea humeralis** n. sp. (pl. 3, fig. 4)

Male.—Broad anteriorly, prothorax short, elytra strongly narrowed behind base; testaceous, bases of antennae, sides of humeri, large part of last abdominal segment and apices of tibiae black, remainder of antennae and sides of tarsi dark reddish-brown, elytra testaceous at extreme base, beyond which ochraceous to dirty brown, dusky along sides and impressed with dark brown punctures on disk. Body clothed with moderately short golden pubescence, some erect golden hairs on basal portion of elytra; antennae very sparsely clothed.

Head as broad as prothorax, moderately swollen anteriorly, concave between antennal insertions, sulcate from occiput to clypeus; surface with moderately dense shallow punctures; ventral lobes of eyes large, separated by slightly more than their individual widths,

rather closely approximating mandibles; frons subequilateral. Antennae one-fifth longer than body, moderately thick; scape swollen; third segment arched, subequal in length to scape, fourth and following segments. Prothorax broader than long, narrowed apically, swollen laterally and dorsally, transversely grooved near base; surface irregularly and shallowly punctured, a pair of round, dark-haired areas on each side of middle of disk. Scutellum short, emarginate-truncate apically. Elytra three times as long as head and prothorax combined; shoulders broad and prominent; sides narrowed to behind middle, slightly expanded before apex; apices narrowed, obliquely truncated and bluntly toothed at both sutural and external angles; surface heavily punctured in six longitudinal rows, many punctures separated by less than their own diameter. Sides of thorax moderately, and abdomen sparsely, punctured. Hind tarsi subequal to following two segments united.

Female.—Antennae exceeding elytral apices; elytra less constricted behind middle

Length 17-18.6 mm.; breadth 3.7-4 mm.

Holotype, male (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, June 7-9, 1934, F. K. To, collector; allotopotype, female, and paratopotypes (Lingnan Museum) May 29-June 9; three paratypes (Gressitt collection), Hong Shan, alt. 700-900 meters, SE. Kiangsi Prov., June 22-26, 1936, J. L. Gressitt, collector.

Differs from *O. japonica* Thunberg and its allies in having the prothorax short, swollen and narrowed apically and the elytra very broad basally, besides being largely testaceous. Differs from *O. sinensis* Pic structurally as above, and also in having the elytra darker with the sides of the humeri black, and the last abdominal segment black instead of pale.

Distribution.—Kwangtung; Kiangsi.

122. **Oberea latipenne** n. sp. (pl. 3, fig. 9)

Female.—Broad, parallel, slightly depressed. Yellowish testaceous; head, antennae, elytra, last abdominal segment and tarsi largely black; head with clypeus and palpi testaceous; antennae with third to sixth segments dull brown in middle and basal portions, the succeeding segments slightly palish basally; elytra testaceous at extreme base and adjacent to scutellum; last abdominal segment testaceous at extreme base; tarsi and apices of tibiae black or dark brown, claws of former reddish. Body largely clothed with fine pale pubescence, giving elytra a silvery-gray appearance; antennae ciliated beneath.

Head barely broader than prothorax, swollen above, slightly excavated between antennal insertions; surface irregularly and somewhat densely punctured; frons broaded than high; inferior lobes of eyes wider than deep, reaching more than half way to base

of mandibles. Antennae thick, five-sixths as long as body; scape fully as long as third segment, following gradually decreasing. Prothorax broader than long, strongly raised beyond base, slightly swollen on each side; surface finely and irregularly punctured. Scutellum short, broad and emarginate apically. Elytra broader than head, hardly more than three times as long as broad; apices narrowed and subobliquely truncate; surface heavily punctured in about six fairly regular rows on basal two-thirds. Sides of metathorax moderately punctured. First segment of posterior tarsi not as long as following two segments combined. Length 17 mm.; breadth 4 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, May 25, 1934, F. K. To, collector.

Similar to *O. mixta* Bates, of Japan, differing in having the head much larger, the prothorax shorter and paler, the elytra broader, much more heavily and regularly punctured and almost entirely black, and the tarsi darker.

123. **Oberea nigriceps** (White)

Saperda (*Isoscelis*) *nigriceps* White, 1844, Ann. Mag. Nat. Hist. 14 : 425 (Hong Kong).

Oberea nigriceps Fairmaire, 1895, Ann. Soc. Ent. Belg. 39 : 189, 190.

"Fulvous. Head, antennae and end of abdomen black. Head fulvous behind, a narrow smooth line running down the middle and terminating before the forehead, the other parts closely punctured. Elytra with six lines of large punctures, the end blackish and abruptly cut off, the sutural angle almost spiniform. Legs and under parts entirely fulvous." Length 15.5 mm. (Original description.)

Distribution.—Hong Kong.

124. **Oberea nigriventris** Bates (pl. 3, fig. 8)

Oberea nigriventris Bates, 1873, Ann. Mag. Nat. Hist., ser. 4, 12 : 390 (Japan).

Female.—Extremely narrow, parallel-sided. Head, prothorax, scutellum, extreme base of elytra and anterior femora testaceous; antennae, hind thorax, abdomen and hind legs black; elytra, middle legs and anterior tibiae and tarsi dark mahogany brown to nearly black. Head fully as broad as base of elytra, strongly swollen anteriorly; head and prothorax densely and finely punctured; antennae one-fifth longer than body, all segments but second subequal; elytra heavily punctured in six series, apices acute externally; abdomen densely punctured. Length 14.5 mm.; breadth 1.5 mm.

A male (Ling. Nat. Hist. Surv. Mus.) was taken at Yao Shan, Lien District, N. Kwangtung Prov., May 1, 1934, by F. K. To. New to Kwangtung.

Distribution.—Japan; E. China; Kwangtung.

125. **Oberea semiargentata** Pic (pl. 3, fig. 3)

Oberea semiargentata Pic, 1923, Mel. Exot. Ent. 38 : 15 (Canton).

Male.—Elongate, subparallel. Reddish-brown; antennae, hind tibiae, second, and base of third, abdominal segments black; elytra dark reddish-brown except at base; first two abdominal segments with silvery pubescence; sides of hind tarsi and apices of metepisterna darkened. Head as broad as prothorax, swollen anteriorly; eyes small; frons large, sparsely punctured. Antennae one-fifth longer than body; scape two-thirds as long as third segment, and shorter than last; third to ninth subequal. Prothorax longer than broad, narrowed apically, swollen at sides and above; surface heavily punctured, transversely subvermiculate at sides of disk. Scutellum trapeziform. Elytra constricted in second and third quarters; apices narrowed and obliquely truncate with both angles denticulate; surface heavily punctured in six regular rows to base of last quarter. Thoracic sterna and base of elytra glossy. Hind femora hardly reaching beyond first abdominal segment. Length 18.5 mm.; breadth 3.2 mm.

One male specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Kam-ting Shan, Hoa-tsak, Chung Shan District, Kwangtung, August 10, 1933, by H. Y. Chan and K. C. Lee.

Distribution.—Kwangtung Province.

126. **Oberea toi** n. sp. (pl. 3, fig. 5)

Female.—Slender, cylindrical, parallel. Testaceous; head and prothorax nearly ochraceous; antennae black, fifth to eighth segments brownish-black; elytra with extreme base ochraceous, remainder pale mahogany brown, except for blackish punctures, apices and external margins; abdomen with sides of second and third, and part of fourth, segments and extreme apex and notum of fifth segment black; middle and hind tibiae slightly darkened towards apices, particularly those of the latter pair. Body clothed with short golden pubescence, most densely so on pronotum; elytra with short, suberect pale hairs on most of surface.

Head broader than prothorax, fully as broad as base of elytra, strongly swollen anteriorly and slightly depressed between antennal insertions; surface densely and finely punctured; eyes with inferior lobes higher than wide; frons subrectangular, broader than high. Antennae as long as body; segments somewhat flattened; scape shorter than third segment, equal to fourth; fourth to seventh subequal. Prothorax cylindrical, longer than broad, very slightly constricted near base; disk slightly raised; surface densely and finely punctured. Scutellum small, squarish. Elytra narrow, slightly attenuated posteriorly; apices narrowed, very oblique and slightly emarginate-truncate; surfaces deeply punctured in six longitudinal rows, punctures one-half as great as, or as great as, distance between punctures. Metepisternum moderately punctured. Hind femora reaching to middle of second abdominal segment. Length 12.5-14.5 mm.; breadth 2 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Lung-ping-hui, Lien District, N. Kwangtung Prov., S. China, May 16, 1934, F. K. To, collector; allotype, male, Yao Shan, Lien District, May 12, 1934; paratopotype, female, in writer's collection; paratype, female, Yao Shan, May 12, 1934, F. K. To.

Close to *O. holoxantha* Fairm., differing in having the antennae and elytra darker, the former less cylindrical, the latter more closely and heavily punctured, the prothorax longer and more cylindrical, the eyes less transverse, and the middle portion of abdomen dark. Differs from *O. formosana* Pic in having the derm paler and less shiny, the punctures finer, the prothorax more cylindrical and the abdomen partly black.

Distribution.—Kwangtung Province.

127. **Oberea walkeri** Gahan (pl. 3, fig. 7)

Obera walkeri Gahan, 1894, Trans. Ent. Soc. London : 487 (Hong Kong).

Female.—Moderately stout, subparallel. Body testaceous; head, antennae, elytra, pygidium, tarsi and apical portions of tibiae including most of hind pair, black; elytra testaceous at extreme base near scutellum and dull brownish on disk from basal fifth to apical sixth; prothorax reddish testaceous, apical margin very narrowly dark. Head broader than prothorax, swollen anteriorly, very slightly concave between antennal insertions, finely and densely punctured; antennae as long as the body, first and third segments subequal and longer than following; prothorax broader than long, rounded at middle of sides, densely punctured; elytra punctured in six rows, the punctures smaller than intervening spaces; apices very narrowly, and obliquely, emarginate-truncate; hind femora barely reaching beyond second abdominal segment; abdomen very sparsely punctured. Length 13.5 mm.; breadth 2.3 mm.

Description based on a female in Ling. Nat. Hist. Surv. Mus., taken by F. K. To, at Taam-yuen-tung, Lien District, N. Kwangtung, May 25, 1934. The specimen differs from the original description of *walkeri* in having the prothorax with its apical margin narrowly black and the last abdominal segment entirely black, and in being slightly smaller.

Distribution.—Hong Kong; Kwangtung.

Genus **Linda** Thomson, 1864

Linda Thomson, 1864, Syst. Ceramb. : 122, 400 (type : *Amphionycha femorata* Chevr.); Lacordaire, 1872, Gen. Col. 9 : 870.

Key to Kwangtung Species of Linda

Antennae very briefly ringed with white on extreme bases of fourth and following segments; abdomen entirely testaceous...**femorata** (Chevrolat)

Antennae irregularly annulated, more or less testaceous on basal portions of fourth to sixth segments; abdomen largely reddish.....
.....**fraterna** (Chevrolat),

128. **Linda femorata** (Chevrolat)

Amphionycha femorata Chevrolat, 1852, Revue Zool., ser. 2, 4 : 418 (Shanghai).
Iinda femorata Thomson, 1864, Syst. Ceramb. : 122.

Relatively broad. Ventral surface, prothorax, scutellum, head and femora largely testaceous; elytra and antennae black, the latter clothed with silvery-gray pubescence on bases of fourth to last segments; head with a black band across vertex, connecting antennal supports, middle and posterior portions of occiput also sometimes black; legs black except for basal two-thirds of middle and hind femora and basal four-fifths of anterior femora; testaceous portions of body clothed with silvery pubescence. Head practically as broad as prothorax, shallowly and somewhat closely punctured, vertex nearly plane, frons weakly swollen; antennae four-fifths as long as body, attenuated apically, scape fully as long as third segment, third slightly arched; prothorax nearly twice as broad as long, swollen at each side, and on middle of disk; elytra broadened preapically, obliquely truncate at apices, deeply subseriately punctured on basal two-thirds, the punctures smaller than their interspaces; metasternum feebly punctured. Length 17-19.5 mm.; breadth 4.2-5.5 mm.

A single specimen (Gressitt collection) was taken at Tai-yong, E. Kwangtung, August 5, 1936. New to Kwangtung Province.

Distribution.—Kiangsu; Kiangsi; Kwangtung; Formosa.

129. **Linda fraterna** (Chevrolat)

Amphionycha fraterna Chevr., 1852, Revue Zool., ser. 2, 4 : 419 (Shanghai).
Oberea seminigra Fairmaire, 1887, Ann. Soc. Ent. Belg. 31 : 134 (Chekiang).
Linda fraterna Gahan, 1894, Trans. Ent. Soc. London : 486.

Moderately slender, cylindrical. Reddish testaceous, eyes, mouthparts (except palpi), elytra entirely, and antennae and legs largely, black; occiput black behind superior eye-lobes; antennae testaceous on basal half of fourth, and extreme bases of immediately following segments; metepisternal-metasternal suture black; legs testaceous on basal halves of anterior and extreme bases of middle and hind femora; head and pronotum with dense silvery-white, and abdomen with thinner, pale whitish-golden, pubescence. Head concave between antennal supports, swollen in front, finely punctured; prothorax one-half again as broad as long, strongly swollen above, moderately so behind middle of each side, constricted preapically, finely punctured; elytra subregularly, and deeply, punctured, bearing three feebly raised longitudinal lines, obliquely emarginate-truncate apically; metasternum deeply punctured. Length 13-17 mm.; breadth 2.7-4.5 mm.

Several specimens (Ling. Nat. Hist. Surv. Mus. and Gressitt coll.) were taken at White Cloud Mountain, near Canton, May 5, 1934, by K. C. Yeung, Taam-yuen-tung, Lien District, N. Kwangtung, June 15-19, 1934, and Yao Shan, Lien District, May 4-5, 1934, by F. K. To.

Distribution.—Kiangsu; Kiangsi; Kwangtung; Fukien; Chekiang; Yunnan.

Genus **Phytoecia** Mulsant, 1839

Phytoecia Mulsant, 1839, Col. France, Longic. : 199 (type :*vittigera* Fabr.); Lacordaire, 1872, Gen. Col. 9 : 858.
Hoplotoma Arcas, 1874, Ann. Soc. Esp. Hist. Nat. 3 : 151.

130. **Phytoecia rufiventris ventralis** Bates

Phytoecia ventralis Bates, 1873, Ann. Mag. Nat. Hist., ser. 4, 12 : 388 (Japan; Formosa; China); Fairmaire, 1889, Ann. Soc. Ent. France, ser. 6, 9 : 68.
Phytoecia rufiventris var. *ventralis* Aurivillius, 1923, Col. Cat., 74 : 565.

Small, subcylindrical, slightly narrowed posteriorly. Body largely black; abdomen, femora (except apices) and middle and anterior portions of pronotal disk of an orange-red color, abdomen slightly paler, reddish testaceous. Body sparsely clothed with partly raised, short pale hairs. Head slightly broader than prothorax, transverse and convex in front, with eyes and antennal insertions distant, vertex feebly convex, surfaces densely punctured, and inferior lobes of eyes wider than deep; antennae barely longer than body, scape flattened-cylindrical, about as long as third segment, fourth barely longer than third and one-half again as long as fifth, fifth and following more pubescent, grayish, thickened towards their respective apices; prothorax nearly as long as broad, moderately rounded at sides, raised along median line, closely punctured, except around raised median ridge; elytra distinctly and somewhat irregularly punctured, a feeble raised line along middle of each; ventral surface with only a few punctures; abdominal segments subequal in length. Length 7-9 mm.; breadth 1.9-2.1 mm.

Some speciments (Ling. Nat. Hist. Surv. Mus.) were taken at Honam Island, Canton, May 3, 1933, by Prof. Wm. E. Hoffmann; one example (Gressitt collection) was taken at Yim-na Shan, June 11, 1936, by the writer.

Distribution.—Japan; Kiangsi; Chekiang (Chusan Is.); Kwangtung; Formosa.

Tribe **Tetraopini**

Tetraophthalmitae Blanchard, 1845, Hist. Nat. Ins. : 160.
Tetraopesitae Thomson, 1860, Classif. Ceramb. : 66.
Asthatitae Thomson, 1864, Syst. Ceramb. : 117, 399.
Astatheinae Pascoe, 1867, Trans. Ent. Soc. London, ser. 3, 3 : 347.
Tetraopides Lacordaire, 1872, Gen. Col. 9 : 849, 871.
Tetraopini Casey, 1913, Mem. Col. 4 : 373.

Key to Kwangtung Genera of Tetraopini

Metasternum with a strong anterior process projecting over intercoxal process of mesosternum; the latter vertical in front...**Astathes** Newman

Metasternum lacking a strong anterior process; mesosternal intercoxal process arched or gradually declivitous, narrow or vestigial.....
.....**Chreonoma** Pascoe

Genus **Astathes** Newman, 1842

Astathes Newman, 1842, Entomologist 1 : 299 (type : *A. perplexa* Newm.); Lacordaire, 1872, Gen. Col. 9 : 873; Gahan, 1901, Trans. Ent. Soc. London : 38-60.

Tetraophthalmus Guerin-Meneville, 1844, Icon. Règne Anim. Ins. : 244.

Tetraophthalme Blanchard, 1845, Hist. Nat. Ins. 2 : 161.

131. **Astathes episcopalis** Chevrolat

Astathes episcopalis Chevr., 1852, Rev. et Mag. de Zool., ser. 2, 4 : 418 (China); Gahan, 1901, Trans. Ent. Soc. London : 44.

Broad, dorso-ventrally compressed, subrectangular. Body orange-testaceous, paler beneath; elytra shining metallic blue with violet and purplish reflections; antennae black to pichy brown, with successively lesser portions of bases of fourth to seventh segments dull testaceous; tibiae and tarsi blackish; claws, and last half of claw segment of tarsus pitchy red. Body clothed on testaceous portions with thin golden pubescence and irregular, moderately long, suberect somewhat gold hairs; elytra similarly clothed with blackish hairs. Head about as broad as prothorax, very wide, obliquely inclined, and broadly grooved at vertex; frons convex below; eyes distant, each lobe rounded-oval; surface strongly, and somewhat closely, punctured; antennae not quite as long as body in female, slightly longer than body in male, third segment longer than scape, which latter is longer than fourth segment; prothorax strongly transverse, deeply constricted a short distance from apex and base, a bulbous swelling at middle of each side, and a larger, even one on center of disk; scutellum broad, rounded behind; elytra short, conjointly rounded posteriorly, deeply and subseriately punctate; ventral surfaces finely punctured; tarsi short. Length 10-14 mm.; breadth 3.5-5.5 mm.

Specimens in Ling. Nat. Hist. Surv. Mus. from Lung-ping-hui, Lien District, N. Kwangtung, May 16-17, 1934, F. K. To, collector, Yao Shan, Lien District, May 1-2, and other localities; specimens in author's collection from Swatow, May 27, Mei-hsien city, May 30, and Yim-na Shan, June 13, 1936, E. Kwangtung, J. L. Gressitt, collector.

Distribution.—Shensi; Kiangsu; Kiangsi; Fukien; Kwangtung; Hong Kong; Formosa.

Genus **Chreonoma** Pascoe, 1867

Chreonoma Pascoe, 1867, Trans. Ent. Soc. London, ser. 3, 3 : 348, 358 (type : *C. venusta* Pascoe); Gahan, 1901, Trans. Ent. Soc. London : 63.

Key to Kwangtung Species of Chreonoma

1. Elytra entirely blue or violaceous 2
   Elytra partly testaceous 3
2. Tarsi, apices of tibiae, and antennae partly, black.....**atritarsis** Pic
   Antennae (except apices) and legs entirely testaceous.....**hoffmanni** n. sp.
3. Elytra testaceous in middle, blue or testaceous basally 4
   Eltra testaceous only at extreme base 5
4. Elytra largely testaceous, blue apically; length under 8 mm.....
   .....**cyaneoapicalis** n. sp.
   Elytra testaceous in middle, blue basally and apically; length over 10 mm.
   .....**nigronotata** Pic
5. Elytra testaceous basally for equivalent of one-half length of prothorax; head of male lacking frontal carina; abdomen densely hairy beneath....
   .....**comata** Gahan
   Elytra testaceous basally for equivalent of one-fourth length of prothorax; head of male with a frontal carina; abdomen sparsely hairy beneath....
   .....**basalis** Gahan

132. **Chreonoma atritarsis** Pic

Chreonoma atritarsis Pic, 1912, Mat. Longic. 8 : 21 (? China); Gressitt, 1935, Philippine Jour. Sci. 57 : 192 (Formosa).

Moderately small, subparallel, slightly depressed. Body yellowish testaceous, slightly orange on head and pronotum; elytra shining metallic purplish-blue to violaceous; antennae brownish-black with most of third to fifth segments testaceous, bases of sixth and following segments slightly dull brownish; apical portions of tibiae, and most of tarsi, pitchy black mixed with brownish. Body clothed with long erect hairs corresponding to ground color: very long on bases of elytra and on pronotal disk. Head fully as broad as prothorax, sparsely and finely punctured, convex on lower portion of frons, feebly concave at vertex, with a fine median impressed line and inferior lobes of eyes nearly round; antennae nearly as long as body in male, three-fourths as long as body in female, scape nearly as long as third segment and longer than fourth; prothorax transverse, strongly swollen at middle of each side, and even more so on middle of disk, deeply punctured on sides and center of disk; scutellum small, bluntly rounded behind; elytra parallel, rounded apically, deeply, but sparsely and irregularly, punctured on basal half of surface; ventral surfaces closely and finely punctured at sides. Length 9-12.5 mm.; breadth 3-4.8 mm.

Several speciments in Ling. Nat. Hist. Surv. Mus. and Gressitt collection from Taam-yuen-tung, June 2-3, Yao Shan, April 29, and Lung-ping-hui, May 16-17, Lien District, N. Kwangtung, 1934, F. K. To, collector; a female (Gressitt collection) was taken at Tsin-leong Shan, E. Kwangtung, June 11, 1936, by the writer.

Distribution.—Kiangsi; Kwangtung; Formosa.

133. **Chreonoma basalis** Gahan

Chreonoma basalis Gahan, 1894, Trans. Ent. Soc. London: 487 (Hong Kong).

"Fulvous; the elytra violet or deep blue, with a very narrow fulvous band at the extreme base reaching from the scutellum to the outer margin. Antennae with the last four to six joints blackish, those of the male about as long as the body, those of the female somewhat shorter.

"The front of the head in the male bears in the middle a short tuberculiform carina. In this and other characters the species seems to come nearest to *C. frontalis*, Gahan." (Part of original description.) Length 10-11 mm.; breadth 3.5-4 mm. (male and female).

Distribution.—Hong Kong.

134. **Chreonoma comata** Gahan

Chreonoma comata Gahan, 1901, Trans. Ent. Soc. London : 67, pl. 4, fig. 8 (Hong Kong).

"Male. Head, antennae at the base, prothorax, and a narrow transverse band at the base of the elytra, yellowish-testaceous; rest of the elytra violaceous-blue; last six joints of the antennae and the apices of the fourth and fifth, dark brown; body underneath, and legs, testaceous, densely clothed with tawny hairs, which are much longer and more densely placed on the sides of the abdomen. Head rather broad and convex in front, without a median carina, densely setose. Prothorax with the centro-notal tubercle rather strongly raised, somewhat oval in outline, convex above, and distinctly and closely punctured except along the middle. Elytra rather closely punctured, with the punctures becoming gradually smaller towards the apex; somewhat densely setose, the setae being longer on the basal part, shorter near the apex, black on the violaceous area, and tawny like those of the head and thorax, on the basal testaceous band. Antennae longer than the body; first joint rather short, obconical, asperate in front near the apex; joints third to eighth or ninth slightly angulate at the apex on the anterior side, the same joints with a fringe of short setae on the posterior side." Length 12 mm.; breadth 4 mm. (Original description.)

Distribution.—Hong Kong.

135. **Chreonoma cyaneoapicalis** n. sp. (pl. 2, fig. 11)

Male.—Minute, abbreviated, parallel, dorso-ventrally compressed; legs short, antennae very slightly longer than body. Pale testaceous, slightly ochraceous on head, prothorax and base of antennae; apical two-sevenths of elytra violaceous purple; distal half of antennae dusky, nearly black towards apex; body well clothed with fairly long, suberect golden hairs, longer on dorsal surface of body and inner sides of antennal segments, a fine silvery pubescence on frons, genae, coxae and thoracic sterna.

Head broader than prothorax, convex anteriorly, plane between the antennal insertions; surface with moderately heavy puncturation; superior lobe of eye one-quarter size of lower, and separated from it by antennal insertion; apical palpal segments elongate-fusiform and acuminate. Antennae thick, barely longer than body; scape subcylindrical, densely punctured, three times as long as second segment and subequal to third; remaining gradually diminishing; eleventh apically acuminate. Prothorax one-third broader than long; disk hardly swollen, concave on each side near base, sides swollen behind middle, a transverse groove near base; surface heavily punctured, except on latero-basal concave areas. Scutellum short, transverse behind. Elytra short, broadly rounded behind; disk heavily punctured in eight or nine rows. Intercoxal process of mesosternum extending two-thirds of space between coxae, concave at apex; metepisternum rather densely punctured basally. First abdominal segment equal in length to the following two combined, and to the last segment. Tarsi minute, first segment of hind pair nearly as long as following two combined.

Female.—Slightly more robust than male; antennae barely reaching to apices of elytra; apical abdominal segment as long as preceding three combined, narrowly grooved medially.

Length 6-8.5 mm.; breadth 2.2-3 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Fong-tong-ping, Hoh-kai-hon, Lien District, N. Kwangtung Prov., S. China, July 6, 1934, F. K. To, collector; allotype, male (Gressitt collection), paratype, male (United States National Museum), and paratype, female (Lingnan Museum), Yao Shan, Lien District, N. Kwangtung, May 1-2, 1934, F. K. To.

Differs from *C. violaceoapicalis* Pic, of Tongking, in being only half as large and in having the ventral surface testaceous instead of black. Similar in size and appearance to *Anastathes parva* Gressitt, of Formosa, but with the antennae and elytra dark apically and the middle intercoxal process longer and less abrupt anteriorly.

Distribution.—N. Kwangtung Province.

136. **Chreonoma hoffmanni** n. sp. (pl. 2, fig. 12)

Female.—Moderately elongate, parallel, dorso-ventrally compressed; nitid; reddish testaceous; elytra deep metallic blue; apical six antennal segments dusky brown; body moderately clothed with fine, golden pubescence and suberect hairs, black on elytra; antennae with fairly long dark hairs internally.

Head as broad as prothorax, swollen anteriorly, concave between antennal insertions and finely grooved midlongitudinally from apex of frons to base of occiput; surface moderately punctured, the punctures fairly fine and sparse. Antennae not quite reaching to elytral apices; scape gradually thickened, asperate externally near apex; second segment twice as long as broad; third slightly shorter than

scape, barely longer than fourth; last bluntly pointed at apex. Prothorax broader than long, swollen on disk and at middle of each side; a transverse constricture before and behind lateral swellings; puncturation rather coarse and close, except on lateral swellings and upper part of diskal protuberance. Scutellum broadly triangular, bluntly pointed behind. Elytra twice as long as head and prothorax combined; shining, somewhat deeply and closely punctured in ten or twelve irregular rows, except at apices, which are rounded externally, with the internal angles blunt. First segment of hind tarsus nearly as long as following two combined. Length 11-11.5 mm.; breadth 3.3-3.6 mm.

Holotype, female (Ling. Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien District, N. Kwangtung Prov., S. China, June 2-3, 1934, F. K. To, collector; paratopotype, female, in writer's collection.

Differs from *C. fortunei* Thomson in being larger and broader, with the antennae largely testaceous instead of black, the elytra more heavily punctate and the body hairs shorter and pale instead of dark on fore-body. Differs from *C. atritarsis* Pic in having the pronotal disk less swollen above, the scutellum longer and more acute, the elytra more heavily punctured and less shiny, and the antennae basally, and tibiae and tarsi entirely, testaceous, instead of being partially black.

Named in honor of Professor William E. Hoffmann, Director of the Lingnan Natural History Survey and Museum of Lingnan University, Canton, and Editor of the Lingnan Science Journal, as a slight token of extensive coöperation and favors extended to the writer.

Distribution.—N. Kwangtung Province.

137. **Chreonoma nigronotata** Pic (pl. 2, fig. 10)

Chreonoma nigronotata Pic, 1912, Mat. Longic. 8 : 21 (Tsouglov", Asia); Gressitt, 1937, Ling. Sci. Jour. 16 (4) :621 (Kiangsi).

Moderately large, parallel, suboblong, strongly compressed dorso-ventrally. Body yellowish testaceous, whitish testaceous on apical half of elytra; basal half of elytra greenish-black; antennae dull testaceous basally with apices of second and following segments brownish-black, postmedian segments largely pitchy with dull testaceous bases, apical segments black; metasternum and sides of third and fourth abdominal segments iridescent black with greenish to purplish tinges. Body clothed with long, suberect hairs, more or less corresponding with ground color, those on dark parts of ventral surface dark reddish-brown. Head broad, feebly convex in front, slightly depressed between antennal insertions, finely and sparsely punctured; antennae four-fifths as long as body, scape as long as third segment, each one-fourth longer than fourth segment, fifth much shorter; prothorax fully twice as broad as long, strongly swollen in center of disk, less strongly swollen at middle of each side,

with moderate, and rather close, punctures; scutellum short, broadly rounded behind; elytra oblong, rounded apically, sparsely and irregularly punctured on basal two-thirds. Length 15 mm.; breadth 5 mm.

A female specimen (Ling. Nat. Hist. Surv. Mus.) was taken at Taam-yuen-tung, Lien District, N. Kwangtung, June 4-6, 1934, by F. K. To. Unrecorded from Kwangtung.

Distribution.—Kiangsi; Kwangtung; "Tsouglov".

Appendix

Note.—In addition to the species ennumerated and discussed, the following have come to my notice since the study was completed, or were not included because of uncertain identity or relationships:

138. **Olenocamptus bilobus** (Fabr.), Hong Kong.
139. **Exocentrus** sp., E. Kwangtung.
140. **Pterolophia persimilis** Gahan, Hong Kong.
141. **Niphonini** ? new genus, new species, Hong Kong.
142. **Apodasyini** new genus, new species ?, Hong Kong.
143. **Nupserha** sp., N. Kwangtung.

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華南廣東省天牛蟲之研究

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(摘要)

本篇材料，乃採自廣東，香港與爛頭山等處。經研究者共一四三種，分隸八十三屬，及五亞科。凡見於各種文獻及曾經觀察之天牛蟲，亦在記載。計屬新品種者三十，其中兩種乃新屬之模式標本。首次發見於廣東者共六十種，發見於廣東以外之中國者亦有四十一種。此一四三種中，有二十五種，曾見於海南島；三十八種爲台灣等處所常見；十八種遠佈及楊子江北岸及日本。一種曾見於歐洲，惟見於東印度者，僅有五種。由此可見廣東係屬印度中華亞區之上部而與歐亞區之關係較少。上述各新品種現存嶺南大學自然博物採集所或加省科學館著者之標本貯藏室中。對於所述各類之檢索表，皆見文中。

Explanation of Plates

Plate I

(Magnified 2.36 times)

Fig. 1. *Leptura aurosericans* (Fairmaire).
2. *L. rubripennis* Pic.
3. *Margites egenus* (Pascoe).
4. *Chloridolum loochooanum kwangtungum* n. subsp., holotype.
5. *Euryphagus chinensis* n. sp., holotype.
6. *Moechotypa delicatula* (White).
7. *Monochamus guerryi* Pic.
8. *Perihammus bifasciatus* Aurivillius.
9. *Cyrtogrammus lateripictus* n. sp.
10. *Glenea suturata* n. sp., holotype.
11. *G. rufipes* n. sp., holotype.

Plate II

(Magnified 3.3 times)

Fig. 1. *Rhaphuma pictiventris* n. sp., holotype.
2. *Xylotrechus pyrrhoderus nigrosternus* n. subsp., holotype.
3. *X. binotaticollis* n. sp., holotype.
4. *Cacia cretifera macularia* n. subsp., holotype.
5. *Falsomesosella hakka* Gressitt, paratype.
6. *Pterolophia cervina* n. sp., holotype.
7. *Olenocamptus biocellatus* Schwarzer.
8. *Niphona cantonensis* n. sp., holotype.
9. *Neoserixia pulchra continentalis* n. subsp., holotype.
10. *Chreonoma nigronotata* Pic.
11. *C. cyaneoapicalis* n. sp., holotype.
12. *C. hoffmanni* n. sp., holotype.

Plate III

(Magnified 3.0 times)

Fig. 1. *Oberea holoxantha* Fairmaire, male.
2. *O. holoxantha* Fairmaire, male.
3. *O. semiargentata* Pic, male.
4. *O. humeralis* n. sp., paratype.
5. *O. toi* n. sp., holotype.
6. *O. distinctipennis lateriventris* n. subsp., holotype.
7. *O. walkeri* Gahan, female.
8. *O. nigriventris* Bates, male.
9. *O. latipenne* n. sp., holotype.
10. *O. discipennis* Fairmaire.
11. *O. bisbipunctata* Pic ?, male.
12. *O. bisbipunctata* Pic ?, female.

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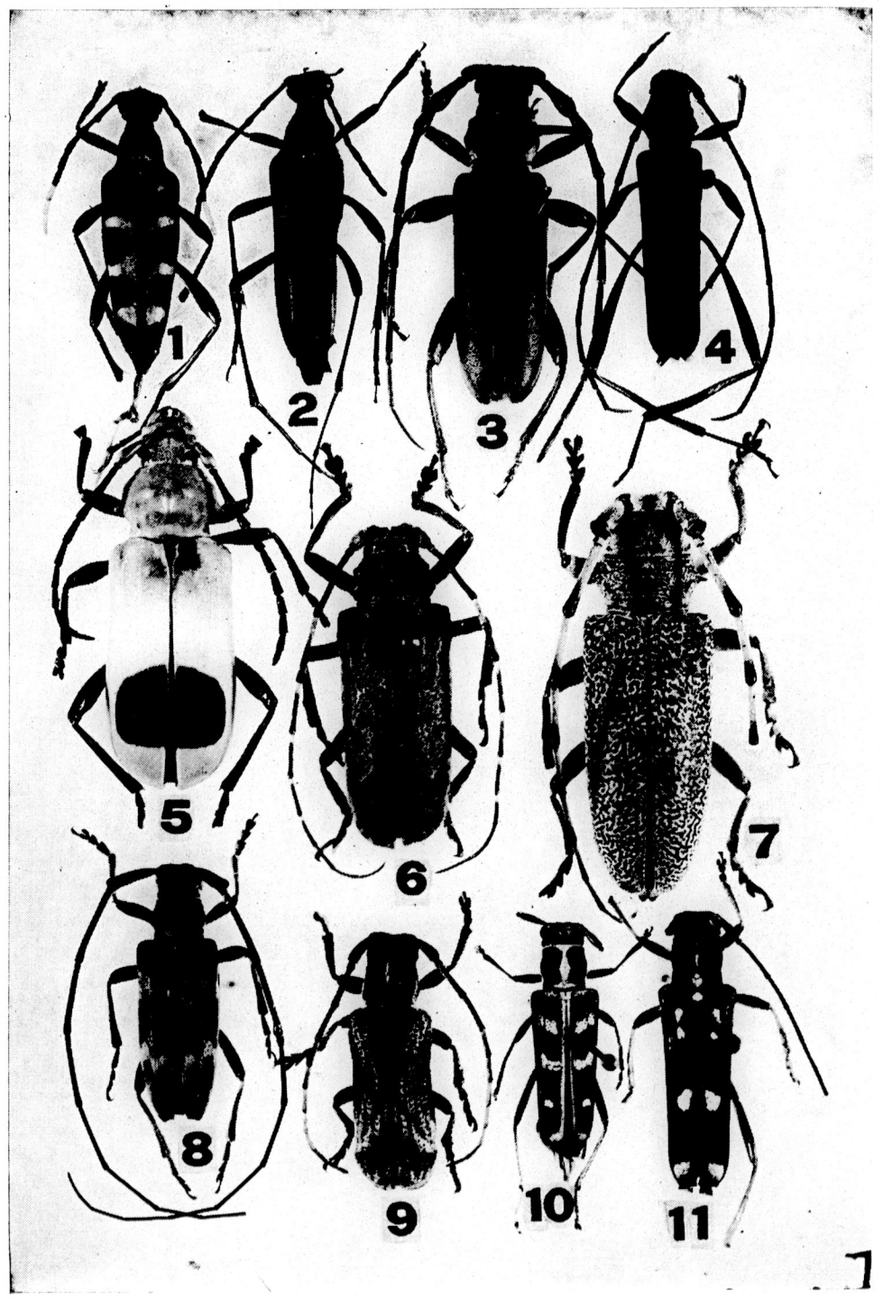

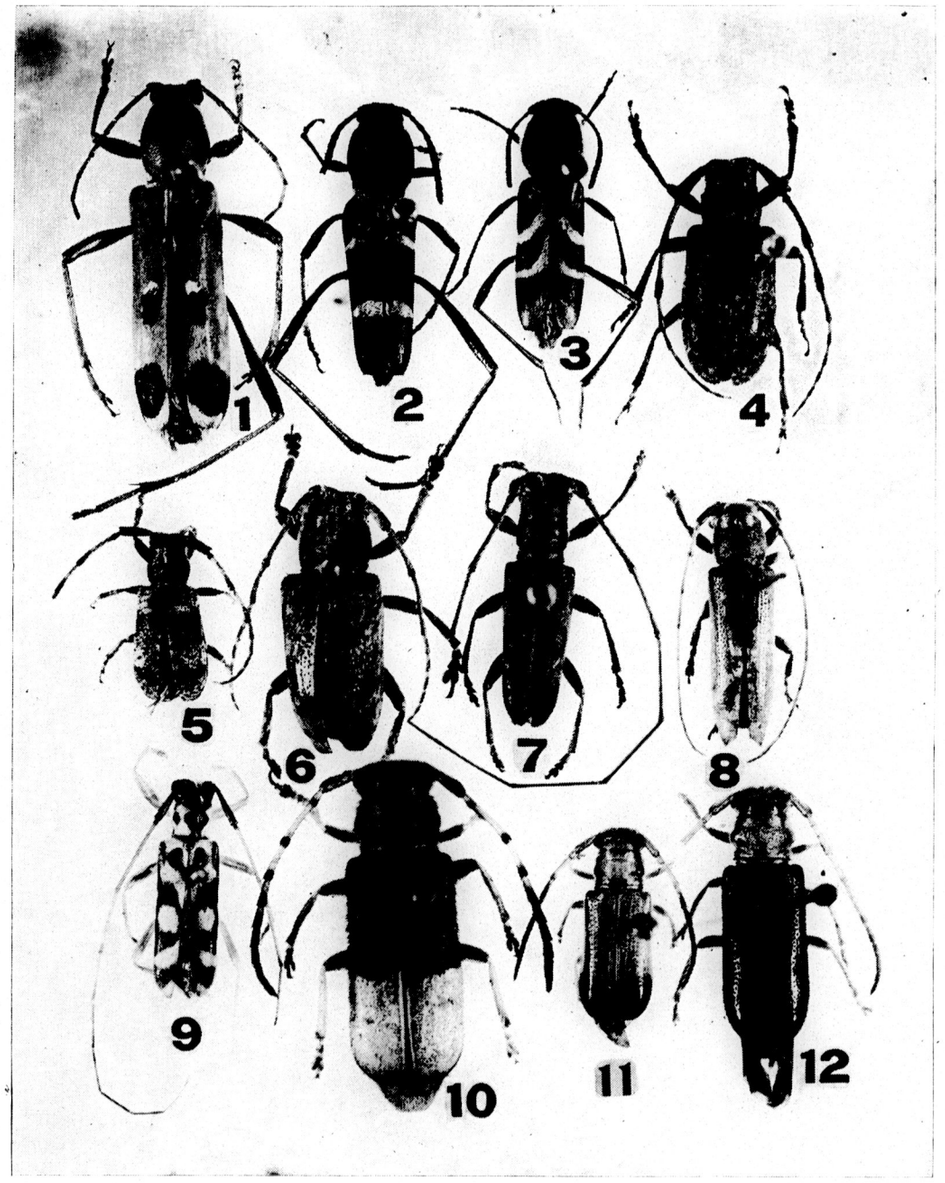
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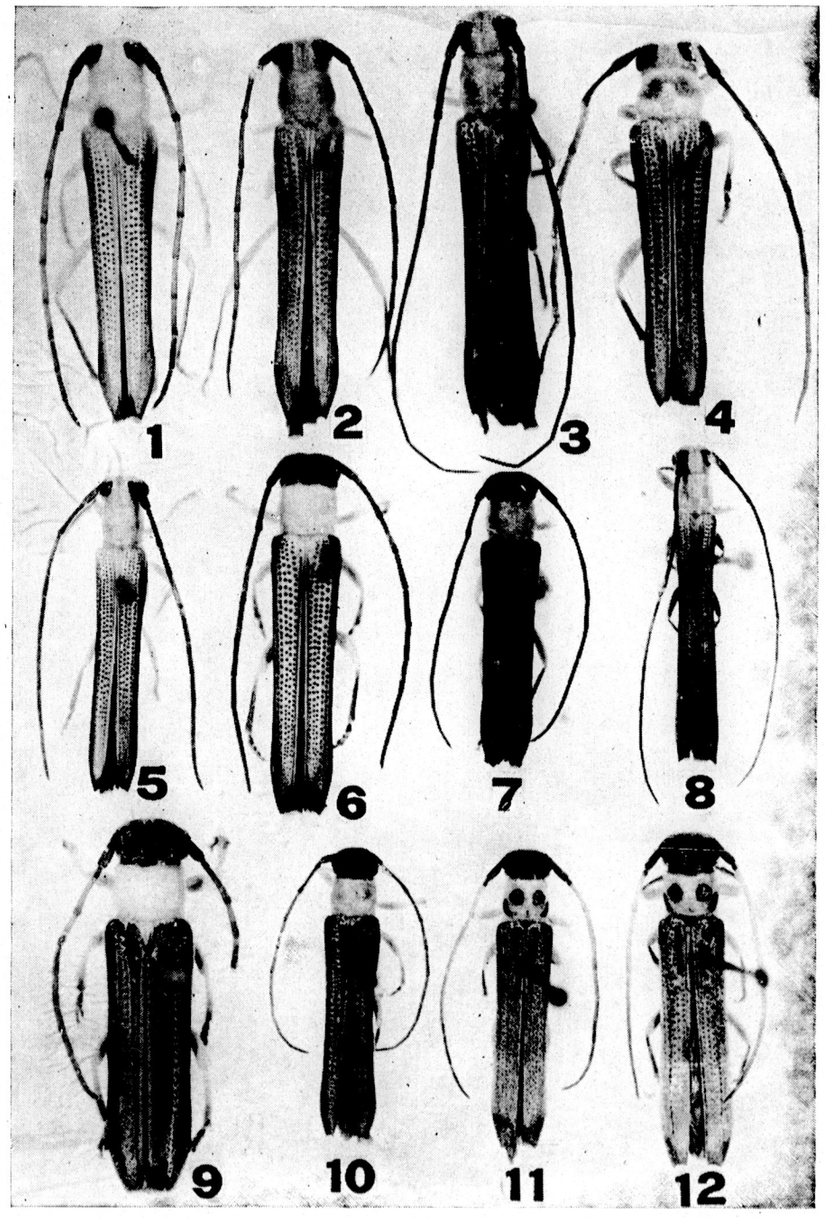
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SHORTER ARTICLES AND SCIENTIFIC NOTES

More Notes on the Ruler of the Yao of Loh-Fau Mountains.—The following discussion supplements a note on the same subject which appeared in this Journal.[1] There I mentioned the Ruler of the Yao of four adjacent districts as indicated in the accompanying official seal which reads 增博龍從撫獠廳印.



By courtesy of Mr. Lai Pik-Yue

This seal is $1\frac{5}{8}\times3\frac{1}{8}$ in., made of copper and new in appearance. According to the present holder of the seal, it is an exact copy of an old one which was lost in the end of the Ching Dynasty. There are good reasons to believe that this is so, because even today the Yao people of Loh-Fau still come to pay homage to the Ruler and secure from him every year a print of the seal which they think will protect them against evil spirits. He did not need to invent a new pattern of the seal.

The transmission of the seal and the title from one generation to another is entirely hereditary. Below I shall give a short history of this Yao-ruling family and the names of all the rulers throughout the generations.

The family record of the rulers as found in 夏街黎氏族譜, republished in 1896, told that in the middle of Sung Dynasty a man named Lai Hin-Shan 黎獻臣 came to Kwangtung to be the prefect 太守 of Luichow 雷州. He settled in Kwangtung and became the first ancestor of the Lai 黎氏 family. His descendants spread in different parts of Kwangtung. One of the descendants in the ninth generation named Wing 榮 (1372-1442) became a commissioner of taxation in Tsang Shing District 增城 where he settled and built the village Ha Kaai 夏街 just outside the south gate of the district town. Seven generations later, i.e., in the sixteenth generation, was born the first Ruler of the Yao whose life history is briefly stated below.

In the reign of Lung Hing (1567-1572) of Ming Dynasty the barbarous people of Tsung Fa District looted the neighboring regions and killed innocent people by the thousands. The Yao people joined

[1] See: Wong, Sik-ling. In Search of a Forgotten Tribe. *Ling. Sci. Jour.* 17(3): 477-481, 1938.

the mutiny. A descendant of the Lai family named Lai Pong-Ning 黎邦寧 (1547-1612) having under him a great number of volunteer patriots suppressed the mutiny and on him was conferred for the first time the title of the Ruler of the Yao 猺官. At his death bed he was attended by a cousin named Lai Mung-Kat 黎夢吉 (1577-1641) from the line of 一沼祖房 to whom he handed the official seal and title which became hereditary hereafter.

Mung-Kat handed the hereditary position to his son Chan-Tsoi 振彩 (1618-1670). At the beginning of Ching Dynasty Chan-Tsoi together with his Yao subjects surrendered to the Manchus who in turn awarded him the same title which was inherited by his descendants in the ensuring two and half centuries. The ruler himself was directly under the viceroy. The Yao villages under his administration were the following: Ying Lung 鸚冚, Lai Muk Ping 犂木坪 Yung Shue Lung 榕樹冚, Tin Wong Lung 天王冚, Tung Haang 通坑, Naam Haang 南坑, Kong Tun 岡墩, Tin Mei 田尾, Mooi Lung 梅龍, Ha Shui 霞水, Sheung Haang 上坑, Sai Haang 西坑, To Fa Ping 桃花坪, Foo Chuk Ping 符竹坪, Paak Sha Haang 白沙坑, Cheung Haang 長坑, Koon Shaan 官山 Cheung Pooi 嶂背, Yue Leung Haang 魚梁坑, Chung Koo Lung 鐘鼓冚, Lung Taam 潭龍, Tit Kau Tsai 鐵狗磜. The ruler made an investigation trip on all these regions once a year. Nowadays only four of these villages, viz., Ha Shui, Tung Haang, Cheung Haang and Cheung Pooi, continue paying taxes to the ruler. The other villages have either disappeared entirely or become colonies of the Chinese.

Chan-Tsoi died and the title was inherited by his son Shing-Chong 城壯 (1661-1697). Shing-Chong handed it down to his son Sheung-Tung 上蓪 (1689-1734), Sheung-Tung to his son Shai-Toh 世多 (1707-1757), who again handed it down to his own son Koon-Kau 觀球 (1730-1772). Koon-Kau had no son and adopted a nephew named Mei-Hing 美興 (1771- ?) who inherited the title. Mei-Hing also had no son and adopted a nephew named Paak-Lung 伯隆 (1817-1850) who inherited the title. Paak-Lung handed it down to his own son Yung-Sik 容錫 (1844-1908 ?).

Since the twenty-first generation, there had been many superstitions connected with the title and the seal. Koon-Kau and Mei-Hing had no sons. Paak-Lung had two sons of whom one died young without any descendant and the other, Yung-Sik, who inherited the title, had a son who died before him. Yung-Sik himself was thunderstruck when he was working on the farm. The title should now fall on his grandson Leung-Shue 良樞 (1890-), but on account of all these misfortunes that took place before him, he gave it up totally and hates to mention it again. He is now a hard working farmer but well contented.

On the other hand the Yao people, who have been so contented with and loyal to their ruler, must have some one to depend upon,

for whenever they have troubles among themselves or with their Chinese neighbors, they always bring the case to their own ruler and never to the district government. They think that their own ruler is a better mediator to settle disputes for them.

So, an imaginary heir was made out to succeed to the "throne." His name is Lai Man-Kwai 黎民歸, meaning "people turn toward him." He shall forever inherit the title, for he is not a mortal being any more but an imaginary figure who will never die. All the ruling family have to do is to ask some one from among the descendants to settle disputes for and collect taxes from the Yao from time to time. At present the office is taken up by the principal of the family school in the village. The court may be anywhere, for the old court collapsed long, long ago, and now, strange to say, has become a public lavatory for the villagers.

LINGNAN UNIVERSITY

S. L. WONG (WONG SIK-LING, 黃錫凌)

增城夏街猺官之來歷

夏街猺官始於明隆慶年間黎邦寧之平猺亂後以耋老舉族弟夢吉代之傳子振彩清初振彩率衆投誠官加守備銜自後累世承襲皆由督院咨部給箚猺人奉法惟謹相安無事凡二百餘年至於今日。

BOOKS AND SPECIAL PUBLICATIONS

[A COMPILATION OF ZOOLOGICAL AND BOTANICAL TERMINOLOGIES, INCLUDING A LIST OF TERMINOLOGIES USED IN MINEROLOGY, by Lo Tack Hing. The Committee on the Standardization of Scientific Terminologies. Sold by The Chinese Scientific Co., Shanghai, 1935.]

魯德馨　動植物名詞彙編，礦物名詞增，科學名詞審查會編印及發行，總代售處上海中國科學公司。定價銀二元 ii+370. 1935.

This book is an attempt to bring together all the Chinese equivalents of biological terms of Latin, English and German, and to standardize them, in the hope that hereafter an adoption of an uniform Chinese biological terminalogy may be put into effect.

The author states in his preface that the compilation work was entrusted to him by the Committee on Scientific Terminologies and that every biological term adopted here was passed by the said Committee. There is a total of more than 10,000 terms altogether which may fall under two main groups, namely, Botany and Zoology. In Botany the following fields are included: Spermatophytes, Pteridophytes, Eumycetes, and other general botanical terms. In Zoology: Anatomy, Embryology, Genetics and Evolution, Mammalia, Birds, etc. Terminologies on minerals are also included but these were not passed by the Committee on Scientific Terminologies and are therefore tentative. They are shown by a dagger in front. Each term of the three fields, including the minerals, is treated under four headings, namely, Latin if present, English sometimes including German, Chinese terms wherever present which have been suggested, and Chinese terms which are chosen. The binding is fairly attractive and the printing is clear and distinct with only a few misprints discovered. Although the book is still incomplete, it is apparently the most comprehensive of its kind, and will prove of great use to all Chinese biologists.

H. T. Chen

WALDEN, AND OTHER WRITINGS OF HENRY DAVID THOREAU, edited, with an introduction by Brooks Atkinson. The Modern Library. Small 16mo., cloth, 732 p., Random House, Inc., N.Y., 1937. 95 cents.

The biographical introduction by the editor is both critical and penetrating and forms a real contribution to the literature on the subject. This is followed by a reprint in full of "Walden," a slight abridgement of "A week on the Concord and Merrimack rivers," four selections of considerable length from "Cape Cod," and one selection from "The Maine Woods." There are also given in full the well known essays entitled "Walking," "Civil Disobedience," "Slavery in Massachusetts," and "Life without Principle." Said James O'Donnell Bennett in 1932 in his little volume entitled "Best Loved Books": "Of Thoreau's masterpiece ("Walden") two things are true: No man having attentively read it is ever the same again, and, nobody ever wrote another book like "Walden" because, I suppose, there never was another man like Thoreau, though many a man earnestly has wished to be like him—perhaps was like him, but lacked the genius for getting himself expressed." This reviewer welcomes this really portable compilation with enthusiasm, and predicts for it a satisfying and steadily growing popularity.

J. S. W.

TEXTBOOK OF COMPARATIVE PHYSIOLOGY, by Charles G. Rogers, 2nd ed., 8vo., cloth, 715 p., *158 figs.*, McGraw-Hill Book Co., N.Y., 1938. $5.50.

We are glad to welcome the newly issued second edition of this well-known, standard work by the equally well-known author, Professor of Comparative Physiology in Oberlin College, and which book forms one of the titles in the McGraw-Hill Series in the zoological sciences. Since the first edition appeared in 1927 there has been published a perfect avalanche of new

and pertinent results of research. The task of selection and digestion of these papers has not been easy, and much had to be laid aside. All students of the subject will be grateful to the author for his labor and pains in making the more important of this new material available in condensed and readable form. Errors in the first edition of the book, some of fact and some of typography, have been corrected. Much material, not strictly physiological, has been removed from the present edition. Also, there has been much rearrangement of material in order to secure more logical presentation. The major part of the work has been rewritten, and all has been reset. Much material, some being results of research in the author's own laboratory, is here presented for the first time in textbook form. It is widely known that this volume is the outgrowth of a course in comparative physiology which has for a number of years been offered to the students of Oberlin College. Their response to the general method of presentation has encouraged the author to put the material into a more generally accessible form, and out of this grew the first edition of this work. It is the purpose of the volume to help modify some of the existing conditions, to assist in the return to a broader view of physiology, and to offer to biological students a cultural background of physiological ideas and ideals not to be gained from a study of technical mammalian physiology alone, since the physiology of animals is really functional zoology. With this objective, it concerns itself with the primary functions of animals of all groups, especially of the invertebrates which constitute probably not far from 93 percent of all known species of animals. Every attempt has been made to give the student definite ideas of the fundamental unity of inorganic and organic words, of a similar unity of life and of animal functions in different animal groups, of some conception of evolutionary changes in animal functions as well as in animal structures, of the fundamental significance of function as related to form among animals, and of some of the physiological bases of animal relationship. The main subject subdivisions of the work include treatment of such subjects as: solutions; diffusion and osmosis; protoplasm; the cell; the general phenomena of life; the transport system; circulation of body fluids; respiration; enzymes and digestion; secretion; nutrition of animals; absorbtion; utilization of food materials in the body; physiology of movement; excretion; physiology of coordination, adjustment, and regulation; and, the physiology of reproduction. Under the discussion of the transport system, special mention should be made of a most interesting chart in full color facing page 126 on which are shown solar spectrum and absorption spectra of blood pigments, with scale numbers giving wave lengths in one hundred-thousandths of a millimeter.

LITTLE LIVES: THE STORY OF THE WORLD OF INSECTS, by JULIE CLOSSON KENLY, illus. by EDNA REINDEL. Large 12mo, cloth, 271 p., *illus.*, bibliog., Appleton-Century Co., N.Y., 1938. $2.50.

This is a popular compilation of some of the more striking and spectacular though well known phenomena within the field of general entomology, and is quite similar in scope to a number of other works of the same type within the same biological category, and obviously has been designed to appeal to a similar class of readers. If one may judge by the almost continuous output, there must be a fairly perennial demand at this time on part at least of a portion of the public for works of this kind with subject matter ranging over the various subdivisions of natural history, and, this seems to be particularly true just now in entomology and ornithology.

The chapter headings of this book will indicate in a general way something of the character of its subject matter and versatility of its author. These include such as:—"Owners of the earth"; "Mysteriously wise"; "Just a bumblebee"; "Green nightmare"; "Quick on the trigger"; "Dashing duelists"; "We all hate them"; "Red-blood hour-glass"; "Trap-doors and terantulas"; "Talented flea"; "Insect infant prodigies"; "Blister-beetle baby"; "Just supposing"; "Poor little man"; and "No thoroughfare." A bibliography of 44 titles to well known popular and semipopular works on various entomological subjects and an index also are included.

As the wife of a military leader, General William L. Kenly, the author of this book has had opportunity during the past forty years or so to visit and to study the natural history of many interesting sections with the result that considerable material based on personal observations over extensive areas also has been given. In addition to numerous periodical articles, particularly in juvenile periodicals, Mrs. Kenly's published books include: "Green Magic"; "The Astonishing Ant"; "Children of a Star"; "Wild Wings" and "Cities of Wax." J.S.W.

AN ECOLOGICAL GLOSSARY, compiled by J. RICHARD CARPENTER, of Lincoln College, Oxford, 307 p., *maps, charts,* Univ. of Oklahoma Press, Norman, Okla., 1938. $4.00.

This is a work likely to be of utmost usefulness to all biological workers who study ecological literature, and particularly to beginners to whom the duplicate usages of terms is likely to be confusing. It comprises an introduction outlining the development of ecological literature, and this is followed by nearly 3,000 definitions, many of them taken from original citations, with subsequent refinements of usage and meaning, and with references to recent generally available papers in which definitions and concepts are discussed in detail. It is believed that works of this kind will serve in clarifying the concepts and usages of the more common systems of terminology and nomenclature, and that the ultimate goal of international understanding may be more rapidly reached through their use. Since the biotic interaction of organisms form the basic framework for all communities, the establishment of any system of criteria or terms which omits any portion of the community in recognizing and designating communities is only a partial completion of the task. Joint action and co-operation on the part of workers in both the fields of botany and zoology—the parts of arbitrarily divided biology—is necessary before a real international system of ecological terminology is possible. Continued free discussion of concepts and terms seems to be best way to attain general agreement. In the past, divergence of ideas has resulted in many duplications of terms meaning nearly the same thing, and, still more unfortunately, several meanings for certain terms. The resulting confusion of meanings has made precise interpretation of many ecological papers increasingly difficult. Then too, another helpful feature of this book may be found in the appendix which includes maps of different systems of life zones and tables of equivalent biotic areas of equivalent terms used by different schools of plant ecologists today. On the whole, the volume should supply a definite need which has been felt for a long time.

STRANGE REPTILES AND THEIR STORIES, by A. HYATT VERRILL, small 8vo., cloth, 195 p., *frontispiece in color, 4 black and white plates, 46 figs.*, L. C. Page & Co., Boston, 1937. $2.50.

There is a definite need for a popular general work of this type, since it is probable that there are more popular fallacies and more superstitions connected with reptiles than perhaps any other form of animal life. Particularly it this true of snakes as there is no other work of exactly this scope dealing with and endeavoring to distinguish between the many useful and beneficial as well as harmless species and those which are definitely known to be venomous. Then too, there are a great many people who regard practically all forms of reptile life with loathing or perhaps with positive fear and a work of this kind tends not only to quiet unnecessary fears but quickens interest in and encourages the study of some of the least known and perhaps least understood of all the common animals. The author has tried to point out all the more attractive features and attributes of reptiles and batrachians and to do away with much misinformation and nonsense which has gained currency regarding them. A study of this work reveals that the majority of reptiles are perfectly innocuous and that some of them are among man's best friends, in destroying vermin, insects and other pests. Then too, many of them are extremely interesting in their life history and habits and ready reference for review purposes. The chapter headings include discussion

a few are even fascinating, once initial repulsion has been overcome. Among the subject subdivisions considered are such as friendly serpents; giant snakes; flying reptiles; strange ways of lizards; the chameleons; living dragons and dinosaurs; man eating reptiles; reptiles of the seas, of ponds and of streams; batrachians of ancient times, and the like. Included therewith the author has given a number of narrations gleaned from his own personal experiences and adventures in many lands over a period of more than forty years of scientific exploration. He is also the well known author of various other books of natural history interest, particularly on birds, insects, shell, and jungle exploration.

ANIMAL NEIGHBORS OF THE COUNTRYSIDE, by JOSEPH WHARTON LIPPINCOTT. Small 8vo., cloth, 272 p., *43 illus., in black and white* by LYNN BOGUE HUNT, J. B. Lippincott Co., Philadelphia, 1938. $2.50.

Written by the author "Naturecraft Creatures" and other popular works on natural history subjects, this little book forms a worthy addition to the series. Dealing as it does in a nontechnical way with the common wild creatures of a typical country neighborhood and interspersed as it is with anecdotes of the author's own personal experiences and with details of his observations of their life-history and habits, it makes particularly interesting and informative reading. A considerable number of works of somewhat similar type and scope have been issued by various publishers in recent years, and the continued output indicates a steady demand on part of the reading public for more of the same kind. Some idea of the nature of the contents of this latest book may be gained by an enumeration of some of its subject subdivisions : These deal with such animals as rabbits; bats; woodchucks; mice; foxes; squirrels; skunks; weasles; coons; birds; rats; beaver; muskrat; turtles; lizards; snakes; deer; cats and others. There are also discussions of such themes as study of tracks in snow time, and of various animals by night. Of particular interest are the chapters treating of birds gentle and fierce, game birds, and crow talk. The subject matter has been prepared with great care, and the little book will be useful to nature students wherever located who desire more information regarding the humble creatures discussed therein.

POULTRY HUSBANDRY, by MORLEY A. JULL, 2nd ed., 8vo., cloth, 548 p., *213 illus.*, McGraw-Hill Book Co., N. Y., 1938. $4.00.

Prepared by the professor and head of the Poultry Department of the University of Maryland, College Park, Maryland, this work is not only of high scientific value but is also of great practical importance as well. It forms one of the volumes of the well known McGraw-Hill series of Publications in the Agricultural Sciences, and as such has already won an honored place in the publication of its first edition in 1930. This second edition will be particularly welcome to all who have used the earlier edition as well as to all commercial poultry raisers every where who desire to get the utmost in profits from their work. The book covers every phase of poultry practice from the breeding of chickens to the layout of the poultry plant; from the keeping of poultry records to the marketing of by-products. The author has endeavored to convey to his readers some conception of the background of the poultry industry, the fundamental principles involved in various poultry practices, and up to date information concerning methods of poultry production. The more important economic factors in producing and marketing poultry products also are given due consideration. Fundamental principles must be understood to some extent at least before the most economical methods can be practiced intelligently, so for this reason the major aspects of poultry production and marketing are discussed, first, with respect to principles involved and, second, with respect to practices to be followed. The results of various lines of research work are reviewed, and selected lists of literature references are given, so that the investigator, teacher, and student each has a of such topics as : Breeds of chickens; biology of the chicken; breeding principles; breeding practice; incubation principles and practice; rearing

principles and practice; housing and yarding principles and practice; feeding principles; feeding practice; disease prevention; egg-marketing problems; poultry marketing problems; and the economics of production and marketing. The discussion of practices to be followed should be of considerable value to extension workers, farmers, and commercial poultrymen. All those really interested in the subject appreciate the fact that science is indeed a foundation or background upon which they may develop more efficient practices in husbandry. This is an attempt to integrate the facts of modern science for the benefit of the practical poultryman. "The preparation of this book has been inspired in the spirit of rendering the greatest possible service to the poultry industry."

PLANT PHYSIOLOGY, by NICOLAI A. MAXIMOV, edited by R. B. HARVEY and A. E. MURNEEK, 2nd English edition, translated and revised from the fifth Russian edition, translated from the Russian by I. V. KRASSOVSKY. 8vo., cloth, 473 p., *144 fig.*, McGraw-Hill Book Co., N.Y., 1938. $4.50.

The English tranlation of Dr. N. A. Maximov's "Textbook of Plant Physiology," edited from the first and second Russian editions, was widely accepted for class use. In the present fifth Russian edition, Dr. Maximov has completely rearranged the text, rewriting a major part of the discussion, and has introduced new materials from the data of recent research. This edition has been published under the title of "Plant Physiology" so that it will not confused by librarians and students with the former edition, entitled "Textbook of Plant Physiology," by the same author and editors. The discussions, data, and arrangement are so different as to make this distinction necessary. This is a completely new book, bringing up to date the results of plant physiological research throughout the world. The editors have introduced data and view points from recent American publications. They have also revised the discussion, particularly where conditions applying in Russia especially were described, and thus have made the presentation of more widespread application. This text is, therefore, not just a translation, but is a new book based on the translation of Dr. Maximov's fifth Russian text. This has necessitated the introduction of the viewpoints of the editors on many subjects, thus amplifying the presentation of the original author. New illustrations and data have been used in many cases. In general, illustrations from publications in English have been chosen. References for collateral reading have been introduced after each chapter. These have been selected deliberately from publications in English, wherever suitable discussion can be found, and a few references to the classical works of plant physiology in other languages have been cited. The main objective in preparing this volume has been to present, in a brief and compact form, clear and exact information concerning the life and vital functions of green plants. Such information should help in the understanding of the significance of various methods that are being applied in agricultural practice to increase the yield and improve its quality. The subject matter of the book has been presented under the following subdivisions :—Physico-chemical organization of the plant; chemical composition of plants and their basic metabolism; respiration of plants; growth of plants; carbon assimilation; assimilation of nitrogen by plants; absorption of mineral elements by plants; water relations of plants; translocation of substances in the plants; resistance of plants to unfavorable environmental conditions; interrelations between different parts of the plant; vegetative propagation; physiology of the development of plants; physiological processes during the flowering and ripening of fruits and seeds; and, seasonal phenomena in the life of plants. In view of the extreme care which has been used in bringing the data down to date it is believed that this new work will be accepted both by students and by teachers with the same cordiality as were the preceding editions.

[Mailed March 23, 1939]

Journal of the Malaria Institute of India

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LINGNAN UNIVERSITY SCIENCE BULLETIN

No. 1. Fifty-one Common Ornamental Trees of the Lingnan University Campus by EGBERT H. WALKER. (Reprinted from the Lingnan Science Journal Volume 6, Numbers 1 and 2. Issued January 24, 1930.) 166 pages, copiously illustrated. Cloth binding. Price $1.00 National currency.

No. 2. Plants of Lungt'aushan by G. WEIDMAN GROFF. An enumeration, with field notes and local names, of two collections of plants made under the auspices of Lingnan University. Lungt'aushan is located in Northern Kwangtung, and is a part of the extension of the Himalayan range which marks the transition zone between subtropical and temperate faunistic and floristic regions of China. Issued June 1930. 138 pages. Price $1.00 National currency.

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Volume 18 1939 Number 2

THE HOUSE-FREQUENTING BEHAVIOR OF ANOPHELES HYRCANUS VAR. SINENSIS WIEDEMANN IN THE SHANGHAI AREA, PART 2[1]—TIME OF EXIT

STEPHEN M. K. HU (胡梅基)
Division of Pathological Sciences, Henry Lester Institute of Medical Research, Shanghai.

Observations were made during 1937 in the Kaochiao District concerning the time of exit of *Anopheles hyrcanus* var. *sinensis* from an inhabited shelter. The data on this phase of the house-frequenting behavior of our local species of *Anopheles* were obtained during the month of July, at a time when they were abundant indoors. A cow stable was selected for making these observations because many more of the anophelines could be found in it than in other farm houses of this region. The stable, shown in fig. 1, consisted of a room attached to the end of a farm house.

The main opening of this small stable through which mosquitoes could fly in and out consisted of a doorway, shown in fig. 2. This passage-way was about six feet high and three feet wide. Besides this, a long, narrow portion of the side wall was found to be broken, making another passage-way through which mosquitoes could gain entrance. This opening was about three feet long and two inches wide. It extended along the upper part of the side wall, under the eaves of the roof. The walls were of mud bricks. The roof was lined with tiles, with a wooden ceiling plastered with mud. Due to the lack of any window, the stable was dark and humid inside. The uncovered ground inside was moist with excretion from the cow. There were numerous cracks along the walls and ceiling but these were plastered with mud some days before these series of observations were made, so that the mosquitoes could fly in and out only through the two passages mentioned above.

During the morning of July 15, a tent of mosquito-net was erected outside of the doorway in order to trap the anophelines as they made their exit from the stable through this passage. This outdoor enclosure was supported by bamboo posts along the sides. One end of the tent was tacked along the edges of the doorway while the bottom of the remaining sides was weighted to the ground. The top

[1] For Part 1 see : *Lingnan Science Journal* 14 (3) : 385-394.

was spread flat and was low enough for any mosquito found resting there to be readily collected. A thin net material was used so as to interfere as little as possible with the penetration of light and other outdoor conditions into the enclosed space.

The side opening of the stable was left uncovered, so that mosquitoes from the outside could still enter the stable freely through this remaining passage-way. It appeared likely that most of the mosquitoes within the stable would be making their exit by flying out through the doorway, as this furnished a much larger passage-way, although the smaller side passage at the same time served as an avenue of exit.

When the mosquitoes flew out through the doorway and in their search for a way out, entered the outdoor tent, they could be found on the inside of the mosquito-net. They were collected with chloroform tubes. During those parts of the evening when they were flying out in considerable numbers, a sweep net was also used to collect them *en masse*. Those caught within a period of every 2 hours were stored in an individual container on which the time of capture was marked. In this manner, by continuous collection for 24-hour periods, it was hoped that some idea concerning the time when the anophelines made their exit from the stable would be obtained. The data obtained from 5 series of such observations carried out continuously from 1 p.m. on July 15 to 1 p.m. on July 20 are summarized in table 1.

During this time of the year, the cow within the stable was ordinarily taken out by the farmer during the daytime, to be tethered outdoors under a tree as shown in fig. 1. It was led back into the stable during the first part of the evening. This routine was not interfered with during the course of these observations. When the cow was led in or out from the stable, all the mosquitoes within the tent were first captured, then one side of the mosquito-net was raised and quickly lowered again.

The mosquitoes flying into the tent at night were detected by means of flash-lights. They were found mainly on the side of the tent opposite to the direction of the prevailing breeze, so that it appeared that most of them were flying against the breeze in their search for a way out.

It appeared that few of the anophelines ventured out from the stable during the main part of the day. In the course of the 5 rounds of examination, none of them were found in the tent from 9 a.m. to 1 p.m. Only a few were found in the tent during the period 3-5 p.m. in the first round and from 1 to 3 p.m. in the second round. The afternoons of the other rounds of examination up to 5 p.m. had none at all.

During the two hours preceding the time of sunset, the anophelines were beginning to fly out continuously. According to the records of the Siccawei Observatory in Shanghai, the time of sunset

TABLE 1

Time of Exit from Cow Stable

TIME		1-3 P.M.	3-5 P.M.	5-7 P.M.	7-9 P.M.	9-11 P.M.	11 P.M.-1 A.M.	1-3 A.M.	3-5 A.M.	5-7 A.M.	7-9 A.M.	9-11 A.M.	11 A.M.-1P.M.	TOTAL
Round No. 1	No.	0	2	52	1767	406	268	113	99	18	0	0	0	2725
July 15-16	%		0.08	1.91	64.85	14.90	9.82	4.15	3.63	0.66				
Round No. 2	No.	3	0	8	1160	165	590	266	370	3	4	0	0	2569
July 16-17	%	0.12		0.31	45.12	6.43	22.97	10.36	14.41	0.12	0.16			
Round No. 3	No.	0	0	1	152	61	174	102	34	3	0	0	0	527
July 17-18	%			0.19	28.83	11.58	33.02	29.35	6.45	0.57				
Round No. 4	No.	0	0	30	202	110	91	100	33	3	0	0	0	569
July 18-19	%			5.28	35.50	19.33	16.00	17.56	5.80	0.53				
Round No. 5	No.	0	0	30	621	82	77	71	16	4	0	0	0	901
July 19-20	%			3.33	69.90	9.12	8.55	7.88	1.78	0.45				

extended from 6.59 p.m. on July 15 to 7 p.m. on July 20. In all the 5 rounds of the examination, during the period before sunset, from 5-7 p.m., anophelines appeared in the tent, although the numbers found ranged from only 0.19 per cent to 5.28 per cent of the total number for each round.

A greater number of anophelines were found flying out from the stable during the 2-hourly period after the time of sunset than at any other time in the course of four rounds of examination, as shown in the graphs. In the third round however, more were found in the tent during the 11 p.m.-1 a.m. period than during the 2-hourly period following sunset. The second round also showed quite a number of anophelines during the period from 11 p.m.-1 a.m., as compared with the preceding 2-hourly period, but not exceeding the number flying out from the stable following the 2 hours after sunset.

During the nights of the second and third rounds of examination, the cow was led into the stable by the farmer at about 11 p.m., instead of at about 9 p.m. as on the other three nights. It was a question, however, whether the disturbance in the stable incidental to this caused more of the anophelines to fly out into the tent. However, there was no marked increase in the number of anophelines flying out following similar disturbances in the stable at about 9 p.m. during the other 3 nights.

After 1 p.m., the number of anophelines flying out from the stable into the tent diminished considerably, except in the second round when there were more during the 3-5 a.m. period than during the preceding 2-hourly period. Few anophelines were found flying out after the time of sunrise, which took place from 4.59 a.m. on July 15 to 5.02 a.m. on July 20. The small number of 0.12 per cent to 0.66 per cent of the total for each round was found in the tent during the 2-hourly period after the time of sunrise. After this time, none of the anophelines came from the stable in the mornings except a small number during the 7-9 a.m. period in the second round of examination.

That the time of sunset influences the exit of some species of anophelines from an inhabited shelter has been reported by various workers from different parts of the world. Grassi (1921) remarked that the movements in and out of buildings of *Anopheles maculipennis* near Rome coincide with the variations in times of sunrise and sunset. The anophelines issued for the most part from their shelters in the evening before nightfall. Reuter (1936) in Holland counted the number of *Anopheles maculipennis atroparvus* leaving a pig-sty. He found the mosquitoes to be most active between half an hour before and half an hour after sunset. Danilova and Polovodova (1935) reported that *Anopheles maculipennis messeae* near Perm in Russia made their exit from a shelter invariably in the evening, depending on the time of sunset. Hackett and Missiroli (1932) at Massarosa, Italy, observed that more than three quarters of the

Anopheles maculipennis in a stable have been observed to leave at dusk, their places being taken by newcomers. Thomson (1929) reported that *Anopheles costalis* in southern Rhodesia was found attempting to leave a room soon after the time of sunset. Before sundown, a window was closed with mosquito netting. Immediately the sun set, the netting became covered with the anophelines trying to get out of the house.

According to other observers, *Anopheles maculipennis* was found to leave an occupied shelter mainly at dusk and soon after sunset, after which, few of the anophelines were found leaving during the rest of the evening. Shipitzuina (1934) reported that *Anopheles maculipennis* along the Caspian Sea in Daghestan, Russia, went out from a shelter during the hour after sunset. Vinogradskaya and Shmeleva (1934) reported that *Anopheles maculipennis* began their exit from a cow shed near Moscow during the hour preceding sunset and continued flying out until 2 to 3 hours afterward, after which none of the anophelines were found going out during the night and only a few just before sunrise. Sella (1920) reported that *Anopheles maculipennis* near Rome leaves occupied buildings only at dusk and once this time is passed, it ceases to attempt to do so.

Some data on the meteorological conditions of the region during this series of observations are given in table 2. The data were obtained from the Siccawei Observatory. There was no rainfall during the period of these observations.

TABLE 2

Outdoor Meteorological Data

TIME		TEMPERATURE (FAH.)	HUMIDITY (%)	WIND MILES PER HR.	WIND DIRECTION
July 15	4 p.m.	85.5	64	12.4	ENE
	9 p.m.	76.1	91	8.7	ENE
July 16	4 a.m.	77.4	94	10.6	E
	9 a.m.	80.8	83	18.1	E
	4 p.m.	84.0	79	16.2	ENE
	9 p.m.	77.9	95	8.1	E
July 17	4 a.m.	77.4	95	9.3	ESE
	9 a.m.	84.6	79	17.5	SE
	4 p.m.	88.9	70	18.1	SE
	9 p.m.	80.1	91	9.9	ESE
July 18	4 a.m.	79.2	91	10.6	SE
	9 a.m.	84.2	80	15.6	SSE
	4 p.m.	90.1	68	16.8	ESE
	9 p.m.	80.4	89	12.4	SE
July 19	4 a.m.	79.6	91	8.7	SE
	9 a.m.	84.9	81	14.9	SSE
	4 p.m.	89.6	72	13.7	SSE
	9 p.m.	81.5	90	8.7	SE
July 20	4 a.m.	79.7	96	8.7	SE
	9 a.m.	85.3	83	10.6	SSE

The outdoor conditions of this region differed considerably during the night as compared to the daytime, not only in regard to light intensity, but in regard to other environmental factors during the period of observation. The temperature was lower at night while the humidity was higher and the velocity of the wind was lower at night. The nocturnal variation of all these environmental factors doubtless played a part in influencing the time of exit of the anophelines from their indoor shelters. Observations over a longer period of time, under other meteorological conditions, might show a greater variation concerning the time of exit of the anophelines.

When their time of entry as previously reported (Hu, 1935) was considered together with the present series of observations, there appeared to be considerable movement of the anophelines in and out from the stable during the evening. The anophelines commenced making their exit at dusk, before sunset, while they were found to make their entry into inhabited shelters generally after sunset. It was found that there was a more or less continuous influx of anophelines throughout the evening. The present series of observations showed a more or less continuous egress of the anophelines from the occupied shelter from dusk to dawn. After the time of sunrise, few anophelines were found either entering or leaving the shelters. Most of the anophelines that were still indoors towards the time of sunrise were found to prefer remaining inside, as many of them could be found resting on the walls and ceiling in the stable during the daytime.

It was a question what proportion of the anophelines collected in the tent consisted of those that were already in the stable before the commencement of these observations, along with newcomers that had since made their entrance into the stable through the side passage. More of the former were likely to be among those leaving the stable in the course of the first two rounds, which might account for the larger numbers collected in the outdoor tent for those evenings. Observations on the turn-over of the anophelines in the stable are being carried out to obtain further data on this aspect of anopheline bionomics.

Summary

1. A series of observations was made concerning the time of exit of *Anopheles hyrcanus* var. *sinensis* from an inhabited shelter in Kaochiao region.

2. Five continuous rounds of 24-hourly collection of the anophelines leaving a cow stable and trapped in an outdoor tent of mosquito-net erected outside the doorway were carried out to obtain these data.

3. The anophelines were found to commence leaving the stable at dusk, after which they could be found flying out more or less continuously for the rest of the evening.

4. In most of the rounds of examination, more of the anophelines were found making their exit within the 2 hours after sunset than at any other time of the evening.

5. Towards the time of sunrise, most of the anophelines which were still in the stable were found to prefer resting indoors for the rest of the day, as few were found making their exit during the daytime.

Acknowledgement

The writer desires to acknowledge his indebtedness to Dr. H. G. Earle, Director of the Henry Lester Institute of Medical Research, and Dr. R. C. Robertson, Head of the Division of Pathological Sciences, for the encouragement and interest given to this research.

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上海 *Anopheles hyrcanus* var. *sinensis* Wied. 在室內之習性 II. 飛出之時間

胡梅基著

上海雷氏德醫學研究院病理學系

(摘要)

(一) 爲研究 *Anopheles hyrcanus* var. *sinensis* 何時由室內飛出，特在上海高橋覓定一牛房，作一次連續之觀察。

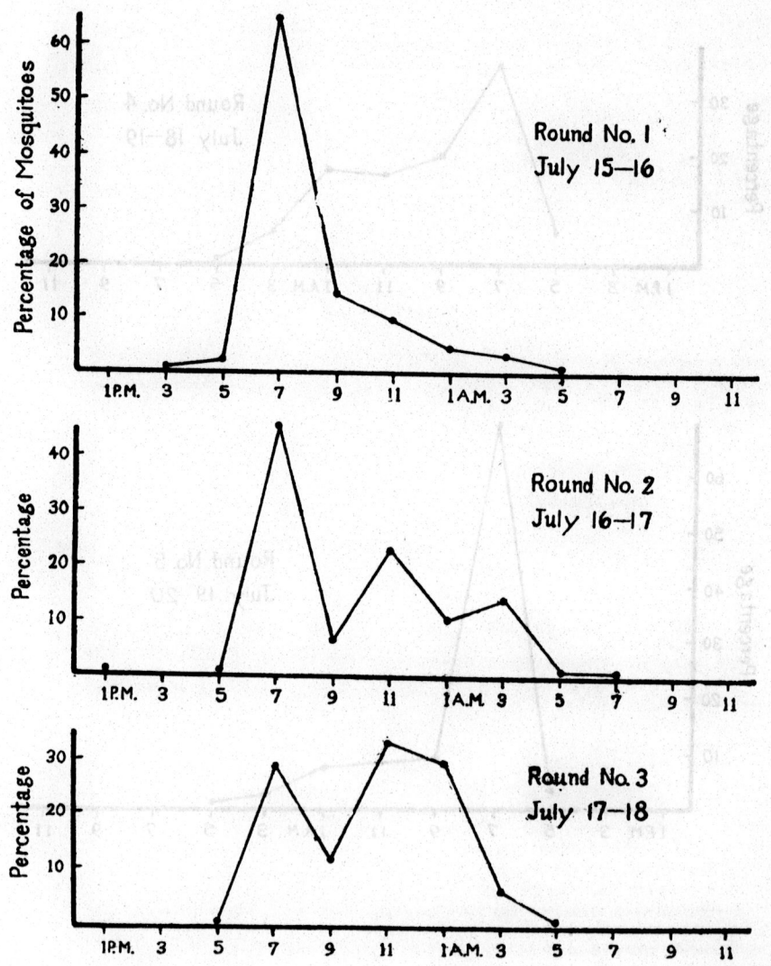
(二) 在該牛房之出口處用珠羅紗搭一棚帳，侯後每二十時在該棚帳內捕捉由門內飛出之蚊虫，幷將其數目紀錄之。

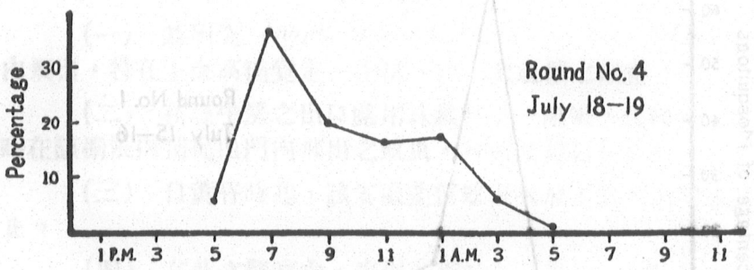
(三) 自黃昏時起，該安俄斐雷蚊漸次飛出直至天明後爲止。

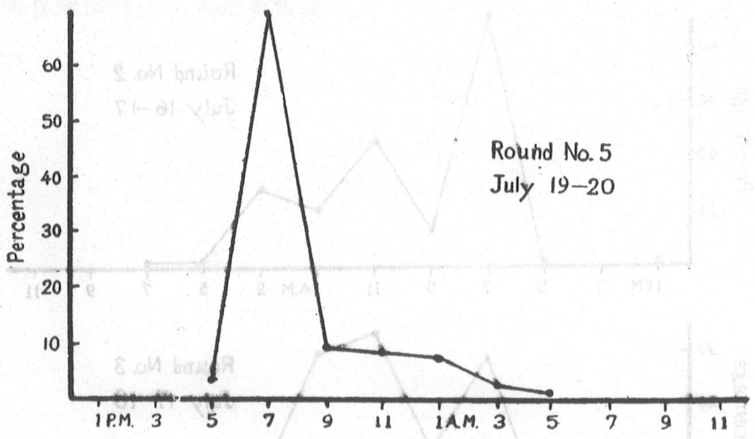
(四) 在此次觀察中，安俄斐雷蚊在日落後二十時內飛出者較其他任何時間爲多。

(五) 侯日出後，最大多數之安俄斐雷蚊皆棲習於室內，間有飛出者，亦爲絕對少數。

Exit of Anopheles from Cow Stable







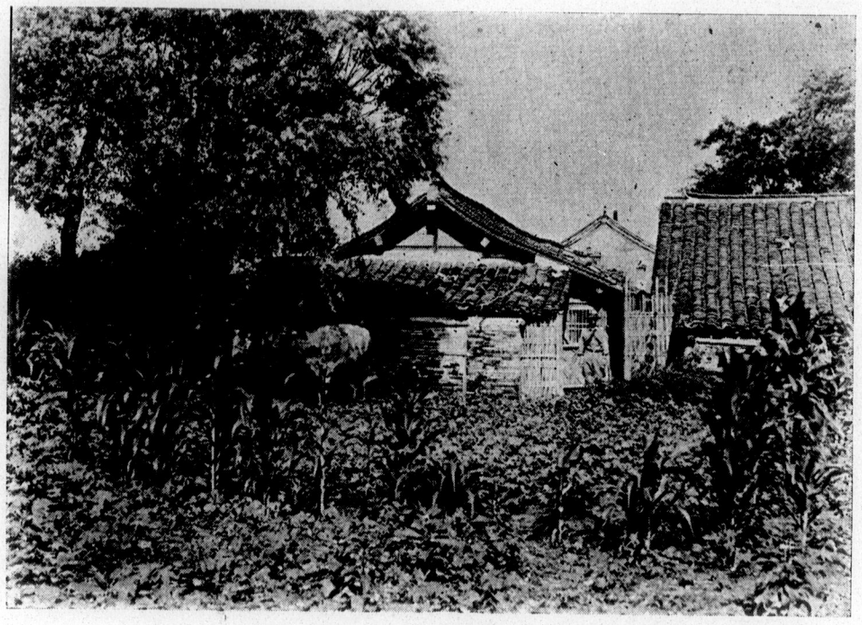


Fig. 1. Cow stable used for observation of anophelines.

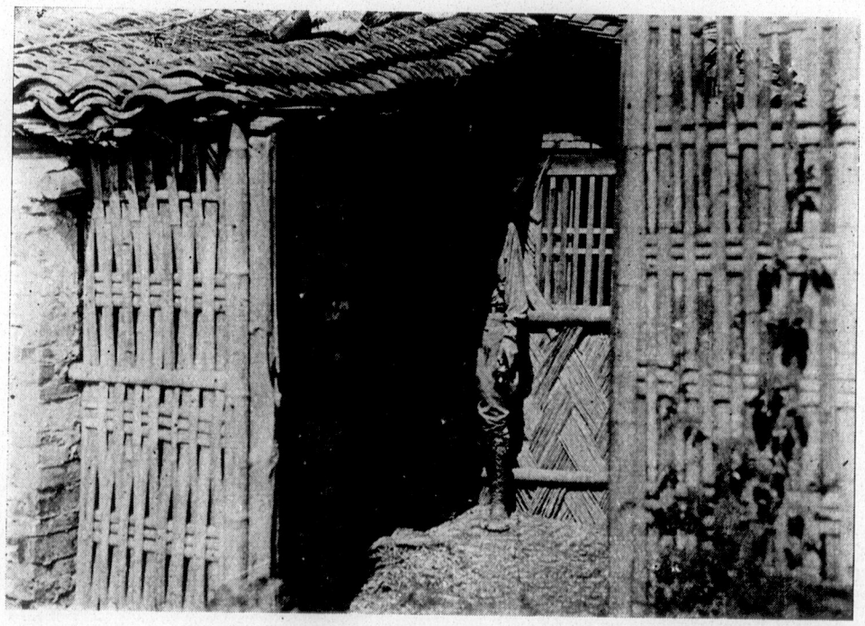


Fig. 2. Close-up view of doorway of the stable.

NEMATODE PARASITES OF BUFO MELANOSTICTUS, THE COMMON TOAD, FROM CANTON[1]

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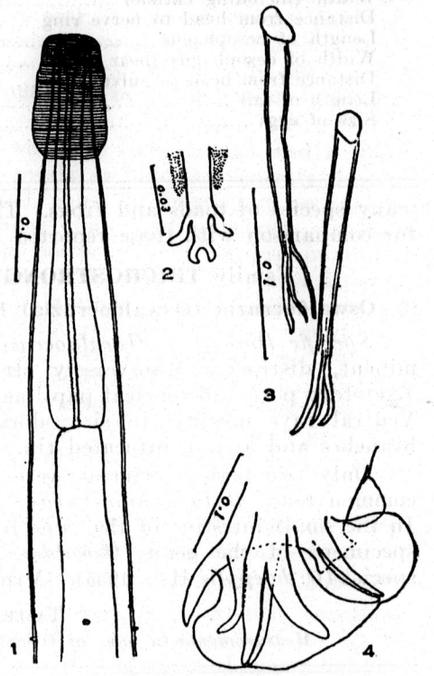
The common toad, *Bufo melanostictus*, has been found very frequently and richly infected by nematode parasites. Eight host-animals of the said species from Canton and fourteen from Amoy were autopsied and examined; none were found negative in the examination, and the majority were infected by more than one species. Not only was more than one species often recovered from one host, but also frequently two or more species occurred in the same location. The location of infection was rather variable; lungs, liver, intestine, rectum, and urinary bladder were all found infected. Strangely enough, except *Sparganum* in muscles of hind legs, all the parasites found were confined to nematodes. Not a single specimen of adult cestode or trematode was seen. The following is a report of six species of nematode parasites collected from the Canton toad, *Bufo melanostictus*.



Oswaldocruzia (*O.*) *heparia* n. sp.
Fig. 1, anterior portion of male, ventral view; fig. 2, dorsal ray; fig. 3, spicules; fig. 4, bursa, lateral view.

Family **RHABDIASIDAE** Railliet, 1915

1. **Rhabdias bufonis** (Schrank, 1788)
   Location.—Lungs.
   Intensity of Infection.—One to numerous.

[1] This is the second part of a thesis submitted to the Graduate Institute of Natural Sciences, Lingnan University, for the partial fulfillment of the requirements for the degree of Master of Science. The work was done under the direction of Dr. H. T. Chen. The first installment was published in the *Lingnan Science Journal* 17(3):395-400, July 1938.

Incidence of Infection.—Four out of eight hosts examined.
Hosts Reported.—Many species of toads and frogs.
Geographical Distribution.—Cosmopolitan.
Remarks.—This is a cosmopolitan species, parasitising lungs of many species of toads and frogs. The measurements are here given for comparison with those reported from other parts of the world.

TABLE 1
Measurements in mm. of Rhabdias bufonis (4 females)

Length	4.250-6.130
Maximum width (excluding cuticle)	0.185-0.385
Width (including cuticle)	0.310-0.547
Distance from head to nerve ring	0.165-0.200
Length of oesophagus	0.350-0.450
Width of oesophagus (near base)	0.056-0.077
Distance from head to vulva	2.450-4.280
Length of tail	0.200-0.344
Size of eggs	0.081-0.101 by 0.049-0.056

Family **TRICHOSTRONGYLIDAE** Leiper, 1912

2. **Oswaldocruzia (Oswaldocruzia) heparia** n. sp. (figs. 1-4)

Specific Diagnosis. Oswaldocruzia.—Cephalic inflation very prominent, distinctly transversely striated. Buccal cavity present. Excretory pore and cervical papillae situated far behind oesophagus. Ventral rays unequal in size; dorsal ray with a pair of lateral branches and a deep bifucated tip.

Only two male specimens were collected from the liver of the common toad, *Bufo melanostictus*. This habitat is rather unusual. In the small intestine of the same host, there were also found many specimens of the genus *Oswaldocruzia*, but apparently of another species (*O. hoepplii* Hsü, 1935). Members of the genus *Oswaldocruzia* are most commonly found in the small intestine, and have occasionally been reported from the stomach and the rectum, and the lungs; this is the first case in which the parasite is found in the liver.

TABLE 2
Measurements in mm. of Oswaldocruzia heparia (1 male)

Length	8.825
Maximum width	0.142
Length of cephalic inflation	0.110
Width of cephalic inflation	0.061
Length of oesophagus	0.375
Distance from head to nerve ring	0.215
Distance from head to excretory pore	0.555
Distance from head to cervical papillae	0.565
Length of tail	0.135
Length of spicule	0.190

Description of the Male. Oswaldocruzia.—Body filiform, tapering slightly toward anterior end. Cephalic inflation very prominent, nearly one-third as long as oesophagus and twice as wide as head; surface distinctly and finely transversely striated, striations 1.7μ apart. No lateral alae behind cephalic inflation. Longitudinal cuticular ridges many, on all sides of body, starting immediately behind cephalic inflation. Lips not apparent. Mouth leading into a long, well-chitinized, funnel-shaped buccal cavity, followed by saw-like oesophageal linings. Oesophagus dilated slightly toward posterior end. Nerve ring behind middle of oesophagus. Excretory pore 0.18 mm. posterior to oesophagus. A pair of distinct cervical papillae, laterally situated, immediately behind excretory pore. Another pair of cervical papillae, more dorsally situated, much more minute and sometimes very difficult to make out, may be located about 0.023 mm. anterior to the larger pair.

Bursa well developed, with two large lateral lobes and a small triangular dorsal lobe. Bursa formula as follows: ventrals close to each other but distinctly separated, equal in length but unequal in size, latero-ventral distinctly wider than ventro-ventral. Laterals about equal in length, medio- and posterio-laterals approximate for whole length, anterio-lateral divergent from basal part and directed ventrad, and also wider than other laterals. Externo-dorsal arising from base of dorsal, approximate with posterio-lateral for most part but divergent at tip. Dorsal with a pair of short lateral branches near distal end and ending in a wrench-shaped bifurcation. Spicules brown, equal in size, ending in three long simple processes. In both of the two specimens examined, the left spicule protruded out through cloaca. Prebursal papillae absent.

Location.—Liver.
Intensity of Infection.—Two individuals recovered from one host.
Incidence of Infection.—One out of eight hosts examined.
Types.—Department of Biology, Lingnan University, Canton.
Discussion.—Although only male specimens are known, *Oswaldocruzia heparia* can be differentiated from other species of the genus by its several characteristic structures, among which the most important ones are the following: A long and wide cephalic inflation; a distinct, well-chitinized buccal cavity; the far post-oesophageal position of the excretory pore and cervical papillae; an additional pair of cervical papillae; and peculiarities in bursal rays. All these are very characteristic structures by which the present species can be easily separated from all other known species of this genus.

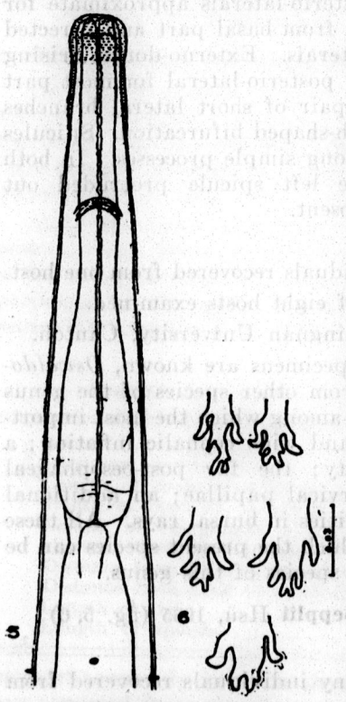
3. **Oswaldocruzia (Oswaldocruzia) hoepplii** Hsü, 1935 (fig. 5, 6)

Location.—Small intestine.
Intensity of Infection.—Few to many individuals recovered from one host.
Incidence of Infection.—Six out of eight hosts examined.

Hosts Reported.—*Bufo melanostictus* (also reported by Hsü, 1935), *Rana rugulosa* and *Kaloula pulchra*.

TABLE 3
Measurements in mm. of Oswaldocruzia hoepplii

	NUMBER OF SPECIMENS MEASURED	
	SEVEN MALES	THREE FEMALES
Length	5.000-9.030	12.900-17.000
Maximum width	0.075-0.162	0.157-0.223
Length of cephalic inflation :		
1st portion	0.033-0.038	0.036-0.038
2nd portion	0.058-0.070	0.069-0.074
Width of cephalic inflation	0.034-0.048	0.042-0.052
Length of oesophagus	0.355-0.486	0.486-0.546
Distance from head to nerve ring	0.133-0.190	0.182-0.205
Distance from head to excretory pore	0.365-0.596	0.558-0.633
Distance from head to cervical papillae	0.380-0.616	0.574-0.635
Length of tail	0.088-0.140	0.201-0.240
Length of spicule	0.140-0.194	———
Distance from vulva to tail	———	4.400-5.400
Size of eggs	———	0.081-0.097 by 0.046-0.056



Oswaldocruzia (O.) hoepplii

Fig. 5, anterior portion of female, ventral view; fig. 6, dorsal rays, showing variations.

Geographical Distribution.—Hanoi and Ha-Dong (Tongking), French Indo-China (Hsü, 1935); Canton.

Remarks.—The specimens studied by the present author fit in with Hsü's description quite well. A few interesting remarks can, however, be made. Firstly, the cervical papillae, which were not made out by Hsü, were definitely found by the present author in every specimen and they were situated always immediately behind the level of the excretory pore. Secondly, no prebursal papillae have been found in any of the author's specimens. Their presence in Hsü's specimen seems very interesting as members of the genus *Oswaldocruzia* have generally been reported not possessing this character. And lastly, certain variations have been found in a number of specimens studied, notably in the position of the excretory pore and the cervical papillae, and in the structure of the bursa, especially in the pattern of the dorsal ray. These variations are important in taxonomic study of this group; and as some species have been erected solely on the basis of some of the above mentioned characters, the present findings may necessitate a revision of the genus.

Family **OXYURIDAE** Cobbold, 1864

4. **Oxysomatium macintoshii** (Stewart) 1914 (fig. 7, 8)

Location.—Rectum.

Intensity of Infection.—Five individuals recovered from one host.

Incidence of Infection.—One out of eight hosts examined.

TABLE 4
Measurements in mm. of Oxysomatium macintoshii

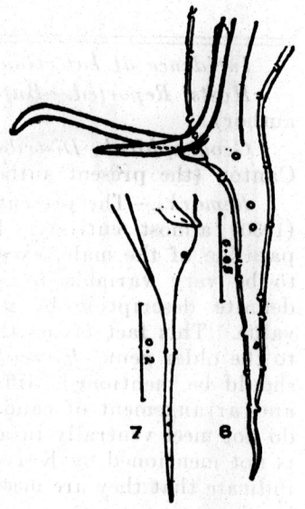
	NUMBER OF SPECIMENS MEASURED	
	TWO MALES	TWO FEMALES
Length	1.600	3.300-3.900
Maximum width	0.110-0.130	0.220-0.250
Width of lateral alae	0.016	0.016
Length of oesophagus	0.290-0.300	0.500-0.600
Size of oesophageal bulb (diam.)	0.056-0.058	0.100-0.110
Distance from head to nerve ring	0.166-0.190	0.185-0.265
Distance from head to excretory pore	0.266-0.292	0.270-0.370
Distance from head to vulva	———	1.650-1.900
Length of tail	0.185-0.220	0.490-0.650
Length of spicules	0.170	———

Hosts Reported.—*Bufo stomaticus* (Stewart, 1914); *Bufo melanostictus* (Karve, 1927; Hsü and Hoeppli, 1933; the present author); *Bufo viridis, B. meuritanicus* (? Baylis, 1929); *Rana tigrina* (Stewart, 1914; Karve, 1927); *Rana delalantii* (?); *Nectophrynoides vivipara* (Baylis, 1929).

Geographical Distribution.—Lucknow (Stewart, 1914); India and Burma (Karve, 1927); Africa (Baylis, 1929); Amoy (Hsü and Hoeppli, 1933); Canton (the present author).

Remarks.—*Oxysomatium macintoshii* was first described by Stewart in 1914 and was later fully redescribed by Karve (1927). The arrangement of the caudal papillae as shown in Karve's figure and description was considered by Hsü and Hoeppli (1935) as representing a variation and should not be taken as characteristic of the type. These authors also fully described their specimens from Amoy. The present specimens from Canton are more similar to Hsü and Hoeppli's description than to Karve's, especially in the number and arrangement of caudal papillae. I, therefore, favor Hsü and Hoeppli's idea.

The present species has been put by some authors (Travassos, 1931; Hsü and Hoeppli, 1933) under a different genus,



Oxysomatium macintoshii

Fig. 7, posterior portion of female, lateral view; fig. 8, posterior portion of male, lateral view.

Aplectana. As the two genera, *Aplectana* and *Oxysomatium*, are so closely related, I am here following Karve (1927) and Baylis (1936) in considering the species as a member of *Oxysomatium*.

Family **HETERAKIDAE** Railliet and Henry, 1914

5. **Heterakis govindi** (Karvé), 1930

Location.—Rectum.

Intensity of Infection.—Six to thirty-one individuals recovered from one host.

TABLE 5

Measurements in mm. of Heterakis govindi

	NUMBER OF SPECIMENS MEASURED	
	TWO MALES	TWO FEMALES
Length	4.650-4.750	5.060-7.210
Maximum width	0.211-0.215	0.316-0.365
Length of pharynx	0.048-0.061	0.068-0.073
Length of oesophagus, including pharynx and bulb	0.878-0.891	1.013-1.045
Width of oesophagus	0.044-0.049	0.049-0.056
Maximum width of oesophageal bulb	0.130-0.150	0.174-0.178
Distance from head to nerve ring	0.283	0.284
Distance from head to excretory pore	0.446-0.476	0.506-0.527
Length of tail	0.200-0.230	0.243-0.350
Size of sucker	0.050×0.045	———
Distance from sucker to cloaca	0.050-0.053	———
Length of spicules	0.247-0.270	———
Distance from head to vulva	———	2.120-3.200
Size of eggs	———	0.061-0.069 by 0.041-0.044

Incidence of Infection.—Three out of eight hosts examined.

Hosts Reported.—Bufo melanostictus (Karve, 1930; the present author).

Geographical Distribution.—Rangoon, Burma (Karve, 1930); Canton (the present author).

Remarks.—The present specimens fit in with Karve's description (1930) almost entirely. But it should be added that the caudal papillae of the male, except the three large pairs, have been found to be very variable in size, number, and position. Therefore, a definite description by groups as given by Karve is not of much value. This fact favors the transference of Karve's genus *Meterakis* to the older genus *Heterakis* by Baylis (1936), since *Meterakis*, it should be mentioned, differs from *Heterakis* mainly in the number and arrangement of caudal papillae in the male. The caudal alae do not meet ventrally in any of the specimens examined by me. This is not mentioned by Karve, but his drawing (p. 485, fig. 4) seems to indicate that they are meeting. It is probably a mistake in drawing.

Family **KATHLANIIDAE** (Travassos, 1918)

6. **Spironoura pectinospiculata** n. sp. (figs. 9-15)

Specific Diagnosis. Spironoura.—Three well-defined lips, each bearing a pair of prominent papillae. No buccal cavity or vestibule.

Tail of both sexes slightly tapering, rather short, and ending in a terminal spike. Spicules pectinate, very long and distinguishable into a distal pectinate, alate, chitinous portion and a basal longitudinally striated, non-alate, non-chitinous portion. Gubernaculum

TABLE 6

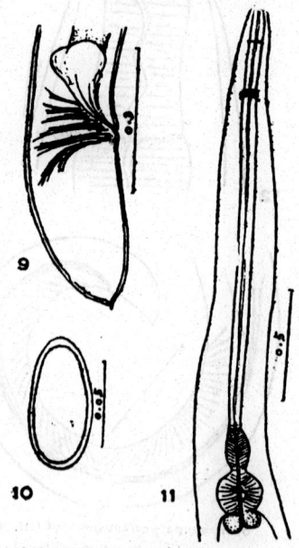
Measurements in mm. of Spironoura pectinospiculata

	NUMBER OF SPECIMENS MEASURED	
	TWO MALES	TWO FEMALES
Length	13.08-17.49	11.84-12.90
Maximum width	0.350-0.500	0.300-0.470
Length of oesophagus, including pharynx and bulb	1.785-2.320	1.680-1.845
Length of pharynx	0.110-0.150	0.100-0.105
Length of pre-bulbular swelling	0.130-0.180	0.130-0.140
Length of posterior bulb	0.170-0.180	0.150-0.170
Distance from head to nerve ring	0.320-0.400	0.270-0.300
Distance from head to excretory pore	1.240-1.624	1.312-1.420
Length of tail	0.240-0.260	0.380-0.470
Length of spicules (distal portion)	1.800-2.850	———
Length of gubernaculum	0.100-0.130	———
Distance from vulva to tail	———	3.450-3.850
Size of eggs	———	0.070-0.100 by 0.033-0.038

well-developed and chitinized. Ten or eleven pairs of caudal papillae, of which three or four pre-anal, two ad-anal, five or six post-anal; and a median pre-cloacal protuberance. Vulva at anterior portion of posterior third of body.

At one time fifteen specimens of both sexes of this species were collected from the small intestine of *Bufo melanostictus* in a mixed infection with many specimens of *Oswaldocruzia hoepplii* Hsü, 1935. At another time in the same kind of mixed infections only one male specimen, of a much larger size, was collected. The larger figures of the male in the measurements given above were taken solely from the latter specimen.

Description of Spironoura.—Relatively large and stout worms; males and females similar in size. Head not wider than neck. Three distinct lips, one dorsal and two sub-ventral, fused at basal portion. Dorsal lip slightly bi-lobed, showing a deep notch at middle; subventral lip entire. Each lip bearing only two prominent papillae, situated evenly at two corners of each lip; each papilla supported by long, strong stalk and with a slightly bifurcating tip. No inner pair



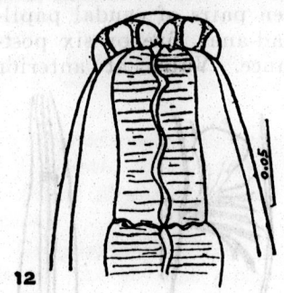
Spironoura pectinospiculata n. sp.

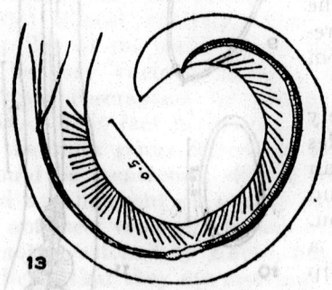
Fig. 9, posterior portion of female, lateral view; fig. 10, egg from uterus; fig. 11, anterior portion of male.

of papillae, nor any remnant of it. Mouth opens directly into a short pharynx. No buccal cavity or vestibule. Pharynx with muscular walls, and set off with oesophagus by a transverse cuticularized lining and a little constriction, being a little narrower than oesophagus. Lumen of pharynx very narrow, lined by heavy cuticularized walls which continue posteriorly to end of oesophageal bulb. Oesophagus rather long, about 1/7 as long as body, turning posteriorly into a distinct pre-bulbular swelling and a large sub-cylindrical bulb, the two being separated by a short narrow neck, thus giving the characteristic gourd-shape. Posterior bulb usually a little longer than pre-bulbular swelling, both being more muscular than oesophagus proper. Bulb containing well-cuticularized vulvular apparatus opens into intestine and is followed by a pair of spherical glands.

Nerve ring rather prominent, situated at anterior end of oesophagus, a little distance behind pharynx. Excretory pore minute, followed by a small vesicle, situated a little distance before pre-bulbular swelling. Cuticle thicker at anterior end. Tail in both sexes very blunt, only slightly tapering, and emerging at posterior extremity as a small terminal spike.

Male.—Caudal portion coiled up ventrally. Tail short, blunt and similar to that of female in shape, ending in a small terminal spike. Pre-cloacal musculature strongly developed, but without aggregating to form any sucker-like organ. Muscle bands can be distinguished in two groups: first group, located next to cloaca, consisting of about 25-30 oblique bands with their ends pointing dorsad and cephalad; and second group, cephalad to the first, consisting of about the same number of muscle bands, at first with their ends pointing dorsad and caudad and then dorsad and finally dorsad and cephalad, thus appearing somewhat fan-shaped, but its course is too long to be considered a sucker-like organ. The pre-cloacal musclature extends cephalad 1.9-2.1 mm. in front of cloaca. Generally 10 pairs of caudal papillae in addition to a single median pre-cloacal protuberance. The latter ventral in position, a little in front of cloaca. Of the 10 pairs of caudal papillae, 3 pre-anal, 2 ad-anal, and 5 post-anal. Pre-anal ones much larger, sub-





Spironoura pectinospiculata n. sp.

Fig. 12, head of female, lateral view; fig. 13, posterior portion of male, showing pre-cloacal musculature and spicules; caudal papillae and gubernaculum not shown.

ventral in position, with the foremost one situated laterad. The distance between first and second papillae is greater than that between second and third. Two ad-anal pairs sub-ventral, sometimes with the posterior one more posteriorly situated appearing like a post-anal one. Post-anal papillae in two groups, 3 sub-ventral and 2 lateral; foremost one of sub-ventral group situated near cloaca, with the other two near posterior end; 2 lateral ones situated between first and second sub-ventral ones in transverse level. Ad-anal and post-anal papillae similar in size. All papillae sessile. Certain variations of the number of papillae have been found. In one specimen, 4 instead of 3 pre-anal papillae present, and in an another specimen, 6 instead of 5 post-anal present, in either case total is 11 pairs. Gubernaculum well-developed. Spicules very long and distinguishable into two portions, a distal and a basal portion. Distal portion well chitinized, distinctly pectinate and broadly alate, reaching muscle bands of the second group. Basal portion non-chitinized, consisting of filamentous bands, with longitudinal striations, becoming more and more ill-defined cephalad and finally forked into many slender branches, ending at about the same level of the most anterior muscle bands. At the junction of the two portions, there is a dilated portion which is devoid of any striations.

Female.—Body tapering cephalad, less so posteriad. Vulva not prominent, can be made out only by careful examination; situated at anterior portion of posterior third of body. Vagina tubular and muscular, very long, running dorsad and cephalad for a little distance before giving rise to two opposed uterine branches. Eggs rectangularly elliptical, about twice as long as wide, not segmented in any part of uterus. Rectum distinct, about 0.2 mm. long, supported dorsad by strong muscle bands. Tail very blunt, only slightly tapering, ended in a terminal spike.

Location.—Small intestine.

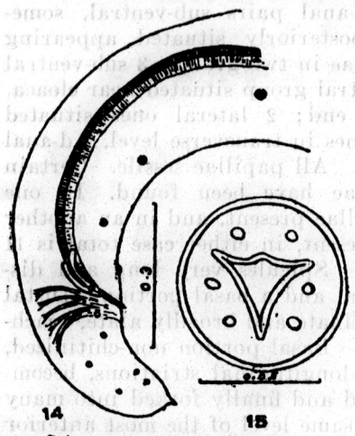
Intensity of Infection.—One to fifteen individuals recovered from one host.

Incidence of Infection.—Two out of eight hosts examined.

Types.—Department of Biology, Lingnan University, Canton.

Discussion.—In the genus *Spironoura* were included by Yorke and Maplestone (1926) 16 species, parasitic in tortoises, snakes, and fishes. Three of the sixteen (*S. gracilis* Leidy, 1856, from intestine of *Ambystoma tigrinum* in U.S.A.; *S. masula* Travassos, 1919, from intestine of *Elosia nasus* in Brazil, and *S. nitida* Travassos, 1919, from large intestine of *Hyla faber* and *Leptodactylus ocellatus*, Brazil) have, however, also been reported from amphibian hosts. Since then seven species have been added to the list. They are the following: *S. onama* Karve, 1927, from a Burmese tortoise

(*Testudo emys*); *S. procera* Canavan, 1929, from large intestine of *Chrysemys rubiventris*, red-bellied terrapin, in U.S.A.; *S. catesbianae* Walton, 1929, from large intestine of *Rana catebiana*, U.S.A.; *A. cryptobranchi* Walton, 1930, from large intestine of *Cryptobranchus alleganiensis*, U.S.A.; *S. elongata* (Baird, 1858) Walton, 1932, from *Ambystoma trigrinum*, Mexico; *S. duyagi* Tubangui and Villaamil, 1933, from caecum of *Cyclemis amboinensis*, Luzon; and *S. brevispiculata* Baylis, 1935, from *Rana hexadactyla*, Ceylon. From all these twenty-three foregoing described species, *Spironoura pectinospiculata* can be easily differentiated by the peculiar structure and the unusual length of the spicules. The bluntness of the tail in both sexes and the arrangement of pre-cloacal musculature in the male are also of specific significance. The number of muscle bands of the latter structure may bear an important role in specific differentiation if a comparative study of different species in this genus can be made.



Spironoura pectinospiculata n. sp.

Fig. 14, posterior portion of male, lateral view; fig. 15, head of male, top view.

The structure of the head of the present species is also very interesting, as it shows some resemblance to that of *Zanclophorus*. The length of the spicules and the stoutness of the tail also suggest the same relation. The two genera, *Spironoura* and *Zanclophorus*, are so closely related that they may be united if more intermediate forms can be discovered.

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廣州蟾蜍體內之寄生圓虫

顧瑞巖著

(摘 要)

本文紀載由廣州蟾蜍 (*Bufo melanostictus*) 體內採得之寄生圓虫六種。其中寄生于肺內者一種，即 *Rhabdias bufonis;* 寄生于肝臟中者一種，即 *Oswaldocruzia heparia,* 乃一新種；寄生于小腸中者二種，即 *Oswaldocruzia hoepplii, Spironoura pectinospiculata,* 後者亦爲一新種；寄生于直腸中者二種，即 *Oxysomatium macintoshii, Heterakis govindi.*

XYLOCOPA ORIENTALIA CRITICA (HYMEN.). I. SUBGENUS BOMBOIXYLOCOPA NOVUM.[1]

By TSING-CHAO MAA (MAA, TSING-CHAO, 馬駿超)

Daw-Tsuen, Hangchow.

Genus **Xylocopa** Latreille, 1802

Subgenus **Bomboixylocopa** novum

Body of large size, very thickly covered with long velvety hairs. Supraclypeal region, lateral frontal regions (up to a little beyond the level of antennal fossae) and clypeus of ♂ pale-colored. Inner orbits of ♂ strongly approximating to each other at their upper extremities, those of the ♀ very weakly so. Frontal keel apically narrow and strong, with a V-shaped median fovea. Mandibles bidentate. Genae long, those of the ♀ about one-half as long as the breadth. Coronal suture usually unrecognizable. Antennal segment III subequal in length to segments IV-VI; IV longer than broad. Disk of mesonotum broadly impunctate. Scutellum almost flat, its posterior margin not sharply marked off from postscutellum, nor overlapping it. Wings subhyaline, apically smoky; vein R_5 weakly curved, perpendicular to vein M_{1+2} at their junction. Posterior tibiae apically incrassate, kneecaps simple (shallowly bifurcate in *X. frieseana* n. sp.), strong. Epipygium of ♀ without recognisable submedian processes; median furrow V-shaped, finely punctate. Hypopygium of ♀ very weakly keeled. Head of stipes of ♂ genitalia petiolate, horizontally dilated.

Typus subgeneris.—*Xylocopa bomboides* F.Sm., 1879.

Habitat.—China (Kwangtung and Fukien Provinces); Formosa.

This new subgenus appears to be the highest one in the sectio *Schönherria* Lepel., 1841, (=*Xylocopa* Grib., 1894, sen. str.) and most closely allied to the subgenera *Zonohirsuta* Maa (Typus subgeneris: *X. collaris* Lepel.) and *Alloxylocopa* (Typus subgeneris: *X. appendiculata* F.Sm.) especially in the general shape of the head of ♂. But it can be readily recognised by the shape of its scutellum and ♂ genitalia.

Key to the Species of Bomboixylocopa

1 Abdominal tergites I-V with unicolored pale hairs.....**frieseana** n. sp.
Abdominal tergites I-V bifasciate, with more or less black hairs..... 2

2. Inner margin of posterior femora of ♂ basally with a sharp spine-like projection; abdominal tergites I-II brightly yellow-haired.....
.....**chinensis** Friese

[1] The writer hereby wishes to acknowledge his indebtness to Dr. Walther Horn, Director of the Deutsches Entomologisches Institut, Berlin-Dahlem, for the loan of the type specimens of *Xylocopa chinensis* Friese and *X. bombimorpha* Strand, and to Prof. Wm. E. Hoffmann for permission to study in the Lingnan Natural History Survey and Museum, Canton.

Inner margin of posterior femora of ♂ basally rounded, without any sharp projection; abdominal tergites I-II black-haired .....**bomboides** F.Sm.

Xylocopa (Bomboixylocopa) chinensis Friese

1911. *Xylocopa chinensis* Friese, Verh. zool.-bot. Gesel. Wien, p. 125, ♂ ♀.
1913. *Xylocopa chinensis* Strand, Suppl. Ent. II, p. 43, ♂ ♀.

Male.—The following notes may be supplemented to the original description given by Friese.

Integument: Oblong spots immediately interior to upper orbital extremities yellowish. Frontal sutures broadly blackened.

Pubescence: Postgenae and vertex covered with a mixture of pale and black hairs. Lower portion of thoracic pleurites with an oblong patch of yellowish hairs. Posterior margin of abdominal tergite II, anterior margin of V and that of abdominal sternite IV black-haired. Anterior tibiae with dominant yellowish hairs and scattered black ones. Anterior tarsi basally with very few black hairs. Intermediate tibiae with a mixture of ferruginous and black hairs.

Structure: Inter-orbital distance at the level of antennal fossae about five-ninths as long as vertico-clypeal distance. Inner orbits weakly curved, distance between upper orbital extremities about two-thirds as long as that between the lower ones. Upper portion of front finely and shallowly punctate in second-degree-density.[2] Frontal keel basally weakened, its median fovea rather deep, short. Pale-colored face markings finely and rather deeply punctate in third-degree-density, interspaces between proximate punctures usually more than twice the punctual diameter. Supraclypeal region flat, smooth, with a median impunctate band, laterally a little more elevated than its neighboring frontal regions. Epistomal suture curved, forming acute interior angles with frontal sutures. Clypeal sutures very weakly curved. Tentorial pits elongate, very shallow. Clypeus with broad median impunctate band, laterally at the same level as its neighboring frontal regions. Labrum with very broad and shallow apical emargination. Genae impunctate, minimum length about five times as long as the diameter of clypeal punctures. Postgenae finely and shallowly punctured in third-degree-density. Vertex finely and rather deeply punctate in first-degree-density, with a median impunctate band. Inter-ocellar distance about twice as long as ocello-ocular distance. Basal side of ocellar triangle about twice as long as either one of the lateral sides. Post-ocellar pits scarcely recognizable. Inter-antennal distance about twice as long as antenno-ocular distance. Dorsum of thorax strongly punctate in first-degree-density, except the disk of mesonotum and median band of scutellum, which are impunctate; postscutellum finely and shallowly punctate in third-degree-density. Wing-veins M and M_{1+2} (first section) subequal in length; vein R_4 curved at a point of basal two-thirds of its length;

[2] Terminology of Allen and Jaynes, *Proc. U.S. Nat. Mus.* 76(17): 4, 1930.

vein r-m almost straight. Outer margin of posterior coxae apically tuberculate. Ventral surface of posterior femora basally with a small impunctate area, remaining portions evenly punctate in third-degree-density; inner margin keeled, strongly curved, basally with a sharp spine-like projection, medially with 2 round tuberculations. Posterior tibiae apically very strongly incrassate; knee-caps V-shaped, apically very sharp and strongly projecting out, extending to basal three-sevenths of tibial length. Inner teeth of anterior and posterior claws respectively about three-fourths and three-fifths as long as the corresponding outer ones. Abdominal tergites finely, rather deeply and evenly punctate in third-degree-density, interspaces between proximate punctures mostly about 1.5 times as long as the punctual diameter; epipygium posteriorly with a broad and shallow median emargination. Hypopygium medially depressed.

Female.—Unknown to the writer.

Measurements (in mm.): Length of body ♂ 21, of anterior wing ♂ 20.5.

Remarks.—The writer has examined only the type of the present species, male, from Fukien Prov. (no further details), 25.VIII.05, *Siemssen*, deposited now in the Deutsches Entomologisches Institut, Berlin-Dahlem. It is not in a very fine condition. The female type is in the Hamburg Museum.

Xylocopa (Bomboixylocopa) bomboides F.Sm. ♂ ♀.

1879. *Xylocopa bomboides* F. Smith, Descr. N. Spec. Hymen. Colln. Brit. Mus.: 124, no. 1, ♂.
1896. *Xylocopa bomboides* Dalla Torre, Cat. Hymen. 10: 205.
1901. *Xylocopa bomboides* Friese, Bien. Eur. 6: 233, no. 36, ♂.
1913. *Xylocopa bombimorpha* Strand, Suppl. Ent. 2: 44, ♀.
1932. *Xylocopa bombimorpha* Sonan, Trans. nat. Hist. Soc. Formosa 22: 135, ♀ ♂.
1934. *Xylocopa bomboides* Sonan, Trans. nat. Hist. Soc. Formosa 24: 226
1934. *Xylocopa bomboides* Yasumatsu, Kontyû 8: 210, pl. 1, figs. *1-n*, ♂.

Male.—Differing from *X. chinensis* Fr. as follows:

Integument: Pale-colored oblong spots interior to upper orbital extremities absent.

Pubescence: Black or sooty-brown, except abdominal tergites (IV-VII, posterior and lateral margins of III) and abdominal sternites (VI, posterior margins of IV-V), which are bright ferruginous-haired.

Structure: Interspaces between ocellar triangle and inner orbits scarcely punctate. Punctuation on pale-colored face markings comparatively denser and more evenly distributed, interspaces between proximate punctures mostly about 1.5 times as long as the punctual diameter. Epistomal suture almost straight. Minimum length of genae about thrice as long as the diameter of clypeal punctures. Postgenae punctate in second-degree-density. Posterior extension of

anterior coxae short and apically rounded. Apex of anterior trochanters rounded, without projection (the writer has not studied the anterior coxae and trochanters of *X. chinensis*). Posterior femora ventrally (except the basal impunctate area) evenly punctate in second-degree-density; inner margin basally rounded, medially with two very weak tuberculations. Posterior tibiae with comparatively weaker apical incrassation; knee-caps extending to basal half of tibial length. Genitalia as shown by Yasumatsu (1934, *loc. cit.*).

Female.—Differing from the male as follows:

Integument: Face purely black. Antennae a little darker.

Pubescence: With less testaceous tints, thoracic pubescence deep black.

Structure: Inter-orbital distance at the level of antennal fossae about ten-elevenths as long as vertico-clypeal distance. Inner orbits very weakly curved, distance between upper orbital extremities slightly shorter than that between the lower. Supraclypeal region shallowly punctate in second-degree-density, and much more elevated than its neighboring frontal regions. Upper half of lateral frontal regions shallowly punctate in second-degree-density also, lower half strongly punctate in first-degree-density. Tentorial pits deep, rounded. Clypeus strongly punctate in second-degree-density. Labrum strongly tuberculate, with shallow apical emargination. Genae about one-half as long as the breadth, upper inner corners with several very shallow punctures. Postgenae and vertex shallowly punctate in third- and second-degree-density respectively. Inter-ocellar distance about one-half as long as ocello-ocular distance. Interspaces between ocellar triangle and inner orbits finely and shallowly punctate in third-degree-density. Inter-antennal distance about one-half as long as antenno-ocular distance. Inner margin of posterior femora keeled. Knee-caps on posterior tibiae with distinct upper margin, apex not very sharp, extending to basal three-fifths of tibial length. Inner and outer teeth of claws long, slender and strongly divergent to each other, the inner ones of anterior and posterior claws respectively about three-fifths and one-half as long as the corresponding outer ones. Median furrow of epipygium deeply depressed.

Measurements (in mm.): Length of body ♂ 27, ♀ 23; of anterior wing ♂ 23, ♀ 21. Breadth of head ♂ 8, ♀ 8.5; of thorax (excluding tegulae) ♂ 9, ♀ 8.5; of thorax (including tegulae) ♂ 11, ♀ 10.5; of second abdominal segment ♂ 12, ♀ 11.5.

Type-specimens: Male, from "Formosa", deposited in the British Museum of Natural History, London; type of *X. bombimorpha* Strand, ♀, from Taihorin, Formosa, in the Deutsches Entomologisches Institut, Berlin-Dahlem. The latter specimen may be designated as the allotype of the species.

Remarks.—The writer has studied the type-specimen of *X. bombimorpha* Strand and a male specimen (Taiheizan, Taihokushu, Formosa, 8.iv.33, K. Sato) kindly loaned to him by Mr. K. Yasumatsu of Fukuoka, Japan.

Xylocopa (Bomboixylocopa) frieseana n. sp. ♀.

Male.—Unknown.

Female.—Integument: Black; antennal segments IV-XII testaceous below. Wings fulvo-hyaline, darkest at cell $Sc + R_1 + R_2$, apical area smoky, with very weak rosy-purple iridescence.

Pubescence: Head covered with a mixture of pale brownish and sooty brown (or black) hairs; the pale one being dominant on occiput, while the dark ones dominate on face and postgenae. Thorax with grayish yellow hairs, those on sternites with much more brownish tints. Legs, epipygium and abdominal sternites dark chestnut brown-haired. Abdominal tergites I-V and extreme basal portion of wings with bright brownish pubescence.

Structure: Inter-orbital distance at the level of antennal fossae about eleven-sixteenths as long as vertico-clypeal distance. Inner orbits curved, distance between upper orbital extremities slightly shorter than that between the lower ones. Face finely and evenly punctate in first-degree-density. Frontal keel extending to the level of lower margin of antennal fossae; its median fovea narrow, very short. Regions above antennal fossae weakly depressed. Supraclypeal region distinctly more elevated than its neighboring frontal regions. Epistomal suture straight. Tentorial pits upwardly produced to the lower margin of antennal fossae. Clypeus flat, with a poorly defined median impunctate band. Mandibles smooth, flat; the basal triangular area slightly depressed, and not well separated from median keel and outer marginal suture. Galea of maxillae exceedingly finely punctate, not striate. Length of genae about two-fifths the breadth. Outer orbital margins not grooved. Postgenae punctate in second-degree-density. Vertex evenly punctate in first-degree-density, except regions immediately posterior to lateral ocelli, where it has scattered punctures. Coronal suture recognizable at its extreme basal portion. Inter-ocellar distance about three-fifths as long as ocello-ocular distance. Basal side of ocellar triangle about 2.5 times as long as either one of the lateral sides. Inter-antennal distance slightly shorter than antenno-ocular distance. Antennal segment III slightly longer than segments IV-VI. Dorsum of thorax (except disk of mesonotum) finely punctate in second-degree-density. Scutellum with a poorly defined median impunctate band. Wing-vein M about four-fifths as long as M_{1+2} (first section). Posterior trochanters apically rounded. Knee-caps on posterior tibiae shallowly bifurcate, extending to basal three-fifths of tibial length. Inner teeth of anterior and posterior claws respectively about one-half and one-third as long as the corresponding outer ones. Abdominal tergites punctate in second-degree-density, without median impunctate band. Hypopygium medially keeled.

Measurements (in mm.): Length of body ♀ 24, of anterior wing ♀ 21.

Holotype: Yam Na Shan, 50± li SE.E. of Ping Chuen, Mei District, Kwangtung Province, S. China, F. K. To, deposited in the Lingnan Natural History Survey and Museum, Canton.

It is a great pleasure for me to name this magnificent species after Prof. Dr. Heinrich Friese of Schwerin/Mecklbg., Germany, to whom I am greatly indebted for his encouragement and valuable advice during the course of my apidological studies.

東亞椽蜂屬之檢討
I. 絨椽蜂亞屬(新亞屬)

馬駿超著

(摘要)

本文所敘之絨椽蜂亞屬 *Bomboixylocopa*（新亞屬）分佈於中國（廣東福建二省）及台灣。全體密被長絨毛，外形頗似獅蜂屬 *Bombus* 或僞獅蜂屬 *Psithyrus*. 已知者凡三種：

(1) 中華絨椽蜂 *Xylocopa chinensis* Friese, 產中國福建。

(2) 台灣絨椽蜂 *Xylocopa bomboides* F.Sm., 產台灣，爲本亞屬之模式種。

(3) 弗氏絨椽蜂 *Xylocopa frieseana* Maa, 新種，產中國廣東梅縣。

文內除記述本亞屬及其所屬種類之特徵外，並附種之檢索表及參攷文献。

HISPINE BEETLES IN THE COLLECTION OF THE LINGNAN NATURAL HISTORY SURVEY AND MUSEUM (COLEOPTERA: CHRYSOMELIDAE: HISPINAE)[1]

By J. Linsley Gressitt

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This report concerns 227 specimens of leaf-mining plant beetles (spiny plant beetles) in the collection of the Lingnan Natural History Survey and Museum of Lingnan University, Canton. The collection contains thirty-eight species, five of which are herein described as new to science. Twenty-three of the species are from mainland Kwangtung Province, sixteen from Hainan Island, four from Indo-China, seven from Hunan, two from Yunnan, two from Kwangsi, two from Kiangsi, one from Fukien, and two from Hupeh Province, south China. The specimens were mainly collected by Prof. Wm. E. Hoffmann, F. K. To, Y. W. Djou, E. R. Tinkham, K. H. Tsui, Chauncey Brownell, the Lingnan University Fifth Hainan Island Expedition, O. K. Lau, and others. A few specimens collected by the writer in south China in 1936 are included as paratypes of two of the new species described from the Lingnan material. Keys are given to the genera and species, since means of identification of species from these regions are scarce. The writer recently reported on the hispids collected by himself on Hainan Island[2], and species in that report lacking in the present collection are also included in the keys. I am much indebted to Prof. Wm. E. Hoffmann, Director of the Lingnan Natural History Survey and Museum, for the privilege of making this study. The type specimens of the new species will be deposited in the collection of the Lingnan Natural History Survey and Museum. Certain paratypes and duplicates will be deposited in the United States National Museum in Washington, D. C., and in the collection of the California Academy of Sciences in San Francisco.

Subfamily **Hispinae**

Key to Genera

A. Body not armed with distinct spines; form generally subcylindrical, oval or wedge-shaped ..... B

Body armed with spines on dorsal surfaces and lateral margins; form generally somewhat flattened and more or less oblong in shape (Hispini) I

B. Elytra with an extra row of punctures along base of suture by scutellum. C

Elytra lacking a scutellar row of punctures (Gonophorini)..... F

[1] Contribution from the Lingnan Natural History Survey and Museum.

[2] Some Hispine Beetles from Hainan Island. *Lingnan Science Journal* 17 (3) : 321-336, pl. 11, 1938.

C. Frons minute; upper edge of mouth cavity close to antennal insertions... D
Frons fully as long as broad, considerably separating mouth cavity from antennal insertions (Oncocephalini) .....**Oncocephala** Chevr.

D. Either anterior or posterior lateral angles of prothorax bearing a fine bristle ..... E
Neither anterior nor posterior lateral angles of prothorax bearing fine bristles; body very narrow, parallel and cylindrical (Leptispini)..... .....**Leptispa** Baly

E. A fine bristle located near each anterio-lateral angle of prothorax; body elongate, prothorax subcylindrical (Anisoderini).....**Lasiochila** Weise
A fine bristle located near each posterior angle of prothorax; body broadly oblong-oval; prothorax transverse (Callispini) .....**Callispa** Baly

F. Two rows of punctures between suture and first costa, at least in part; mouth not very close to antennal insertions ..... G
A single row of punctures between suture and first costa from base to apex; mouth close to antennal insertions .....**Wallaceana** Maulik

G. Prothorax not parallel-sided, not flattened above; elytral costae for most part distinct ..... H
Pronotum parallel-sided, flattened and somewhat margined laterally; elytral costae depressed .....**Downesia** Baly

H. Prothorax subcylindrical, narrowly margined laterally.....**Agonia** Weise
Prothorax transverse, broadened in middle with prominent denticulate lateral margins .....**Gonophora** Baly

I. A group of spines on each side of middle of anterior margin of pronotum. J
Anterior dorsal margin of pronotum lacking spines..... M

J. At least first antennal segment with a long dorsal spine..... K
Antennae lacking spines entirely .....**Dactylispa** Weise

K. Tarsal claws normal, paired L
A single claw at extremity of each tarsus .....**Monochirus** Chapuis

L. First to sixth antennal segments with one or more spines on upper sides... .....**Hispella** Chapuis
Only first antennal segment with a spine above .....**Rhadinosa** Weise

M. Narrow, subparallel; prothorax with a group of several spines behind anterio-lateral angles and generally a single one at each side behind middle; elytral margins not produced; antennae of eleven segments .....**Hispa** Linn.
Broad; prothorax with a broad, spined expansion at each side, and two similar expansions on each side of elytra; antennae of nine segments... .....**Platypria** Guerin

Tribe **Anisoderini**

Genus **Lasiochila** Weise, 1916

1. **Lasiochila longipennis** (Gestro), n. comb.

Anisodera longipennis Gestro, 1906, Ann. Mus. Civ. Genova: 474 (Tongking).

Three specimens were collected in Tongking, French Indo-China, on a mountain 37 kilometers south of Laokay, at an altitude of 4,500 to 4,800 feet, Aug. 14-16, 1934, by Ernest R. Tinkham.

Elongate, subparallel, very slightly broadened posteriorly. Head, antennae, ventral surfaces and legs pitchy black; pronotum and scutellum pitchy black to reddish; elytra reddish brown. Length 10.5-11 mm.; breadth 3.2-3.4 mm.

Tribe **Callispini**

Genus **Callispa** Baly, 1858

Key to Species[3]

A. At least head and prothorax reddish; elytra blue, violet or black on apical half or entire surface ..... B
Dorsal surface of body entirely steel-blue; prothorax distinctly narrowed anteriorly .....**bowringii** Baly

B. Elytra entirely metallic blue or violet..... C
Elytra reddish on approximately basal half, blue or blackish apically..... D

C. Elytra regularly punctured in eleven rows, steel-blue; length less than 7 mm. .....**[fortunii emarginata** Gressitt**]**
Elytra irregularly punctured, greenish near margins, purplish violet on disks; length over 8 mm. .....**[karena** Maulik**]**

D. Form elongate-oblong; prothorax parallel-sided, emarginate anteriorly; elytra greenish blue apically; length over 5 mm. ....**[dimidiatipennis recticollis** Gressitt**]**
Form slightly ovate, abbreviated; prothorax slightly narrowed anteriorly, not emarginate; elytra greenish black apically; length under 4 mm..... .....**sundara** Maulik

2. **Callispa bowringii** Baly

Callispa Bowringii Baly, 1858, Cat. Hispidae Brit. Mus. 1: 5 (Hong Kong); Weise, 1893, Ins. Deutschl. 6: 1060; Chen, 1929, Lingnan Science Journal 7: 515-529, pl. 16 (Canton); Gressitt, 1938, op. cit. 17 (3): 321 (Hainan I.).

One specimen was taken at Sa-tai-heung, Hok-chian, Fu-tsing Dist., Fukien Prov., Oct. 14-15, 1932, by S. H. Tsang. Eight specimens were collected in Kwangtung Province: Canton, May 8, 1932, W. E. Hoffmann; Honam I., Canton, Aug. 7, 1933, H. Y. Chan; Ts'in-pai, Sin-I Dist., July 9, 1932, W. E. Hoffmann; Shiu-hing, Aug. 1, 1921; Naam-kong-paai, Yao Shan, Yang-shan Dist., Oct. 18-20, 1934, F. K. To; Linchow, Lien Dist., Aug. 6, 1934, F. K. To; Tsang-sing, Tseng-ch'eng Dist., Apr. 5-7, 1935, H. Fung; and Tung-koon, Tung-kwan Dist., June 6, 1936, S. Y. Lau. New to Fukien Province.

Broad, narrowed anteriorly; prothorax rounded laterally and hardly one-half as wide at apex as at base; elytra punctured in about twelve rows at middle of body, the punctures much larger on central portion of disk than along suture or on apical portion. Dorsal surface of body steel-blue or violet with a slight purplish tinge, to greenish black; antennae and thoracic sterna black; legs reddish, pitchy, or black ("var. *atripes*" Pic); abdomen reddish testaceous. Leength 5.6-7 mm.; breadth 3.1-3.7 mm.

Note.—This is undoubtedly the species the biology of which was described and the immature stages figured by H. T. Chen in the Lingnan Science Journal 7: 515-529, plate 16, June 1929 (Biological Notes on a Chrysomelid Pest of Bamboo).

[3] Including, in brackets, species recorded from Hainan Island by the writer in a preceding article: *Lingnan Science Journal* 17 (3): 321-323, 1938.

3. **Callispa sundara** Maulik

Callispa sundara **Maulik**, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 61 (Tavoy, Tenasserim).

Three specimens were collected on Hainan Island, in 1935, by F. K. To: one at Fat-loh, Yai Dist., Mar. 7, one at Kom-yan City and vicinity, Kan-en Dist., Mar. 9, and one at Sam-kwong ts'uen, Lam-wan-tung (Loi territory), Kiung-shan Dist., Aug. 16-18. New to China.

Minute; broad, oblong-oval, compressed; prothorax transversely oblong, nearly parallel-sided, finely punctured; scutellum short, convex posteriorly; elytra subparallel for basal three-fourths, broadly rounded apically, distinctly punctured in nine regular rows just before middle; abdominal segments minutely punctured. Head, pronotum, scutellum, basal two-fifths of elytra and ventral surfaces reddish ochraceous; antennae black; apical portions of elytra black with a slight tinge of metallic blue. Length 3.3-3.5 mm.; breadth 1.5 mm.

Tribe **Leptispini**

Genus **Leptispa** Baly, 1858

Key to Species

A. Dorsal surfaces entirely black; prothorax with slightly rounded lateral margins ..... B
Thorax and legs red; prothorax distinctly broader than long, its sides nearly straight .....**longipennis** Gestro

B Abdomen red; prothorax distinctly narrowed anteriorly, minutely and irregularly punctured; scutellar stria feebly impressed.....
.....**abdominalis** Baly
Body entirely black; prothorax hardly narrowed anteriorly, deeply punctured but impunctate along median line .....**godwini** Baly

4. **Leptispa abdominalis** Baly

Leptispa abdominalis Baly, 1858, Cat. Hispidae : 3 ("N. China").

Eight specimens were collected on Honam Island, Canton, Kwangtung Prov., S. China: one in April 1932 and five on March 15, 1936, by Prof. Wm. E. Hoffmann, one on March 9, 1937, by F. K. To and K. W. Chouk, and one without exact date; mostly taken on bamboo. One example was collected at Shiu-hing, Kwangtung, on January 8, 1921.

Dorsal surfaces shiny black; legs and thoracic sterna black or dark reddish brown; abdomen reddish castaneous. Surfaces practically glabrous except for thin silvery pubescence on apical portions of antennae.

Head minutely punctured on posterior portion of occiput, more sparsely and deeply punctured on each side of median groove between eyes. Antennae gradually thickened beyond second segment. Prothorax not quite as long as broad, narrowed anteriorly; sides feebly convex; pronotum finely and irregularly punctured over entire surface. Elytra narrow, the striae fine and with small punctures.

Abdomen with fine punctures along middle of sternites and nearly impunctate laterally. Length 5.4-6 mm.; breadth 1.5-1.7 mm.

5. **Leptispa godwini** Baly

Leptispa Godwini Baly, 1869, Trans. Ent. Soc. London : 364 (Shanghai).
Paradownesia Fruhstorferi Gestro, 1906, Ann. Mus. Civ. Genova : 483 (Tongking).

Two specimens were collected at Kuling, Kiu-kiang Dist., N. Kiangsi Prov., central China, July 23-26, 1933, by Y. W. Djou; one specimen was collected at a point six miles south of Hwang-mei, Hwang-mei Dist., Hupeh Prov., central China, Aug. 1-6, 1933, by Y. W. Djou. New to Kiangsi and Hupeh Provinces.

Body entirely black; coxae reddish brown; femora and tibiae slightly reddish; dorsal surface shiny.

Head finely punctured between upper eye-lobes; posterior portion of occiput impunctate. Antennae gradually thickened from third to ninth segments, slightly hairy apically. Prothorax a little broader than long, feebly rounded at sides, slightly narrower at apex than at base; dorsal surface deeply, and somewhat closely, punctured except along mid-longitudinal line. Elytra with striae and punctures moderately deep, particularly on scutellar row. Ventral surfaces with large, shallow punctures on first abdominal segment and sides of metasternum, and with sparse, minute punctures on remainder of abdomen. Length 5.5-5.8 mm.; breadth 1.6 mm.

6. **Leptispa longipennis** (Gestro)

Downesia longipennis Gestro, 1890, Ann. Mus. Civ. Genova : 243 (Karen Hills, Burma).
Paradownesia longipennis Gestro, 1899, Ann. Mus. Civ. Genova : 220.
Leptispa longipennis Maulik, 1917, Ann. Mag. Nat. Hist., ser. 8, 20 : 130; 1919, Fauna Brit. India, Chrysom. : Hisp. and Cassid. : 81 (Burma and Bhutan).

Two specimens were collected on Honam Island, Canton, Kwangtung, S. China: one in 1932 by Prof. Wm. E. Hoffmann, and one without date or collector. New to China.

Slender and elongate, elliptical-oblong, nearly parallel-sided. Pronotum (except anterior margin), thoracic sterna, abdomen and legs dark red; elytra shiny black; antennae blackish, pitchy red at bases; head black with vertex and mouthparts reddish.

Head three-fifths as wide as base of prothorax, convex on center of occiput, fairly level and finely punctured between upper lobes of eyes; vertex slightly emarginate anteriorly above antennal insertions. Antennae not quite as long as head and prothorax combined, feebly, and gradually, thickened distally. Prothorax a little broader than long, slightly wider at base than at apex, straight-sided; disk smooth, irregularly impressed with sparse, fine punctures and minute punctulae. Elytra very narrow, parallel, with ten grooved rows of punctures behind middle and a short accessory row of six or eight

punctures on each near scutellum. Ventral surfaces densely punctured on sides of metasternum and almost impunctate on abdomen. Length 7-8.5 mm.; breadth 2-2.15 mm.

Tribe **Oncocephalini**

Genus **Oncocephala** Chevrolat, 1847

7. **Oncocephala atratangula** Gressitt

Oncocephala atratangula Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 324, pl. 11, figs. 1 and 2 (Chung Kon, Hainan I.).

A single specimen was collected at Tai-pin-ts'uen, Lam-ka-heung, Lai-mo-ling, Kiung-shan Dist., Hainan Island, May 10-11, 1935, F. K. To.

This second specimen differs from the type only in being somewhat lighter; of a more orange color with the posterio-lateral angles of the elytra pitchy brown instead of black.

Tribe **Gonophorini**

Genus **Downesia** Baly, 1858

Key to Species

Body and appendages largely black, with sides of pronotum reddish; pronotum distinctly margined and slightly concave laterally..... .....**marginicollis** Weise

Body and appendages largely reddish testaceous, elytra brownish testaceous; pronotum incompletely margined and feebly convex laterally..... .....**tarsata** Baly ?

8. **Downesia marginicollis** Weise

Downesia marginicollis Weise, 1922, Phil. Jour. Sci. 21 : 71 (China).

Two examples were collected on Honam Island, Canton, P'an-yu Dist., Kwangtung Province, S. China.

Elongate, subparallel, flattened above; pronotum smooth and finely punctured, distinctly margined laterally, slightly broadened anteriorly; elytra slightly widened behind middle; impressed with four pairs of puncture-rows separated by slightly raised broad interstices. Black; sides of pronotum dull reddish; metasternum pitchy brown; abdomen reddish testaceous. Length 7-7.8 mm.; breadth 1.8-2.1 mm.

9. **Downesia tarsata** Baly ?

Downesia tarsata Baly, 1869, Trans. Ent. Soc. London : 377 (Hongkong).

Two specimens collected on Loh-fau Shan, alt. 3,800-4,000 ft., Kwangtung Prov., Aug. 4 and 12, 1933, by E. R. Tinkham, are provisionally referred to this species, though the tarsi are not black.

Pronotum finely and sparsely punctulate, feebly and incompletely margined at sides; elytra punctured in eight rows beyond basal third, the rows in pairs separated by three raised costae, the inner two of which are broad and flat on basal quarter. Color testaceous brown; head and prothorax somewhat orange; antennae pitchy brown; legs testaceous. Length 4.8-5.7 mm.; breadth 1.6-1.9 mm.

Genus **Agonia** Weise, 1905

Key to Species

A. Elytra shiny black; ventral surfaces of body, and legs, reddish..... B
Elytra red or ochraceous with black spots; ventral surfaces black or testaceous C

B. Prothorax and scutellum black; first two elytral costae strongly raised, narrow and straight .....**carbunculus** Maulik
Prothorax and scutellum red; first two elytral costae low, thick, and slightly zig-zag .....**chinensis** Weise

C. Dorsal surfaces entirely red; antennae, legs and ventral surfaces black; middle elytral costa entire .....**immaculata** (Gestro)
Dorsal surfaces yellowish ochraceous, with a number of small black spots; scutellum black; antennae pitchy; ventral surfaces testaceous; middle elytral costa interrupted behind middle.....**maculigera** (Gestro)

10. **Agonia carbunculus** Maulik, subsp. ?

Agonia carbunculus Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 139 (Ruby Mines, Burma).

A single specimen was collected at Naam-kong-paai, Yao Shan, Yang-shan Dist., N. Kwangtung Prov., Oct. 29-30, 1934, by F. K. To. New to China.

Pronotum coarsely and irregularly punctured, obliquely impressed at each side of base; elytra regularly punctured in eight rows at base and apex and in seven rows in middle, where third costa is obsolete. Elytra, and notum and sides of prothorax, shiny black; head pitchy brown; antennae pitchy black; ventral surfaces and legs reddish testaceous, middle of fourth, and most of fifth, abdominal sternite pitchy black. Length 5 mm.; breadth 1.65 mm.

A. semicyanea Pic is probably close to this form.

11. **Agonia chinensis** Weise

Agonia chinensis Weise, 1922, Phil. Jour. Sci. 21 : 75 (China).

Five specimens were collected on Yao Shan, Lien Dist., N. Kwangtung Prov., May 6-8, 1934, by F. K. To.

Head, prothorax, scutellum, ventral surfaces and legs reddish ochraceous; elytra shiny black; antennae dull blackish with bases pitchy red. Head no wider than anterior margin of prothorax; pronotum sparsely punctured on disk, with oblique depressions at sides of base; elytra punctured in eight rows at base and apex and in seven rows at middle, costae low and not very narrow or straight. Length 7.1-7.5 mm.; breadth 1.7 mm.

12. **Agonia immaculata** (Gestro)

Gonophora immaculata Gestro, 1888, Ann. Mus. Civ. Genova: 175 (Burma).
Agonia immaculata Weise, 1911, Col. Cat., 35 : 56; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 136, fig. 43.

A single specimen was collected at Laokay, WNW. Tongking, French Indo-China, Aug. 12-15, 1934, by Chauncey Brownell. New to Indo-China.

Prothorax broader than long, disk of notum very finely punctate, basal portion with two oblique punctate depressions at each side; elytra strongly punctured in seven rows at middle, third costa distinct but not strongly raised like first and second. Body largely red; antennae, metathorax, abdomen and legs black or pitchy black. Length 7.5 mm.; breadth 1.8 mm.

13. **Agonia maculigera** (Gestro)

Gonophora maculigera Gestro, 1888, Ann. Mus. Civ. Genova 26:131 (Burma).
Agonia maculigera Weise, 1911, Col. Cat. 35 : 56; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 128; Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 325 (Hainan).

Two specimens were collected at Cheung-kon-ts'uen, Ka-luk-kong (18 mi. E. of Nam-fung), Kiung-shan Dist., Hainan Island, Apr. 11-12, 1935, F. K. To.

Body yellowish ochraceous, slightly paler beneath; legs yellowish testaceous; antennae dark pitchy brown; dorsal surface of body marked with spots of pitchy black as follows: one on posterior portion of occiput, five on pronotum, eight or nine on each elytron: one on humerus, the others in four oblique rows on sutural three-fifths, except for a small spot at posterio-lateral angle, and scutellum entirely black. Length 5.5-5.7 mm.; breadth 1.6-1.7 mm.

Genus **Gonophora** Baly, 1858

14. **Gonophora pulchella** Gestro

Gonophora pulchella Gestro, 1888, Ann. Mus. Civ. Genova : 176 (Burma); Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 146, fig. 45.
Gonophora bengalensis Weise, 1908, Stett. Ent. Zeit. 49 : 214 (Bengal).

Four examples were taken on Hainan Island by F. K. To: one at Nam-fung, 10 mi. SSW. of Nodoa, Tan Dist., July 7, 1932, and three at Tai-tsing-lam-ts'uen, back of Lai-mo-ling, Ting-an Dist., May 8, June 3-4, and June 22, 1935. New to China.

Prothorax broader than long, expanded at middle of each side, with a denticulate margin; disk coarsely rugulose-punctate and grooved medially; elytra deeply punctured in seven rows at middle, first costa strongly raised, second and third incomplete in middle. Largely ochraceous: testaceous or pitchy brown in part, and marked on dorsal surface and on sides of thorax with variable spots of pitchy black, which form four indefinite bands on elytra and at least five spots on pronotal disk; antennae ochraceous; legs testaceous. Length 5.7-6.5 mm.; breadth 3-3.3 mm.

Genus **Wallaceana** Maulik, 1928

15. **Wallaceana foveicollis** n. sp. (pl. 5, fig. 2)

Minute, narrow, depressed; elongate-oblong, slightly broadened posteriorly. Ochraceous, subhyaline-testaceous, pitchy brown and black; largely pale above and dark beneath. Antennae and eyes black, remainder of head, as well as prothorax and anterior femora and tibiae, pale ochraceous, subhyaline; scutellum reddish; elytra hyaline and testaceous to pale amber color on large part of dorsal surfaces, pitchy black along lateral margins and on apical fifth; intercoxal portion of prosternum yellowish; meso- and metasterna and abdomen black with a slight piceous tinge; middle pair of legs light pitchy brown, hind pair darker, pitchy red-brown. Dorsal surface of body glabrous except for moderately dense, suberect, fine hairs on anterior third of pronotum; antennae clothed with minute golden-brown hairs, denser and longer on apical segments; abdomen and legs sparsely clothed with fine silvery or tawny hairs.

Head short, narrower than base of prothorax, abbreviated beneath; mouth cavity close to antennal insertions; front of head distinctly elevated between antennal insertions; occiput with a slight depression in middle behind raised area. Antennae about one-third as long as body, slightly thickened apically; scape subglobular, hardly as long as second segment; third segment one-half again as long as second. Pronotum about as broad as long, widest at end of anterior third and gradually narrowed to base; anterior margin convex; disk smooth across middle except for two large punctures in center, anterior portion with a large hairy fovea on each side, and basal portion with some large punctures and a large semicircular concavity opposite scutellum. Scutellum subrectangular, a little longer than broad. Elytra barely broader than widest portion of prothorax, at humeri, slightly broadened posteriorly, broadly rounded apically; surface of each deeply punctured in eight rows at middle and in nine rows before and behind middle, and with four distinctly raised and similar costae, only a single row of punctures between suture and first costa; first and fourth, and second and third, costae respectively, uniting before apex. Abdomen with a few shallow foveae along sides and some fine punctures on apical segments. Length 3.85 mm.; breadth 1.4 mm.

Holotype (Lingnan Natural History Survey and Museum), Ying-ko-au (Mt.), west of, and near, Lai-mo-ling (Loi Mother Mt.), Kiung-shan Dist., central Hainan Island, June 23-24, 1935, F. K. To, collector.

Differs from *W. dactyliferae* Maulik, in having a few large punctures and foveae on the pronotum, with the middle portion of the disk largely impunctate, the elytra much less narrowed apically and with four distinctly raised costae and only eight puncture-rows at middle of each.

Tribe **Hispini**

Genus **Monochirus** Chapuis, 1875

16. **Monochirus callicanthus** (Bates)

Hispa callicantha Bates, 1866, Proc. Zool. Soc. London : 354 (Formosa).
Monochirus callicanthus Chapuis, 1876, Ann. Soc. Ent. Belg. 19, c. r. : 25.
Hispellinus callicanthus Weise, 1897, Deutsche Ent. Zeit. : 145.
Monochirus sp. Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 325 (Hainan I.).

Fifteen examples were collected on Hainan Island and in Kwangtung and Hunan Provinces, S. China, by F. K. To: five at Sam-ah-kong, Yai Dist., S. Hainan I., Jan. 24-Feb. 3, 1935, one at San-ts'uen-kai-hui, SE. of Lai-mo-ling, Ting-an Dist., June 27, 1935, and one en route from Cheung-kon-ts'uen to Tai-pin-ts'uen, Kiung-shan Dist., July 19, 1935, central Hainan I.; one at Ma-t'an Shan, Sheung-shui-heung, Aug. 19, one at Sheung-shui-heung, Aug. 16, one at Linchow, Aug. 7-8, one at Fong-tong-ping, Hoh-kai-hon, July 4-5, two at Yao Shan, Apr. 24-May 2, Lien Dist., N. Kwangtung, 1934; one at Yuet-loi-hui, about 40 li (10 miles) NW. of Ping-chuen, Mei Dist., E. Kwangtung, July 29, 1933; and one at Tai-kwong Village, Lam-mo Dist., Hunan Prov., July 21-22, 1934. New to China.

Entirely black, slightly metallic; very sparsely clothed with short silvery-white hairs. Pronotum with a pair of long, straight, bifurcating, erect spines near anterior margin and a similarly dichotomous horizontal one followed by a long isolated one, at each side, surface subrugulose with a shallowly grooved medial raised strip; elytra deeply and regularly punctured, external margins with seventeen to nineteen strong, tapering spines, those on apical portion slightly shorter. Length 4.5-5 mm.; breadth 1.7-2 mm.

Genus **Hispella** Chapuis, 1875

17. **Hispella donckieri** Pic ? (pl. 5, fig. 3)

Hispella Donckieri Pic, 1924, Mel. Exot. Ent. 42 : 28 (Tongking).
Hispella sp. Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 325 (Hainan I.).

Five specimens were collected in Kwangtung and Kwangsi Provinces and on Hainan Island: two on Honam I., Canton, May 16, 1932, by Y. W. Djou, one at Lok-chang, Lok-ch'ang Dist., Kwangtung, Mar. 26, 1933, by Y. T. Feng; one in mountains five miles south of Lung-chow, Lung-cheu Dist., Kwangsi, Aug. 8, 1934, E. R. Tinkham; and one at Kom-yan and vicinity, Kan-en Dist., Hainan I., Mar. 9, 1935, by F. K. To. New to China.

Shiny black; sparsely clothed with pale yellowish hairs; pronotum with a pair of long, slender, suberect, dichotomous spines near anterior border and three very long ones at each side, first two with a common basal stem; elytra with long slender spines, fifteen to seventeen on external margin of each. Length 4-4.5 mm.; breadth 1.6-1.75 mm.

Genus **Rhadinosa** Weise, 1905

Key to Species

A. Third to fifth antennal segments unarmed ..... B
Third to fifth antennal segments very briefly spined or toothed on upper sides at, or near, apices ..... D

B. Fifth and sixth antennal segments longer than broad; branches of anterior pronotal spines strongly divergent, forming a "V"; first and third lateral prothoracic spines nearly forming a right angle; length under 5 mm. C

Fifth and sixth antennal segments broader than long; branches of anterior pronotal spines not very strongly divergent, forming a "U"; first and third lateral prothoracic spines forming an angle of about 60°; length of body generally over 5 mm. ..... **reticulata** (Baly)

C. External margin of each elytron with about fifteen spines, those at apices distinctly shorter than those on anterior portion of sides; humeral spines long and straight ..... **fleutiauxi** (Baly)
External margin of each elytron with about twenty-one spines; those at apices nearly as long as those on anterior portion of sides; humeral spines slightly arched and moderately short ..... **nigrocyanea** (Motsch.)

D. Elytral disks and margins of pronotum almost glabrous; external margin of each elytron with twenty-two or twenty-three spines..... **lebongensis Maulik**

18. **Rhadinosa fleutiauxi** (Baly)

Hispa Fleutiauxi Baly, 1889, Ann. Soc. Ent. France, ser. 6, 9: 491 (Cochin-China).
Rhadinosa Fleutiauxi Weise, 1911, Col. Cat. 35 : 62.

Thirty-three specimens were collected in Kwangtung Prov., S. China, on Hainan Island, and in Cochin-China: fifteen at Canton, May 4, July 12-14, Aug. 4, Dec. 11, Y. W. Djou, June 30, July 30, W. E. Hoffmann, and Dec. 1, T. P. Lau, 1932; three at Yao Shan, Apr. 24-30, and two at Linchow (Lien-hsien), Apr. 16-20, Lien Dist., N. Kwangtung, F. K. To, 1934; three at Tai-ping, Lo-ting Dist., Kwangtung, July 6, 1932, W. E. Hoffmann; six at Hoihow, N. Hainan, Aug. 1932, W. E. Hoffmann; one at Nodoa, Tan Dist., north central Hainan, June 11, 1932, O. K. Lau and F. K. To; and three in Cochin-China, French Indo-China, July 1932, K. H. Tsui; two at Travinh, Travinh Prov.; and one at Vinglon, Vinglon Prov. New to the mainland of China.

Entirely black, elytra shiny; antennae pale pubescent apically; prothoracic spines and marginal spines of elytra long; pronotal disk finely pitted, swollen transversely in middle. Length 2.5-3.5 mm.; breadth 1-1.6 mm.

19. **Rhadinosa lebongensis** Maulik ?

Rhadinosa lebongensis Maulik, 1919, Fauna Brit. India, Chrysom.: Cass. Hisp.: 168 (N. India and Assam).

A single specimen taken at Copper Temple, four miles north of Yunnan-fu, alt. 6,000-6,500 feet, Aug. 27, 1934, by Chauncey Brownell, is tentatively referred to this species. New to China.

Body black, elytra shiny bluish black and nearly glabrous; form narrow and parallel-sided; prothoracic spines slightly curved, elytral punctures large, marginal spines shorter at posterio-lateral corners. Length 4.8 mm.; breadth 1.85 mm.

20. **Rhadinosa nigrocyanea** (Motschulsky)

Hispa nigrocyanea Motsch., 1861, *in* Schrenck's Reise Amur 2 : 237, pl. 11, fig. 26 (Dauria).
Rhadinosa nigrocyanea Weise, 1911, Col. Cat. 35 : 62.

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One specimen was taken at Kuling, Kiukiang Dist., N. Kiangsi Prov., south central China, July 23-26, 1923, by Y. W. Djou. New to Kiangsi Province.

Entirely black, elytra shiny; antennae clothed with pale pubescence apically; pronotum sparsely clothed with very short tawny hairs, elytral punctures relatively small; ventral surfaces finely granulose-punctate. Length 4.2 mm.; breadth 1.7 mm.

21. **Rhadinosa reticulata** (Baly)

Hispa reticulata Baly, 1888, Ann. Mus. Civ. Genova 26:665 (Teinzo, Burma).
Rhadinosa reticulata Weise, 1911, Col. Cat. 35 : 62; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 164, fig. 52.

Eleven specimens were collected in Kwangtung Province and on Hainan Island: two at Lok-chong, Lok-ch'ang Dist., Mar. 26, 1933, Y. T. Feng and P. K. Fok, two at Shiu-chow, K'uh-kiang Dist., Mar. 28, 1933, T. Y. Chue, two at Yao Shan, May 9-10, one at Linchow, Aug. 15, one at Shui-chuk-t'ong, Aug. 20, and one at Cheung-kon-ts'uen, Aug. 21, Sheung-shui-heung, Lien Dist., 1934, F. K. To, Kwangtung Prov.; one at Uen-moon-tung, 20 miles south of Fan-ta, Ting-an Dist., July 14-15, and one at Cheung-kon-ts'uen, Ka-luk-kong (18 miles east of Nam-fung), Kiung-shan Dist., Mar. 29-31, Hainan I., 1935, F. K. To.

Black; elytra shiny; antennae with thin golden brown pubescence apically; sixth antennal segment very short; prothoracic spines stout and not very long; marginal spines of elytra subequal in length throughout. Length 5-5.5 mm.; breadth 2-2.2 mm.

22. **Rhadinosa tayana** n. sp. (pl. 5, fig. 7)

Black; elytra shiny, slightly greenish black; pronotum shiny along middle. Antennae sparsely clothed with short pale goldish hairs, principally on apical half; frons and clypeus with a few whitish hairs and eyes edged with the same; erect white hairs on anterior margin and sides of prothorax and some shorter suberect ones on pronotal disk; elytra with an erect white hair arising from each puncture; ventral surfaces with a very few short pale oblique hairs.

Head narrower than neck, feebly swollen on occiput and frons, former finely granulose, subrugulose and shallowly grooved medially, latter microgranulose and finely carinate medially; vertex feebly obtuse between antennal insertions; eyes elongate-oval, moderately convex. Antennae one-half as long as body, fairly thick; scape longer and stouter than other segments, bearing on upper side of apex a straight spine which reaches to end of third segment; second segment a little longer than broad; third nearly twice as long as either second or fourth, bearing a short curved spine near apex on upper side; fourth with a similar, but less curved, spine; fifth and sixth broader than long, each with a minute rudiment of a spine on upper side of apex; seventh longer than sixth and eighth. Prothorax broader than long, convex at sides, bearing a pair of dorsal spines near anterior border, bifurcating almost at bases, anterior and posterior branches of which are widely divergent, fairly straight and subequal in length, and armed at each side with a spine dividing near its base into two fairly straight, subequal, obliquely raised and moderately divergent branches followed by a single, feebly arched and slightly raised spine slightly shorter than preceding; pronotal disk convex, with a transverse depression in front of base and a less distinct one before middle, surface finely granulose-punctate and slightly rugose, except along a median strip, on which is a slight convexity just behind center. Scutellum rounded behind, micropunctulate. Elytra subparallel, rounded behind; disk of each coarsely punctured in about eight rows and armed with about eighteen slender spines; base, including parascutellar margin and front of humerus, with four spines; external margin with sixteen spines, slightly shorter at apex than at anterior portion of side. Ventral surfaces finely granulose except on middle of apical portions of abdominal sternites. Length 4.4 mm.; breadth 1.8 mm. (excluding spines).

Holotype (Lingnan Natural History Survey and Museum), Put-ka-shan, Taya Island (lat. 19°56′ N., long. 111°20′ E.), near Hainan Island, south of China mainland, July 27, 1934, collected by C. I. Li.

Differs from *R. reticulata* (Baly) in having the spines more slender, those on the prothorax more elevated and fewer on external margins of elytra, in having distinct spines on third and fourth antennal segments and the elytra slightly greenish, and in being slightly smaller. Differs from *R. lebongensis* from Yunnan in being more hairy and in having the pronotum smoother and more convex, and the elytral margins with much fewer, and more slender, spines.

Genus **Dactylispa** Weise, 1897

Key to Species[4]

A. Anterior portion of pronotum with a pair of spines which bifurcate more or less close to bases ..... B
Anterior portion of pronotum with a pair of spines, each of which divides into three spines ..... O

B. Elytral margins broadly expanded anteriorly and posteriorly, marginal spines broad and flattened, triangular C
Elytra more or less oblong in shape, margins regularly, or not at all, expanded, not greatly broadened anteriorly and posteriorly; marginal spines generally long and slender ..... D

[4] Including (in brackets) additional Hainan species described by the writer in *Lingnan Sci. Jour.* 17: (3) 326-332, not contained in the Lingnan collections.

C. Pronotum with five raised smooth areas across middle; disk of elytra and marginal spines of prothorax and elytra pitchy red; anterior lobes of marginal expansions of elytra with numerous tubercles; posterior branch of anterior spines of pronotum broad and hardly longer than anterior branch .....[**latispina** (Gestro)]

Pronotum with three closely approximate rounded smoothish areas on center of disk; elytral disk and marginal spines of prothorax and elytra pale ochraceous; anterior lobes of marginal expansions of elytra with only a few tubercles, posterior branch of anterior spines of pronotum slender and much longer than anterior spine .....**platyacantha** (Gestro)

D. Pronotum with a transverse, oblong-oval convex area across middle of disk ..... E

Pronotum lacking a large transverse raised impunctate area on middle of disk ..... H

E. Pronotum and elytra fairly hairy, latter with some of hairs arising from erect projections; middle spine at each side of prothorax much longer than others, nearly straight and appendiculate at about middle; prothorax red or pitchy ..... F

Pronotum and elytra nearly glabrous, lacking small bristle-bearing projections; middle spine at each side of prothorax not much longer than first, lacking spinules or else somewhat curved, unevenly tapered and appendiculate just before apices; prothorax black or testaceous..... G

F. Spines of anterio-dorsal pair on pronotum not very long or slender, widely divergent; prothorax red with distal portions of spines black; elytra entirely pitchy black .....**balyi** (Gestro)

Spines of anterio-dorsal pair on pronotum long, slender and feebly divergent; pronotum pitchy red with spines and central raised area black; elytra brownish testaceous with spines and their bases black..... .....**longispina** Gressitt

G. Dorsal surface pale ochraceous with diskal spines and marginal spines on posterio-lateral portion of elytra black, tips of thoracic spines and a feeble spot on each side of pronotal disk pitchy, middle lateral spine slightly curved and appendiculate preapically .....[**longula** Maulik]

Dorsal surface of body largely black, elytra with some pitchy areas on disk and apical margin; middle lateral prothoracic spine short, straight and non-appendiculate .....**piceomaculata** n. sp.

H. Lateral margins of elytra broadly expanded; first two lateral prothoracic spines generally not branching from a common base at any distance from sides of pronotum I

Lateral margins of elytra not expanded; first and second lateral prothoracic spines with a common basal trunk; third lateral prothoracic spine arising from base of trunk of anterior two, and fully as long as first, all testaceous except at tips; pronotal disk entirely punctured; elytral disks with a number of short, pale spines.....**filiola** Weise

I. Spines on apical margins of elytra not extremely short, considerably longer than broad ..... J

Spines on apical margins of elytra very short, flattened, mostly no longer than broad L

J. Pronotal disk with a median impunctate band; third lateral prothoracic spine separated from origin of first two; numerous small spines interspersed among major marginal spines of elytra ..... K

Pronotal disk entirely punctured; all three lateral prothoracic spines arising from a common base, equally spaced and similarly shaped; few small spines on elytral margins .....**gestroi** Gressitt

K. First two lateral prothoracic spines more or less round in cross-section, with a subcylindrical common base; third spine four-fifths as long as first two; pronotum pale ochraceous, no distinct impunctate area on each side of median strip .....[**pallidicollis** Gressitt]

First two lateral prothoracic spines flattened basally, with a broad common base; third spine one-half as long as first two; pronotum marked with blackish or pitchy, an impunctate area on each side of median area..... .....**sinuispina** Gressitt

L. Spines on apical margins of elytra unequal and not regularly spaced; spines on lateral margins unequal in length, major ones less than twelve in number ..... M

Spines on apical margins of elytra equal and regular; spines on lateral margins fairly equal in length, at least three times as long as broad, feebly flattened basally, about fifteen in number; first two lateral prothoracic spines appendiculate and longer than third spine..... .....**crassicuspis** Gestro

M. Lateral margins of elytra distinctly flattened, with long spines alternating with short ones; pronotal disk with an oblique raised impunctate area on each side bordered by an external depression, spines of elytral disks long and slender .....**corpulentina** Uhmann

Lateral margins of elytra hardly expanded, with long spines with only an occasional shorter spine interspersed among them; pronotal disk largely rugose-punctate with a raised median line; spines of elytral disks short and tubercle-like .....**paucispina** n. sp.

N. Each side of prothorax with three spines ..... O

Each side of prothorax with four or five spines..... P

O. Pronotum with a transversely oblong-oval raised smooth area across center. .....**sjostedti** Uhmann

Pronotum lacking a transversely oblong-oval raised smooth area across center; dorsal surface largely black; antennae, lateral prothoracic spines, legs and middle of elytral margins ochraceous; elytra with broad margins bearing spines of various lengths.[**nigrodiscalis** Gressitt]

P. Pronotum with broad reticulate punctures on each side of a narrowly oblong median impunctate strip; elytral margins very broad and flat; two spines in penultimate transverse row on elytral disk; dorsal surface testaceous with pitchy spines .....**chaturanga** Maulik

Pronotum with scattered punctures on each side of a central triangular impunctate area; elytral margins only slightly expanded, not flat; four spines in penultimate transverse row on elytral disk; dorsal surface black and pitchy red .....[**pungens** (Boheman)]

23. **Dactylispa balyi** (Gestro)

Hispa Balyi Gestro, 1890, Ann. Mus. Civ. Genova 30: 250 (Teinzo, Burma); op. cit. 1897 : 82.

Hispa discoidalis Baly (nec Chapuis), 1888, Ann. Mus. Civ. Genova 26 : 664 (Teinzo, Burma).

Dactylispa Balyi Weise, 1911, Col. Cat. 35 : 64; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 210; Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 332 (Hainan).

A series of eleven specimens from Kwangsi and Kwangtung Provinces and Hainan Island represent this species: four were taken at Nanning, Yih-ning Dist., Aug. 2-3, E. R. Tinkham, and one at Tai-ping-fu, Sung-shen Dist., Aug. 5-6, Chauncey Brownell, Kwangsi, 1934; three at Yao Shan, Lien Dist., Kwangtung, Apr. 27-28, 1934, F. K. To; one between Fan-ta-ts'uen and Poh-shang, Hung-mo-tung, central Hainan, July 31, 1929, Lingnan Univ. Fifth

Hainan I. Exped., one in Five Finger Mts., Ting-an Dist., south central Hainan, Apr. 25-27, and one in E. Hainan, Apr. 30, Wm. E. Hoffmann, 1932.

Body red; antennae pitchy brown; elytra pitchy black; distal portions of prothoracic spines blackish. Spines very long and slender, particularly posterior one of each anteriodorsal group, and middle one of each lateral group, on prothorax; latter spine with a small spinule on each side at about middle, otherwise regularly tapering and needle-like; pronotum with a medially grooved, raised, impunctate oblong area on pronotal disk. Length 6-6.5 mm.; breadth 2.8-3 mm.

24. **Dactylispa chaturanga** Maulik ?

Dactylispa chaturanga Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 237, fig. 67 (Nilgiri Hills, India).

Two specimens were collected: one at Tai-kwong Village, Lammo Dist., S. Hunan Prov., July 26-28, the other at Yao Shan, Lien Dist., N. Kwangtung Prov., May 6-8, F. K To, 1934. New to China.

Dorsal surface dull testaceous; scutellum and a spot on each side of middle of pronotum pitchy black; diskal spines of elytra mostly pitchy black on distal slender portions; marginal spines pitchy brown; abdomen and legs testaceous; thoracic sterna black. Broad, subrectangular; prothorax with three spines in each anterior group and generally four at each side; pronotum broadly reticulate-punctate; elytral margins broadly expanded and bearing large, basally compressed spines with minute spinules in the interspaces. Length 4.2-4-5 mm.; breadth 3 mm.

25. **Dactylispa corpulentina** Uhmann

Dactylispa corpulentina Uhmann, 1927, Suppl. Entom. 16 : 113 (Kosempo, Formosa); Chujo, 1933, Trans. Nat. Hist. Soc. Formosa 23 : 325.

A single example was collected at Tai-pin-ts'uen, Lam-ka-heung, Lai-mo-ling, central Hainan I., May 19-20, 1935, by F. K. To.

Yellowish testaceous with elytral disks ochraceous, their spines pitchy black, and a vague pitchy spot on each side of pronotum. Body moderately broad, slightly widened posteriorly; prothoracic spines slender, dorsal spines and anterior two of each side long, third lateral spine three-fifths as long as preceding; pronotum irregularly punctured and slightly raised on each side of an impunctate median strip; elytral disks each with fourteen long spines besides basal and humeral spines, lateral margins each with about eleven irregular longish spines, in part interspersed by small spinules, apical margins with a few sparse, very short, broad spines. Length 4.5 mm.; breadth 3 mm.

26. **Dactylispa crassicuspis** Gestro

Dactylispa crassicuspis Gestro, 1906, Bull. Soc. Entom. Ital.: 184 (Yunnan).

Nine specimens were collected in Kwangtung and Hunan Provinces: five at Keung-tin-heung, July 8-15, and one at Lung-ping-hui, May 15, Lien Dist., N. Kwangtung; two at Siu-kwong Village, July 23-25, and one at Tai-kwong Village, July 26-28, Lammo Dist., S. Hunan. New to Kwangtung and Hunan Provinces.

Pale testaceous; pronotum largely pitchy brown; elytral disks slightly reddish, spines pitchy black distally, marginal spines pitchy only at posterio-lateral angles; abdomen and legs testaceous; thoracic sterna pitchy black. Body fairly broad, somewhat angular; spines short: those on prothorax stout, all but third lateral spine appendiculate near apex, those on elytral disks stout and tubercle-like, lateral spines of elytra subregular, compressed, shorter at posterio-lateral angles, apical spines very short, nearly uniform; pronotum almost entirely rugulose-punctate, deeply depressed transversely behind middle, center transversely raised. Length 4-4.8 mm.; breadth 2.2-2.8 mm.

27. **Dactylispa filiola** Weise

Dactylispa filiola Weise, 1897, Deutsche Ent. Zeits. : 135 (Kanara, India), op. cit. 1905 : 120; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 199.

Dactylispa feae Gressitt (nec Gestro), 1938, Ling. Sci. Jour. 17 (3) : 332 (Hainan).

Seven specimens from Kwangtung and Hainan are referred to this species: three from Honam I., Canton, May 4, 1932, Y. W. Djou, three from Ting-wu Shan, Kao-yao Dist., Kwangtung, Apr. 6-7, 1934, E. R. Tinkham, and one from Tun-heung-ts'uen, six miles SE. of Nodoa, between Sam-kok-ling and Laan-yeung, Lin-kao Dist., June 13-14, 1932, O. K. Lau and F. K. To. New to mainland of China.

Dorsal surface of body mostly orange testaceous with bases of antennae, apices of thoracic spines, scutellum, sides of humeri and most of diskal and lateral spines and their bases black; ventral surface of body pitchy black; legs testaceous. Body narrow, subparallel, with long spines; prothoracic spines slender and evenly tapering, both branches of each anterio-dorsal group long, second and third on each side subequal in length and longer than first; elytral spines slender, about eleven on each disk besides basal and humeral ones, about nine long, though slightly irregular, ones on each lateral margin and five slender ones of moderate length on apical margin of each. Length 3.5-4 mm.; breadth 1.2-1.7 mm.

28. **Dactylispa gestroi** Gressitt

Dactylispa gestroi Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 327, pl. 11, fig. 4 (Ta Han, Hainan Island).

Fourteen specimens are in the collection from Kwangtung, Hunan and Hupeh Provinces and Hainan Island: six from Naam-kong-paai, Oct. 16-Nov. 8, one from Fong-tong-ping, Hoh-kai-hon, July 4-5, one one from Sheung-shui-heung, Aug. 16, and one from Iu-ling-paai, Yao Shan, Sept. 28, Lien Dist., N. Kwangtung, 1934, F. K. To; two from Tai-kwong Village, Lam-mo Dist., S. Hunan, July 20-28, 1934, F. K. To; two from Wu-tsu-tsz (Mt.), Hwang-mei Dist., Hupeh, Aug. 25-29, 1933, Y. W. Djou; and one from Cheung-kon-ts'uen, Ka-luk-kong, 18 mi. NE. of Nam-fung, Hainan I., Apr. 4-7, 1935, F. K. To. New to Kwangtung, Hunan and Hupeh Provinces.

Tawny brown to dark reddish brown, extensively marked with pitchy black on pronotum, apices of thoracic spines, and almost all of elytral spines and their bases; metasternum dull pitchy brown. Body broad, elytra slightly constricted in middle; spines only of moderate length, those on disks of elytra with wide bases and slender distal portions; lateral spines of prothorax with a common base, second slightly longer than first, which latter is but little longer than third; elytral margins expanded, each lateral margin bearing about twelve similar spines, apical margin of each with six or seven moderately short broadened spines. Length 3.7-4.8 mm.; breadth 2-2.6 mm.

29. **Dactylispa longispina** Gressitt

Dactylispa longispina Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 328, pl. 11, fig. 5 (west central Hainan I.).

Two examples were taken at Tai-tsing-lam-ts'uen, back of Lai-mo-ling (Loi Mother Mt.), Tin-an Dist., central Hainan I., June 17-18, 1935, by F. K. To. A single specimen collected at Laokay, NNW. Tongking, French Indo-China, Aug. 12-13, 1934, by E. R. Tinkham, is provisionally referred to this species. New to the continental mainland.

Yellowish testaceous with pronotal disk and spines dark pitchy brown and elytral spines and their bases black. Body fairly narrow, slightly broadened posteriorly; spines very long: posterior anterio-dorsal spine and middle lateral spine of prothorax each nearly as long as breadth of pronotum; third lateral prothoracic spine about one-third as long as middle spine. Length 4-5.8 mm.; breadth 2-2.8 mm.

30. **Dactylispa paucispina** n. sp. (pl. 5, fig. 6)

Small, narrow, suboblong, slightly broadened posteriorly, sides nearly straight. Color reddish ochraceous, extensively marked with pitchy brown to black: antennae dull testaceous with distal and proximal portions reddish; head pitchy brown, nearly black on neck; pronotum reddish brown with spines pale amber colored and an area on each side of middle of disk pitchy black; scutellum reddish brown, pitchy towards base; elytra reddish brown with humeri and diskal spines and their bases pitchy black and parts of basal costae, margins and marginal spines (except at posterio-lateral angles) pale amber

colored, subhyaline; ventral surfaces dull pitchy brown; legs testaceous. Body largely glabrous; antennae, head, pronotum and apical margins of abdominal segments sparsely clothed with short goldish hairs.

Head not quite as wide as anterior margin of prothorax, nearly parallel-sided; frons triangular, convex and closely punctulate on inferior half, finely carinate medially on superior portion; occiput with three slightly raised, punctulate, longitudinal strips. Antennae four-fifths as long as body, slightly thickened apically; second segment three-fourths as long as third; third to fifth subequal; sixth slightly shorter; seventh and following more cylindrical, darker and more hairy. Prothorax but slightly broader than long; pronotum slightly raised along midline at center, remainder grossly punctured; anterio-dorsal pair of spines branching almost at bases, slender but not very long, posterior branch slightly longer than anterior; lateral spines likewise short and slender, arising from a common base, unstalked, first two subequal in length, third barely more than one-half as long as preceding. Scutellum triangular, rounded apically, micropunctulate. Elytra closely, and somewhat irregularly, punctured, some broad, strongly raised costae on basal portion; basal margin of each with about six short spines, including parascutellar row; humerus with seven compressed saw-tooth like spines of mediocre length; disk with six or seven more or less compressed, broad, tubercle-like spines besides a number of lesser spines of various sizes; lateral margin slightly expanded and bearing about nine slender and similar spines of medium length; apical margin with about six short flattened teeth-like spines, those near suture minute. Ventral surface micropunctulate, with some larger punctures in central portion of each abdominal sternite. Length 3.4-4.2 mm.; breadth 1.7-2.2 mm.

Holotype (Lingnan Natural History Survey and Museum), Yao Shan, Lien District, N. Kwangtung Province, south China, April 27-28, 1934, F. K. To, collector; paratype (Gressitt collection), Tai-au-hong, alt. 1,850 feet, SE. Kiangsi Prov., July 4, 1936, J. L. Gressitt.

Differs from *D. corpulentina* Uhmann in being narrower, with the spines much shorter and fewer, those on the humeri not slender, and those on the elytral disks much larger at bases and not attenuated distally, the pronotum more evenly punctured, the elytral margins less expanded and with fewer spines, etc.

31. **Dactylispa piceomaculata** n. sp. (pl. 5, fig. 5)

Elongate-oblong, moderately narrow, slightly broadened posteriorly. Body black, in large part shiny; abdomen and legs reddish testaceous; antennae pitchy brown on first two segments, lighter reddish brown on following segments; frons slightly piceous; elytra with indistinct blotches of dull piceous in interspaces between spines

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near suture, with a large spot at apex of each. Antennae, front of head and ventral surface of abdomen sparsely clothed with short, suberect, pale hairs.

Head nearly as broad as anterior margin of prothorax, rounded-squarish in front; labrum transverse, swollen; frons broadened below, convex and transversely corrugated; vertex with a small narrow projection between antennal tubercles; occiput swollen and micro-punctulate on each side, smooth, and concave, along midline; eyes elongate-oval. Antennae three-fourths as long as body; apical segments slightly thickened; scape subcylindrical, feebly arched, thickest at middle, four-fifths as long as fifth segment; second segment twice as long as broad, gradually thickened apically; fourth three-fifths as long as third, equal to fifth; sixth slightly shorter, and seventh a little longer, than fifth; eighth to tenth each barely longer than sixth. Prothorax strongly transverse, armed on each side of dorsal border near anterior margin with a pair of long, basally joined, nearly straight spines, posterior one of which is one-third longer than anterior; each side with a group of three nearly straight, tapering spines, round in cross-section, anterior and middle spine arising from a common base, subequal in length, posterior spine one-half as long as preceding ones; anterior narrowed portion moderately smooth, with a small, horizontal projection on each side of dorsal surface near margin; disk coarsely and closely punctured, with a large, transverse, subrectangular, medially grooved swollen area in middle. Scutellum large, narrowed and rounded posteriorly, finely granulose, dull. Elytra slightly narrowed beyond base and broadened before apex, rounded-truncate apically; surface impressed with about nine rows of large, subtransverse punctures, armed with ten long, broad-based spines on disk besides humeral row of three spines of increasing length; basal spines short; external margin of each elytron with seventeen or eighteen spines, very long at sides and successively shortened towards sutural angles at apices, interspersed at intervals with minute spinules. Metasternum sparsely punctured laterally; abdomen partly punctured along middle, wrinkled at sides; femora feebly swollen, smooth. Length 4.8-5.3 mm.; breadth 1.7-2 mm.

Holotype (Lingnan Natural History Survey and Museum), Loh-fau Shan (Big Pool, alt. 2,800 feet), south central Kwangtung Province, south China, Oct. 14, 1934, E. R. Tinkham, collector; five paratopotypes, Oct. 13 and 14, 1934 and Aug. 13, 1933, E. R. Tinkham, one from Bird Gorge, alt. 3,400-3,800 ft., and one from between 3,800 and 4,000 ft. alt.; two paratypes, Hong Shan, alt. 2,500 ft., SE. Kiangsi Prov., June 23, and another from Yim-na Shan, alt. 2,000 ft., E. Kwangtung Prov., June 14, 1936, J. L. Gressitt. Paratypes in Lingnan Nat. Hist. Surv. and Mus., U. S. Nat. Mus., California Acad. Sci. and Gressitt collection.

Differs from *D. pugnax* (Gestro) in being larger and in having a swollen and shiny area on middle of prothoracic disk, the area being transversely rectangular and finely grooved midlongitudinally,

and also in having the head shiny black above and the elytra with four pairs of dark rufo-piceous spots, the last apical, the others near suture.

32. **Dactylispa platyacantha** (Gestro)

Hispa platyacantha Gestro, 1897, Ann. Mus. Civ. Genová : 126 (Burma).
Dactylispa platyacantha Weise, 1911, Col. Cat. 35 : 68.

Four specimens were collected in Kwangtung and Hunan Provinces: two at Keung-tin-heung, Lien Dist., July 8-9, 1934, and one at Yam-na Shan (Yim-na San), SE. of Ping-chuen, Mei Dist., Aug. 24-25, 1933, Kwangtung, and one at Tai-kwong Village, Lam-mo Dist., Hunan, July 26-28, 1934, F. K. To. New to China.

Testaceous to reddish brown, diskal spines of elytra pitchy black on upper portions, other spines blackish only at apices; pronotum with a pitchy black spot surrounding an impunctate area on each side of middle of disk; ventral surfaces dull testaceous, metasternum pitchy. Body broad; elytral margins widely expanded; particularly just behind humeri, marginal spines short and flattened, irregular in length; diskal spines short and blunt. Length 4.6-5.2 mm.; breadth 2.6-3 mm.

33. **Dactylispa sinuispina** Gressitt

Dactylispa sinuispina Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 331, pl. 11, fig. 7 (Ta Han, Hainan I.).

Three examples were taken in Kwangtung and Hunan Provinces: one at Keung-tin-heung, July 10, and one at Fong-tong-ping, Hoh kai-hon, July 7, Lien Dist., N. Kwangtung, and one at Tai-kwong Village, Lam-mo Dist., Hunan, July 21, 1934, F. K. To. New to mainland of China.

These specimens are paler than the type, being largely testaceous, and have the lateral prothoracic spines narrower and less sinuate. The lateral margins of the elytra are broadly expanded and bear long flattened spines of various lengths alternating with small spinules. Length 5-5.4 mm.; breadth 2.6-2.8 mm.

34. **Dactylispa sjöstedti** Uhmann ? (pl. 5, fig. 4)

Dactylispa (*Triplispa*) *Sjöstedti* Uhmann, 1928, Ent. Tidskr. 49 : 102 (Trichinopoly, India).

Six specimens were taken in Kwangtung Province: five on Honam Island, Canton, June 22, 1933 and Mar. 15, 1936, by W. E. Hoffmann, and one at Shiu-hing, Jan. 8, 1921. New to China. Most of the examples were collected on bamboo.

Orange testaceous with lateral spines of elytra paler and diskal spines black above bases; prothoracic spines blackish distally; some pitchy pigmentation on scutellum and on each side of raised impunctate area of pronotal disk; margins of elytra slightly expanded, lateral and apical spines similar, subcylindrical, the length gradually becoming shorter towards sutural angles of apices. Length 5-5.5 mm.; breadth 2.8 mm.

Genus **Hispa** Linnaeus, 1767

35. **Hispa armigera** Olivier

Hispa armigera Oliv., 1808, Ent. : 763, pl. 1, fig. 8 (E. Indies); Weise, 1904, Deutsche Ent. Zeitschr. : 457.
Hispa cyanipennis Motschulsky, 1861, Schrenck's Reise Amur 2 : 238 (Burma).
Hispa aenescens Baly, 1887, Jour. Asiat. Soc. Bengal : 412 (Sumatra).

A single specimen was collected at Kachek, K'iung-tung Dist., E. Hainan I., May 3-6, 1932, by Prof. W. E. Hoffmann. New to Hainan Island.

Shiny green above; pronotum somewhat coppery; ventral surfaces of body black; femora castaneous; tibiae and tarsi pitchy black. Pronotum with a group of four long spines arising at each side near anterior end, and a much smaller, suberect spine near each posterio-lateral angle; each elytron with about nine large diskal spines, two basal ones, and nine lateral spines, and with apices almost unarmed. Length 4 mm.; breadth 1.8 mm.

Genus **Platypria** Guerin, 1840

Key to Species

A. Anterior lobe of each elytron normally with five spines; elytra with sparse erect pale hairs; basal portion of each lateral lobe of prothorax with a single large depression ..... B
Anterior lobe of each elytron normally with six spines; pronotum and elytra glabrous; basal portion of each lateral lobe of prothorax with four deep depressions .....**fenestrata** Pic

B. Dorsal surface with many hairs, conspicuous on margins and lateral spines of elytra; base of pronotum and most of elytral surfaces black; scutellum shallowly concave .....**alces** Gressitt
Dorsal surface with but few short hairs, almost lacking on lateral spines of elytra; pronotum and elytra only spotted with black; scutellum deeply concave .....**yunnana** n. sp.

36. **Platypria alces** Gressitt

Platypria alces Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 334, pl. 11, fig. 9 (W. and S. central Hainan Island).

Two specimens were collected on Hainan Island in 1935 by F. K. To: one at Loh-fung-tung, Yai Dist., Feb. 22-24, the other at Cheung-kon-ts'uen (18 miles E. of Nam-fung), Kiung-shan Dist., April 11-12.

Largely black or pitchy brown above, with antennae, legs, thoracic lobes, and middle of sides, and apices of elytra yellowish testaceous; elytra sparsely clothed with long pale hairs; anterior lobes of elytral margins with five spines. Length 4.8-5.2 mm.; breadth 3.8 mm. (5 mm. including lateral spines).

37. **Platypria fenestrata** Pic ?

Platypria fenestrata Pic, 1924, Bull. Soc. Ent. France : 100 (Lac Tho, Tongking, Indo-China).

Thirty-five specimens were collected in Kwangtung and Hunan Provinces in 1934 by F. K. To: twenty-six at Linchow, Apr. 16-18 and Aug. 6-13, five at Yao Shan, May 6-8, one at Naam-kong-paai, Yao Shan, Nov. 4-5, one at Sing-taz-chan, June 25-26, and one at Iu-ling-paai, Oct. 1-2, Lien Dist., N. Kwangtung, and one at Tai-kwong Village, Lam-mo Dist., S. Hunan, July 20. New to China.

Large and broad; testaceous; elytral disks reddish-ochraceous with tubercles and spines of lateral lobes black or pitchy; pronotal disk pitchy black on each side of center; ventral surfaces and legs ochraceous. Length 5.6-8 mm.; breadth 5-7 mm.

38. **Platypria yunnana** n. sp. (pl. 5, fig. 1)

Yellowish testaceous to subochraceous, marked in part with black: head pale ochraceous, with labrum reddish and maxillae testaceous; antennae orange testaceous, briefly clothed with goldish pile, denser on apical segments; pronotum pale ochraceous with middle of disk black and lateral lobes testaceous, spines pitchy black apically; scutellum entirely black; elytral disks ochraceous with all spines black, generally to bases or to below mid-points; explanate margins whitish testaceous at middle of sides and at apices, pitchy brown to black on bases of lateral lobes and on spines of lateral lobes as well as those immediately following posterior lobe; ventral surfaces testaceous with metasternum, mesepisterna, parts of metepisterna and coxae black, and propleura with a pitchy spot on middle of each. Pronotum and elytra sparsely clothed with short pale hairs; ventral surfaces with longer, sparse hairs.

Head wider than anterior margin of prothorax, slightly concave and finely grooved on occiput, strongly convex and rugulose on frons. Antennae fully two-thirds as long as body, slightly thickened apically; scape twice as long as second segment and barely more than one-half as long as third; fourth three-fifths as long as third and slightly longer than fifth. Prothorax transverse, flattish; disk granulose-punctate, with a shallow transverse depression behind middle; lateral lobes with bases moderately broad, concave, and directed obliquely upwards, each bearing five strong tapering spines, round in cross section, first four subequal in length and fully twice as long as fifth, first directed somewhat obliquely inward from a line parallel with body axis, fourth nearly perpendicular to body axis, feebly arcuate, fifth extending slightly backward. Scutellum sub-trapeziform, narrowed and slightly rounded posteriorly; surface largely concave and finely granulose. Elytra broad, each with about ten regular rows of transversely oblong punctures, a distinctly raised longitudinal costa after second and fourth puncture-rows from suture, and less distinct ones after the following alternate rows; explanate margins broad; anterior lateral lobe with five spines, each fully as long as first four on prothoracic lobes; posterior lobe with three large spines and generally a medium-sized one behind; apical

margin with six or eight spines of decreasing size. Length 5.5-6.5 mm.; breadth 4.4-5 mm.

Holotype (Lingnan Natural History Survey and Museum), Dragon Noir, alt. 5,000 feet (20 miles S. of Mentsze), Yunnan Province, southwestern China, Aug. 19, 1934, E. R. Tinkham; two paratopotypes with same data; one paratype, Copper Temple, 4 miles N. of Yunnan-fu, alt. 6,000-6,500 feet, Yunnan, Aug. 27, 1934, Chauncey Brownell. Paratypes in Lingnan Nat. Hist. Surv. and Mus., U. S. Nat. Mus., and Gressitt collection.

Differs from *P. hystrix* (Fabr.) in being much less hairy above, in having the bases of the prothoracic lobes slightly narrower, the elytra with the humeral spines longer, the spines of the anterior lateral lobe more slender, the posterior lobe with four spines instead of three, and the spines on the posterior margin decreasing more strikingly in length towards sutural angles.

嶺南大學自然博物採集所之鐵甲虫（鞘翅目：金花蟲科：鐵甲蟲亞科）

嘉 理 思 著

嶺 南 大 學 自 然 博 物 採 集 所

（摘 要）

此報告係根據嶺南大學自然博物採集所之二二七鐵甲虫標本，共有三十八品種，其中五種爲科學上首次之記載。其分佈如左：廣東各地二三種，海南十六種，印度支那四種，湖南七種，雲南二種，廣西二種，江西二種，福建一種，及湖北二種。至其屬與品種之檢索表，皆見文中。上文所述之新種：*Wallaceana foveicollis* 發見於海南之中部，與 *W. dactyliferae* Maulik 類似；*Rhadinosa tayana*, 發見於海南之左近，與 *R. reticulata* (Baly) 及 *R. lebongensis* 類似；*Dactylispa paucispina*, 採自廣東及江西，與 *D. corpulentina* 類似；*D. piceomaculata*, 發見於廣東及江西則與 *D. pubnax* (Gestro) 類似；*Platypria yunnana*, 發見於雲南，則與 *P. hystrix* (Fabr.) 類似。

Omission

In a previous paper by the writer, "Some Hispine Beetles from Hainan Island," *Lingnan Science Journal* 17 (3): 321-336, pl. 11, 1938, under species no. 10 (p. 325), *Rhadinosa reticulata* (Baly), the following was omitted: "A single specimen was collected at Fan Ta, alt. 320 meters, north central Hainan Island, July 17, 1935, J. L. Gressitt."

Explanation of Plate

Fig. 1. *Platypria yunnana* Gressitt, n. sp., dorsal view of head and prothorax, X 20.

2. *Wallaceana foveicollis* Gressitt, n. sp., same, X 20.

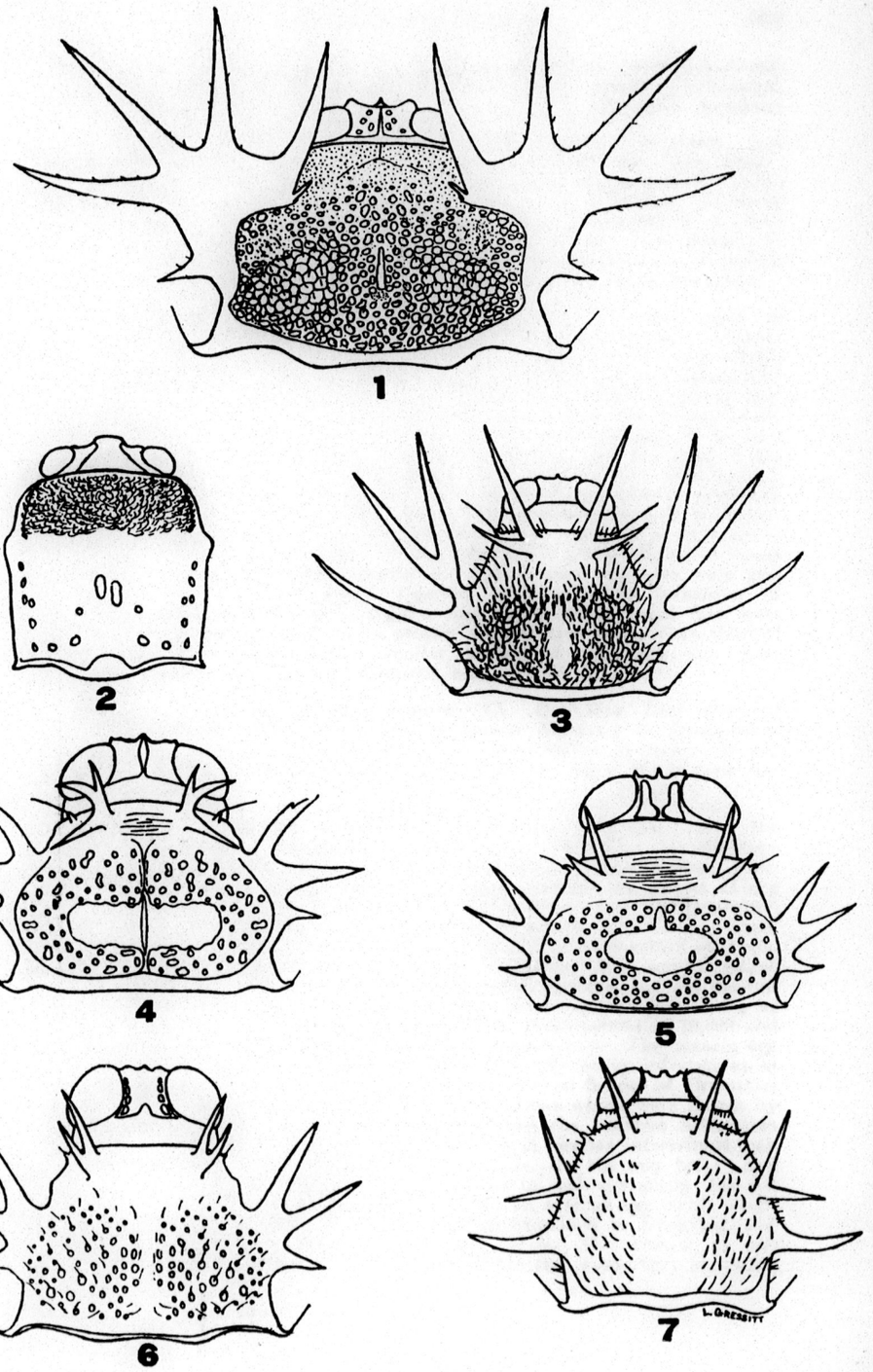
3. *Hispella donckieri* Pic ?, same, X 20.

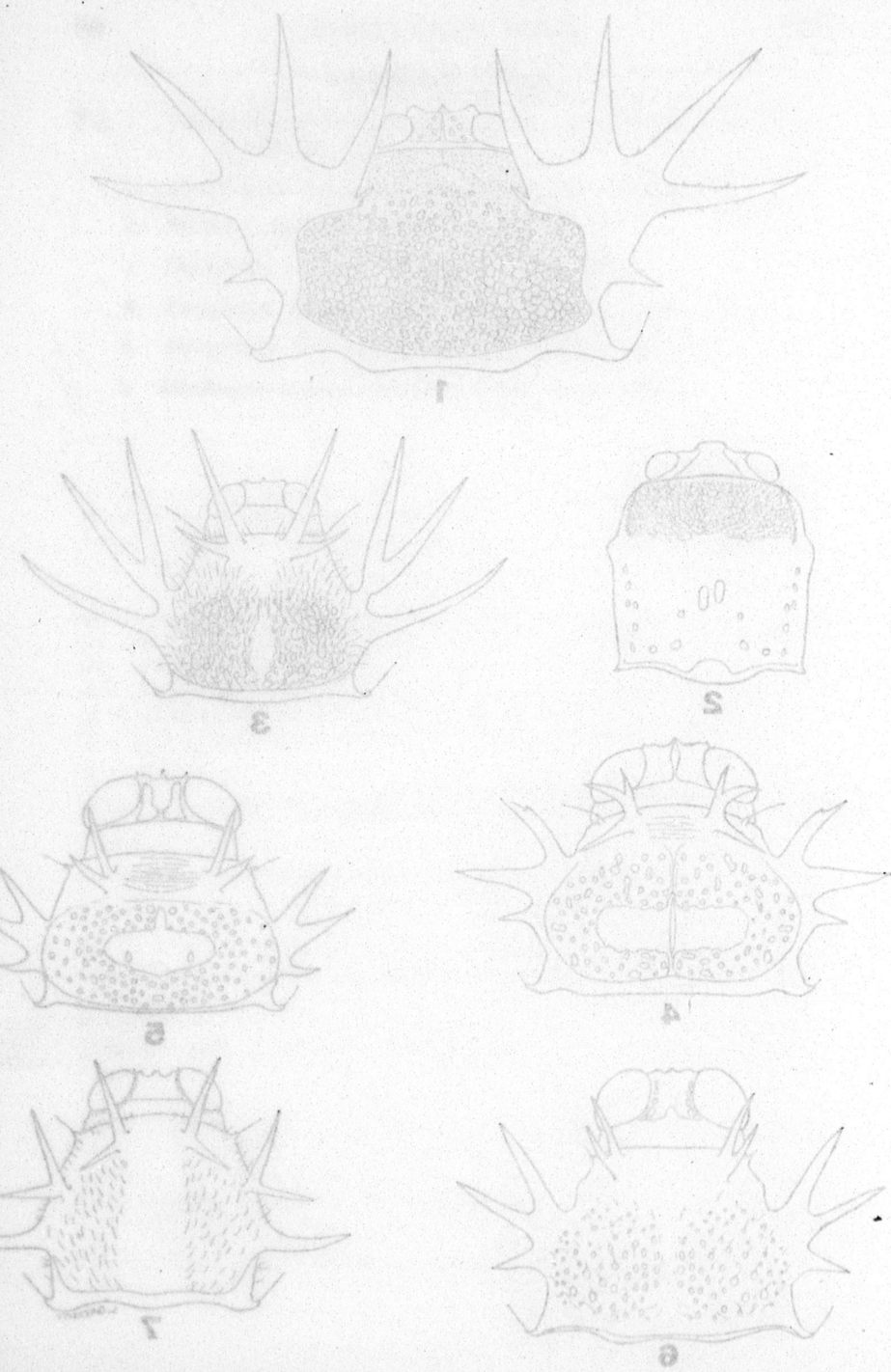
4. *Dactylispa sjöstedti* Uhmann ?, same, X 20.

5. *Dactylispa piceomaculata* Gressitt, n. sp., same, X 20.

6. *Dactylispa paucispina* Gressitt, n. sp., same, X 30.

7. *Rhadinosa tayana* Gressitt, n. sp., same, X 20.





SOME PRIONOCERIDAE FROM CHINA, HAINAN, FORMOSA AND COCHIN-CHINA (COLEOPTERA)[1]

By J. Linsley Gressitt

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This study concerns the beetles of the family Prionoceridae contained in the collection of the Lingnan Natural History Survey and Museum, Canton, China, and in the writer's collection. The specimens in the former were largely collected by F. K. To, Prof. Wm. E. Hoffmann, O. K. Lau, D. C. Ngu, K. H. Tsui and E. R. Tinkham, in Kwangtung and Fukien Provinces, south China, on Hainan Island, and in Cochin-China; while those in the latter were collected by the writer in Formosa, Hainan Island, and Kwangtung and Kiangsi Provinces in south China. The collections comprise about one hundred and fifty specimens of ten species, seven of the species having been contained originally in the Lingnan collection, and eight of the species in the writer's collection. One of the species is herein described as new to science, and the type specimen of this species will be deposited in the collection of the Lingnan Natural History Survey and Museum. Following the enumeration of the species in the collections at hand is appended a list of the species recorded from China and neighboring regions.

I am grateful to Professor Wm. E. Hoffmann, Director of the Lingan Natural History Survey and Museum for the privilege of making this study.

Family **Prionoceridae**

This family contains only the genera *Prionocerus* and *Idgia*, and is distributed only in the southern parts of the Old World, with most of the species Oriental, and a lesser number African. The two genera have been placed in the family Dasytidae, were also for a long period grouped with the Melyridae, and earlier were included in the Malacodermidae, or Malacodermata. They have only in more recent years been considered as a distinct family. The group is closely related to the Dasytidae, and the species superficially resemble members of the heteromerous family Oedemeridae.

Key to Genera

Antennae serrate, with the third to tenth segments flat, greatly broadened, and angulate ectapically .....**Prionocerus** Perty

Antennae slender and simple, with the segments more or less cylindrical or very slightly flattened, the distal ones somewhat excavated..... .....**Idgia** Castelnau

[1] Contribution from the Lingnan Natural History Survey and Museum.

Genus **Prionocerus** Perty

1. **Prionocerus coeruleipennis** Perty (pl. 6, fig. 8)

Nine specimens are in the Lingnan collection from Hainan Island: two taken Apr. 28-30, 1932, by Prof. Wm. E. Hoffmann, six taken at Nai-suen, 21 mi. SE. of Naam-fung, Aug. 31-Sept. 2, and one at Ch'ung-mei, 15 mi. SE. of Naam-fung, Aug. 24, Lin-kao Dist., 1932, by F. K. To. Eight examples were collected by the writer on Hainan: Ta-hian, alt. 600 meters, foot of Five Finger Mountains, south central Hainan, June 11-19, 1935. New to Hainan Island.

Prothorax and last antennal segment reddish orange or reddish purple; scutellum bluish or violet; metallic violet blue or bronzy green; head and antennae largely metallic bluish or greenish black or pitchy brown; legs and ventral surfaces metallic blue or green to dark reddish brown. Antennae serrate; pronotum nearly impunctate, depressed on each eide behind middle, a little broader than long; elytra densely punctulate, with three indistinct costae, sparsely clothed with erect black bristles and with some short, scattered, golden-brown recumbent hairs. Length 9-12 mm.; breadth 3-3.5 mm.

Distribution.—India, Indo-China, Hainan, Yunnan, Japan, Malay Archipelago, Philippines, Australia, Andaman Is., E. Africa.

Genus **Idgia** Castelnau

Key to Species

A. Elytra largely pale: orange testaceous, with apices dark ..... B
Elytra metallic blue or green, or pitchy brown with bronzy or bluish green tinges C

B. Prothorax rather evenly rounded at sides, edged with long blackish bristles, surface smooth; head and apical halves of femora black; elytra with apical fifth black and external margins with black bristles..... **deusta** Fairm.
Prothorax strongly narrowed behind middle, edged with moderate, brownish hairs, finely and sparsely granulose; head largely brownish or testaceous; only extreme apices of femora black; elytra with apical tenth or so black, margins with small pale brown bristles..... **ungulata** Champion

C. Eyes as widely separated as antennal insertions; femora very slender..... D
Eyes much less widely separated than antennal insertions; femora generally at least slightly swollen ..... F

D. Elytra metallic green; head green or testaceous anteriorly ..... E
Elytra bronzy brown; head dull reddish brown; pronotum smooth, nearly impunctate and with very few hairs..... **foveifrons** Fairm.

E. Pronotum bimaculate, finely punctured and hairy; head black basally and testaceous apically; abdomen pitchy black to testaceous; form slender. ..... **bimaculata** Pic
Pronotum immaculate, impunctate and nearly glabrous on disk, margins with black bristles; abdomen metallic green ..... **flavicollis** Redtenb.

F. Elytra lacking distinct rows of black bristles along costae; form greatly elongate, parallel; length over 15 mm.; prothorax maculate, or else femora entirely metallic green ..... G
Elytra with distinct rows of black bristles along costae; form not very elongate, slightly broadened posteriorly; length under 13 mm.; prothorax immaculate; femora testaceous basally, or else elytra margined narrowly with pale ..... H

G. Pronotum immaculate, smooth and shaped similarly at apex and base; elytra closely punctulate basally; abdomen metallic green on basal two-thirds; femora entirely metallic green ..... **hoffmanni** n. sp.
Pronotum with a pair of purplish or pitchy rounded spots just before middle, surface slightly rugulose and rather hairy; elytra granulose basally; abdomen orange-testaceous; femora testaceous basally and purplish brown or bluish apically ..... **oculata** Redtenb.

H. Pronotal disk with scattered brown or blackish bristles; elytra unicolorous: metallic blue or purplish brown; ventral surfaces of body, and basal halves of femora, testaceous ..... **femorata** Champion
Pronotal disk nearly glabrous, lacking dark bristles; elytra blackish brown margined along sides and suture with testaceous; ventral surfaces of body and legs, except coxae and trochanters, brownish black..... **marginata** Champion

2. **Idgia bimaculata** Pic (pl. 6, fig. 2)

A number of specimens (Gressitt coll., and Lingnan Nat. Hist. Surv. and Mus.) were collected by the writer at Taiheizan, alt. 1,500 meters, NE. Formosa, May 8, 1932, and at Arisan, alt. 2,150 meters, central Formosa, June 4, 1932, and May 23-29, 1934.

Elongate, slender, subparallel; elytra metallic green; pronotum testaceous with a longitudinally oval, purplish spot on each side of center of disk; head testaceous apically and greenish black behind antennal insertions; antennae, legs, pro-and mesosterna testaceous; metasternum greenish black; abdomen pitchy black along middle of first four sternites, testaceous at sides and apex. Pronotum finely punctulate and clothed with short black bristles, a few longer ones on margins; elytra shallowly punctulate, clothed with short recumbent pale hairs and about six rows of oblique black bristles. Length 11-13 mm.; breadth 2.2-2.7 mm.

Distribution.—Formosa.

3. **Idgia deusta** Fairmaire (pl. 6, fig. 10)

Ten specimens are in the Lingnan Nat. Hist. Surv. and Mus. from Cha-po-hui, Kien-yang Dist., Fukien Prov., SE. China, May 10-18, 1933, D. C. Ngu; and Taam-yuen-tung, Lien Dist., N. Kwangtung Prov., June 10-19, 1934, F. K. To. The writer collected one specimen at Yim-na Shan, alt. 550 meters, E. Kwangtung, June 12, several at Hong Shan, alt. 800-900 meters, June 22-29 and July 15, and one at Tai-au-hong, alt. 550 meters, July 4, SE. Kiangsi Prov., 1936; and one slightly atypical specimen at Kuraru, alt. 150 meters, Koshun, S. Formosa, Apr. 9, 1932. A specimen collected at Pi-shit-chat (near Mengtsze), alt. 1,400-1,650 meters, Yunnan Prov., SW. China, Aug. 18, 1934, E. R. Tinkham, is provisionally referred to this species, but seems to be broader, and to lack the longitudinal rows of bristles on the elytra. New to Kwangtung, Fukien and Yunnan Provinces.

Orange testaceous with antennae, head, tibiae, apical halves of femora and apical fifth of elytra, black; elytra with longitudinal rows of black bristles; pronotum distinctly furnished with black bristles. Length 9.5-12 mm.; breadth 2.5-3 mm. Resembling *Nacerda melanura* Linnaeus (Oedemeridae) in appearance.

Distribution.—China: Kiangsi, Kiangsu, Fukien, Kwangtung, Szechwan (?) and Yunnan; Formosa; Tongking.

4. **Idgia femorata** Champion ? (pl. 6, fig. 5 (♀), fig. 6 (♂))

Twenty-nine specimens were taken on Hainan Island, twenty-six by the Lingnan Nat. Hist. Surv. and Mus.: Five Finger Mts., Ting-an Dist., Apr. 25-27, 1932, Ling-moon (Liamui), Tingan Dist., Apr. 23-24, W. E. Hoffmann; Nodoa, Tan Dist., Apr. 6-20, June 4-10, F. K. To, June 20, O. K. Lau and F. K. To, Yau-ma-woh, 3 mi. SW. of Nodoa, July 8-9, F. K. To; Naam-fung, 10 mi. SSW. of Nodoa, June 23-30, O. K. Lau and F. K. To; Nai-suen, 21 mi. SE. of Naam-fung, Aug. 31-Sept. 2, Ch'ung-mei, 15 mi. SE. of Naam-fung, Aug. 24-25, Lam-ko, Lin-kao Dist., May 23-25, 1932, F. K. To; Taai-chau (Tinhosa) Island, Wan-ning Dist., June 2, 1932, W. E. Hoffmann and O. K. Lau; Kau-sho, Tai Dist., May 4-5, Cheung-kon-ts'uen, Ka-luk-kong, Mar. 27-Apr. 7, and Tai-ping-ts'uen, Lai-mo-ling, Kiung-shan Dist., April 16-May 18, 1935, F. K. To. Three specimens were taken by the writer: at Nodoa, May 30-31, and Ta-han, central Hainan, June 7, 1935. New to Hainan Island.

Body orange testaceous; head and legs (except coxae, trochanters and basal halves of femora) black; elytra greenish blue, sometimes purplish brown, in which case dark portions of legs are also purplish brown. Femora of males strongly swollen. Length 10-12 mm.; breadth 3-3.6 mm.

Distribution.—India; Hainan I.

5. **Idgia flavicollis** Redtenbacher (pl. 6, fig. 7)

A number of specimens (Gressitt coll., and Lingnan Nat. Hist. Surv. and Mus.) were collected by the writer at Kuraru, alt. 150 meters, Koshun, S. Formosa, Apr. 9, 1932, Mizuho, alt. 200 meters, E. Formosa, Apr. 21, Taroko Gorge, near Karenko, NE. Formosa, Apr. 24, Taihoku, alt. 25 meters, N. Formosa, Apr. 29, Taiheizan, alt. 1,500 meters, NE. Formosa, May 9, and Musha, alt. 1,500 meters, north central Formosa, May 20, 1932.

Shiny metallic green; antennae ochraceous and prothorax orange testaceous; head tinged with golden and bluish, ventral surfaces with bronzy green, and tarsi with blackish green. Pronotal disk smooth and with few bristles, margin with distinct suberect black ones; elytra micropunctulate, thinly clothed with recumbent golden-brown hairs and with rows of short, erect, black bristles. Length 9-11 mm.; breadth 2-2.8 mm.

Distribution.—Hongkong; Formosa.

6. **Idgia foveifrons** Fairmaire (pl. 6, fig. 4)

A single specimen was taken for the writer by a native collector at Hori (Horisha), alt. 500 meters, central Formosa, in April 1935.

Greenish or purplish brown, slightly metallic, prothorax, antennae and palpi yellowish testaceous; pronotum nearly impunctate; front of head with a transverse depression. Length 10 mm.; breath 2.2 mm.

Distribution.—Formosa.

7. **Idgia hoffmanni** n. sp. (pl. 6, fig. 3 (female); text-fig. 1 (male genitalia))

Large, elongate, flattened above, slightly broadened behind middle and narrowed posteriorly. Color largely metallic green and blue: head steel blue with a greenish tinge, clypeus slightly purplish; antennae pale ochraceous, base of scape piceous; prothorax orange yellow, subhyaline, slightly dark near apex and base, clothed with black setae; scutellum bronzy purple; elytra metallic blue-green; ventral surfaces bluish green and shiny except on apical two or three abdominal segments and sides of preceding sternites, which are orange testaceous; legs metallic greenish, or bluish, black. Body clothed with short, subrecumbent pale tawny hairs on elytra, ventral surfaces and legs; head, neck and pronotum clothed with longer, suberect or oblique black bristles; antennae with very short pale golden hairs.

Female.—Head attenuated anterior to eyes, largely smooth with small sparse punctures; frons longer than broad, slightly convex between antennal insertions, feebly wrinkled posteriorly at each side; labrum fully as long as broad, slightly broader apically, feebly concave, smooth and sparsely punctured. Antennae two-fifths as long as body; segments compressed and slight produced ectoapically; third segment longer than fourth; last longest, subsinuate and with an oblique impression. Prothorax three-fourths as broad as elytra, rounded-hexagonal, a little longer than broad, rounded-truncate at apex and base, subobtuse at each side. disk concave at each side and behind center, micropunctulate, the punctures giving rise to bristles; anterior margin raised. Scutellum short, rounded posteriorly. Elytra long, subparallel, leathery, narrowed and separately rounded at apices; entire surfaces closely punctured, three or four slightly raised costae along central portion of each. Ventral surfaces micropunctulate; abdominal sternites with large shallow depressions on lateral portions; fifth sternite emarginate apically, sixth convex apically. Legs with femora compressed, tibial spurs short and subequal, and anterior tarsi lacking combs; claws simple. Length of holotype, 18.5 mm.; breadth 4.6 mm.

Male.—Frons concentrically striated or wrinkled around center; eyes separated by a space more than one-half as wide as frons; fifth abdominal sternite feebly concave, sixth distinctly concave; inner

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sides of first three tarsal segments of fore-legs with distinct, close-toothed black combs beneath. Genital armature (text-figure 1, dorsal view, A, and lateral view, B): lateral lobes fairly narrow, rather

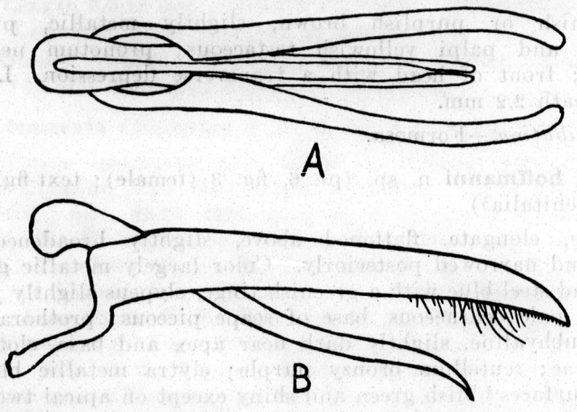

Fig. 1, *Idgia hoffmanni* Gressitt, n. sp., male genital armature: A. dorsal view; B. lateral view.

straight and subacute in lateral outline, bearing hairs of varying length arranged in different directions on lower margins before apices; median lobe gradually narrowed, emarginate and hooked downwards at apex, sinuate in lateral outline.

Holotype, female (Lingnan Nat. Hist. Surv. and Mus.), Yao Shan, Lien Dist., N. Kwangtung Province, S. China, May 12, 1934, F. K. To, collector; allotype, male (Gressitt collection), Lung-ping-hui, Lien Dist., May 15, 1934, F. K. To; two female paratopotypes (Lingnan Nat. Hist. Surv. and Mus. and U. S. Nat Mus.), Yao Shan, May 1-5.

Differs from *I. oculata* Redtenbacher in being less parallel, with the elytra more papery, less rigid, and less granulose, the prothorax much broader and flatter, and immaculate, the ventral surfaces largely metallic and the legs entirely metallic, the antennae shorter and thicker, etc. Differs from *I. viridescens* Gorham in being narrower and more parallel, with the labrum larger, and broader apically, the antennae entirely testaceous, and the apical portion of the abdomen yellowish.

Dedicated to Professor William E. Hoffmann, Director of the Lingnan Natural History Survey and Museum of Lingnan University, as a slight token for many favors extended to the writer.

Distribution.—S. China: N. Kwangtung.

8. **Idgia marginata** Champion (pl. 6, fig. 9)

One example in the Lingnan Nat. Hist. Surv. and Mus., taken at Travinh, Travinh Prov., Cochin-China, French Indo-China, in

July 1932, by K. H. Tsui, is referred to this species. New to Indo-China.

Pitchy brown; antennae, palpi and prothorax orange-testaceous; elytra narrowly margined with pale along suture and external border nearly to apices, which are darker and more glabrous than rest of elytral surfaces; pronotum very minutely punctulate and with short pale hairs on each side. Length 8.5 mm.; breadth 2 mm.

Distribution.—India; Cochin-China.

9. **Idgia oculata** Redtenbacher (pl. 6, fig. 1)

Numerous specimens were collected on Hainan Island: Nodoa, Tan Dist., Apr. 27 and June 4-10, 1932, F. K. To, and Mar. 31 and July 10, 1935, J. L. Gressitt; Nam-fung, S. of Nodoa, July 3-4, Lok-kei to Nodoa, June 18 and 21, Tun-heung-ts'uen, 6 mi. SE. of Nodoa, June 13-14, and Lin-fa Shan, alt. 650 meters, 6 mi. SE. of Nodoa, June 9, O. K. Lau and F. K. To, 1932; Fan-ta-ts'uen, Hung-mo-ling, June 1, 1929, W. T. Tsang; Hau-ying-ts'uen, SE. of Nodoa, July 31, Yau-ma-woh, 3 mi. SE. of Nodoa, July 8-9, and Lam-ko, May 23-25, 1932, F. K. To; Ta-hian, alt. 600 meters, near Five Finger Mts., June 14-19, Ta-han, alt. 750 meters, near Red Mist Mt., June 24, 1935, J. L. Gressitt. New to Hainan Island.

Elytra metallic greenish blue; prothorax testaceous with a round purplish black spot on each side of center of disk; scutellum testaceous; head steel-blue to purple; antennae testaceous; metasternum blue-green; abdomen testaceous; legs purplish to blackish with basal halves of femora testaceous; pronotum slightly rugulose-punctate; elytra deeply and densely punctured, subgranulose basally. Length 17-20 mm.; breadth 4-4.6 mm.

Distribution.—China; Hainan Island.

10. **Idgia ungulata** Champion (pl. 6, fig. 11)

Numerous specimens were collected in Kwangtung Prov., S. China: Honam I., Canton, May 1-24, June 20, 1933, Apr. 21, 1935, Wm. E. Hoffmann, May 14, 1936, F. K. To; Yuet-loi-hui, July 29, and Yam-na Shan, Aug. 29, Mei Dist., 1933, F. K. To; Keung-tin-heung, July 10, Linchow, Aug. 6, and Chung-tung, Aug. 23, Lien Dist., 1934, F. K. To; Mei-hsien City, May 30-31, and Tsin-leong Shan, June 1, Mei Dist., 1936, J. L. Gressitt. One example was taken at Hong Shan, SE. Kiangsi Prov., June 20, 1936, J. L. Gressitt. Another was collected at Kachek, E. Hainan Island, May 11, 1932, F. K. To. New to Kiangsi Province and Hainan Island.

Pale orange testaceous; antennae, basal portion of head, extreme apices of elytra, tibiae and tarsi, and apices of femora pitchy brown; pronotum finely granulose; elytra micropunctulate, with rows of erect black bristles. Length 8-10 mm.; breadth 2-2.4 mm.

Distribution.—S. China: Fukien, Kiangsi, Kwangtung; Hong Kong; Hainan Island.

List of Prionoceridae of China and Neighboring Regions

Genus **Prionocerus** Perty

Prionocerus Perty, 1831, Obs. Col. Indiae Orient. : 33 (type : *P. coeruleipennis* Perty); Lacordaire, 1857, Gen. Col. 4 : 411, 412; Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3 : 328.

bicolor Redtenbacher, 1868, Reise Novara 2: 109, pl. 4, fig. 3 (Java); Champion, 1919, op. cit. : 329. Also: India, Burma, Siam, Indo-China, Formosa, Malaya.

coeruleipennis Perty, 1831, Obs. Col. Indiae Orient. : 33, pl. 1, fig. 4 (India); Champion, op. cit. : 328.

fuscipennis Lewis, 1879, Ann. Mag. Nat. Hist., ser. 5, 4: 464 (Yokohama, Japan). Also: Burma, Malaya, Philippines, Australia, E. Africa, Andamans, Indo-China, Hainan and SW. China.

Genus **Idgia** Castelnau

Idgia Castelnau, 1836, *in* Silbermann, Rev. Ent. 4 : 27 (type : *I. terminata* Cast.); Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3 : 329.

Deromma Kollar et Redtenbacher, 1844, Hügels Kaschmir 4 (2): 511 (type: *D. melanura* K. et R.).

Epiphyta Dejean, 1837, Cat. Col., ed. 3 : 123 (part).

Disprosopus Mulsant, 1851, Mem. Acad. Lyon 1 : 209.

Thaccona Walker, 1859, Ann. Mag. Nat. Hist., ser. 3, 3 : 260 (type : *T. dimelaena* Walk).

amplipennis Pic, 1908, Echange 24: 59 (China).

var. *obscurimembris* Pic, 1923, Bull. Mus. Paris: 73 (Kweichow, China).

var. *obscuriceps* Pic, 1928, Faune ent. Indo-Chine 6: 48 (Tongking).

ardesiaca Pic, 1908, Echange 24: 59 (China).

bimaculata Pic, 1910, Echange 26: 75 (Formosa).

coomani Pic, 1931, Echange 47, hors-texte: 100 (Tongking).

deusta Fairmaire, 1878, Ann. Soc. ent. France, ser. 5, 8: 118 (central China); Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 338. Also Formosa, Tongking, Yunnan, Kweichow, Fukien, Kiangsu and west China.

eleganticeps Pic, 1928, Faune ent. Indo-Chine 6: 62 (Laos).

femorata Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 346 (India). Also Hainan.

flavicollis Redtenbacher, 1868, Reise Novara 2: 111 (Hong Kong); Fairmaire, 1889, Ann. Soc. ent. France, ser. 6, 9: 45; Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 339; Miwa, Rept. 55, Dept. Agr., Gov. Res. Inst., Formosa: 107 (Formosa).

flavirostris Pascoe, 1860, Jour. Ent. 1: 43 (N. China); Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 340 (Chusan Is.; Hong Kong).

flavithorax Pic, 1927, Mel. Exot. Ent. 49: 4 (Tongking).

foveifrons Fairmaire, 1899, Ann. Soc. ent. France 68: 629 (Formosa).

granulata Pic, 1920, Echange 36, hors-texte 402: 12 (Tongking).

granulipennis Fairmaire, 1891, C. R. Soc. ent. Belg. 35: ccix (Tchangyang, China). Also Kweichow.

var. *abdominalis* Pic, 1929, Echange 36, hors-texte 401: 7 (China).

hoemorrhoidalis Pic, 1906, Bull. Soc. ent. France: 217 (Yunnan).

hoffmanni Gressitt, n. sp. (Kwangtung, S. China).

hügeli (Redtenbacher), 1868, Reise Novara 2: 110 (China). (*Prionocerus*).

lajoyi Pic, 1920, Echange 36, hors-texte 401: 8 (Tongking).

maculatithorax Pic, 1919, Mel. Exot. Ent. 30: 7 (Tongking).

major Pic, 1908, Bull. Soc. ent. France: 128 (Yunnan).

marginata Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 350 (India). Also Cochin-China.

minuta Pic, 1920, Echange 36, hors-texte 401: 8 (Tongking).

moupinensis Fairmaire, 1889, Ann. Soc. ent. France, ser. 6, 9: 44 (Szechwan). Also Kweichow.

oculata Redtenbacher, 1868, Reise Novara 2: 110, pl. 4, fig. 2 (China). Also Hainan I.

testaceipes Pic, 1908, Echange 24: 95 (Yunnan).

thibetana (Obenberger), 1918, Ent. Blätter 14: 60 (W. Himalaya). (*Prionocerus*).

tonkinea Pic, 1908, Naturaliste 30: 150 (Tongking).

ungulata Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 339 (China, Hong Kong, Amoy). Also Kiangsi and Hainan I.

virescens Champion, 1919, Ann. Mag. Nat. Hist., ser. 9, 3: 340 (W. China: Chin-fu San).

中國海南台灣及印度支那之一部之 Prionoceridae (鞘翅目)

嘉理思著

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(摘要)

經已研究之標本，約一五〇，分爲十種（屬 *Prionocerus* 者一種，及屬 *Idgia* 者九種）。查見於廣東之 *Idgia hoffmanni*, 乃新種，而與 *I. oculata* Redtenb. 類似。

Explanation of Plate

(Magnified 3.15 times)

Fig. 1. *Idgia oculata* Redtenbacher, Nodoa, Hainan I.

2. *Idgia bimaculata* Pic., Arisan, Formosa.

3. *Idgia hoffmanni* Gressitt, n. sp., holotype, Yao Shan, Kwangtung.

4. *Idgia foveifrons* Fairmaire, Hori, Formosa.

5. *Idgia femorata* Champion ?, female, Lam-ko, Hainan I.

6. *Idgia femorata* Champion ?, male, Nodoa, Hainan I.

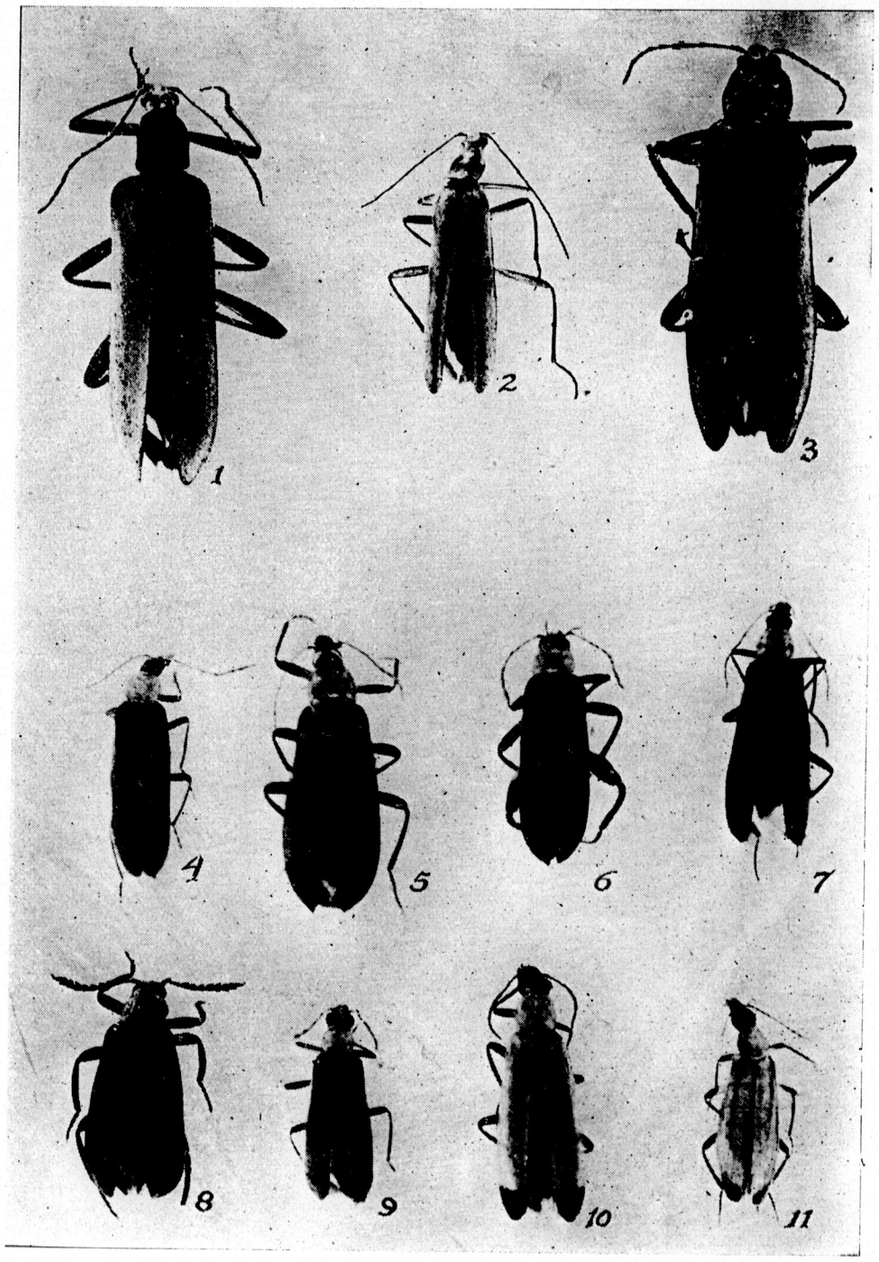
7. *Idgia flavicollis* Redtenbacher, Taiheizan, Formosa.

8. *Prionocerus coeruleipennis* Perty, Ta-hian, Hainan I.

9. *Idgia marginata* Champion ?, Travinh, Cochin-China.

10. *Idgia deusta* Fairmaire, Hong Shan, Kiangsi.

11. *Idgia ungulata* Champion, Mei Dist., Kwangtung.



SOME HISPINE BEETLES FROM SOUTHEASTERN CHINA (COLEOPTERA: CHRYSOMELIDAE: HISPINAE)[1]

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This constitutes the fourth[2] report on beetles collected on a trip[3] made by the writer to southeastern China during the summer of 1936. The collecting was done in eastern Kwangtung Province, southeastern Kiangsi, and southwestern Fukien Province, from latitudes 23° 20′ to 25° North, and longitudes 115° 30′ to 116° 40′ East. The collection of this subfamily (leaf-mining plant-beetles) contains twenty-five species, representing eight genera. Four of the species are described as new to science, and keys to the species of the genera *Callispa*, *Rhadinosa* and *Dactylispa* are presented. The writer has recently reported on the hispids in the collection of the Lingnan Natural History Survey and Museum,[4] and species discussed in that paper which originated from regions neighboring on the area now under consideration, are included in the keys to species. The type specimens of the new species are deposited in the United States National Museum in Washington, D. C., or are placed on loan deposit in the California Academy of Sciences in San Francisco, with paratypes and other specimens in the writer's collection, the Lingnan Natural History Survey and Museum, and the Van Dyke collection in the California Academy of Sciences.

Tribe **Callispini**

Genus **Callispa** Baly, 1858

1. **Callispa bowringii** Baly

Callispa Bowringii Baly, 1858, Cat. Hispidae Brit. Mus. : 5 (Hong Kong).

A large number of specimens were collected at Tai-yong, alt. 600 meters, E. Kwangtung Province, S. China, Aug. 5-6, 1936; one example was taken at Mei-hsien, alt. 185 meters, E. Kwangtung, June 9.

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[1] Contribution from the Lingnan Natural History Survey and Museum.

[2] See Gressitt : New longicorn beetles from China, III. *Lingnan Science Journal* 16 (3) : 447-456. pl. 4; part IV. op. cit. 16 (4) : 595-621, pls. 19 and 20 (1937); Some tortoise beetles from southeastern China. op. cit. 17 (3) : 383-388 (1938).

[3] See Gressitt : Notes on a collecting trip to southeastern China. *Lingnan Science Journal* 16 (3) : 439-445, 1 map (1937).

[4] See Gressitt : Hispine beetles in the collection of the Lingnan Natural History Survey and Museum. *Lingnan Science Journal* 18 (2) : 161-186, pl. 5 (1939).

2. **Callispa elliptica** n. sp. (pl. 7, fig. 2)

Small, narrow, subelliptical, narrowed anteriorly and rounded-truncate behind; reddish brown, antennae and elytra largely blackish: head dull reddish brown, eyes golden piceous; antennae black, slightly piceous at apex and base; pronotum and scutellum reddish brown; elytra partly reddish brown on basal two-fifths: a large, rounded triangle on dorsal surface, its apex at suture two-fifths elytral length from base, and sides, below humeri, also reddish to about middle of lateral margins, remainder shiny black with a faint greenish tinge; ventral surface and legs reddish testaceous, slightly fuscous at sides of thoracic sterna.

Head about three-fourths as wide as anterior margin of prothorax; vertex with a blunt projection along antennal insertions; occiput squarish, feebly narrowed anteriorly, shiny, with fine, sparse punctures. Antennae one-third as long as body, compressed apically, longitudinally striate and clothed with short, adpressed, dark hairs; scape thickened apically, barely longer than second segment; third segment three-fourths as long as second; fourth to ninth subequal to third; tenth about as long as second and longer than eleventh. Prothorax one-half again as broad as long, slightly wider at base than at apex; anterior margin convex; basal margin sinuate, convex at middle; lateral margins nearly straight; anterior angles rounded; surface more strongly convex anteriorly, impressed with distinct, irregularly placed punctures, except along mid-longitudinal line. Scutellum smooth, short, broadly rounded posteriorly. Elytra elongate-oval, broadest at about middle, rounded-truncate posteriorly; surface shiny, punctured in ten rows near base and in eleven rows behind middle, punctures much larger on basal half. Ventral surface deeply punctured on sides of metasternum and sparsely and finely punctured on abdomen, some of the latter punctures giving rise to short palish hairs. Length 4.5 mm.; breadth 1.8 mm.

Holotype (loan deposit, California Academy of Sciences, Entom.), Wong-sa-shue, alt. 800 meters, southeastern Kiangsi Province, S. China, July 9, 1936, J. L. Gressitt.

Differs from *C. apicalis* Pic, in being of much more slender build, with the prothorax longer and more rectangular, with closer puncturation, the scutellum shorter, the elytra narrower and more finely punctured, and the coloration more reddish with the elytra more extensively black. Differs from *C. dimidiatipennis recticollis* Gressitt, of Hainan, in being more elliptical, of a darker red, with more rounded anterior prothoracic angles and the black portions of elytra extending to humeral angles.

3. **Callispa fortunii** Baly

Callispa Fortunii Baly, 1858, Cat. Hispidae Brit. Mus. : 6, pl. 4, fig. 2 (N. China).

A single example was taken at Wong-sa shue, alt. 850 meters, southeastern Kiangsi Prov., July 10, 1936, J. L. Gressitt. New to south China.

Key to Species of Callispa

A. Prothorax reddish, subrectangular, nearly as wide at apex as at base; head and metasternum reddish; body narrow..... B

Prothorax greenish blue, strongly narrowed anteriorly; head greenish; metasternum black; body broadened posteriorly.....**bowringii** Baly

B. Body very narrow, elliptical; prothorax less than twice as broad as long; elytra reddish basally, blackish posteriorly; length of body less than 5 mm. .....**elliptica** n. sp.

Body subparallel; prothorax more than twice as broad as long; elytra entirely steel-blue; length of body more than 6 mm. .....**fortunii** Baly

Tribe **Leptispini**

Genus **Leptispa** Baly, 1858

4. **Leptispa abdominalis** Baly

Leptispa abdominalis Baly, 1858, Cat. Hispidae Brit. Mus. : 3 (N. China).

Two specimens were collected at Mei-hsien city (Moejen), alt. 190 meters, Mei Dist., E. Kwangtung Prov., June 18, 1936, J. L. Gressitt. New to south China.

Tribe **Gonophorini**

Genus **Agonia** Weise, 1905

5. **Agonia laticeps** n. sp. (pl. 7, fig. 1)

Moderate-sized, flattened, subparallel, barely wider posteriorly; body reddish brown to pitchy black, antennae, elytra and legs largely black: head pitchy black, reddish brown in front; antennae blackish, scape pitchy red, second segment pitchy black; prothorax pitchy red, pitchy black on middle of disk and anterior portion of pronotum; scutellum piceous; elytra black, bottoms of punctures giving goldish sheen; ventral surface of body reddish brown, pitchy black on sides of metathorax, median part of abdominal sternites and most of last abdominal segment; legs pitchy black, bases and apices of femora and tarsal claws somewhat reddish.

Head nearly as broad as prothorax; frons raised, strongly transverse, broadly triangular, with raised lateral margins; vertex with a narrow ridge between antennal insertions; occiput broad, feebly convex, irregularly punctured; eyes broadly oval, vertical, swollen. Antennae one-third as long as body, moderately clothed with black hairs; scape short, swollen, no longer than second segment; third to fifth segments subequal, each a little longer than second; sixth shorter than fifth or seventh; seventh to tenth subequal, each as long as third, but thicker; last longest. Prothorax fully as broad as long, widest at middle, narrower at apex than at base, sinuately margined laterally; disk swollen, flattish in center, a broad, oblique depressed area extending to each side from middle

of base, terminating in a rounded, concave area on each side; surface coarsely and irregularly punctured, middle of disk nearly impunctate and shallowly grooved longitudinally. Scutellum narrow, rectangular. Elytra only a little broadened posteriorly, rounded apically, slightly dehiscent at sutural angles; surface heavily punctured in eight regular rows beyond basal third, each pair of rows divided by a strongly raised, narrow ridge, the third obsolete in central portion, second and third puncture-rows broken up anteriorly. first into three rows and then into an irregularly punctured area. Ventral surface distinctly and irregularly punctured, most densely so on last abdominal sternite. Length 5.5-6.2 mm.; breadth 2-2.2 mm.

Holotype (U. S Nat. Mus.), Hong Shan, alt. 1,000 meters, southeastern Kiangsi Province, S. China, June 26, 1936, J. L. Gressitt; two paratopotypes, June 26 and 27, one in Van Dyke collection, California Academy of Sciences, other in writer's collection.

Differs from *A. chinensis* Weise in being larger, with the body duller red, marked with piceous, and the elytra with the punctures of the second interstice from suture with three or more rows of punctures anteriorly and the outer two interstices with four, instead of three, rows of punctures on basal three-fourths.

Tribe **Hispini**

Genus **Monochirus** Chapuis, 1875

6. **Monochirus callicanthus** (Bates)

Hispa callicanthus Bates, 1866, Proc. Zool. Soc. London : 254 (Formosa).
Monochirus callicanthus Chapuis, 1876, Ann. Soc. Ent. Belg. 19, c.r. : 25.
Hispellinus callicanthus Weise, 1897, Deutsche Ent. Zeit. : 145.

Numerous specimens were collected at the following localities: Hong Shan, alt. 950 meters, June 29-30, Sungwu, alt. 400 meters, July 2 and 12, Tai-au-hong, alt. 550 meters, July 4-6, Wong-sa-shue, alt. 700 meters, July 11, southeastern Kiangsi Prov.; Liung-chon Shan, alt. 750 meters, southwestern Fukien Prov., July 21; and Tai-yong, E. Kwangtung Prov., Aug. 5-6, 1936. New to Kiangsi and Fukien Provinces.

Genus **Hispella** Chapuis, 1875

7. **Hispella donckieri** Pic

Hispella Donckieri Pic, 1924, Mel. Exot. Ent. 42 : 28 (Tongking).

Two examples were taken at Yim-na Shan, alt. 550 meters, Mei Dist., E. Kwangtung Prov., June 13, 1936, J. L. Gressitt.

Genus **Rhadinosa** Weise, 1905

8. **Rhadinosa fleutiauxi** (Baly)

Hispa Fleutiauxi Baly, 1889, Ann. Soc. Ent. France, ser. 6, 9: 491 (Pnomh-Penh, Cochin-China).
Rhadinosa Fleutiauxi Weise, 1911, Col. Cat. 35 : 62.

A single specimen was collected at Wong-sa-shue, alt. 800 meters, southeastern Kiangsi Prov., July 11, 1936. New to Kiangsi Province.

9. **Rhadinosa reticulata** (Baly)

Hispa reticulata Baly, 1888, Ann. Mus. Civ. Genova 26:665 (Teinzo, Burma).
Rhadinosa reticulata Weise, 1911, Col. Cat. 35 : 62; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 164, fig. 52.

Two specimens were collected by the writer at Wong-sa-shue, alt. 800 meters, southeastern Kiangsi Prov., July 10, 1936.

Key to Species of Rhadinosa

Elytra dull black, subglabrous; first lateral prothoracic spine slender and longer than following spines; external margin of each elytron with about fourteen long slender spines; length under 3.5 mm. ....**fleutiauxi** (Baly)

Elytra black with a steel-blue tinge, clothed with white hairs; first lateral prothoracic spine stout and shorter than following; external margin of each elytron with about twenty-three short stout spines; length more than 5 mm. .....**reticulata** (Baly)

Genus **Dactylispa** Weise, 1897

10. **Dactylispa approximata** n. sp. (pl. 7, fig. 4)

Moderately elongate, parallel-sided, rectangular; spines very long. Color pale to reddish testaceous marked with shiny black or piceous: head pitchy red in front, pitchy black above, and shiny black on neck; antennae reddish ochraceous, pitchy brown on first two and last few segments; prothorax pitchy black with anterior and basal margins, and sides of disk, reddish testaceous; spines paler testaceous with apical portions piceous; scutellum dark pitchy brown; elytra pale amber colored, with basal quarter, anterior half of sides, diskal spines and their bases shiny black, lateral spines pitchy black, apical spines ochraceous tipped with black; thoracic sterna pitchy brown, blackish at sides; abdomen and legs testaceous.

Head narrower than prothorax at anterior margin; frons trapezoidal, with a transversely striolate and sparsely punctured convex triangular area; occiput micropunctulate, with a transverse, and a longitudinal groove. Antennae three-fourths as long as body, slender, slightly thickened before apices; scape a little more than, and second segment nearly, twice as long as broad; third segment slender, one-fourth longer than scape; fourth two-thirds as long as third, equal to fifth and seventh, longer than sixth. Prothorax trapezoidal, armed with a pair of long, bifurcating spines near anterior border, posterior ramus of each arched slightly forward and one-third longer than anterior ramus; a group of three spines at each side, third spine slightly detached from first two and barely two-fifths as long as they, second slightly sinuous and a little longer than first; disk impressed with close punctures of different sizes except on central transverse raised area, which is slightly punctured at each side of middle. Scutellum subtrapezoial, broadly rounded posteriorly, micro-punctulate. Elytra long, subparallel, slightly broadened at humeri and

just before apices, deeply impressed with subtransverse rounded or squarish spots, in nine regular rows at middle; margins not expanded, except at apices where they are very slightly so; each margin with twelve or fourteen long spines, a few of lateral ones reduced or very small in size, those on apical margins about three in number, much shorter and relatively stouter, alternating with minute spinules; disk of each elytron with eight or nine very long spines and some short spinules along suture; basal margin with a few short spines, and one of medium length near scutellum; humerus with four spines of increasing length; last three diskal spines arranged in a transverse row. Ventral surface finely wrinkled on sides of metasternum and irregularly punctured on abdominal sternites. Legs fairly slender; posterior femora reaching at least to posterior margin of third abdominal sternite. Length 4.8-5 mm.; breadth 1.7-1.9 mm.

Holotype (U. S. Nat. Mus.), Tai-yong, alt. 650 meters, near Wuking-fu, west northwest of Swatow, E. Kwangtung Province, S. China, Aug. 5, 1936; paratype (Gressitt collection), Gang-keu, alt. 450 meters, southeast of Shanghang, southwestern Fukien Prov., July 25, 1936, J. L. Gressitt.

Differs from *D. balyi* (Gestro) in being practically glabrous instead of quite hairy, in having the spines much longer, more slender and less numerous, the raised portion of pronotal disk partially punctate, the pronotum largely black and the elytral surfaces partly testaceous, etc. Differs from *D. longispina* Gressitt in having the prothoracic spines shorter and non-appendiculate, the diskal spines of elytra longer and less numerous, the margins with fewer spinules, etc.

11. **Dactylispa corpulentina** Uhmann

Dactylispa corpulentina Uhmann, 1927, Suppl. Entom. 16 : 113 (Kosempo, Formosa).

Three specimens were collected in southeastern Kiangsi Prov.; two at Tai-au-hong, alt. 500 meters, July 7, and one at Wong-sa-shue, alt. 700 meters, July 10. New to mainland of China.

12. **Dactylispa crassicuspis** Gestro

Dactylispa crassicuspis Gestro, 1906, Bull. Soc. Ent. Ital. : 184 (Yunnan).

Eleven examples were taken in southeastern Kiangsi and southwestern Fukien Provinces: four at Tai-au-hong, alt. 450 meters, July 4-7, four at Wong-sa-shue, alt. 600-750 meters, July 9-10, one at Hong Shan, alt. 850 meters, July 15, Kiangsi; one at Liung-chon Shan, alt. 750 meters, July 21, and one at Gang-keu, alt. 450 meters, July 28, Fukien. New to Kiangsi and Fukien Provinces.

13. **Dactylispa excisa repanda** Weise

Dactylispa excisa var. *repanda* Weise, 1922, Philippine Jour. Sci. 21 : 81 (Kiautschau).

A single specimen was collected on Hong Shan, alt. 850 meters, southeastern Kiangsi Prov., near the Fukien border, July 15, 1936, J. L. Gressitt. New to Kiangsi Province.

14. **Dactylispa filiola** Weise

Dactylispa filiola Weise, 1897, Deutsche Ent. Zeitschr. : 135 (Kanara, India); 1905, op. cit. : 120.

Four specimens were taken in southwestern Fukien and southeastern Kiangsi Provinces: two at Liung-chon Shan, alt. 800 meters, July 21-22, one at Gang-keu, alt. 425 meters, July 28, Fukien, and one at Tai-au-hong, alt. 550 meters, Kiangsi, July 5. New to Fukien and Kiangsi Provinces.

15. **Dactylispa gestroi** Gressitt

Dactylispa gestroi Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 327, pl. 11, fig. 4 (Ta Han, Hainan Island).

One example was collected at Liung-chon Shan, alt. 800 meters, southwestern Fukien Prov., July 22, 1936, J. L. Gressitt. New to Fukien Province.

16. **Dactylispa latispina** Gestro

Dactylispa latispina Gestro, 1899, Ann. Mus. Civ. Genova : 228 (Tongking).

One specimen was collected at Yim-na Shan, alt. 550 meters, Mei Dist., E. Kwangtung Prov., June 14, 1936. New to the mainland of China.

17. **Dactylispa longula** Maulik ?

Dactylispa longula Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 204 (Momeit, Burma).

A single example was taken at Tai-au-hong, alt. 550 meters, southeastern Kiangsi Prov., July 7, 1936, J. L. Gressitt. New to mainland of China.

18. **Dactylispa marginicollis** n. sp. (pl. 7, fig. 3)

Oblong, hardly broadened posteriorly, moderately convex; spines fairly long. Body largely reddish ochraceous beneath and pitchy black above: head pale pitchy red in front, duller above, and dark pitchy red on neck; antennae ochraceous except for first two segments, which are pitchy black; prothorax pitchy black on pronotal disk, reddish testaceous on margin, sides and spines, extreme tips of latter piceous; scutellum pitchy black; elytra light pitchy red, diskal spines and tubercles pitchy black, lateral spines of margins dark rufopiceous, apical spines dull reddish testaceous with pitchy tips; ventral surfaces reddish ochraceous except for pitchy sides of meso- and metathorax. Body largely glabrous above; antennae clothed with pale golden-buff hairs; legs and abdomen sparsely clothed with suberect golden-brown hairs.

Head as broad as anterior margin of prothorax; frons trapezoidal, feebly convex, medially carinate, punctured on lower portions; vertex with a weak median carina; occiput slightly concave, micropunctulate, opaque; neck shiny. Antennae three-fourths as long as body, slightly thickened beyond middle; scape at least three times as long as broad, gradually thickened; third segment four-fifths as long

as scape, and slightly longer than fourth; fourth to sixth subequal; seventh to tenth gradually shorter. Prothorax strongly transverse, anterior constricted portion short; expanded portion subrectangular; disk with large shallow punctures, except on mid-line, a transverse feebly raised area across middle, preceded and followed by transverse shallow furrows; anterior margin bearing a pair of strong bifurcating spines, anterior branch of each arched slightly upwards, posterior rami long, nearly erect, bent slightly backwards before apices; sides expanded, anterior corner of each side bearing a group of three long spines with a common base, all about equal in length and bent a little before apices, one-half distance between this group and base, on each side, is a small spine about two-fifths as long as one of the anterior spines. Scutellum broad, subtrapeziform, rounded-truncate posteriorly, densely micro-punctulate. Elytra subrectangular, each striate-punctate in about nine rows at middle, armed with about twelve strong spines besides those on margins and humerus; margins slightly expanded, bearing nine to eleven long spines at side and six or seven apical spines, each of the latter about two-fifths as long as spines at middle of side. Metasternum nearly impunctate; abdomen irregularly punctured. Length 4.2-4.6 mm.; breadth 2.2-2.4 mm.

Holotype (U. S. Nat. Mus.), Tai-yong, alt. 650 meters, near Wuking-fu, eastern Kwangtung Province, Aug. 6, 1936, J. L. Gressitt; paratopotype (Gressitt collection), Aug. 5; paratype (Lingnan Natural History Survey and Museum), Liung-chon Shan, alt. 750 meters, southwestern Fukien Province, July 22; paratype (Gressitt collection), Tai-au-hong, alt. 550 meters, southeastern Kiangsi Province, July 4, 1936, J. L. Gressitt.

Differs from *D. daipa* Maulik in having the pronotal disk entirely black and not very densely punctured, the scutellum trapezoidal instead of triangular, the elytral punctures without silvery hairs, the humeri with fewer and longer spines, etc.

19. **Dactylispa nigrodiscalis** Gressitt

Dactylispa nigrodiscale Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 329, pl. 11, fig. 6 (Tai Han, Hainan Island).

One example was collected at Tai-au-hong, alt. 525 meters, southeastern Kiangsi Prov., July 5, 1936, J. L. Gressitt. New to mainland of China.

This specimen differs from the type in having the median impunctate strip of the pronotum broadly grooved, in lacking an impunctate area on each side of center of disk, and in having the lateral prothoracic spines slightly sinuate.

20. **Dactylispa paucispina** Gressitt

Dactylispa paucispina Gressitt, 1939, Ling. Sci. Jour. 18 (2) : 178, pl. 5, fig. 6 (N. Kwangtung and SE. Kiangsi, S. China).

A single specimen, the paratype, was taken at Tai-au-hong, alt. 550 meters, southeastern Kiangsi Prov., July 4, 1936, J. L. Gressitt.

21. **Dactylispa piceomaculata** Gressitt

Dactylispa piceomaculata Gressitt, 1939, Ling. Sci. Jour., 18 (2) : 179, pl. 5, fig. 5 (south central Kwangtung and SE. Kiangsi, S. China).

Three specimens, paratypes, were taken: two at Hong Shan, alt. 750 meters, southeastern Kiangsi Prov., June 23, and one at Yim-na Shan, alt. 550 meters, eastern Kwangtung Prov., June 14, 1936.

22. **Dactylispa platyacantha** (Gestro)

Hispa platyacantha Gestro, 1897, Ann. Mus. Civ. Genova 38 : 126 (Burma).
Dactylispa platyacantha Weise, 1911, Col. Cat. 35 : 68; Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 191.

Six specimens were collected in southeastern Kiangsi and southwestern Fukien Provinces: one at Hong Shan, alt. 800 meters, June 28, three at Tai-au-hong, alt. 550 meters, July 4-5, one at Wong-sa-shue, alt. 700 meters, July 10, Kiangsi, and one at Liung-chon Shan, alt. 750 meters, Fukien, July 21, 1936. New to Kiangsi and Fukien Provinces.

23. **Dactylispa sinuispina** Gressitt

Dactylispa sinuispina Gressitt, 1938, Ling. Sci. Jour. 17 (3) : 331, pl. 11, fig. 7 (Ta Han, Hainan Island).

Four examples were taken in southeastern Kiangsi Prov.: two at Tai-au-hong, alt. 550 meters, July 7, and two at Hong Shan, alt. 850 meters, July 15, 1936. New to Kiangsi Province.

24. **Dactylispa sjöstedti** Uhmann

Dactylispa (Triplispa) sjöstedti Uhmann, 1928, Ent. Tidskr. 49 : 102 (Trichinopoly, India).

A single specimen taken at Tai-au-hong, alt. 550 meters, southeastern Kiangsi Prov., July 6, 1936, is provisionally referred to this species. Hitherto unrecorded from Kiangsi.

Key to Species of Dactylispa[5]

A. Anterior portion of pronotum with a pair of spines which bifurcate more or less close to bases ..... B
Anterior portion of pronotum with a pair of spines, each of which divides into three spines ..... O

B. Each side of prothorax with four spines..... C
Each side of prothorax with three spines ..... D

C. Elytral margins broadly expanded, four-lobed, deeply excised at middle of each side, marginal spines short and flat; anterior spines of pronotal pair appendiculate .....**excisa repanda** Weise
Elytra oblong, margins very slightly broadened, straight; marginal spines long and slender; anterior spines of pronotal pair unbranched.....
.....**marginicollis** n. sp.

D. Elytral margins broadly expanded anteriorly and posteriorly, marginal spines broad and flattened, triangular ..... E

[5] Including two additional species recorded from south China in another paper by the writer (*Lingnan Sci. Jour.* 18 (2) : 161-186, 1939).

Elytra more or less oblong in shape, margins regularly, or not at all, expanded, not greatly broadened anteriorly and posteriorly; marginal spines generally long and slender ..... F

E. Pronotum with five raised smooth areas across middle; disk of elytra and marginal spines of prothorax and elytra pitchy red; anterior lobes of marginal expansions of elytra with numerous tubercles; posterior branch of each anterior spine of pronotum broad and hardly longer than anterior ramus .....**latispina** (Grestro)

Pronotum with three closely approximate rounded smoothish areas on center of disk; elytral disks and marginal spines of prothorax and elytra pale ochraceous; anterior lobes of marginal expansions of elytra with only a few tubercles, posterior branch of each anterior spine of pronotum slender and much longer than anterior branch.....
.....**platyacantha** (Gestro)

F. Pronotum with a transverse, oblong-oval, convex area across middle of disk ..... G

Pronotum lacking a large transverse raised impunctuate area on middle of disk ..... J

G. Dorsal surfaces testaceous with diskal spines and their bases, and markings on pronotum and scutellum black or pitchy; posterior branch of anterio-dorsal spine of prothorax shorter than one-half width of pronotum ..... H

Dorsal surfaces black or pitchy black with head and prothorax red; posterior ramus of anterio-dorsal spines of prothorax shorter than one-half width of pronotum I

H. Both rami of anterio-dorsal spines on prothorax simple and regularly tapered; all three lateral spines arising from a common base; bases of elytra largely black and lateral spines of same pitchy, lighter at tips...
.....**approximata** n. sp.

Both branches of anterio-dorsal spines on prothorax with a spinule in front, before apices; third lateral spine arising separately from anterior two; bases of elytra largely testaceous, and lateral spines of same yellowish with slightly pitchy tips; lateral margins narrowly expanded.
.....**longula** Maulik

I. Elytra rather hairy, with some of hairs arising from small erect spine-like projections; elytra pitchy black; head, prothorax and scutellum red....
.....[**balyi** (Gestro)]

Elytra practically glabrous, with but few small spinules; dorsal surface almost entirely black with a few dark pitchy brown areas on disks and apices of elytra .....**piceomacula** Gressitt

J. Lateral margins of elytra broadly expanded; first two lateral prothoracic spines generally not branching from a common base at any distance from sides of pronotum ..... K

Lateral margins of elytra not expanded; first and second lateral prothoracic spines with a common basal trunk; third lateral prothoracic spine arising from base of trunk of anterior two, and fully as long as first, all testaceous except at tips; pronotal disk entirely punctured; elytral disks with a number of short, pale spines.....**filiola** Weise

K. Spines on apical margins of elytra not very short, considerably longer than broad L

Spines on apical margins of elytra very short, flattened, mostly no longer than broad ..... M

L. Pronotal disk entirely punctured; all three lateral prothoracic spines arising from a common base, equally spaced and similarly shaped; but few small spines on elytral margins .....**gestroi** Gressitt

Pronotal disk with a median impunctate band and an irregular impunctate area on each side; third lateral prothoracic spine separated from origin of first two; numerous small spines interspersed among major marginal spines of elytra; first two lateral prothoracic spines flattened basally, with a broad common base; third spine one-half as long as first two; pronotum marked with blackish or pitchy.....**sinuispina** Gressitt

M. Spines on apical margins of elytra unequal and not regularly spaced; spines on lateral margins unequal in length, major ones less than ten in number ..... N

Spines on apical margins of elytra equal and regular; spines on lateral margins fairly equal in length, at least three times as long as broad, slightly flattened basally, about fifteen in number; first two lateral prothoracic spines appendiculate and longer than third spine.....
.....**crassicuspis** Gestro

N. Lateral margins of elytra distinctly flattened, with longer spines alternating with short ones; pronctal disk with an oblique raised impunctate area on each side bordered by an external depression, spines of elytral disks long and slender .....**corpulentina** Uhmann

Lateral margins of elytra hardly expanded, with long spines with only an occasional shorter spine interspersed among them; pronotal disk largely rugose-punctate with a raised median line; spines of elytral disk short and tubercle-like .....**paucispina** Gressitt

O. Each side of prothorax with three spines ..... P

Each side of prothorax with four or five spines arising from a common base, fourth and fifth very short; pronotum with broad reticulate punctures on each side of a narrowly oblong median impunctate strip; elytral margins very broad and flat; dorsal surface testaceous with pitchy spines .....[**chaturanga** Maulik]

P. Pronotum with a transversely oblong-oval raised smooth area across center; elytral margins narrow with strong spines subequal in length.....
.....**sjöstedti** Uhmann

Pronotum lacking a transversely oblong-oval raised smooth area across center; dorsal surface largely black; antennae, lateral prothoracic spines, legs and middle of elytral margins ochraceous, elytra with broad margins bearing spines of various lengths .....**nigrodiscalis** Gressitt

Genus **Hispa** Linnaeus, 1767

25. **Hispa armigera** Olivier

Hispa armigera Olivier, 1808, Ent. 6 : 763, pl. 1, fig. 8 (E. Indies); Maulik, 1919, Fauna Brit. India, Chrysom. : Hisp. Cass. : 249, fig. 70.

Four specimens were collected: one at Mei-hsien city, alt. 180 meters, Mei Dist., E. Kwangtung Prov., June 8, two at Hong Shan, alt. 850 meters, southeastern Kiangsi Prov., June 23, and one at Liung-chon Shan, alt. 750 meters, southwestern Fukien Prov., July 11, 1936, J. L. Gressitt.

中國東南部之鐵甲蟲（鞘翅目：金花蟲科，鐵甲蟲亞科）

嘉理思著

嶺南大學自然博物採集所

（摘要）

本文係作者於民國廿五年，在中國東南部採得之甲蟲之第四次報告。此亞科包括二十五種，分爲八屬。*Callispa*, *Rhadinosa*, 及 *Dactylispa* 之品種，皆有檢索表以辨別之。*Callispa elliptica*, *Agonia laticeps*, *Dactylispa approximata*, 及 *D. marginicollis* 則爲新種。

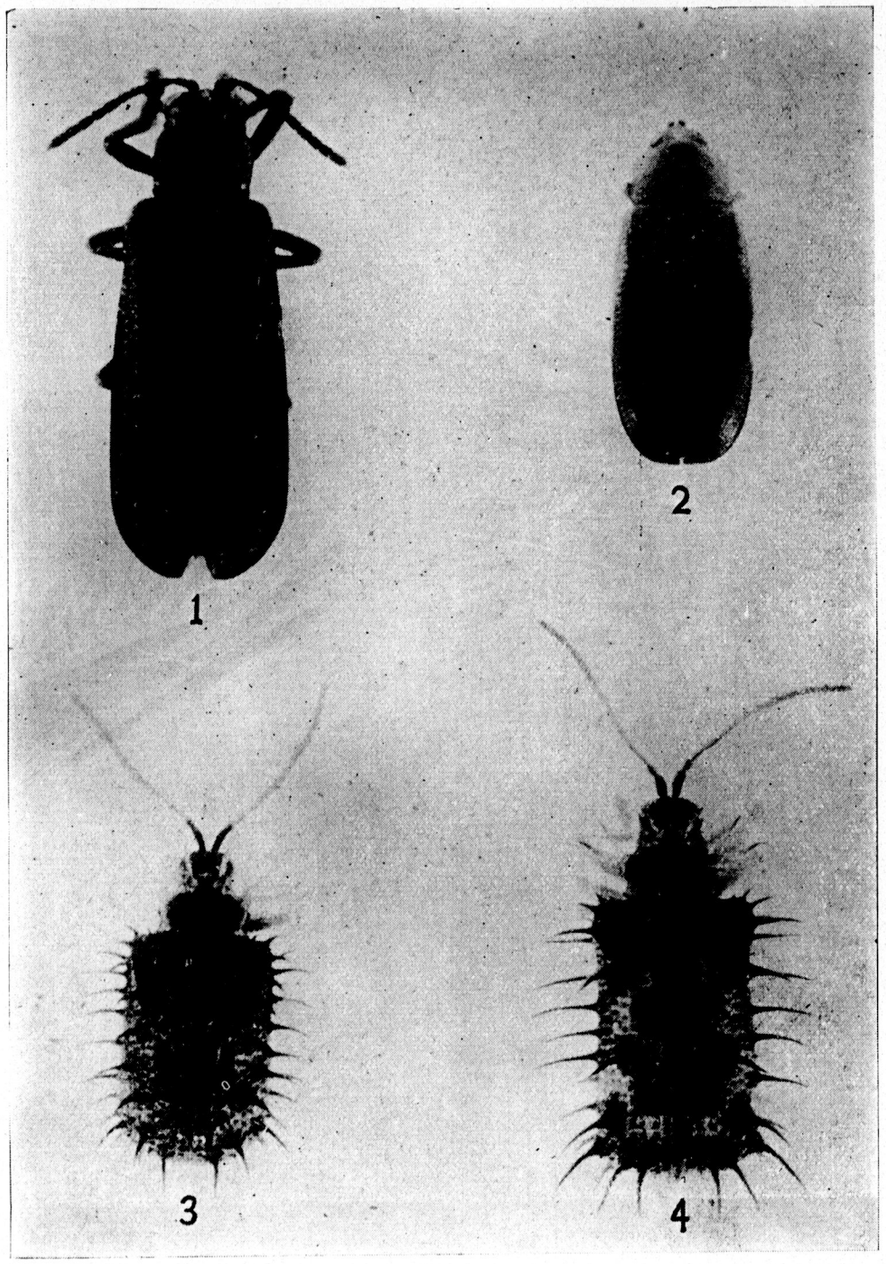
Explanation of Plate

Fig. 1. *Agonia laticeps* Gressitt, n. sp., × 10.6.

2. *Callispa elliptica* Gressitt, n. sp., × 10.6.

3. *Dactylispa marginicollis* Gressitt, n. sp., × 10.6.

4. *Dactylispa approximata* Gressitt, n. sp., × 10.6.



NEW LONGICORN BEETLES FROM CHINA, VII (COLEOPTERA: CERAMBYCIDAE)[1]

By J. Linsley Gressitt
Insect Taxonomist, Lingnan Natural History Survey and Museum, Lingnan University.

The present number of this series[2] concerns some miscellaneous longicorns from various parts of China. Five new species are herein described, representing as many tribes, three of them belonging to the subfamily Cerambycinae, and two to the Lamiinae. The sources of the material of the different species are as follows: two are from the British Museum, collected in 1848 and 1855 by J. C. Bowring and, probably, by Robert Fortune, respectively, on Hong Kong and in "N. China"; one is from the United States National Museum, collected in Shensi in 1904; one is from the California Academy of Sciences, taken by Dr. E. C. Van Dyke during 1923 in Kiangsu; and one was taken by the writer in southern Kiangsi in 1936.[3] One of the species is also represented by additional material from Musée Heude, Université l'Aurore, in Shanghai. The types of the new species are to be deposited in the museums from which they originated, that collected by the writer being placed on loan deposit in the California Academy of Sciences in San Francisco. The writer is greatly indebted to Dr. K. G. Blair of the British Museum, Mr. W. S. Fisher of the United States Bureau of Entomology, Mr. E. P. Van Duzee of the California Academy of Sciences, Dr. E. C. Van Dyke of the University of California, and Prof. Wm. E. Hoffmann of Lingnan University, for the privilege of studying and reporting upon this material.

Subfamily **Cerambycinae**

Tribe **Cerambycini**

Genus **Neocerambyx** Thomson, 1861

1. **?Neocerambyx mandarinus** n. sp. (pl. 8, fig. 5)

Female.—Moderately large, fairly slender, subparallel, bluntly rounded posteriorly. Color reddish brown to pitchy or black, shiny on prothorax, basal portions of antennae and elytra and on much of ventral surfaces and legs: head black; clypeus orange; palpi pitchy red; antennae black on scape and dark brown on remainder; prothorax black above, slightly brownish at sides and beneath; scutellum brownish black; elytra nearly black on basal quarter, dull reddish

[1] Contribution from the Lingnan Natural History Survey and Museum.
[2] Part VI, see: *Lingnan Sci. Jour.* 17 (2): 151-159, 1938.
[3] See part IV: *Lingnan Sci. Jour.* 16 (4): 595-621, pls. 19 and 20, 1937.

brown on remainder of surface; ventral surfaces blackish brown on thoracic sternites and apical margins of abdominal segments, reddish brown on remainder of abdomen; legs reddish brown. Body largely clothed with a thin tomentum of oblique, pale tawny hairs, which is extremely short on pronotal and elytral disks, and on antennae consists of a thin, adpressed silver-gray pubescence which is dense beyond fifth segment.

Head subparallel-sided, subvertical anteriorly; eyes deeply emarginate, with inferior lobes relatively small, feebly swollen and finely facetted; occiput reticulate-punctate, grooved on midline between posterior borders of eyes; vertex grooved; antennal supports broad and low, shallowly and closely punctured; genae sparsely and finely punctured, shiny. Antennae five-sixths as long as body, thicker basally than apically; scape short, hardly twice as long as broad, somewhat compressed, with a shallow longitudinal depression in front, closely punctulate; second segment very short; third not quite as long as scape, suddenly and strongly swollen in apical three-fifths; fourth slightly shorter than third, similar, but less strongly swollen; fifth slightly longer than third, feebly swollen distally; sixth to ninth subequal in length, each somewhat compressed and flattened on outer side, ectoapical angles successively more acute; last segment strongly compressed. Prothorax slightly broader than long, rounded at sides, broadest behind middle and considerably narrower at apex than at base; surface coarsely vermiculate, the ridges mainly arranged in transverse directions across median portion of disk; ridges smooth with a few fine punctures. Scutellum very short, declivitous, narrowly emarginate apically. Elytra subparallel-sided, conjointly rounded apically; surfaces closely and rather finely vermiculate-punctate, more heavily so on basal quarter. Ventral surfaces micropunctulate, with some scattered larger punctures. Legs slender; femora compressed; first hind tarsal segment barely as long as following two segments combined. Length 28 mm.; breadth 8 mm.

Holotype, female (United States National Museum), Chin-ling (Tsin-ling) Mountains, Shensi Province, northwest China, April-May, 1904.

Differs from *N. grandis* Gahan, of India, in being much shorter, with the prothorax more evenly rounded at sides, narrower apically and more regularly ribbed transversely across disk, and the third and fourth antennal segments more swollen. This species differs in various respects from the typical members of the genus, particularly in lacking the thick pubescence on the dorsal surfaces of the body, in having the prothorax more regularly rounded at sides, the elytra parallel, etc.

Tribe **Obriini**

Genus **Stenhomalus** White, 1855

2. **Stenhomalus incongruus** n. sp. (pl. 8, fig. 3)

Male.—Small and slender; head broad and prothorax long. Body dark chestnut brown; prothorax and legs pale ochraceous, nearly testaceous on apex and base of prothorax and bases of legs; head blackish brown tinged with red on frons and vertex and between superior eye-lobes, reddish brown on occiput, clypeus, mandibles and ventral side, ochraceous on neck and labrum; antennae dark brown, fourth and following segments each with basal third or so testaceous. Surfaces of body sparsely clothed with short recumbent pale hairs and scattered erect golden hairs; antennae with very thin silvery golden pubescence and with a few long dull golden hairs on inner sides of first five segments and some shorter ones on outer sides of first four.

Head broad, strongly constricted behind eyes; vertex microrugulose, medially grooved, barely concave between antennal insertions; occiput sublongitudinally vermiculate between superior eye-lobes; anterior portion of neck finely punctured; eyes very large, coarsely facetted, reaching genal margins, subapproximate above. Antennae slender, one-half again as long as body; scape arched basally, subcylindrical apically, closely punctulate, as long as second and third segments combined; fourth subequal in length to third, two-thirds as long as fifth; fifth to seventh subequal; following segments shorter. Prothorax about one-third longer than its greatest breadth, nearly twice as long as breadth at base, one-half again as broad at apex as at base, constricted before and behind middle; each side rounded-tuberculate a little before middle; surfaces sparsely but distinctly punctured. Elytra parallel-sided, each broadly rounded apically; surfaces irregularly, and somewhat closely, punctured except on humeri and apical quarter. Ventral surfaces nearly impunctate. Legs slender; posterior femora reaching to elytral apices. Length 4.8; breadth 1 mm.

Female.—Head narrower, hardly as broad as elytra; first abdominal segment about as long as remaining segments combined; second segment emarginate and fringed posteriorly; elytra of a more reddish black than a reddish brown. Length 6.7; breadth 1.75 mm.

Holotype, male (No. 4795, Calif. Acad. Sci., Ent.), Nanking, Kiangsu Province, east China, June 20, 1923, E. C. Van Dyke, collector; allotype, female (Musée Heude), Zo-sé, near Shanghai, Kiangsu, July 23, 1933, R. P. A. Savio, collector.

Differs from *S. cleroides* Bates, of Japan, in being smaller and more slender, with the head broader, the prothorax more swollen at sides, the elytra narrower, more extensively punctured and uniformly colored, etc. Differs from *S. cephalotes* Pic, of Tongking, in having the elytra entirely dull brown, the legs entirely pale, the third antennal segment not yellow at base, etc.

0466

Tribe **Callidini**

Genus **Ropalopus** Mulsant, 1839

3. **Ropalopus ruber** n. sp. (pl. 8, fig. 4)

Male.—Moderate-sized, strongly compressed dorso-ventrally, subparallel; antennae long, stout and strongly toothed. Color shiny reddish castaneous; antennae, prothorax and femoral clubs more reddish, elytra and ventral surfaces of body more brownish; eyes, extreme apices of femora and external margins of elytra black or dark pitchy brown; hind wings of a light brown color. Body largely glabrous on dorsal surfaces; ventral portions of body sparsely clothed with small suberect pale hairs; antennae with scattered short blackish brown hairs, a definite fringe of longer ones on inner side, denser towards apices of segments.

Head short, barely broader than anterior end of prothorax, abbreviated before eyes, subvertical anteriorly; occiput smooth, sparsely punctured; vertex broad, feebly concave between antennal insertions, closely punctured in part; frons vertical, short, less punctate on lower portion; eyes very broadly emarginate, superior lobe not very much smaller than inferior lobe, which latter is rounded-triangular. Antennae one-third longer than body; scape short, subcylindrical, distinctly punctured; second segment barely longer than broad; third one-fourth longer than scape, slightly thickened apically; fourth to seventh subequal; eighth and ninth slightly shorter; tenth and eleventh subequal, together no longer than fourth; sixth to tenth segments acutely spined below at apices, eighth and ninth most strongly so. Prothorax fully as broad as long, obtusely rounded laterally, widest just behind middle, flattened and sparsely punctured on disk, microrugulose-punctate on sides. Scutellum short, concave, rounded behind. Elytra not quite twice as long as head and prothorax combined, parallel, dehiscent and subrounded apically; surfaces finely punctured, coarsely wrinkled from end of basal third to near apex. Ventral surfaces finely, and in the main sparsely, punctured; metasternum flat; metepisterna convex. Femora pedunculate and strongly clavate; tarsi slender, first segment of posterior pair nearly as long as following two combined. Length 13.3; breadth 4.6 mm.

Holotype, male (British Museum, Nat. Hist.), "N. China" (probably from Kiangsu, Chekiang or Anhwei Province, east China), 1855, probably collected by Robert Fortune.

Differs from *Ropalopus clavipes* (Fabricius) in being smaller, red instead of black, with the dorsal surfaces much less heavily punctured, the femora more suddenly clavate, the third antennal segment relatively longer and thicker, the third to fifth segments not distinctly spined internally at apices, the apical segment more strongly acuminate distally, and the last two segments together hardly longer than the ninth.

Subfamily **Lamiinae**

Tribe **Apodasyini**

Genus **Mimanaesthetis** Pic, 1926

4. **Mimanaesthetis bowringi** n. sp. (pl. 8, fig. 2)

Female.—Body reddish brown, paler on head, prothorax, coxae and apices of middle abdominal segments and most of last; tibiae, apical portions of femora and basal portions of tarsi nearly black. Body almost entirely clothed with long, fine, erect grayish white hairs, blackish brown on antennae, where they are longer internally, reddish brown and relatively short on front of head, shortest on sides of metathorax.

Head as broad as widest part of prothorax, constricted behind eyes, a little less densely so on parts of vertex than on rest of surface; frons moderately convex, about as high as wide, wider on upper part than at clypeal margin; vertex broad, slightly convex; occiput with a fine median carina; eyes large, superior lobes approaching each other, inferior lobes nearly reaching genal margins, a little deeper than wide. Antennae practically as long as body; scape gradually thickened to beyond middle, cylindrical apically, irregularly punctured, as long as second and third segments combined; third segment very slightly thickened distally, equal in length to fourth and fifth segments; fourth and following equal in shape and thickness, hardly swollen apically, subcylindrical; fifth to tenth gradually shortened. Prothorax one-third broader than long, moderately convex at each side; nearly as broad at apex as at base; surfaces closely punctured, particularly at sides, a narrow median impunctate raised line on disk from near base to a short distance beyond center. Elytra parallel, bluntly rounded apically, irregularly, deeply, and rather closely, punctured, less heavily so at apices. Ventral surfaces heavily punctured on anterior portion and sides of metasternum and on metepisterna, finely, sparsely and subasperately so on abdomen. Legs short; tarsi slender. Length 7.4; breadth 2.5 mm.

Holotype, female (British Museum, Nat. Hist.), Hong Kong Island, off southern Kwangtung, S. China, 1848, J. C. Bowring, collector.

Differs from *M. atripennis* Pic, of Tongking, in having longer hairs on the outer sides of the antennae, in having the prothorax broader, more evenly rounded laterally and less constricted basally, the elytra reddish instead of blackish, more densely, and more completely, punctured, and grooved parasuturally for a shorter distance at apices, the sides of the metasternum more densely punctured, the legs darker, and the antennal scape entirely dark.

Named in honour of J. C. Bowring, early British official stationed at Hong Kong, as well as in other parts of the oriental tropics.

0467

Tribe **Estolini**

Genus **Sydonia** Thomson, 1864

5. **(Sydonia) ropicoides** n. sp. (pl. 8, fig. 1)

Female.—Subabbreviated, parallel, swollen, cristate or carinate dorsally. Body dark reddish brown, blackish brown on ventral surfaces and blackish on head and prothorax; antennae dark brown with bases of third and following segments reddish. Surfaces irregularly clothed with tawny, gray-brown and whitish pubescence at follows: head thinly clothed with tawny, denser on occiput and lower sides of frons; antennae thinly clothed with tawny brown, bases of third and following segments with denser pale gray pubescence; prothorax thinly clothed with tawny, subglabrous on disk; scutellum tawny; elytra with thin dull tawny brown pubescence, a narrow, irregularly defined transverse whitish band slightly behind middle, subglabrous near base and before and behind transverse pale band; ventral surfaces and legs thinly clothed with dull tawny gray-brown.

Head nearly as broad as prothorax, a few very deep punctures on vertex, occiput and behind eyes, remainder sparsely and less distinctly punctured; frons feebly convex, about as high as wide, slightly broader above; inferior eye-lobes occupying a little less than one-half distance between antennal insertions and genal margins. Antennae barely longer than body, slender; scape not very strongly swollen, subfusiform, heavily and sparsely punctured, not much shorter than third segment; fourth as long as third, one-fourth longer than fifth; fifth and following slightly diminishing in length. Prothorax about as long as broad, parallel-sided, strongly swollen above, coarsely rugose-punctate except for a small area on each side of disk and part of median line. Elytra parallel for basal three-fifths, gradually narrowed posteriorly; apices obliquely truncate and subacute; surfaces subseriately punctured, heavily so on basal half; disk of each with three raised lines, the innermost in form of a strong crest near base and a lesser one just before middle, continued posteriorly as a feeble costa, the second a distinctly raised costa from above humerus to near apex, and the third less distinct, from behind humerus to near apex. Thoracic sterna distinctly punctured at sides; abdomen nearly impunctate. Length 8.8; breadth 2.7 mm.

Holotype, female (loan deposit, Calif. Acad. Sci., Ent.), Hong Shan, alt. 950 meters, SE. Kiangsi Province, SE. China, June 26, 1936, collected by the writer.

This species does not properly belong in the genus *Sydonia*, and a new genus may be erected in the near future to contain it and certain others. It is congeneric with *Sydonia costata* Matsushita, of the Riukiu Islands, *S. subglabrata* Gressitt, of Szechwan Province, and another species from Japan. This species differs from *S. costata* Matsush. in being shorter and darker, with the scape longer, the prothorax more swollen, more coarsely punctured, and less costate,

and the elytra more strongly carinate and shorter. It differs from *S. subglabrata* Gressitt in being less attenuated, dark brown with a pale postmedian band instead of subochraceous, and in having the third antennal segment shorter, the prothorax much more coarsely punctured and swollen and the elytra more grossly punctured, more strongly crested basally and less produced apically.

華產天牛蟲之新種誌（鞘翅目：天牛科）（七）

嘉理思著

嶺南大學自然博物採集所

（摘要）

本文此節係記載發見於中國各地之各種天牛蟲。其中有五新種：— ?*Neocerambyx mandarinus*, 發見於陝西，與印度之 *N. grandis* Gahan 類似；*Stenhomalus incongruus*, 採自江蘇，與日本之 *S. cleroides* Bates 類似；*Ropalopus ruber*, 發見於中國北部，與 *R. clavipes* (Fabricius) 類似；*Mimanaesthetis bowringi*, 採自香港，則與東京之 *M. atripennis* Pic 類似；(*Sydonia*) *ropicoides*, 採自江西雖與 *S. costata Matsushita* 及 *S. subglabrata* Gressitt 同屬，但或非屬於 *Sydonia*.

Explanation of Plate

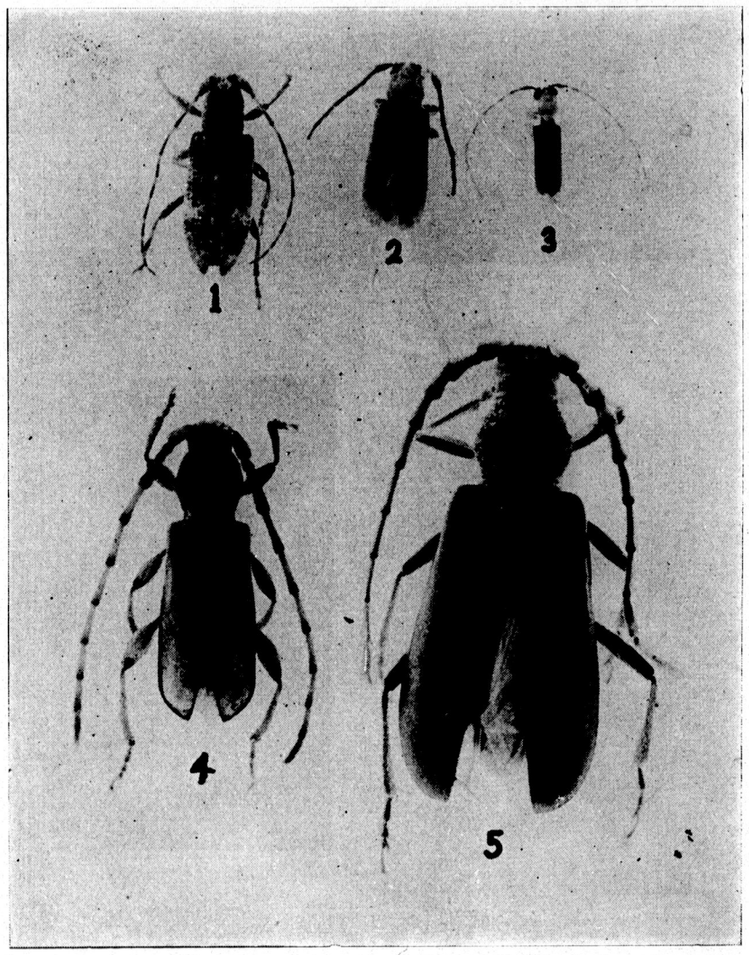
Fig. 1. (*Sydonia*) *ropicoides* Gressitt, n. sp., holotype (mag. ×3.16).

2. *Mimanaesthetis bowringi* Gressitt, n. sp., holotype (mag. × 3.16).

3. *Stenhomalus incongruus* Gressitt, n. sp., holotype (mag. × 3.16).

4. *Ropalopus ruber* Gressitt, n. sp. holotype (mag. × 3.16).

5. *Neocerambyx mandarinus* Gressitt, n. sp., holotype (mag. × 2.4).



SOME OEDEMERIDAE FROM SOUTH CHINA, HAINAN I., FORMOSA AND THE RIUKIU ISLANDS (COLEOPTERA)[1]

By J. Linsley Gressitt

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The material upon which this study is based includes the oedemerid beetles in the Lingnan Natural History Survey and Museum from Kwangtung Province, S. China, and from Hainan Island, collected under the direction of Prof. Wm. E. Hoffmann, as well as the specimens in this family collected by the writer in Formosa, the Riukiu (Loochoo) Islands, Hainan Island, and Kwangtung, Kiangsi and Fukien Provinces in southeastern China. Some additional specimens from the Riukiu Islands were kindly presented to the writer by Mr. H. Yashiro of the Naha Sugar Experiment Station, and Mr. M. Maki, formerly of the Nase Sugar Experiment Station. Seventeen species are contained in the material at hand, and of these four are from mainland south China, three are from Hainan Island, eight originated on the Island of Formosa and three were taken in the Riukiu Islands. Six of the species are from the Lingnan Natural History Survey and Museum, and thirteen are from the writer's collection. Six of the species are described as new to science, three of these being from mainland south China, and three from Hainan Island. The types of the new species are to be deposited in the Lingnan Natural History Museum and the California Academy of Sciences, with paratypes in the writer's collection and in the United States National Museum. Keys are given to both genera and species, as a provisional aid to the identification of species from these regions. At the end of the annotated list and descriptions of the species here studied is appended a list of the species of Oedemeridae known from China, Japan, Riukiu Is., Formosa, Hainan and Cochin-China. I am indebted to Prof. Wm. E. Hoffmann, Director of the Lingnan Natural History Survey and Museum, for the privilege of making this study.

Key to Genera

1. Antennae arising apart from eyes, not inserted on prominences nearly surrounded by eyes 2
   Antennae inserted on prominences nearly surrounded by eyes..... ....**Sparedropsis** Heyden
2. First four tarsal segments of two anterior pairs of legs with velvet-like tomentum beneath 3
   Only penultimate tarsal segments of two anterior pairs of legs with velvet-like tomentum beneath 5
3. Anterior tibiae with a single apical spine each 4
   Anterior tibiae with two apical spines each .....**Eobia** Semenov

[1] Contribution from the Lingnan Natural History Survey and Museum.

4. **Eyes large**, more or less rounded, barely emarginate; elytra with several distinct costae .....**Xanthochroa** W. Schmidt
   Eyes transversely reniform, distinctly emarginate anteriorly; elytra with only last costa distinct .....**Anancosessinia** Kono
5. Eyes transverse, reniform .....**Asclera** Stephens
   Eyes rounded, strongly convex .....**Oedemera** Olivier

Subfamily **Calopodinae**

Genus **Sparedropsis** Heyden, 1886

1. **Sparedropsis subserratus** n. sp.

Male.—Moderately elongate, subparallel. Body dark reddish brown, in parts almost pitchy red; antennae light brown, pale reddish at bases of segments; legs pale ochraceous brown, apices of femora pitchy brown. Surfaces thinly and rather evenly clothed with oblique pale tawny hairs, extremely short on antennae.

Head slightly broader than prothorax, closely and distinctly punctured; frons concave, transversely oblong, twice as wide as interocular portion of occiput; eyes large and deeply emarginate. Antennae nearly three-fourths as long as body, moderately slender; scape slightly swollen apically, shorter than third segment and about as long as fourth; fifth to tenth segments briefly produced at ectoapical angles. Prothorax barely broader than long, subparallel, slightly broader at middle, depressed above; surface closely punctured, slightly irregular, compressed near elytral bases. Elytra broad and depressed, closely punctured; disk of each with vestiges of four costae. Ventral surfaces finely punctured, a little more sparsely and deeply so on first two abdominal segments; last abdominal sternite evenly rounded, not quite as long as preceding segment. Length 12 mm.; breadth 3.35 mm.

Female.—Body broader; antennae barely three-fifths as long as body. Length 18 mm.; breadth 4.6 mm.

Holotype, male (Lingnan Nat. Hist. Surv. Mus.), Sam-ah-kong (Sama), Yai Dist., S. Hainan Island, May 22-25, 1932, Wm. E. Hoffmann and O. K. Lau, collectors; allotopotype, female (Gressitt coll.), May 22-23; paratopotype, male (U. S. Nat. Mus.).

Differs from *S. latipennis* Pic, of Tongking, in being of a darker or more pitchy brown, in being more slender, in having the pronotum ungrooved, etc.

Distribution.—Hainan I.

Subfamily **Oedemerinae**

Tribe **Nacerdini**

Genus **Xanthochroa** W. Schmidt, 1842

Key to Species

1. Elytra metallic 2
   Elytra non-metallic; body testaceous except for brownish black elytral apices, antennae, tibiae and tarsi .....**apicalis** Kono

2. Ventral surfaces and legs metallic green, with coppery tinges; elytra metallic green, somewhat bronzy on disk.....**baibarana** Kono
   Ventral surfaces and legs reddish ochraceous; elytra metallic blue.....**taiwana** Kono

2. **Xanthochroa apicalis** Kono

A single female was taken for the writer at Taiheizan, alt. 1,550 meters, northeastern Formosa, in June 1924, by a native collector.

Distribution.—Formosa.

3. **Xanthochroa baibarana** Kono

Several examples were collected at Arisan, alt. 2,250 meters, central Formosa, on June 2, 1932, by the writer.

Distribution.—Formosa.

4. **Xanthochroa taiwana** Kono

Two specimens from Amami-Oshina, northern Riukiu (Loochoo) Islands are in the writer's collection: one taken at Nase (Naze) by M. Maki, the other collected at Gusuku, on the east coast, on July 11, 1932, by the writer. New to the Riukiu Islands.

Distribution.—Formosa; Riukiu Is.

Tribe **Asclerini**

Genus **Eobia** Semenov, 1849

Key to Species

1. Elytra unicolorous, grayish green or testaceous brown; antennae pale; legs testaceous 2
   Elytra orange yellow with apices black; antennae black; ventral surfaces yellow; tibiae and tarsi blackish .....**chinensis** (Hope)
2. Elytra dull greenish with gray pubescence; ventral surfaces of body similarly colored and clothed .....**cinereipennis** (Motsch.)
   Elytra testaceous brown; metasternum and legs of same color; abdomen darker .....**pallidipennis** n. sp.

5. **Eobia chinensis** (Hope)

A single specimen in the writer's collection was collected at Mawashi, Okinawa I., central Riukiu Is., by H. Yashiro. New to the Riukiu Islands.

Distribution.—E. China; Riukiu Is.

6. **Eobia cinereipennis** (Motschulsky)

One specimen was collected by the writer at Gusuku, Amami-Oshima I., northern Riukiu Is., on July 10, 1932.

Distribution.—Central and S. Japan; N. Riukiu Is.

7. **Eobia pallidipennis** n. sp.

Male.—Moderately slender, subparallel. Body largely testaceous: head reddish testaceous, slightly piceous on occiput; antennae reddish

testaceous, pitchy brown basally; prothorax testaceous orange; scutellum and elytra uniformly pale brownish testaceous; thoracic sterna reddish testaceous, pitchy on metepisterna; abdomen dark brown, lighter on first and last segments; legs with tarsi pitchy brown. Surfaces clothed with sparse, subrecumbent, pale buff hairs, more whitish on metepisternum.

Head finely punctured, sparsely so on clypeus and labrum, very minutely and closely so on sides of frons; frons separated by a shallow, crescent-shaped depression from clypeus. Antennae slender, four-fifths as long as body; scape distinctly longer than third segment; third to last subequal in length, each very slightly thickened apically. Prothorax distinctly longer than broad, anteriorly not quite as broad as head at eyes; basal margin slightly expanded; surface very finely, and somewhat closely, punctured; basal portion of disk flat, almost concave. Elytra elongate, slightly narrowed apically; surface of each microscopically punctulate and bearing feeble traces of three or four costae. Ventral surfaces finely punctured; last abdominal sternite evenly rounded apically, slightly longer than preceding segment; femora slender. Length 9.5 mm.; breadth 2.55 mm.

Holotype, female (Lingnan Nat. Hist. Surv. Mus.), Hoihow, northern Hainan Island, April 11-18, 1932, F. K. To, collector; paratopotype, female (Gressitt coll.), Hoihow, May 12-14, 1932, O. K. Lau, collector.

Differs from *E. cinereipennis* (Motsch.) in having the head and prothorax narrower, the former paler and the latter more finely punctured, the elytra testaceous instead of grayish green, the ventral surfaces paler, etc.

Distribution.—Hainan I.

Genus **Anancosessinia** Kono, 1937

8. **Anancosessinia tarsalis** Kono

A single specimen was collected by the writer at Hassenzan, alt. 1,200 meters, north central Formosa, on June 22, 1932.

Distribution.—N. Riukiu Is. and Formosa.

Genus **Asclera** Stephens, 1839

Key to Species[2]

1. Elytra with very short, oblique hairs in large part dark; prothoracic hairs, if present, largely blackish; third to sixth antennal segments distinctly thickened apically 2
   Elytra with longer, pale gray or silvery buff hairs; prothoracic hairs, if present, whitish; third to sixth antennal segments slender and cylindrical, hardly thickened apically 4

[2] All the species included in this key have the prothorax testaceous or orange and the elytra at least slightly metallic.

2. Elytra blue or greenish, metallic, coarsely rugulose-punctate; antennae testaceous or piceous; prothorax longer than broad 3
   Elytra black with a slight violet-brown tinge, micropunctulate; antennae black; prothorax as broad as long ..... **brevicollis** n. sp.
3. Elytra green, somewhat brownish near suture; prothorax finely and closely punctured and densely hairy; antennae blackish brown, slightly reddish basally; scutellum lacking pale pubescence ..... **diluta** n. sp.
   Elytra bright metallic blue; prothorax deeply and sparsely punctured and sparsely hairy; antennae reddish testaceous, darker basally; scutellum with pale pubescence ..... **rugosipenne** Pic
4. Elytra finely granulose or shallowly rugulose, with distinct traces of costae on sutural halves; prothorax sparsely or very finely punctured; antennae pitchy brown; scutellum greenish black 5
   Elytra densely and distinctly punctured, lacking distinct traces of costae on sutural halves; prothorax closely and deeply punctured; antennae testaceous at apex and base, black in middle; scutellum testaceous..... ..... **loi** n. sp.
5. Prothorax nearly glabrous, sparsely punctured, with bronzy tinges; elytra with subrecumbent hairs; frons separated from clypeus by a deep groove; ventral surfaces green or bluish green ..... **formosana** Pic
   Prothorax hairy, finely punctured, with golden-green tinges; elytra with suberect hairs; frons separated from clypeus by a shallow depression; ventral surfaces blue ..... **subrugosa** Kono

9. **Asclera brevicollis** n. sp.

Female.—Relatively broad and somewhat depressed. Prothorax reddish orange with parts of apical and basal margins pitchy black; body blackish with slight metallic tinges: head black with indistinct bluish tints, reddish at antennal insertions and on apical portions of clypeus, labrum and mandibles; antennae black, slightly reddish brown on first two segments; scutellum purplish black; elytra black, tinged with dark bluish and purplish brown, hardly metallic and somewhat velvety in appearance; ventral surfaces dark green on metasternum and greenish black on abdomen; legs purplish violet on femora and blackish on tibiae and tarsi. Surfaces thinly clothed with silvery black adpressed hairs on elytra, with short, sparse, suberect black hairs on prothorax and with oblique silvery buff hairs on ventral surfaces and legs.

Head finely punctured, closely so except on clypeus and labrum; eyes small and swollen, much more widely separated than are antennal insertions; occiput with a slight central depression; frons and clypeus separated by a crescent-shaped groove. Antennae nearly two-thirds as long as body; second segment three-fourths as long as scape; third to sixth distinctly thicker than remaining five. Prothorax as broad as long, very finely punctured, a grooved ridge along center and basal margin slightly collared. Elytra minutely granular, each with almost imperceptable first and second costae. Ventral surfaces and legs minutely punctulate; last abdominal sternite triangular, blunt apically, broader than long and slightly longer than preceding sternite. Length (holotype) 12 mm.; breadth 2.7 mm. Paratypes: length 9.5-12.6 mm.; breadth 2.5-3.6 mm.

Holotype, female (loan deposit, Calif. Acad. Sci.), Gang-keu, alt. 450 meters, near Shanghang, southwestern Fukien Province, southeastern China, July 23, 1936; paratype, female (Gressitt coll.), Yimna Shan, alt. 560 meters, eastern Kwangtung Prov., June 14, 1936; paratype, female (U.S. Nat. Mus.), Hong Shan, alt. 950 meters, southeastern Kiangsi Prov., June 30, 1936. All collected by the writer.

Differs from *A. nigrocyanea* Lewis, of Japan, in having the prothorax orange, the rest of the body more blackish than bluish, and less metallic beneath, the elytra with fewer, and less distinct, costae, etc.

Distribution.—Fukien, S. Kiangsi and Kwangtung Provinces, SE. China.

10. **Asclera diluta** n. sp.

Female.—Somewhat abbreviated, compressed dorsally, subparallel-sided. Prothorax yellowish orange with slightly bronzy or greenish tinges; remainder of body largely metallic green, in parts bluish or brownish black: head black tinged with green, testaceous on apex of clypeus and reddish on apices of mandibles; antennae blackish apically and pitchy brown basally; scutellum blackish; elytra metallic green, slightly bluish apically and suffused with brownish along sutural portions; ventral surfaces bronzy green on metasternum and greenish blue on abdomen; legs bluish green on femora and purplish brown on tibiae and tarsi. Surfaces clothed with short dark hairs on elytra, silvery in certain lights on sutural portions, blackish on prothorax and silvery white on ventral surfaces and legs.

Head with moderate-sized, and fairly dense, punctures; occiput with a feeble depression in center; frons plane; clypeus raised and separated from frons by a nearly straight line. Antennae three-fifths as long as body, moderately stout, with first five segments distinctly thickened apically; second segment hardly one-half as long as, and third slightly longer than, scape. Prothorax a little longer than broad, suddenly narrowed behind middle, feebly depressed on each side of disk before middle, finely and closely punctured, and slightly collared basally. Elytra narrowed and conjointly rounded apically, densely rugose-punctate, each with almost obsolete first and second costae and a distinct lateral one. Ventral surfaces micropunctulate, more closely so on metasternum than on abdomen. Legs with feebly swollen femora and slightly curved tibiae. Length 9 mm.; breadth 2.65 mm.

Holotype, female (Lingnan Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien Dist., northern Kwangtung Province, south China, June 7-9, 1934, F. K. To, collector.

Differs from *A. rugosipenne* Pic, of Formosa, in having the antennae darker, the prothorax more hairy, more finely and closely punctured and less deeply concave on each side of disk, the elytra duller and more finely punctured, and the ventral surfaces less brilliant and green instead of blue.

Distribution.—Kwangtung, S. China.

11. **Asclera formosana** Pic

Two specimens were collected by the writer in central Formosa: one at Hori (Horisha), alt. 600 meters, May 25, 1932, the other at Bukai, east of Hori, at alt. 800 meters, June 13, 1934.

Distribution.—Formosa.

12. **Asclera loi**[3] n. sp.

Male.—Moderately stout, parallel-sided, suboblong. Body largely metallic greenish or bluish; prothorax and mesothorax yellowish orange with faint greenish gold and purplish tinges; antennae pale testaceous on first three and last three segments, black on middle five segments; head greenish black with apical portion of clypeus creamy yellow, middle portions of mandibles dark reddish and palpi ochraceous brown; scutellum pale testaceous; elytra largely green, except for violet black bases and steel blue apices, external halves slightly bluish and sutural portions greenish brown in certain lights; ventral surfaces metallic bluish green on metasternum, greenish blue on first four abdominal segments and brown tinged with blue and bronzy on last; legs blue to purplish brown on femora, reddish brown on tibiae and brownish black on tarsi. Surfaces clothed with obliquely raised silvery buff hairs on prothorax and elytra, with silvery white hairs on scutellum, apical portions of elytra and most of ventral surfaces.

Head finely punctured, densely so except on labrum, clypeus and center of occiput; frons separated from clypeus by a shallow depression. Antennae a little more than one-half as long as body; second segment one-half as long as scape; third longer than scape, barely longer than fourth; fourth to tenth subequal, hardly thickened apically; last longest, constricted at middle and more slender apically. Prothorax a little longer than broad; base with a slight collar; surfaces deeply concave on each side of disk anterior to middle and closely and finely, but deeply, punctured. Elytra together evenly rounded apically; surfaces swollen near scutellum, closely reticulate-punctate; ventral surfaces finely granulose-punctate; last abdominal sternite broadly rounded and feebly emarginate, hardly longer than preceding segment. Length (holotype) 7.2 mm.; breadth 2.7 mm. Paratype: length 8.5 mm.; breadth 2.2 mm.

Female.—Last abdominal sternite subrounded-triangular, about as long as preceding segment. Length (allotype) 9.6 mm.; breadth 2.8 mm. Paratype: length 8.5 mm.; breadth 2.4.

[3] "Loi" is the name of the main grouping of aboriginal peoples on Hainan Island.

Holotype, male (Lingnan Nat. Hist. Surv. Mus.), Tai-pin-ts'uen (Dwa-bi), alt. 450 meters, near Loi Mother Mt., central Hainan Island, April 25-26, 1935, F. K. To, collector; allotopotype, female (Gressitt coll.), April 28-30; paratopotype, female (Lingnan Nat. Hist. Surv. Mus.), April 28-30, F. K. To; paratype, male (U. S. Nat. Mus.), No-kyu-chun, central Hainan, March 22, 1936, taken by the writer's native collector.

Differs from *A. rugosipenne* Pic in being green instead of blue, slightly less metallic with the elytra not uniformly colored, the antennae black in middle and paler at extremities, the prothorax more hairy and more closely punctured, etc. Differs from *A. diluta* Gressitt in having the antennae whitish apically, the prothorax more coarsely punctured, the scutellum yellow, the elytra blackish basally, bluish apically, and even less distinctly costate.

Distribution.—Hainan I.

13. **Asclera rugosipenne** Pic

Two specimens were collected in Formosa by the writer in 1932: one at Botansha, north of Koshun, southern Formosa, on April 13, and the other at Hassenzan, north central Formosa, on June 22.

Distribution.—Formosa.

14. **Asclera subrugosa** Kono

A single example was taken by the writer at Mizuho, south of Karenko, east coast of Formosa, on April 21, 1932. New to Formosa; described from the Riukiu Islands.

Distribution.—Riukiu Is.; Formosa.

Tribe **Oedemerini**

Genus **Oedemera** Olivier

Key to Species

1. Prothorax metallic green, golden green or reddish bronze; femora partly testaceous, at least in one sex 2
   Prothorax orange testaceous; femora entirely bluish or bronzy green ..... **testaceithorax** Pic
2. Head, prothorax and elytra uniformly dull metallic green; femora dull reddish in female; antennae reddish basally and blackish apically; abdomen testaceous ..... **angustipennis** n. sp.
   Head and elytra golden green or bluish green; prothorax coppery red or brassy golden; femora greenish in female; antennae dull testaceous; first four abdominal segments metallic ..... **sauteri** Pic

15. **Oedemera angustipennis** n. sp.

Female.—Elongate and slender, flattened above; elytra dehiscent. Dorsal surfaces of head, prothorax and elytra dark green, metallic but not very shiny, tinged with blue on parts of head and on humeri and apices of elytra; antennae reddish ochraceous basally, pitchy black beyond third segment; ventral surfaces of head and thorax

bluish green to greenish blue, shiny; abdomen, coxae, femora and anterior tibiae reddish ochraceous, shiny; tarsi and middle and posterior tibiae blackish green, metallic. Elytral surfaces thinly clothed with short, oblique grayish buff hairs; ventral surfaces with sparser, and more erect whitish gray hairs.

Head much longer than broad, finely granulose-punctate; clypeus and labrum nearly impunctate. Antennae slender, about two-thirds as long as body; scape arched, about two-thirds as long as third segment; third to seventh nearly equal in length, feebly thickened at apices. Prothorax about one-third longer than broad, widest before middle, but nearly as broad at base, feebly constricted behind middle; anterior and posterior borders raised; surfaces finely rugose-punctate, indistinctly carinate medially. Elytra narrow, attenuated posteriorly; surface of each closely punctate or rugose-punctate and bearing a short first costa and a median and a lateral one extending to apex. Ventral surfaces minutely punctate, more densely so on thoracic pleura; last abdominal sternite narrowly triangular, briefly emarginate apically. Length 9.5 mm.; breadth 1.9 mm.

Holotype, female (Lingnan Nat. Hist. Surv. Mus.), Taam-yuen-tung, Lien Dist., northern Kwangtung Province, S. China, June 1, 1934, F. K. To, collector.

Differs from *O. sauteri* Pic in having the pronotum dark green like the elytra, instead of golden or bronzy, in having the antennae darker apically, the femora and abdomen reddish orange instead of green, etc.

16. **Oedemera sauteri** Pic

Two specimens were collected by the writer in Formosa in 1932: a female at Kuraru, near Koshun, southern Formosa, April 11, and a male at Mizuho, south of Karenko, east coast of Formosa, April 21.

Distribution.—Formosa.

17. **Oedemera testaceithorax** Pic

Two examples were taken by the writer in Formosa in 1932: a male at Mizuho, April 21, and a female at Hassenzan, June 23; the Lingnan Nat. Hist. Surv. Mus. has many specimens collected by F. K. To at Yaoshan, and one each at Linchow and Taam-yuen-tung, Lien Dist., northern Kwangtung Prov., S. China, April 16 to June 1, 1934; a few examples were taken by the writer at Tsin-leong Shan, eastern Kwangtung, June 15, 1936.

Distribution.—S. China; Formosa.

List of Oedemeridae of China, Japan and Neighboring Regions

Subfamily **Calopodinae**

Genus **Sparedropsis** Heyden, 1886
(*Saloninus* Fairmaire)

angustatus Pic, 1923, Mel. Exot. Ent. 39: 22 (Cambodia).

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atricolor Pic, 1935, Rev. français Ent. 2: 100 (Tongking).

davidis Fairmaire, 1888, Rev. d'Ent. 7: 131 (Pekin). (*Sparedrus*): 1891, Ann. Soc. Ent. Belg. 35: cxxxiv (*Saloninus*).

latipennis Pic, 1923, Mel. Exot. Ent. 39: 22 (Tongking).

subserratus Gressitt, n. sp. (Hainan I.).

Genus **Ocularium** Pic, 1922

rufum Pic, 1922, Mel. Exot. Ent. 36: 18 (Tongking).

Subfamily **Oedemerinae**

Tribe **Nacerdini**

Genus **Xanthochroa** W. Schmidt, 1842

ainu Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 436 (Hokkaido, Japan); Kono, 1932, Ins. Matsumurana 6 (3): 141 (Honshu).

angustata Pic, 1922, Mel. Exot. Ent. 37: 22 (Tongking).

apicalis Kono, 1932, Ins. Matsumurana 6(3): 141 (Baibara, Formosa).

atriceps Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 436 (Honshu, Japan); Kono, 1932, Ins. Matsumurana 6 (3): 141 (Sachalin, Hokkaido and Kuriles).

atricornis Pic, 1922, Mel. Exot. Ent. 37: 22 (Tongking).

atripennis Pic, 1934, Mel. Exot. Ent. 64: 29 (China).

baibarana Kono, 1932, Ins. Matsumurana 6 (3): 139 (Baibara, Formosa).

caudata Kono, 1936, Festschr. E. Strand 1:157 (Honshu and Shikoku, Japan).

coomani Pic, 1925, Bull. Soc. Ent. France: 301 (Tongking).

fulvicrus Fairmaire, 1889, Ann. Soc. Ent. France, ser. 6, 9: 50 (Moupin, W. China).

hilleri Harold, 1878, Deutsche Ent. Zeitschr. 22: 81 (Japan); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 437; Kono, 1932, Ins. Matsumurana 6 (3): 142.

var. *impressithorax* Pic, 1936, Mel. Exot. Ent. 67: 24 (Japan).

katoi Kono, 1932, Ins. Matsumurana 6 (3): 140 (Honshu, Japan).

luteipennis Marseul, 1876, Ann. Soc. Ent. France, ser. 5, 6: 484 (Japan); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 457.

metallipennis Fairmaire, 1889, Ann. Soc. Ent. France, ser. 6, 9: 49 (Moupin, W. China).

potanini Ganglbauer, 1889, Hor. Soc. Ent. Ross. 24: 36 (Szechwan Prov., W. China).

semenowi Ganglbauer, 1889, Hor. Soc. Ent. Ross. 24: 37 (Kansu Prov., NW. China).

strandi Kono, 1936, Festschr. E. Strand 1: 518 (Japan).

taiwana Kono, 1932, Ins. Matsumurana 6 (3): 140 (Formosa).

testaceithorax Pic, 1922, Mel. Exot. Ent. 37: 22 (Tongking).

umenoi Kono, 1937, Bull. Umeno Ent. Lab. 5: 3 (?Japan).

violaceonotata Pic, 1922, Mel. Exot. Ent. 37: 22 (Tongking).

waterhousei Harold, 1875, Col. Hefte 14: 93 (Japan); 1876, Abh. Nat. Ver. Bremen 5: 133; 1877, Deutsche Ent. Zeitschr. 21: 360; Heyden, 1879, Deutsche Ent. Zeitschr. 23: 355; Kolbe, 1886, Archiv. Naturgesch. 52: 209 (Korea); Kono, 1932, Ins. Matsumurana 6 (3): 139.

cyanipennis Marseul, 1876, Ann. Soc. Ent. France, ser. 5, 6: 483 (Japan).

var. *bicostata* Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 436 (Japan).

var. *subviolacea* Pic, 1911, L'Echange 27: 101 (Yunnan).

yunnana Pic, 1923, Mel. Exot. Ent. 39: 23 (Yunnan).

Genus **Nacerda** Stephens, 1839

coarctata (Germar), 1824, Ins. Spec. Nov.: 165 (Siberia) (*Oedemera*); Kono, 1932, Ins. Matsumurana 6(3): 143 (Sachalin and Korea).

sambaca Schenkling, 1915, Col. Cat. 65: 19 (misspelling).

sambucea Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 439 (Hokkaido and Honshu, Japan) (*Anoncodes*).

davidis (Fairmaire), 1886, Ann. Soc. Ent. France, ser. 6, 6: 352 (Moupin, W. China).

melanura (Linnaeus), 1758, Syst. Nat., ed. 10, 1: 403 (*Cantharis*); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 439 (Japan).

strangulata Fairmaire, 1889, Ann. Soc. Ent. France, ser. 6, 9: 50 (Moupin, W. China) (*Anoncodes*).

Genus **Ezonacerda** Kono, 1934

nigripennis (Matsumura), 1911, Jour. Coll. Agr. Sapporo 4: 128 (Sachalin) (*Oedemera*); Kono, 1932, Ins. Matsumurana 6 (3): 143 (Hokkaido and Kuriles) (*Nacerda*); 1934, op. cit. 9: 28 (*Ezonacerda*); 1935, op. cit. 9: 85.

Tribe **Asclerini**

Genus **Pseudolycus** Guerin, 1833

uniformis Pic (undescribed ?)

var. *nigriceps* Pic, 1909, Naturaliste 31:19 (Yunnan) (*Pseudolycas*).

Genus **Ditylus** Fisch. v. Waldh., 1817

laevis (Fabricius), 1787, Mant. Ins. 1: 213 (Europe) (*Helops*); Matsumura, 1911, Jour. Coll. Agr. Tohoku Imp. Univ., Sapporo, 4: 129.

Genus **Schistopselaphus** Fairmaire, 1896

sonani Kono, 1937, Ins. Matsumurana 11 (4): 140, fig. 4 [Kotosho (Botel-Tobago I.), near Formosa].

Genus **Copidita** J. LeConte, 1866

saigonensis Pic, 1928, Mel. Exot. Ent. 52: 12 (Saigon, Indo-China).

testaceopyga Pic, 1923, Mel. Exot. Ent. 39: 32 (China).

Genus **Eobia** Semenov, 1849

ambusta Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 438 (Kyushu, Japan).

cinereipennis (Motschulsky), 1866, Bull. Moscou 39 (1): 173 (Japan) (*Asclera*); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 437.

var. *ishigakiana* Kono, 1937, Bull. Umeno Ent. Lab. 5: 9 (Ishigaki I., Riukiu).

var. *ogasawarensis* (Matsumura), 1915, Dainippon Gaichu Zensho 8: 227, pl. 28, fig. 17 [Ogasawara (Bonin) Islands]; Kono, 1937, Ins. Matsumurana 11 (4): 138.

chinensis (Hope), 1845, Trans. Ent. Soc. London 4: 10 (Chusan Is., E. China) (*Nacerda*); Schenkling, 1915, Col. Cat. 65: 32 (*Sessinia*).

var. *kotoensis* Kono, 1937, Ins. Matsumurana 11 (4): 138 [Kotosho (Botel-Tobago I.), near Formosa].

curticornis Pic, 1911, Deutsche Ent. Nat.-Bibl. 2: 188 (Formosa).

var. *diversithorax* Pic, 1927, Ent. Mitt. 16: 48 (Formosa).

florilega Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 438 (Japan).

formosana Pic, 1923, Mel. Exot. Ent. 39: 31 (Formosa).

matsumurai Kono, 1937, Ins. Matsumurana, 11 (4): 138, fig. 2 [Ogasawara (Bonin) Islands].

nigriceps Pic, 1923, Mel. Exot. Ent. 39: 30 (Japan).

pallidipennis Gressitt, n. sp. (Hainan I.).

piceopyga Pic, 1923, Mel. Exot. Ent. 39: 31 (China).

testaceiceps Pic, 1923, Mel. Exot. Ent. 39: 30 (China).

var. *seraphini* Pic, 1934, Mel. Exot. Ent. 63: 25 (Annam).

Genus **Alloxacis** G. Horn, 1896

geniculata Kono, 1937, Bull. Umeno Ent. Lab. 5: 10 (Okinawa I., Riukiu).

Genus **Sessinia** Pascoe, 1863

fuscostrigosa (Fairmaire), 1879, Rev. Zool., ser. 3, 7: 203 ("Souf", China) (*Nacerdes*); 1894, Ann. Soc. Ent. France 38: 312 (*Ananca*); Schenkling, 1915, Col. Cat. 65: 32.

sinensis (Gemminger), 1870, Col. Hefte 6:124 (Hong Kong) (*Ananca*).

chinensis Boheman, 1858, Resa Eugen.: 111 (nec Hope) (*Nacerdes*).

Genus **Anancosessinia** Kono, 1937

tarsalis Kono, 1937, Ins. Matsumurana 11 (4): 140, fig. 3 (Tanegashima, Riukiu; Baibara, Formosa).

Genus **Falsosessinia** Pic, 1923

inspinosa Pic, 1923, Mel. Exot. Ent. 39: 29 (Saigon).

Genus **Probosca** W. Schmidt, 1846

haemorrhoidalis Pic, 1907, L'Echange 23: 174 (China).

maculicollis Pic, 1907, L'Echange 23: 174 (China).

Genus **Asclera** Stephens, 1839

abdominalis Heyden, 1887, Deutsche Ent. Zeitschr. 31: 30 (Siberia); Tamanuki, 1931, Kontyu 5: 161 (Sachalin).

binotata Pic, 1927, Mel. Exot. Ent. 49: 13 ("Tonkin or Yunnan").

brevicollis Gressitt, n. sp. (SE. China).

carinicollis (Lewis), 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 439 (male; Hokkaido, Japan) (*Oxacis*); Kono, 1937, Ins. Matsumurana 11 (4): 137 (Honshu, Shikoku and Kyushu).

brunneipennis Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 440 (female; Hokkaido).

chapaensis Pic, 1927, Mel. Exot. Ent. 49: 13 (Chapa, Tongking).

coreana Fleischer, 1919, Ent. Blätter 15: 168 (Korea) (*Ischnomera*, subgenus *Asclera*).

dalatensis Pic, 1929, Mel. Exot. Ent. 52: 12 (Annam).

var. *bifoveolata* Pic, 1934, Mel. Exot. Ent. 64: 29 (Annam).

diluta Gressittt, n. sp. (Kwangtung, S. China).

formosana Pic, 1910, L'Echange 26: 95 (Formosa); 1927, Ent. Mitt. 16: 48.

griseicornis Pic, 1922, Mel. Exot. Ent. 37: 23 (Tongking).

japonica Pic, 1910, L'Echange 26: 95 (Japan); Kono, 1937, Ins. Matsumurana 11 (4): 137 (Shikoku).

ruficollis (Lewis), 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 434 (Honshu) (*Ditylus;* nec Say, 1823); Seidlitz, 1899, Naturgesch. Ins. Deutschl. 5 (2): 821, 827.

loi Gressitt, n. sp. (Hainan I.).

longipennis Pic, 1922, Mel. Exot. Ent. 37: 23 (Tongking).

maculicollis Ganglbauer, 1890, Hor. Soc. Ent. Ross. 24: 42 (Kansu, NW. China); Seidlitz, 1899, Naturgesch. Ins. Deutschl. 5 (2): 850 (Subgenus *Ascleropsis*).

nigrocyanea Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 440 (Honshu and Kyushu, Japan); Kono, 1937, Ins. Matsumurana 11 (4): 136 (Hokkaido and Kuriles).

obsoleta Ganglbauer, 1890, Hor. Soc. Ent. Ross. 24: 43 (Shansi, NW. China).

peculiaris Pic, 1914, Mel. Exot. Ent. 9: 16 (Laokay, Tongking).

rugosipennis Pic, 1910, L'Echange 26: 95 (Formosa); 1927, Ent. Mitt. 16: 48.

subrugosa Kono, 1937, Ins. Matsumurana 11 (4): 137, fig. 1 (Okinawa I., Riukiu).

Genus **Chrysanthia** W. Schmidt, 1846

integricollis Heyden, 1886, Deutsche Ent. Zeitschr. 31: 275 (Siberia); Seidlitz, 1899, Naturg. Ins. Deutschl. 5 (2): 867; Kono, 1937, Ins. Matsumurana 11 (4): 136 (Kurile Is.).

viatica Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 443 (Honshu and Hokkaido, Japan); Kono, 1935, Ins. Matsumurana 9 (3): 86 (Kuriles and Sachalin).

Genus **Patiala** Lewis, 1895

antennata Lewis, 1895, Ann. Mag. Nat. Hist. 434, pl. 8, fig. 12 (Honshu, Japan).

deformis Lewis, 1895, loc. cit.: 435 (Honshu, Japan).

ocularis Lewis, 1895, loc. cit.: 435 (Honshu, Japan).

testaceipennis Pic, 1923, Mel. Exot. Ent. 39: 28 (China).

Tribe **Oedemerini**

Genus **Oncomera** Stephens, 1839

venosa Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 441, fig. 9 (Honshu, Japan); Matsumura, 1931, 6000 Illus. Ins. Japan: 203, fig. 514 (Hokkaido); Kono, 1937, Ins. Matsumurana 11 (4): 141 (Kuriles, Kyushu and Shikoku).

cinereipennis Matsumura, 1915, Thous. Ins. Japan 3: 129, pl. 51, fig. 10 (*Sessinia;* nec. Mots.).

vitticollis Motschulsky, 1866, Bull. Mosc. 39 (1): 174 (Japan); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 441; Seidlitz, 1899, Naturg. Ins. Deutschl. 5 (2): 883, 905.

Genus **Oedemera** Olivier, 1794

amurensis Heyden, 1884, Deutsche Ent. Zeitschr. 28: 295 (Siberia); Tamanuki, 1931, Kontyu 5: 163 (Kaibato I.); Kono, 1934, Ins. Matsumurana 9: 30 (Sachalin and Korea).

angusticollis Fairmaire, 1888, Rev. d'Ent. 7: 131 (Peking).

angustipennis Gressitt, n. sp. (Kwangtung, S. China).

concolor Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 442 (Hokkaido, Japan); Kono, 1935, Ins. Matsumurana 9(3): 86 (Sachalin and Kuriles).

coreana Pic, 1926, L'Echange 42: 6 (Korea).

flaviventris Fairmaire, 1891, Bull. Soc. Ent. Belg. 35: ccxix (Tschang-yang, China).

inapicalis Pic, 1910, L'Echange 26: 65 (China).

lucidicollis Motschulsky, 1866, Bull. Moscou 39 (1): 174 (Japan); Kono, 1935, Ins. Matsumurana 9 (3): 86 (Kuriles and Hokkaido).

montana Marseul, 1876, Ann. Soc. Ent. France, ser. 5, 6: 486 (Japan); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 441 (Honshu and Kyushu).

manicata Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 442 (Honshu, Japan).

pallidipes Pic, 1907, L'Echange 23:174 (China) (subgenus *Oedemerella*).

robusta Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 443 (Honshu, Japan).

sauteri Pic, 1927, Ent. Mitt. 16: 48 (Formosa).

sexualis Marseul, 1876, Ann. Soc. Ent. France, ser. 5, 6: 486 (Japan); Lewis, 1895, Ann. Mag. Nat. Hist., ser. 6, 15: 441.

sieversi Seidlitz, 1899, Naturgesch. Ins. Deutschl. 5 (2): 908, 919 (Korea) (subgenus *Oedemerella*).

tastaceipennis Pic, 1922, Bull. Soc. Ent. France: 170 (Tongking).

tastaceithorax Pic, 1927, Ent. Mitt. 16: 49 (Formosa; "originally described from China").

var. *okinawana* Kono, 1937, Bull. Umeno Ent. Lab. 5: 11 (Okinawa I., Riukiu) (subgenus *Oedemerella*).

華南海南島台灣及琉球島之擬天牛蟲(鞘翅目)

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(摘要)

經研究之各標本中，考得十七種。其採自華南者四種，海南島者三種，台灣者八種，及琉球者三種。其中六種爲新種(三種發見於中國內地，三種發見於海南)。其屬與品種，皆有檢索表以辨別之。對於中國，琉球，台灣，及海南島等地之擬天牛蟲名錄，亦見文中。上文所述新種:—*Sparedropsis subserratus*, 採自海南，與 *S. latipennis* Pic 類似；*Eobia pallidipennis* 亦採自海南，則與 *E. cinereipennis* (Motsch.) 類似；*Asclera brevicollis*, 採自中國東南部，則與日本之 *A. nigrocyanea* Lewis 類似；*A. diluta*, 採自廣東，則與台灣之 *A. rugosipenne* Pic 類似；海南之 *A. loi* 則亦與 *A. rugosipenne* Pic 類似；廣東之 *Oedemera angustipennis* 則與 *O. sauteri* Pic 類似，

BOOKS AND SPECIAL PUBLICATIONS

BIBLIOGRAPHY OF TROPICAL AGRICULTURE, 1936, vii and 326 p., International Institute of Agriculture, Prof. ALESSANDRO BRIZI, general secretary, Villa Umberto I, Rome, 1937. 10 lire.

BIBLIOGRAPHY OF TROPICAL AGRICULTURE, 1937, vii and 420 p., International Institute of Agriculture, Prof. ALESSANDRO BRIZI, general secretary, Villa Umberto I, Rome, 1938. 15 lire.

"Each volume contains the titles of all publications relating to the Agriculture of Tropical Regions, with the exception of those relating to stock breeding, to questions of a purely economic character and to plant diseases and pests, these subjects being already treated in other publications of the Institute. Each title is accompanied by a summary in English and French, giving in a few lines the views expressed by the authors."

BIBLIOGRAPHY ON SOIL EROSION AND SOIL AND WATER CONSERVATION, by STANLEY H. GAINES, with abstracts by FRANCESCA VINCENT, MARION BLOOM and JAMES F. CARTER, v and 650 p., paper, Miscellaneous Publication of the United States Department of Agriculture, No. 312, Washington, D. C., 1938. $0.60 U. S. cy.

A comprehensive list of references is given alphabetically by authors, under the following subjects: Erosion and conservation in general; Bibliographies; Climate and physiography as related to soil erosion; Drought; Economic and farm management phases of soil conservation; Educational phases of soil conservation; Engineering in erosion control; Flood control and related subjects; Forest cover in soil and water conservation; Gullies; Land-use planning and surveys for soil and water conservation; Legislation; Pasture and range management; Run-off and soil loss; Soil structure, fertility, and moisture studies; Stream flow, sedimentation, and related subjects; Vegetative and tillage control in general; Wildlife management as related to soil conservation; Wind erosion, windbreaks, and shelterbelts; Wood lots. Brief abstracts are given for each reference. While only those studies are included that are of significance to workers in the United States, the bibliography will be of value to all who are interested in soil conservation problems. Citations to 28 papers dealing specifically with problems in China are given.

L'INDOCHINE FRANCAISE, Recueil de notices rédigées a l'ocassion du Xe congrès de la Far Eastern Association of Tropical Medicine—Hanoi (Tonkin) 24-30, novembre 1938. [FRENCH INDOCHINA, Collections of articles prepared on the occasion of the X Congress of the Far Eastern Association of Tropical Medicine—Hanoi (Tonkin), November 24-30, 1938], by JEAN LOUBET, et al., 428 p., *51 illus., 3 maps, 4 tab.*, 1938.

The articles which comprise this volume are grouped in two sections: a series on topics of more or less general interest, and a somewhat shorter series pertaining directly to medical and public health work in Indo-china. The first series is itself susceptible of further division. The first seven contributions present the geographical and historical background of French Indochina, a region whose topography makes for segmentation rather than for unification, with a population racially and linguistically diverse. There had been no political unity in Indochina before the period of French control. In Tonkin and Assam the influence of China had been dominant, while the civilizations of Champa, Cambodia, and Laos had been primarily Indian in character. The remaining chapters in Part One are concerned with the present activities of the French in, and on behalf of, Indochina: the administrative organization, public works, educational system, and so on. The account of the efforts being made to preserve the indigenous arts in Cambodia is especially interesting.

The first article in Part Two outlines the organization of all the Public Health work. It is followed by separate reports for each of the six adminis-

trative districts, for the army, for the four Pasteur Institutes, for the Radium Institute, and for the veterinary service. The reports include statistics on personnel, number of patients treated, equipment, etc. for the year 1937.

CHARLOTTE D. GOWER

SOILS AND MEN, Year book of Agriculture, 1938, by the COMMITTEE ON SOILS, xiii and 1232 p., *portrait, 240 fig., 118 tab.*, 8vo., cloth, United States Department of Agriculture, Washington, D. C., 1938. $1.75 U. S. cy.

This book contains 58 essays on the nature of soils, their use and conservation, with special reference to problems in the United States. Much of the material discussed is equally applicable to Chinese conditions.

ABSTRACTS AND REVIEWS

An attempt is made to notice, abstract, or review articles and publications dealing with the biological and physical sciences in China. Articles in these fields which do not pertain specifically to China but contain information of interest and value to scientists and others in China are also included. Although this abstract service is maintained primarily for the benefit of people in China (where scientific literature is not plentiful) it is hoped that it will also be of service to those in other countries who are interested in following the progress of science in China.

Obviously we can make mention of, or abstract, only such literature as comes to the attention of the editors who, accordingly, will appreciate receiving literature for this purpose. Literature thus received is placed in Lingnan University Library.

Akiyama, T. Life-history of *Lema tristis* Herbst in north Manchuria. (In Japanese.) *Manchuria Biol. Soc. Rept.* 1(3) :49-50, 1938.—*Lema tristis* Hbst. is one of the most important pests of Italian millet (*Setaria italica*) in Manchuria, where it has one generation a year. The adults overwinter among dried plants and in stubble, and resume feeding in June, also attacking wheat, rice and rye, and to a very slight extent barley and maize. The females deposit about 37 eggs, usually singly and on the upper sides of the leaves, from mid-June to July. The eggs hatch in 4-9 days, and the larvae feed for 15-26 days on the young leaves, preferring those of Italian millet, and pupate in the soil. The pupal stage lasts 7-13 days, and the adults emerge from late July to early September. They feed for a time and begin to enter hibernation in late September. The males and females live for 326-400 and 329-410 days, respectively.

REV. APPL. ENT.

Alexander, Charles P. New or little-known Tipulidae from eastern Asia (Diptera), XL. *Phil. Jour. Sci.* 67(2) :129-166, *3 pl.*, 1938.—The crane flies described in this report are all from N. Korea. Thirty-four species, 2 subspecies and 3 varieties are described. Of the species 25 are new to science and both the subspecies are new.

Allen, Caroline K. Studies in the Lauraceae. II. Some critical and new species of *Cinnamomum* and *Neocinnamomum*. *Jour. Arn. Arb.* 20(1) :44-63, 1939.—Studies were made on 28 species of *Cinnamomum* and 2 of *Neocinnamomum*. Most of the species are from tropical Asia with a few from W. and central China and Japan. The following are new : *C. platyphyllum* (Diels) [*Machilus platyphylla* Diels] ; *C. Burmanni* Blume var. *angustifolium* (Hemsl.) [*C. pedunculatum* Nees var. *angustifolium* Hemsl.] ; *C. Lioui* n. sp. (Kwangtung) ; *C. ovatum* n. sp., *C. Tsoi* n. sp., *C. Merrillianum* n. sp., *C. Liangii* n. sp. (all from Hainan) ; *Neocinnamomum hainanianum* n. sp. (Hainan) ; *N. Wilsoni* n. sp. (western and central China).

Ames, Oakes. Resupination as a diagnostic character in the Orchidaceae with special reference to *Malaxis monophyllos*. *Bot. Mus. Leaf. Harvard Univ.* 6(8) :145-183, *28 fig.*, 1938.—Resupination is regarded as a purely physiological phenomenon which should be treated with circumspection in taxonomic work.

Anderson, R. H. Trees from other lands. *Agri. Gaz. N.S.W.* 49 (12) :643-646, *4 fig.*, 1938.—In this section of a paper on the advantages of systematic introduction of trees, those contributed to New South Wales by China and Japan are treated, among others. Seventeen useful and ornamental trees are mentioned.

André, Marc. Description de trois Halacariens de Cochinchine. *Bull. Mus. Nat. Hist. Nat.*, ser. 2, 9(3) :206-211, *3 fig.*, 1937.—*Copidognathus* (s. str.) *Bavayi* Troues., *C.* (s. str.) *manicatus* Trt., and *C.* (s. str.) *spinula* Trt. are redescribed in detail and figured.

Andrews, Mary N. A survey of intestinal parasites in Chinese hospital patients in Shanghai. *Chinese Med. Jour.* 54(4) :341-350, *4 tab.*, 1938.—Records for a 5 year period show that 67% of the individuals examined

contained parasites. Protozoa were found in 695 persons (24%), with *Endamoeba coli, E. nana, E. histolytica, Giardia* and *Trichomonas* most frequently occurring. *E. histolytica* showed 4.3% infection, with 84 cyst carriers, many of whom had apparently recovered from diarrhaea and showed no symptoms. One case of *Isospora hominis* infection was found. Helminths were found in 1753 patients (61%). Hookworms and *Ascaris* were common; the cases of trematode infections all came from endemic areas outside Shanghai. Cestodes were found in only 7 cases (6 of *Taenia* and one of *Hymenolepis nana*).

Andrews, Mary N., and **Chu, Tso-Chih.** Note on a malaria survey in Kiao-Chiao. *Chinese Med. Jour.* 52(6) :884-886, *2 tab.*, 1937.—Surveys of school children were made in Summer, Autumn and Spring terms of school. A total of 7,766 examinations showed 324 positive for malarial parasites. Incidence was highest in Autumn and lowest in Spring. The dominant parasite was *Plasmodium vivax*, next in frequency *P. malariae* and the least frequent *P. falciparum*. Gametocyte carriers were common in all three species. FROM AUTHORS' SUMMARY

Anonymous. The annual report of the Formosan agriculture, 1938. (In Japanese with English table of contents.) *Formosan Agri. Rev.*, No. 385, p. 1-200, 1938.—A report, mostly in tabular form, on the following subjects: Climate; Land, cultivated land and irrigation system; Division and management of cultivated lands; Agricultural population; Agricultural products; Production in agricultural manufactures; Import and export of principal agricultural products; Fertilizer; Emigration; Agricultural association; Outline of Agricultural Institution; Agricultural policy and experimental organs; Agricultural statics [sic] in savage land.

Anonymous. Botanical Magazine. *From* Miscellaneous Notes. *Bull. Misc. Inform.*, No. 7, p. 311, 1938.—"Part I of vol. 161 was published on April 8th, 1938. It contains the following plant portraits : . . . . *Meconopsis superba* King ex Prain (t. 9513), the handsome white-flowered species found in the Chumbi District, Tibet, and in Western Bhutan; . . . . *Gaultheria Wardii* Marquand & Airy Shaw (t. 9516), a fine purple-fruited species found in S. E. Tibet, N. E. Assam and N. W. Upper Burma; . . . . *Prunus* (*Cerasus*) *dawyckensis* Sealy (t. 9519), a new species or possibly a hybrid, probably Chinese, but known only in cultivation in Lt. Col. F. R. S. Balfour's garden at Dawyck, Stobo, Scotland; *Cypripedium japonicum* Thunberg (9520), described in 1784, a native of Japan and China; . . . . . ." FROM BULL. MISC. INFORM.

Anonymous. New species of insects described from the Empire of Japan in 1937. *Ins. Matsumurana* 12(4) :199-208, 1938.—A bibliography, listing names of new species under each title. There are 18 references to Hymenoptera, 11 to Diptera, 50 to Coleoptera, 23 to Lepidoptera, 15 to Rhynchota, 6 to Thysanoptera, 1 each to Neuroptera, Orthoptera, Odonata, Ephemerida.

Anonymous. Rice : food crop of tropical and sub-tropical lands. *Malayan Agri. Jour.* 26(12) :530-534, *1 tab.*, 1938.—Abstract.

Aoyama, T. A pear midge (preliminary report). (In Japanese.) *Rept. Jap. Assn. Adv. Sci.* 13(3) :473-476, *5 fig.*, 1938.—Descriptions are given of all stages of an unidentified species of *Diplosis* that is very injurious to pear in Korea. It has two generations a year, the adults emerging in early May and in August, and overwinters in the larval or pupal stage. Females of the overwintered generation deposit 5-13 eggs each in the young pears in May, causing them to fall, and the larvae pupate in the soil in mid-July. First-generation females oviposit in the leaf stalks, and the larvae bore in the fruit buds near the stalks, 3-12 larvae occurring in a bud, and become full-fed in late September. REV. APPL. ENT.

Baliani, Armando. Studi sulle *Amara* Asiatiche (Coleopt. Carabidae). XI. *Boll. Soc. Ent. Ital.* 70(9-10) :183-187, *4 fig.*, 1938.—Four new species are described and figured. *A.* (s. str.) *Kaulbacki* and *A.* (s. str.) *laevistriata* are from Tibet, *A.* (*Celia*) *rubroangulata* from Szechwan and E. Tibet, *A.* (s. str.) *consimilis* from Korea.

Banks, Nathan. Further Neuropteroid insects from Malaya. *Jour. Fed. Malay States Mus.* 18(2) :220-235, *17 fig.*, 1938.—Sixty-seven species are listed as new to Malaya. Eleven new species are included. *Phanoperla pallipennis* n. sp. is also from Hainan Island. There is a key to the Chrysopidae of the Malay Peninsula.

Bernhauer, Max. Neue Staphyliniden aus China. *Notes Ent. Chin.* 5(6) :49-57, 1938.—Ten new species are described from north China : *Anthobium chinense*, near *A. minutum* F.; *Geodromicus sinuatocollis*, near *G. sinuatus* Sharp; *Paederus Licenti*, related to *P. birmanus* Fauv.; *Xantholinus* (s. st.) *densicephalus*, distinguished from *X. suffusus* Shrp.; *Staphylinus* (*Platydracus*) *Becquarti*, near *S. pseudopaganus* Bernh.; *Tachinus Licenti*, near *T. scapularis* Steph.; *T. Becquarti*; *Falagria* (*Melagria*) *Becquarti*, compared with *F. nigra* Grav.; *Atheta* (s. str.) *Licenti*; *Oxypoda* (*Podoxya*) *tcheulyensis*, near *O. vicina* Kr.

Bollow, H. Monographie der palaearktischen Dryopidae, mit Berücksichtigung der eventuell transgredierenden Arden (Col.). *Mitteil. Münchner Ent. Ges.* 28(2) :147-182, *61 fig.*, 1938.—Among the numerous species discussed, *Mataeopsephenus nitidipennis* Waterh. is described from China, *Freyiella foveicollis* n. sp. from Kwangtung, *F. bispinosa* n. sp. from Yunnan.

Boring, Alice M. Studies in variation among Chinese Amphibia II. Variation in five wide-ranging common Salientia. *Peking Nat. Hist. Bull.* 13(2) :89-110, *9 tab.*, 1938.—The variations in the following species are discussed and tabulated : *Bufo bufo gargarizans* (Cantor), *Hyla arborea immaculata* (Boettger), *Rana nigromaculata* Hallowell, *Rana placyi* La Taste, and *Rana temporaria chensinensis* David. In each case a large number of individuals of one species from one region, and also of individuals from a series of localities were studied and compared. On the basis of the study, it is suggested that "a number of so-called 'new species' be relegated to the synonymy of these common wide-ranging species. Three of these North China species are so close to European forms that they may be considered as constituting merely geographical varieties or subspecies :—the common toad *Bufo bufo gargarizans*, the treetoad, *Hyla arborea immaculata*, and the woodfrog, *Rana temporaria chensinensis*. Each of these is replaced in South China by a distinctly different species :—*Bufo melanostictus*, *Hyla chinensis* and *Rana japonica*, although the line of limitation between the northern and southern form in each of the three cases is at a different latitude. The two northern pondfrogs *Rana nigromaculata* and *Rana plancyi* extend much further south than any of the other three species discussed in this paper. At the southern end of the range of *Rana plancyi* there seems evidence for a subspecies *fukienensis*, but the evidence for a *reinhardtii* subspecies of *Rana nigromaculata* at the southern part of its range does not seem well founded."

Brunn, Anton Fr. Notes sur les types des Exocets décrits par Cuvier et Valenciennes. *Bull. Mus. Nat. Hist. Nat.*, ser. 2, 9(3) :180-187, 1937.—Systematic notes are given on the types of 23 species of *Exocoetus* and on *Hemiramphus cuspidatus*. *Exocoetus apus* is from Macao.

Bunyard, E. A. The history and development of the apple. *School Sci. Rev.* 20(77) :69-76, 1938.—The early development of the apple in its native N. Europe is briefly discussed. It is noted that although *Malus* species are found in China no edible apples have been developed there and the apple has been little grown, although the climate in parts of the country is suitable to its culture.

Caresche, L. Note préliminaire sur le borer du caféier au Phu-qui (Annam). Étude écologique et incidence sur l'économie des plantations. *Bull. écon. Indochine* 41(4) :836-850, *2 pl., 2 graphs,* 1938.—The incidence of *Xylotrechus quadripes* Chevr. and its injury to coffee at Phu-qui is studied. The life history is described. Fertilizing, pruning of infested branches and destruction of seriously infected bushes are recommended control measures.

Carpenter, F. M. Mecoptera from China, with descriptions of new species. *Proc. Ent. Soc. Wash.* 40(9) :267-281, *2 pl.,* 1938.—A study was made of a collection of Mecoptera sent by D. C. Graham from Szechwan. The 17 species of *Panorpa* Linn., 10 species of *Neopanorpa* Weele, and one of *Leptopanorpa* McLachlan, previously recorded from China, are listed. *Panorpa diceras* McLachlan and *P. tjederi,* n. n. for *P. diceras* Tjeder, are redescribed. The following are new to science : *Panorpa flavipennis, P. curva, P. difficilis, P. grahami, Neopanorpa claripennis, N. nigritis, N. chelata,* and *N. banksi.*

Chan, K., (陳冠女), and **Potter, A. L.** Some observations on local butterflies. *Hong Kong Nat.* 9(1-2) :53-57, *1 pl.,* 1938.—Descriptions and life history notes on *Catopsilia pyranthe* Linn., *Eurema hecabe* (Linn.), *Precis oenone* Linn. and *Clerome eumeus* Drury.

Chang, K., 張奎. A study on intestinal protozoa of pigs, with special reference to the pig as a probable reservoir host of *Endamoeba histolytica. Peking Nat. Hist. Bull.* 13(2) :117-127, *3 tab.,* 1938. —A survey was made of the intestinal protozoa of 209 domestic pigs. The protozoa encountered were *Endamoeba polecki,* 70.8% ; *"Iodamoeba suis",* 51.2% ; *"Endolimax nana",* 15.3% ; *"Trichomonas suis",* 81.7% ; *Chilomastix,* 14.4% ; *Eimeria debliecki,* 46.4% ; *E. scabra,* 9.6% ; *E. perminuta,* 2.4% ; *Balantidium coli,* 70.6% ; and *B. suis,* 28.4%. In striking contrast to Kessel's work, which was also carried out in N. China, the present survey was completely negative for *E. histolytica.* Climate, breed of pig, diet of the pig, liability to infection with *E. histolytica* and methods of examination as possible factors influencing Kessel's and the writer's results are discussed and appear to have no significance.
FROM AUTHOR'S SUMMARY

Chen, T. P. Some aquarium fishes of China. *Hong Kong Nat.* 9 (1-2) :43-47, *5 fig.,* 1938.—Six native fishes suited to use in aquaria are described, with notes on biology and culture. The species are : *Tanichthys albonubes* Lin, *Rhodeus ocellatus* (Kner), *R. sinensis* Guenther, *Lissochilus fasciatus* (Steindachner), *Leucogobio tienmusanensis* Chu, and *Barbus semifasciolatus* Guenther.

Chiu, Y. T. Analyses of Chinese foods. *Chinese Med. Jour.* 54(5) : 435-441, *5 tab.,* 1938.—This is a lecture given at the Canton Branch of the Chinese Medical Association. It reports the analyses of the following foods : soybean milk, which is compared with fresh cow and goat milk and with preserved milk ; Chinese rice wines, teas, vegetables and fruits.

Christensen, C. Taxonomic fern-studies. V. Descriptions of 36 new species of ferns. *Dansk. Bot. Ark.* 9(3) :53-73. *6 pl.,* 1937.—Includes the new species *Asplenium trialatum* from Yunnan, *Athyrium pachyphlebium* from Shansi and Shantung, *Dryopteris cyclopeltidiformis* from Hainan, *D. Handeliana* from Yunnan, *Elaphoglossum lepidopodum* from Formosa, and *E. Ogatai* from Formosa.
E. H. WALKER

Chûjô, Michio. H. Sauter's Formosa collection : subfamily Cryptocephalinae. *Arb. morph. tax. Ent. Berlin-Dahlem* 5(3) :294, 1938.—The new species *Dioryctus sauteri* is described from Koshun. Specimens are in the collections of H. Sauter and R. Takahashi. The new species is closely related to *D. mouhoti* Baly from Indo-China but may be distinguished by less broad shape, impunctate pronotum and coloration of body.

Committee on Nutrition, Council on Public Health, Chinese Medical Association. Minimum nutritional requirement for China. *Nutrition Notes,* No. 10, p. 2-7, *3 tab.,* 1938.—Minimum dietaries are recommended for adults, children, pregnant and nursing women. "The committee has taken into consideration : 1. The existing economic and social conditions in China, 2. The nature of the present day Chinese diet, 3. The smaller body weight of the Chinese as compared with the Occidentals."

Conrard, L. Les *Calamus* de l'Indochine et la clef des especes. *Not. Syst.* 7(1) :17-29, 1938.—Many species of Calamus are found throughout the humid regions of tropical and subtropical Asia. In Indo-China 21 species are known. Diagnosis is given for the following : *Calamus ceratophorus* Conrard, *C. pseudoscutellaris* Conrard, *C. p.* var. *cylindrocarpus* n. var., *C. Poilanei* Conrard. All are from Annam.

Copeland, Edwin Bingham. Genera Hymenophyllacearum. *Phil. Jour. Sci.* 67(1) :1-110, *11 pl., 1 fig.,* 1938.—A taxonomic revision is made of this family of ferns. Thirty-three genera are recognized. There is a key to the genera and each genus is described. A list of species, showing distribution, is given for each genus and there is a list of synonyms. *Mecodium corrugatum* (Christ) [*Hymenophyllum corrugatum* Christ], n. comb., is recorded from W. China ; *M. badium* (H. and G.) [*H. badium* Hooker and Greville], n. comb., from Formosa ; *M. crispato-alatum* (Hayata) [*H. crispato-alatum* Hayata], n. comb., from Formosa ; *M. exsertum* (Wall.) [*H. exertum* Wallich], n. comb., from China ; *Microtrichomanes nitidulum* (v. d. B.) [*Trichomanes nitidulum* van den Bosch], n. comb., from Tonkin ; *Hymenophyllum simonsianum* Hooker, from Formosa ; *Meringium acanthoides* (v. d. B.) [*Didymoglossum acanthoides* van den Bosch], n. comb., from Formosa ; *Vandenboschia stenosiphon* (Christ) [*Trichomanes stenosiphon* Christ], n. comb., from Korea ; *V. parva* Copeland, from Formosa ; *Crepidomanes latemarginale* (Eaton) [*T. latemarginale* Eaton], n. comb., India to Formosa ; *Microgonium beccarianum* (Cesati) [*T. beccarianum* Cesati], n. comb., Ceylon to Formosa ; *Cephalomanes sumatranum* (v. A. v. R.) [*T. sumatranum* v. A. v. Rosenburgh], n. comb., from Annam ; *C. oblongifolium* Presl., from Formosa ; *Selenodesmium obscurum* (Blume) [*T. obscurum* Blume], n. comb., from Formosa.

Corbet, A. Steven. Observations on certain species of Rhopalocera from the Malay Peninsula. *Jour. Fed. Malay States Mus.* 18(2) :242-262, *6 fig.,* 1938.—Revisional notes are given and several new subspecies are described in the families Papilionidae, Pieridae, Danaidae, Nymphalidae, Lycaenidae, and Hesperiidae. Comparisons are made to related forms from Indo-China, Hainan, Hong Kong and Formosa.

Corner, E. J. H. Notes on the systematy and distribution of Malayan Phanerogams, I. *Gard. Bull., Straits Settlements,* 10(1) :1-55, 1939. —Starting out with the intention of writing a semi-popular book about the common forest trees of Malaya, the author found the current taxonomic treatment and nomenclature of many of these in a very unsatisfactory state. This paper (the first of a series) presents the results of extensive and intensive studies, in field, herbarium and library, directed at the elucidation of the variational limits, relationships and distribution of critical species of the following genera : *Wormia* and *Dillenia* (Dilleniaceae), *Anaxagorea, Goniothalamus* and *Canangium* (Annonaceae) *Crataeva* (Capparidaceae), *Cratoxylon* and *Hypericum* (Hypericaceae), *Garcinia* (Guttiferae), *Zanthoxylum* (Rutaceae), *Allophylus* and *Guioa* (Sapindaceae), *Leea* (Ampelidaceae) *Gardenia, Pavetta, Randia, Tarrenna, Timonius* and *Vangueria* (Rubiaceae), a number of which, by the way, are common to the flora of southern China. Several new species and varieties are described, while a number of old names are reduced to synonomy. The author's industry and zest for facts bid fair to produce an interesting and reliable compendium as the ultimate fruit of his labor.
F. A. MCCLURE

Corner, E. J. H. Notes on the systematy and distribution of Malayan Phanerogams, II. The Jack and Chempedak. *Gard. Bull., Straits Settlements,* 10(1) :56-81, *2 pl., 5 fig.,* 1938.—By reference to the original description and type-specimen of *Rademachia integra* Thunbg., I have shown that the combination *Artocarpus integer* (Thunbg.) Merrill, published in 1917, as the legitimate botanical name for the Jack, is really another species called the Chempedak. The Jack must, therefore, be called by its earliest legitimate synonym which is *Artocarpus heterophyllus* Lamarck (1789). The type-specimen of *A. integer* is in Thunberg's herbarium at Uppsala. The type of *A. heterophyllus* is in Lamarck's herbarium in Paris. I have contrasted in detail the macroscopic characters of the Jack and the Chempedak in both its cultivated and wild states. The species differ in some two dozen features, the most important of which concern the base of the leaf-blade, the base of the inflorescence-head and the structure of the syncarp, true-fruit and seed. The two species were much confused by the early botanists and it seems that they still are confused in Southern India. The Sone-ka-dat of Burma is the Chempedak. It is much to be desired that the status of the Indian Jack in all its varieties should be thoroughly examined. The Wild Chempedak of Malaya is distinguished as *A. integer* var. *silvestris* var. nov., chiefly on account of its broad inodorous fruits, the insipid pulp round its seeds and its wild habitat. The synonymy of the two species I have discussed with the conclusion that *Artocarpus Champeden* (Lour.) Spreng. must be a Cochinchinese species different from the Chempedak and one that has not been recognised again. It seems to have been as much misinterpreted as *A. integer.*

AUTHOR'S SUMMARY

Corner, E. J. H. A revision of *Ficus,* subgenus *Synoecia. Gard. Bull., Straits Settlements* 10 (1) : 82-161, *1 tab., 37 text-fig., 2 pl.,* 1939.—Thirteen species and four varieties are described, the following as new :—*F. barba-jovis, F. Carri, F. dens-echini, F. grandiflora, F. tulipifera, F. callicarpa* var. *parvifolia,* var. *crassinervia,* var. *angustifolia,* var. *multinervia. F. megacarpa* is reduced to *F. callicarpa* as var. *parvifolia. F. trachycoma* is raised to specific rank. *F. aurantiaca, F. Simiae* and *F. singalana* are doubtful species. The Philippine specimens referred to *F. apiocarpa* are *F. Scratchleyana. F. antoniana, F. areolata, F. brunnea, F. Warburgii,* referred to *Synoecia,* are *Eusyce, F. Johnsoni,* referred to *Synoecia,* is *Urostigma. F. callicarpa* is hardly to be distinguished specifically from *F. punctata. Synoecia* is a natural subgenus of closely allied root-climbers, the more advanced species being among the most highly specialised developments of *Ficus.* It is important to recognise a. the distinction between bathyphylls (leaves on creeping stems) and acrophylls (leaves on the free-hanging, subaerial stems). b. the presence or absence of stomatal pits on the underside of the leaves. c. the position, the colour and the structure of the orifice of the receptacles. A natural and artificial classification of the species is given. *Synoecia* is limited to Malaysia with Burma, ? Indo-China, Formosa, New Guinea, Timor, Java, and Sumatra as its limits. Its greatest development is in Borneo whence it seems to have spread. The five new species were all found in N. Borneo. It seems that animals do not eat the large, brightly coloured receptacles, so that species of *Synoecia* are without special means of dispersal. Drawings are given of the flowers and leaves of all species and, in many cases, of the orifice of the receptacle.

AUTHOR'S SUMMARY

Davis, Tenney L., and **Chao, Yün-ts'ung.** Chang Po-tuan, Chinese alchemist of the eleventh century. *Jour. Chem. Educ.* 16(2) :53-59, *2 fig.,* 1939.—Chang Po-tuan, 983-1082 A.D., was the author of "Essay on the Understanding of the Truth," one of the classics of Chinese alchemy. Some translations of his poems are given, together with a brief biography.

Deshayes, E. A propos de la Bruche des haricots (*Acanthoscelides obsoletus* Say). *Bull. Soc. Nat. Seine-et-Oise,* ser. 3, 5(6-7) :96, 1937.—This pest has a world-wide distribution. Its injury in France is described.

Feng, L. C., and **Hoeppli, R.** Attempts to immunize rats and mice against *Cysticercus fasciolaris. Chinese Med. Jour.* 55(1) :45-54, *3 fig., 3 tab.,* 1939.—Injection of emulsions prepared from either fresh or dried substance of *C. fasciolaris* into white rats with unknown natural immunity, and inbred mice of a less and a more resistant strain failed to produce immunity to *C. fasciolaris* when eggs of *T. taeniaeformis* were fed to the rats and mice. In rats, the number and size of the cysts were similar in injected animals and controls; in mice of the same strain, the result was similar. On the other hand, mice belonging to the less resistant strain, whether injected or not, had, on the average, more cysts than mice of the more resistant strain. Apart from resistance as a character of the strain, the degree of natural immunity depended also on the individual irrespective of the strain, since in animals of both strains which had received an equal number of *Taenia* eggs, there were some completely free from infection.

AUTHORS' SUMMARY

Ferguson, John C. The oracle bones. *Peking Nat. Hist. Bull.* 13 (1) :1-11, 1938.—Since 1900, several studies have been made by Chinese and Western scholars of a large group of bones inscribed with ancient characters and found in the neighborhood of Anyang in Honan Province. These bones are mostly fragments of the plastron of tortoises, a few being shoulder blades of oxen or deer and tibia of deer. The species of tortoises represented are unknown. The inscriptions are considered to belong to the Yin period, 1324 to 1191 B.C., and as such are our earliest records of China. The bones were scraped clean and held over live coals until cracks appeared on the surface. From the position of the cracks diviners read the answers to questions propounded, usually by members of the Royal House. Apparently after the reading, question and answer were incised on the bone. On the thousands of bones found, at least 3000 characters have been read. The author discusses the bearing of the oracle bones in determining the extent of the territory in which the paticular type of civilized life found at Anyang extended.

Filchner, W. Meine geophysikalischen Arbeiten in Zentral-Asien. (In German with English summary.) *Current Sci.* 7(3) :95-97, 1938.—The object of Prof. Filchner's expeditions to USSR, China, Tibet and India was the magnetic investigation of a region so far not magnetically surveyed. It includes the regions between Pamir, Himalaya, Sungaria and Shanghai. On the two expeditions 520 stations were established where magnetic and astronomical observations were made. The reduction of the former is in the hands of Prof. Dr. O. Venske of Potsdam, and that of the latter has been taken up by Prof. Dr. Przbyllok of Konigsberg.

Fischer, C. E. C. Three new species from Tibet. *Bull. Misc. Inform.,* No. 7, p. 285-288, 1938.—*Vicia tibetica* (Papilionaceae, related to *V. chinensi* Franch.) is from Tibet and Szechwan; *Aster Gouldii* (Compositae, near *A. molliusculo* Wall.) and *Saussurea Chapmanni* (Compositae, near *S. Kunthianae* C. B. Clarke) are from Tibet. All are described from dried specimens only.

Fok, Yen Sang, 霍仁生. Some birds seen at Wang Chau. *Hong Kong Nat.* 9(1-2) :48-52, 1938.—Field notes on 16 species.

Fowler, Henry W. A synopsis of the fishes of China. Part VII, cont. *Hong Kong Nat.* 9(1-2) :58-86, *10 fig.,* 1938.—This part of the series on fishes of China is devoted to the perch-like fishes of the families Plesiopidae (*Plesiops nigricans* (Ruppell)), Pseudochromidae (*Pseudochromis perspicillatus* Gunther), Lobotidae (*Lobotes surinamensis* (Bloch)), Pempheridae (2 spp. of *Pempheris*), Priacanthidae (4 spp. of *Priacanthus*), Lutjanidae (2 spp. of *Glaucosoma,* 15 of *Lutjanus, Pristipomoides argyrogrammicus* (Valen.), and *Etelis carbunculus* Cuv.). All genera and species are redescribed and range is indicated for each species.

Foxworthy, F. W. Philippine Dipterocarpaceae, III. *Phil. Jour. Sci.* 67(3) :241-333, *9 pl.,* 1938.—This is a revision of 8 genera of Philippine Diptero-

carpaceae. *Shorea guiso* is widely distributed and is recorded from Indo-China, as are some species of *Hopea, Parashorea,* and *Pentacme* that are related to the Philippine representatives.

Funkhouser, W. D. Two new Chinese Membracidae. *Notes Ent. Chin.* 5(2) :17-19, *2 fig.*, 1938.—Two new species are described from single specimens in the Musée Heude. Both are from T'ienmu Shan, China. *Machaerotypus rubronigris* is "a beautiful large shining black species with eyes, edges of auriculate suprahumerals and fascia of posterior process bright red and with the tegmina shining black and opaque." *Maurya denticula* is near *M. angulata* Funkhouser but is distinguished by a tooth on the median dorsal line just behind the suprahumerals.

Furtado, C. X. Validating botanical names by referring to invalid literature. *Gard. Bull., Straits Settlements,* 10(1) :162-172, 1939.—*Epipogium* R. Br. (1810), *Pterocarpus* Jacq. (1763), and *Pterocarpus* Burmann (1755) are rejected, being invalid names based on pre-1753 literature.

Galliard, H., and **Dang-van-ngu.** Variations saisonnières de l'évolution de *Dirofilaria immitis* chez *Aedes* (*Stegomyia*) *albopictus*. *Ann. Parasit. Hum. comp.* 16(3) :210-214, 1938.—In Tonkin *D. immitis* develops successfully in *A. albopictus* and especially so in *A. aegypti*. The full development takes from 8 to 9 days during the hot season from May to September, when the temperature ranges between 24°C. and 37°C., while during the winter, with the temperature ranging from 12°C. to 18°C., a month is required. Whereas during the hot season the infection rate is 80% to 100%, during the winter the infestation is very slight.

R. T. L. *in* HELMINTH. ABST.

Goltz, D. H. F. v. d. Die Callerebien der Ausbeute Höne. *Ent. Runds.* 56(6) :41-45, 1939.—Distributional and taxonomic notes are given on four species of *Hedamara*. *H. seitzi* Goltz and *H. ruricola minorata* Goltz are mentioned from China.

Goodrich, Mrs. Caspar F. The gardens of China. *Bull. Gard. Club Amer.*, ser. 7, No. 1, p. 99-104, 1939.—A brief note on the characteristics of Chinese gardens.

Granger, Walter. Medicine bones. *Nat. Hist.* 42(4) :265-271, *16 fig.*, 1938.—Many priceless fossil bones have been bought from Chinese drug shops where they are called "dragon bones" and are used for treatment of many ailments. The author visited Yenchingkou, above the Yangtze Gorges, in Eastern Szechwan, where numerous fossils are found in the pits of a limestone ridge. The farmers of the community spend the winters digging into the pits for bones to sell to the drug buyers. At 9 cents a pound the author was able to buy a good collection of bones including a complete skeleton of a giant Pleistocene gaur, the largest known bovid. The skeleton has recently been mounted in the American Museum of Natural History.

Gressitt, J. Linsley. Some amphibians from Formosa and the Ryu Kyu Islands, with description of a new species. *Proc. Biol. Soc. Wash.* 51 :159-164, 1938.—Eleven species were collected from Formosa and the Ryu Kyu Islands. Nine of the species are from Formosa, 4 are also from China, 2 are restricted to the Ryu Kyu Islands. *Rana gracilipes* from S. Formosa is new to science.

Gross, R. Neue Cyperaceen. *Not. Bot. Gart. Mus. Berlin-Dahlem* 14(122) :189-194, 1938.—Among the 8 new species and varieties of Cyperaceae described are the following: *Carex hypolytroides* Gross & Mattfeld, *C. Petelotii* Gross, *C. tristachya* Thunb. var. *pseudopocilliformis* Gross, *C. ligata* Boott var. *indochinensis* Gross, *C. manca* Boott var. *contigua* Gross, *C. Harlandii* Boott f. *longibracteata* Gross and *Scirpus Petelotii* Gross, all from Tongking.

Guinet, Camille. Floraisons observées a l'Ecole de Botanique du Muséum pendant l'année 1937. *Bull. Mus. Nat. Hist. Nat.*, ser. 2, 10(1) : 115-120, 1938.—Thirty-nine of the species listed are recorded from China and Japan.

Guy, R. A., and **Yeh, K. S.** Peking diets. *Chinese Med. Jour.* 54(3) : 201-222, *9 tab.*, 1938.—Two distinct types of diet are found in Peking. One is a whole-cereal-soybean diet, the other a milled-cereal-pork diet. Their merits are pointed out and the more important ways in which each diet is so distorted as to become inadequate for normal metabolism and complete health are discussed.

AUTHORS' SUMMARY

Hamblin, Stephen F. [Astilbe.] *Lexington Leaf.* 8(8) :29-32, 1938.—Astilbes are distinguished from Spireas which they somewhat resemble. They are steeple-bush herbs, with narrow pyramidal spires of white or rose, rising above the thrice-divided foliage. About 15 species are cultivated as ornamentals. Two are American, the others from China and Japan. Each species is described with notes on culture.

Hamblin, Stephen F. [Perennial vines.] *Lexington Leaf.* 8(11) :41-44, 1938.—Hardy climbing perennial herbs useful as ornamentals are briefly discussed. The list includes *Dioscorea batatas* (cinnamon-vine), a native of the Far East; *Aconitum hemsleyanum, Thladiantha dubia,* and *T. oliveri* from China; and the climbing cucumbers *Actinostemma paniculatum* and *A. multilobum* from Asia.

Haupt, Hermann. Psammocharidae vom unteren Yang-tse. *Notes Ent. Chin.* 5(5) :33-48, *6 fig.*, 1938.—Distribution notes are given on 25 species in 13 genera. The 7 species of *Pseudagenia* Kohl. are described in a key. The following are described as new: *Pseudagenia ochracea* from Lushan; *P. chusanensis* from Chusan; *P. exortiva* from Kiangsu; *P. pekinensis* from Chusan, Peking and Kiangsu; *P. opacifrons* and *P. punctata* from Chusan; *P. frequens* from Kiangsu; *Machaerothrix coactifrons,* n. gen. and sp., from Kiangsu; *Poecilagenia nigrina, Psammochares cinctellus rufa* n. f., and *Orientanoplius obscuratus* from Kiangsu; *O. apicalis* from Kuling; *Episyron intermedius atripes* n. f. from Kiangsu.

Hennig, Willi. Beiträge zur Kenntnis des Kopulationsapparates und der Systematik der Acalyptraten. I. Chamaemyiidae und Odiniidae. *Arb. morph. tax. Ent. Berlin-Dahlem* 5(3) :201-213, *1 pl., 9 fig.*, 1938.—The genitalia of various species are described and figured. The taxonomic discussion includes a description of *Leucopis* (*L.*) *formosana* n. sp. from Formosa.

Hennig, Willi. Tyliden aus Japan. *Ins. Matsumurana* 13(1) :1-14, *13 fig.*, 1938.—A geographical and systematic review of the family as it occurs in Japan. Eight species and subspecies in 5 genera are discussed. The Neriini, *Mimegralla albimana galbula* Osten Sacken and *Stypocladius appendiculatus* Hendel, are found in Formosa.

Herklots, G. A. C. The birds of Hong Kong, Part XXX. *Hong Kong Nat.* 9(1-2) :1-3, *1 pl.*, 1938.—Three cuckoos are present in Hong Kong: the Asiatic Cuckoo (*Cuculus canorus telephonus* Heine), the Indian Cuckoo (*C. micropterus micropterus* Gould), and the Burmese Plaintive Cuckoo (*Cacomantis merulinus querulus* Heine). The two last are figured in a colored plate. For each species notes are given on distribution, description, field identification, habits and nesting habits.

Herklots, G. A. C. The flowering shrubs and trees of Hong Kong, part X. *Hong Kong Nat.* 9(1-2) :19-36, *4 pl., 9 fig.*, 1938.—In this part of the series *Rhododendron* and *Caesalpinia* of Hong Kong are treated. The species described are: *R. Farrerae* Tate, *R. ovatum* Planchon, *R. Simsii* Planchon, *R. Fordii* Hemsley, *R. Westlandii* Hemsley, *R. Championae* Hooker,

Caesalpinia kwangtungensis Merrill and *C. Nuga* Aiton. Besides descriptions, there are notes on distribution, flowering period, localities in the colony and references. Keys are given to the species of each genus.

Hilden, Kaarlo. On the relation between the age and the occurrence of the Mongolian eye-fold. *Comment. Biol.* 7(6) :1-5, *1 tab.*, 1938.—Although complete age records are unobtainable it seems that the eye-fold in its extreme form disappears gradually as the individual grows older, in the 3 Mongolide groups studied. The age between 20 and 30 appeared to be a transition period during which the disappearance began.

Ho, Ch'i. On a collection of anopheline mosquitoes from the island of Hainan. *Ann. Trop. Med. Parasit.* 32(4) :387-411, *16 fig.*, 1938.—The following species and varieties of mosquitoes were collected in Hainan in 1934 : *Anopheles sintonoides* Ho, *A. hyrcanus* var. *sinensis* Wiedemann, *A. h.* var. *nigerrimus* Giles, *A. barbirostris* Van der Wulp, *A. kochi* Donitz, *A. minimus* Theobald, *A. jeyporiensis* var. *candidiensis* Koidzumi, *A. subpictus* var. *indefinitus* Ludlow, *A. vagus* Dönitz, *A. maculatus* var. *hanabusai* Yamada, *A. philippinensis* Ludlow. Each is described, with records of breeding places.

Ho, Ch'i. A new tree-hole breeding *Anopheles* from the Island of Hainan. *Ann. Trop. Med. Hyg.* 32(3) :279-285, *4 fig.*, 1938.—*Anopheles sintonoides* n. sp. is closely related to *A. sintoni* and *A. culiciformis*. The morphology and life history are described. The larvae were found in tree-holes in the forest at an altitude of 600 m. or over. Twice larvae were found with aedine larvae, twice with culicine larvae.

Ho, Ch'i. The significance of the female terminalia of house-flies as a grouping character. *Ann. Trop. Med. Hyg.* 32(3) :287-312, *13 fig., 2 tab.*, 1938.—A study of the types of female terminalia of *Musca* (in its old and wide sense) has convinced the writer that there are three types of reproduction in houseflies, in accord with the three markedly different types of female terminalia and that these differences in terminalia, as also reported by Awati, constitute the best criteria for generic differentiation. The author proposes the recognition of three genera, *Musca, Eumusca, Viviparomusca*, with subgenera, in general, corresponding to the genera recognized by Townsend.

Ho, Ch'i. On some species of *Sarcophaga* from Java and its neighbouring islands. *Ann. Trop. Med. Parasit.* 32(2) : 115-127, *12 fig.*, 1938. —A small collection of specimens representing 14 species of *Sarcophaga* was studied. *S. antilope* Böttcher was previously reported from Hainan. *S. fusci-cauda* Bött. is also from Formosa.

Hoffmeyer, Skat. *Heliothis dipsacea* L. og *maritima* Grasl. *Flora og Fauna* 44(1-2) :1-12, *1 pl., 1 fig., 1 tab.*, 1938.—The variations of these species are discussed.

Hori, Matsuji. Aphids infesting *Lonicera morrowii* Asa Gray in Hokkaido, with description of a new species (Studies on Aphididae of the northern part of Japan, II). (In English with Japanese summary.) *Ins. Matsumurana* 12(4) :160-165, *1 pl.*, 1938.—Four species are discussed as to Locality records, General distribution, Biology and notes, Japanese name, and Taxonomy. *Amphorophora lonicericola* Takahashi is the only one represented in China. It feeds on the underside of leaves, causing them to turn yellow and show purplish dots. The stem mother matures in late June and deposits living alate young. The aphids leave the host in July and return in late Sept. The species is allied to *A. lonicerae* (Seibold).

Hsü, H. F. *Schistosoma turkestanicum* in north China. *Chinese Med. Jour.* 54(6) :568-570, 1938.—A mature male *Schistosoma turkestanicum* was found in a sheep from the vicinity of Peiping.

Hsüeh, Mu-lien, 薛慕蓮. A study of the tracheation and venation of *Gampsocleis gratiosa* Brunetti (Orthoptera, Tettigoniidae). *Peking Nat. Hist. Bull.* 13(1) :19-27, *1 pl., 2 tab.*, 1938.—The development of the tracheae and veins in the wings of this katydid is described and is summarized in an extensive table.

Hu, P. C. A study of the intelligence of Anglo-Chinese children. *Eugenics Rev.* 30 :109-116, 1938.—This investigation aimed at determining the general intellectual level of Anglo-Chinese children with the object of discovering what differences existed between their general standard of intelligence compared with that of English children selected from the same social environment. The total number of children tested was 2,943 English and 116 Anglo-Chinese. The tests used were the Northumberland standardized tests, perceptual tests and performance tests. The home environment, social and economic status, father's trade and earnings were comparable for both groups. The results showed that on the whole the Anglo-Chinese children were slightly superior to the English children, though the differences were not of any practical importance. It is of interest, however, to note that the difference between the two races is so small. MAY SMITH *in* BULL. OF HYG.

Hu, Stephen M. K. Preliminary observations on the effects of filarial infection on *Culex pipiens* var. *pallens* Coq. *Chinese Med. Jour.* 55(2) :154-161, *2 tab.*, 1939.—Experiments have been carried out to observe the effect of infection with *bancrofti* larvae on the longevity of *Culex pipiens* var. *pallens*. Mosquitoes fed at the same time on uninfected blood were used as controls. Few of the infected mosquitoes were found dead during the incubation period of the parasite. After the incubation period, the mosquitoes in the infected lots which were able to survive longest were generally those that were either negative to the infection or those that were harbouring few of the filarial larvae. AUTHOR'S SUMMARY

Hu, Stephen M. K. Studies on the susceptibility of Shanghai mosquitoes to experimental infection with *Wuchereria bancrofti* Cobbold. V. *Culex fuscanus* Wiedemann. *Peking Nat. Hist. Bull.* 13(1) :39-52, *1 pl., 5 tab.*, 1938; VI. *Culex vagans* Wiedemann. *Peking Nat. Hist. Bull.* 13 (2) :113-116, *3 tab.*, 1938.—V. Of 75 *C. fuscanus* experimentally fed on a heavy *Wuchereria bancrofti* case, 69 were found infected with filaria larvae, which, at different stages in development, had undergone more or less chitinous encapsulation in all but 7 of the infected mosquitoes. In a few cases, partial encapsulation of an immature larva did not interrupt further development of the parasite, as the larva was able to shred off the cuticle in the course of ecdysis or to break loose from its chitinous sheath, leaving the empty shell in the coelomic cavity of the mosquito. Such extensive chitinization of the larvae was not found in some other species of *Culex*, infected on the same case. VI. Of 206 *C. vagans* infected on a heavy *W. bancrofti* case, 189 were found with infective filarial larvae when they were dissected after the incubation period of the parasite. The average number of larvae was 10.2 for each infected mosquito. As compared to a series of *C. pipiens* var. *pallens* infected at the same time on the same case, 94.8% were infected to 95.9% of *C. pipiens* var. *pallens*. In the above series the average number of infective larvae per infected mosquito was 10.9 for *C. vagans*, 9.3 for *C. p.* var. *pallens*. FROM AUTHOR'S SUMMARY

Ijima, K. Studies on the biology of *Eucosma schistaceana* Snellen in Formosa. Part. I. The biology of the adult moth. (In Japanese with English summary.) *Rept. Govt. Sug. Exp. Sta. Formosa*, No. 5, p. 73-115, *8 fig.*, 1938.—Emergence of adults of *Eucosma schistaceana* Sn. occurs throughout the year in Formosa; it is most intense in May and December and least so in February and August. The numbers of the two sexes are about equal. Males and females lived 9 and 10.3 days on an average, females of medium size surviving longest. Pairing occurred soon after emergence, and females oviposited during the following night. About 22% of the eggs in the ovaries matured 24 hours after emergence; the oviposition period averaged 18.7

days in December and January and 6-8 days in other months. Females remained in sheltered places during the daytime and oviposited mostly in the evening. The eggs were laid on the leaves and sometimes on the stalks of sugar-cane, especially on the lower sides of the basal and middle parts of full-grown leaves of the current season. The numbers laid by individual females varied directly with body length and averaged 240. When newly emerged females were kept at 10°C., 18.3% of the eggs in the ovaries matured in 8 days. The moths were not usually attracted to light; they fed on honey and sugar solutions in captivity. REV. APPL. ENT.

Iso, E. On the cultivation of flax, a promising crop in Formosa. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 383, p. 542-556, No. 384, p. 614-628, *6 fig.*, 1938.

Jackson, R. B. Notes on *Ae.* (*F.*) *togoi* Yamada as met with in the Colony of Hongkong. *Chinese Med. Jour.* 54(6) :559-562, *2 fig.*, 1938.—Larvae of *A. togoi* were found in rock pools by the seashore, in water of 0.046% to 0.17% salinity. They were reared in an incubator that is described. The figures are microphotographs of the mentum.

James, Maurice T. New Formosan Stratiomyidae in the collection of the Deutsches Entomologisches Institut. *Arb. morph. tax. Ent. Berlin-Dahlem* 6(1) :31-37, 1939.—The paper is based on a small collection of Stratiomyidae made by H. Sauter in Formosa. The following, all new to science, are described: *Solva* (*Ceratosolva*) *aurifrons*, subgenus *Formosolva*, *S.* (*F.*) *concavifrons*, *S.* (*Xylomyia*) *sauteri*, *Hoplacantha flavicornis*, *Cephalochrysa stenogaster*, the genus *Formosargus*, *F. kertészi*, and *Aulana insularis*.

Kanervo, Erkki. Die Syrphidenfauna (Dipt.) Sibiriens in vorlaufiger Zusammenstellung. *Ann. Ent. Fennici* 4(3) :145-170, *9 fig.*, 1938.—A taxonomic discussion of the Siberian Syrphidae. Many of the species mentioned are found also in Manchuria and China. *Paragus tibialis* n. var. *mongolicus* is from Dairen.

Kau, L. S., and **Wu, Kuang.** A note on the pathology of schistosomiasis due to *S. japonicum* among cattle in China. *Ann. Trop. Med. Parasit.* 32(2) :129-132, *1 pl.*, 1938.—Random samples from the livers of oxen and water buffaloes slaughtered in Shanghai showed many positive findings for ova of *S. japonicum*. Morbid anatomical changes in spleen and liver of affected animals are briefly noted. In some cases *Fasciola hepatica* was also found in the liver.

Kau, L. S., and **Wu, Kuang.** Pathological findings among pigs experimentally infected with *Fasciolopsis buskii*. *Ann. Trop. Med. Parasit.* 32(2) :133-136, *1 pl.*, 1938.—The pigs were fed with cysts obtained from water caltrops collected near Hangchow. Gross pathological changes consisted mainly of minute foci of petechial haemorrhages scattered in the mucosal wall of the gastro-intestinal tract, level with the surface.

Kobuski, Clarence E. New and noteworthy species of Asiatic *Jasminum*. *Jour. Arn. Arb.* 20(1) :64-72, 1939.—The following are described: *Jasminum* (*Unifoliolata*) *albicalyx* n. sp. from Kwangsi; *J.* (*U.*) *cinnamomifolium* n. sp., Hainan; *J. c.* Kobuski var. *axillare* n. var., Yunnan; *J. laurifolium* Roxburgh, Kwangsi; *J.* (*U.*) *pericallianthum* n. sp., Burma; *J.* (*U.*) *pilosicalyx* n. sp., Hainan; *J.* (*U.*) *Rehderianum* Kobuski, Hainan; *J.* (*U.*) *robustifolium* n. sp., Yunnan; *J.* (*U.*) *Wangii* n. sp., Yunnan; *J.* (*U.*) *anisophyllum* n. sp., Yunnan; *J.* (*Trifoliolata*) *Forrestianum* n. sp., Yunnan.

Koch, C. Beitrag zur Systematik und geographischen Verbreitung der *Achenium*-Arten (Col. Staph.). *Pub. Mus. Ent. "Pietro Rossi" Duino*, No. 2, p. 51-187, *6 pl.*, *1 map*, 1937.—An extensive taxonomic and distributional revision of the genus *Achenium*, which is distributed across central and southern Europe, north Africa and central Asia. *A.* (*Chinachenium*) *chinense* Bh. is listed from China.

Koidzumi, G. *Sedum. Acta Phytotax. Geobot.* 7(3) :192-193, 1938.—The new species *Sedum rupifragum* from Japan and *S. rosulatobulbosum* from Korea are described.

Kojo, K. Investigation of sweet-potato culture in Formosa. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 382, p. 487-499, 1938.

Kono, Hiromichi. Die Anobiiden und Ptiniden in Tannen-und Fichtenwaldung in Japan. (In German with Japanese summary.) *Ins. Matsumurana* 12(4) :174-178, *4 text fig.*, 1938.—There are brief notes on 5 species. *Ptinus japonicus* Reitter is recorded from Korea and China.

Kora, K. Notes on *Hynobius* sp. of Mt. Heityo, Manchoukuo (I). *Ecol. Rev.* 3(4) :339-345, *13 fig.*, *2 tab.*, 1938.—Biological notes are given with a table showing range of sizes and charts of density in distribution.

Ku, Chang-Tung, 顧昌棟. New trematodes from Chinese birds. *Peking Nat. Hist. Bull.* 13(2) :129-136, *3 fig.*, 1938.—Three new trematodes are described. *Oswaldoia turdia* was found in the gall bladder of a Chinese black bird, *Turdus merula mandarinus* Bp. *Paramonostomum macrostomum* is from a coot, *Fulica atra atra* Linn. It is a caecal fluke. *Petasiger longicirratus* was collected from the duodenum of the ruddy sheldrake, *Cassarca ferruginea*. All are from Soochow. Each new species is described and references are cited to related species.

Kurosawa, M. A new species of *Trichothrips* injuring lily bulbs in Japan and Korea. *Zool. Mag.* 50(3) :154-156, 1938.—Brief descriptions are given of the macropterous male and female of *Hoplothrips* (*Trichothrips*) *liliorus*, sp. n., which has been recorded in Japan and Korea together with *Liothrips vaneeckei*, Priesn., on lily bulbs. REV. APPL. ENT.

Kuwayama, S. On the biology of *Grapholitha glycinivorella* Mats. (In Japanese.) *Rept. Jap. Assn Adv. Sci.* 13(4) :581-585, 1938.—*Cydia* (*G.*) *glycinivorella* Mats. is widely distributed in Japan, Korea and Manchuria and is a serious pest of soy beans. In Hokkaido in the years 1931-36, it attacked less than 10 per cent of the beans in localities where the mean temperature from May to October did not exceed 13°C., but in other localities, infestations of up to 94 per cent were recorded. Less than 20 per cent of the eggs were deposited on parts other than pods. The males are more attracted to light than the females, but more females are attracted to molasses. Soy bean is the only food-plant, but some varieties are only slightly damaged, as they do not produce pods during the oviposition period.
FROM REV. APPL. ENT.

Lee, Juishüan. Division of labor among the workers of the Asiatic carpenter ants (*Camponotus Japonicus* var. *aterrimus*). *Peking Nat. Hist. Bull.* 13(2) :137-145, *6 fig.*, *8 tab.*, 1938.—The results of the investigation show that every worker class of the Asiatic carpenter ants participates in all varieties of work of the colony and by the division of labor among the workers of this species is meant only the preponderance of certain classes in certain activities. The large individuals are preponderant in work requiring strength and courage, such as fighting, guarding, foraging, and exploring, but also in regurgitating which is probably related to foraging. The small workers are most active in carrying, foraging, building, tending the young and carrying the jumping plant louse. The intermediates are active in all sorts of activities given above but only to a moderate extent. They are neither most active nor most indifferent in any kind of activity. FROM AUTHOR'S SUMMARY

Lesne, Pierre. Bostrychides nouveaux des collections du Muséum (Coléopt.). *Bull. Mus. Nat. Hist. Nat.*, ser. 2, 9(5) :319-325, *5 fig.*, 1937.—A description of five new species, one the type of a new genus. *Minthea bivestita* n. sp. is from Tonkin.

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Lin, Kwan-te. Movement of the strandline near Foochow. *Bull. Geol. Soc. China* 17(3-4) :343-347, *1 fig.*, 1937.—The coastal region of SE. China is unstable, with evidence of both submergence and emergence. From field evidences the author believes that the coast, especially near Foochow, is now slowly emerging. Studies were made at Haitang Island.

Lindberg, Hakan. Über einige chinesische Hemipteren im Naturhistorischen Reichsmuseum in Stockholm. *Not. Ent.* 18(4) :119-124, *2 fig.*, 1938.—Specimens of 34 species and varieties of Chinese Hemiptera are in the Natural History Museum in Stockholm. Of these *Elasmucha Potanini* and *Reduvius fasciatus* Reut. var. *limbatus* are new to science. The former is from Shensi Province, the latter from "China."

McClure, F. A. Notes on bamboo culture with special reference to southern China. *Hong Kong Nat.* 9(1-2) :4-18, *7 pl.*, 1938.—The paper is devoted almost entirely to methods of propagation by means of vegetative fractions. Bamboos of the area considered fall, in respect to their vegetative growth, into two distinct groups or types, the distinguishing characteristics of which are given. Bamboos belonging to these two types, being different in structure and in growth habit, require somewhat different treatment in propagation. For sympodial (clump type) bamboos, the paper describes propagation by division, by culm segments, by lateral branches as cuttings, also planting methods, production and harvesting of culms. The matter under monopodial (spreading type) bamboos deals with propagation by division, by the stump method, by rhizome sections, and by culm sections, the production and harvesting of shoots and culms, and monopodial bamboos for ornamental purposes. The paper is concluded with several paragraphs under the following headings : general notes on cultural requirements, the expected length of life of a grove of cultivated bamboos, and pests. There is a list of six references to relevant literature.
F. A. McClure

Mannheims, B. J. Uber das Vorkommen der Gattung *Curupira* in Manschukuo. *Arb. morph. tax. Ent. Berlin-Dahlem* 5(4) :328-332, *3 fig.*, 1938.—A taxonomic treatment of a small collection of *Curupira* (Diptera : Blepharoceridae) from Manchuria. *C. manschukuensis* is new to science.

Manning, W. E. The morphology of the flowers of the Juglandaceae I. The inflorescence. *Amer. Jour. Bot.* 25 :407-419, 1938.—Summary : "The inflorescences of all six genera of the family are described and figured. A possible evolutionary series from primitive to advanced types of inflorescences is proposed, and the probable type of inflorescence of the ancestors of the family is described. The inflorescence of the pre-Juglandaceous stock was probably a terminal highly branched panicle of perfect flowers. In the modern Juglandaceae the inflorescence of primitive members is a terminal androgynous panicle, combining one central pistillate and several staminate branches or catkins. From this condition there is an advance to inflorescences entirely pistillate or entirely staminate. In the pistillate flower clusters the solitary catkin remains terminal, or rarely becomes axillary, and in the most advanced genera is reduced to a few-flowered spike. In the staminate inflorescences the advance is from a terminal position to an axillary one, first in the axils of foliage leaves on the old wood, then in the axils of bud scales, and from a several-catkined panicle to few-catkined clusters, to a solitary, finally sessile catkin. In the Juglandaceae each catkin represents one branch of a panicle, and the solitary catkin is the most advanced type of inflorescence, the branches of the panicle having disappeared through abortion. *Engelhardtia, Alfaroa,* and *Platycarya* have primitive types and positions of inflorescences, though there is considerable advance in some species of *Engelhardtia. Pterocarya* has advanced types, while the inflorescences of *Juglans,* similar to those of *Pterocarya,* are still more advanced. The type of staminate inflorescence of *Carya* is rather primitive, but the location is a specialized one; the pistillate flower cluster is the most advanced in the family." Excellent drawings and diagrams of the inflorescences and a list of literature cited accompanies this first discussion. A treatment of the flowers is promised in a later paper.
E. H. Walker

Marcus, E. Papers from Dr. Th. Mortensen's Pacific Expedition 1914-16. LXIX. Bryozoen von St. Helena. *Vidensk. Meddel.* 101 :183-252, *32 fig.*, 1937-8.—Thirty-eight species of Bryozoa are described. Those whose range extends to the China seas are the following : *Tubulipora dichotoma* (d'Orb.), *Lichenopora novae-zelandiae* (Bsk.), *Cellaria punctata* (Bsk.), *Schizoporella unicornis* (Johnst.), *Hippoporina porcellana* (Bsk.), and *Crepidacantha longiseta* C. & B.

Marsh, T. D., and **Kanagaratnam, N.** Feeding trials with pure-bred Chinese pigs. *Malayan Agri. Jour.* 26(9) :361-368, *3 tab.*, 1938.—Chinese breeds of swine in Malaya mature more slowly than European strains, requiring two months longer to reach the same average weights, but beyond this point they made similar live-weight gains per day on a balanced diet.

Matsumura, Shonen. Homopterous insects collected by Mr. Tadao Kano at Kotosho, Formosa. *Ins. Matsumurana* 12(4) :147-153, 1938.—From a study of a collection of 21 species the author is convinced that the insects of this island belong to the Formosan, rather than the Philippine group. *Poophilus costalis* Walk., *Kirbyana pagana* Mlich. and *Nephotettix apicalis* Motsch. are also known from China. There are 10 new species (2 types of new genera) and one new variety.

Matsumura, Shonen. A new species of *Zephyrus* from Formosa. *Ins. Matsumurana* 13(1) :44-45, *2 fig.*, 1938.—*Z. mushaellus* n. sp. is closely allied to *Z. scintillans* Leech. Both ♂ and ♀ are figured.

Merrill, E. D., and **Perry, L. M.** Additional notes on Chinese Myrtaceae. *Jour. Arn. Arb.* 20(1) :102-103, 1939.—Six new range-extensions are noted and the new variety *Baeckea frutescens* Linn. var. *brachyphylla* is described from Kwangsi.

Merrill, E. D., and **Perry, L. M.** The Myrtaceae of China. *Jour. Arn. Arb.* 19(3) :191-247, 1938.—After a critical examination of the Chinese species of *Eugenia* Linn. *sensu latiore* the authors not only recognize *Eugenia* proper, but also *Syzygium* Gaertner (including *Jambosa* de Candolle), *Acmena* de Candolle and *Cleistocalyx* Blume. *Eugenia* is limited to one introduced species of American origin. *Acmena* is represented by a single indigenous species and *Cleistocalyx* by two. All other known Chinese species of the group, whether native or introduced, fall into the genus *Syzygium* which, as the authors interpret it, becomes by far the largest genus and includes many species. Keys to all the genera are included as well as to the species under each genus. The following new species, varieties, and combinations are made :—*Rhodamnia dumetorum* (Poir.) M. & P. (*Myrtus dumetorum* Poir.), *R.d.* var. *hainanensis* M. & P., *Decaspermum gracilentum* (Hance) M. & P. (*Eugenia gracilenta*), *D. albociliatum* M. & P., *Syzygium malacocense* (Linn.) M. & P. (*Eugenia m.* Linn.), *S. latilimbum* (Merr.) M. & P. (*E. l.* Merr.), *S. polypetaloideum* M. & P., *S. brachyantherum* M. & P., *S. Championii* (Benth.) M. & P. (*Acmena C.* Benth.), *S. stenocladum* M. & P., *S. rysopodum* M. & P., *S. Rockii* M. & P., *S. tephrodes* (Hance) M. & P. (*E. t.* Hance), *S. araiocladum* M. & P., *S. myrsinifolium* (Hance) M. & P., (*E. m.* Hance.), *S. cathayense* M. & P., *S. Handelii* M. & P., *S. Grijaii* (Hance.) M. & P., (*E. G.* Hance.), *S. buxifolium* var. *austrosinense* M. & P., *S. salwinense* M. & P., *S. Forrestii* M. & P., *S. brachythyrsum* M. & P., *S. Chunianum* M. & P., *S. fluviatile* (Hemsl.) M. & P., (*E. f.* Hemsl.), *S. kwangtungense* (Merr.) M. & P. (*E. k.* Merr.), *S. euonymifolium* (Metcalf) M. & P. (*E. e.* Metcalf), *S. Hancei* M. & P. (*E. minutiflora* Hance, not *S. minutiflora* (Bedd.) Gamble), *S. Howii* M. & P. and *S. Rehderianum* M. & P.
F. P. Metcalf

Mitsuya, T. A study of derris culture in Formosa. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 378, p. 367-409, *7 graphs*, 1938.

Miwa, Y. On Javanese-beetle introduced to Formosa for the control of banana-weevil. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 383, p. 557-565, *6 fig.*, 1938.

Miyazawa, B. The chromosome number of wild tea plants in Formosa. (In Japanese.) *Agri. & Hort.* 12 :1583-1584, 1937. Abstracted in German in *Jap. Jour. Bot.* 9(2), Abst. 324, 1938.

Montilla, Jose R. A review of Philippine Holocentridae. *Phil. Jour. Sci.* 67(2) :207-229, *5 pl.*, 1938.—There are keys to *Holocentrus* (10 spp.) and *Myripristis* (4 spp.), the two genera of Holocentridae represented in Philippine waters. All the species are described. *H. ruber* is recorded from Hong Kong.

Moriyama, T. On the abstract to literature of paddy and rice in Formosa. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 382, p. 513-526, No. 384, p. 671-677, 1938.

Murayama, J. Recherches sur les insects chez la terre des Pépinières dans la Corée. (In Japa..ese.) *Bull. For. Exp. Sta. Korea*, No. 29, 86 p., *3 fig.*, 1938.—The results are given of investigations on soil pests in nurseries of forest trees in various parts of Korea. Of the pests taken, 82.3% were insects and 87.4% of the latter were Coleoptera, of which 83.7% were Lamellicorns. A list is given of the species collected, with descriptions of each stage, and notes on the bionomics of the more important, which included *Barathra brassicae* L. and *Gryllotalpa africana* P. de V. in addition to Lamellicorns. Of the latter, *Anomala* (*Phyllopertha*) *pallidipennis* Reitt. is common and is widely distributed over Korea. The larvae are polyphagous and feed particularly on the roots of *Lespedeza*, larch, ash, *Prunus* and pine. A female lays about 20 eggs, which hatch in 2 weeks. *Anomala chameleon* Fairm., which hibernates as a third-instar larva, is common; the adults emerge in July and August and feed on *Prunus*, alder, willow and grape-vines. The adults of *Aserica* (*Serica*) *orientalis* Motsch., which has one generation a year, emerge in late June and July, overwinter, resume feeding in late March and oviposit in April and May. The larvae feed on roots of various weeds and young trees, sometimes injuring the rootlets of conifers. *Lachnosterna* (*Holotrichia*) *diomphalia* Bates has a two-year life-cycle and hibernates in both the larval and adult stages. The larvae are common in pine forests, and the adults feed on fruit trees. REV. APPL. ENT.

Murayama, Kazutura. Riebeckite-granite from Ha la pa shan, near Hai lung, north Manchuria. *Mem. Ryojun Coll. Eng.* 11(6) :239-248, *2 fig.*, 1938.—The granite of N. Manchuria is rich in felspar; has a higher content of orthoclase than that of Japan, but a little lower than that of Europe and America; shows a low content of mafic minerals, many of which are early ones.

Nakayama, S. Notes on the biology of *Naranga aenescens*, Moore. (In Japanese with English summary.) *Ann. Agri. Exp. Sta. Tyosen* 10 (1) :8-32, *2 pl.*, 1938.—Outbreaks of *Naranga aenescens* Moore, which is one of the most injurious pests of rice in Korea, occur at intervals of 3-5 years. In the years preceding outbreaks a greater number of pupae from early broods hibernate, and this leads to an increased population in spring. There are usually 4 generations a year, the adults emerging in May, June, July and August. In experiments, females lived for about 5 days and deposited 22-280 eggs, with an average of 107, on rice, beginning 2-3 days after emergence. The length of the egg stage varied from 6-7 days in May to 2-3 in August, and up to 97% of eggs hatched. In the first instar, the larvae fed on the epidermis of the leaves between veins, but later they attacked the edge of the leaves. They pupated in cocoons at the leaf-tips, which they bent over. The larval and pupal stages lasted 12-30 and 4-6 days, respectively. The larvae were attacked by four Hymenopterous parasites, of which two were

Apanteles glomeratus L. and *Elachertus tabashii* sp. n. The new species is described. Good control of *Naranga* was given by sprays of pyrethrum-soap or lead arsenate. REV. APPL. ENT.

Ohwi, Jisaburo. Symbolae ad floram Asiae orientalis 17. (In Latin with Japanese summary.) *Acta Phytotax. Geobot.* 7(3) :129-138, 1938. —Seventeen species are listed. They include *Setaria autumnalis* n. sp., from Japan, Korea, Formosa and China; *Polygonum brachytrichum* n. sp. from Korea; *P. hypoleucum* n. sp. from Formosa; *Carex holotricha* n. sp. from Korea; *Poa taiwanicola* n. sp. from Formosa; *Scirpus lushanensis* n. sp. from Kiangsi, China; and *Cyperus platystylis* R. Br. from Formosa.

Okada, I. Relation of the oviposition of *Grapholitha glycinivorella* Mats. to the size of the pods of soy bean in Manchuria. (Preliminary report.) (In Japanese.) *Agri. and Hort.* 13(4) :973-978, *2 fig.*, 1938.—An account is given of observations and experiments in Manchuria showing that females of *Cydia* (*Grapholitha*) *glycinivorella*, Mats., prefer to oviposit in the larger pods of soy beans. REV. APPL. ENT.

Okada, Yoshikazu. Desmids from the Sinsiru Island in the middle Kuriles. *Jour. Imp. Fish. Inst.* 33(2) :107-122, *6 pl.*, *1 fig.*, 1938.—Desmids belonging to 33 species, 7 varieties and 3 forms in 12 genera were collected. Eight of the species are new to Asia. *Penium didymocarpum* Lund and *Closterium striolatum* Ehrenb. are in common with China.

Patrick, Ruth. A taxonomic and distributional study of some diatoms from Siam and the Federated Malay States. *Proc. Acad. Nat. Sci. Philadelphia* 88 : 367-470, *1 pl.*, 1936.—Diatoms are not generally studied in proportion to their value because of the difficulties of collection and the scarcity of workers in this field. This paper is made possible by the use of very able assistant collectors in the form of tadpoles. The diatoms found in the intestines of tadpoles preserved in the U. S. National Museum, the British Museum and the Raffles Museum of Singapore were studied taxonomically. In this systematic enumeration of 185 forms each species and variety is briefly described, including five new species. The difficult problem of synonomy is carefully dealt with. The world distribution of these species is given with each description and then tabulated and discussed. The theory that all species of diatoms are cosmopolitan is refuted. Evidence is derived for the following: a. The diatom flora of the eastern United States is distinct from that of the western United States. b. Until recent geological times a land connection existed between northern Europe and northeastern North America. c. The presence of a land connection or the close juxtaposition of India and eastern Africa. d. Australia has long been separated from Asia. An extensive list of references is given. E. H. WALKER

Pearson, G. H. Hookworm in Shaoyang, Hunan. *Chinese Med. Jour.* 54(6) :574-578, *1 fig.*, 1938.—Of 556 persons examined, 112 showed the presence of hookworm eggs in the stool in sufficient quantity to be found by simple microscopic examination. Adults of both *Ancylostoma duodenale* and *Necator* were found in specimen stools. Hookworm disease was also found to be very common among males who work in the rice fields. Storage of all feces destined for use as fertilizer for two months before use is recommended as a possible means of control of infections.

Pendlebury, H. M., and **Corbet, A. S.** The *Lubentina* group of the genus *Euthalia* Hbn. *Jour. Fed. Malay States Mus.* 18(2) :236-239, *4 fig.*, 1938.—A key and descriptions are given for the 4 Indo-Malayan species of this group. *Euthalia lubentina malaccana* Fruh. is also known from Indo-China.

Pic, M. Drei neue Coleopteren-Arten. *Arb. morph. tax. Ent. Berlin-Dahlem* 5(4) :332-349, 1938.—Three new species of beetles are described, including *Cryptocephalus Hoffmanni* (Phytophaga) from Tientsin, China. It is related to *C. sareptanus* Mor.

Piel, O. Note sur le parasitisme de *Dastarcus helophoroides* Fairmaire (Coléoptère Colydiide). *Notes Ent. Chin.* 5(1) :1-14, *2 pl.*, 1938.—An example of the infestation of cells of *Xylocopa appendiculata* Sm. by *D. helophoroides* is described. The life history of the insect is described and figured.

Priesner, H. Materialien zu einer revision der *Taeniothrips*-Arten (Thysanoptera) des Indo-Malayischen Faunengebietes. *Treubia* 16(4) :469-526, 1938.—Of the 30 species and varieties of thrips described *Taeniothrips nibricornis* (Schmutz) is from China and Formosa; *T. distalis* Karny from Hangchow; *T. pallipes* Bagnall from China and Formosa. In addition to the species fully described, there is a key to 5 groups of thrips, with 96 species and varieties.

Randhawa, M. S. Observations on some Zygnemales from northern India. *Proc. Indian Acad. Sci.*, Sect. B, Part I, 8(3) :109-150; Part II, 8(4) :336-366, *1 chart, 58 fig.*, 1938.—The Algae treated were collected in various places in the Punjab and in the United Provinces from 1929 to 1938. Periodicity is briefly discussed. Most of the paper is given over to a systematic enumeration of species. Several of the species are of wide distribution. *Mougeotia parvula* Hassal is recorded from China; the new species *Spirogyra aplanosporum* is described as closely related to the Chinese *S. subpapulata*.

Rehder, Alfred. New species, varieties and combinations from the collections of the Arnold Arboretum. *Jour. Arn. Arb.* 20(1) :85-101, 1939.—Among the 36 species, varieties and forms treated are: *Clematis Armandi* Franchet, which is redescribed from specimens from Hupeh, Szechwan, Hunan, Yunnan, and Annam; *C. A.* var. *Biondiana* (Pavol.) [*C. Biondiana* Pavol.], n. comb., redescribed from Hupeh specimens; *C. koreana* Komar. f. *lutea* n. f., from Manchuria and Korea; *Magnolia Wilsonii* (Fin. & Gagnep.) Rehd. f. *Nicholsoniana* (Rehd. & Wils.) [*N. Nicholsoniana* Rehd. & Wils.], n. comb., from Szechwan and Yunnan; *Cotoneaster microphylla* Lindl. f. *melanotricha* (Franch.) [*C. buxifolia* Wall. f. *melanotricha* Franch.], n. comb., from Yunnan; *Photinia villosa* f. *Maximowicziana* (Lévl.) [*Pirus sinensis* Lindl. var. *Maximowicziana* Levl.] n. comb., from Korea.

Ridley, H. N. Additions to the flora of Borneo and other Malay Islands: X. *Bull. Misc. Inform.* No. 7, p. 275-285, 1938.—The following families are treated in this section of the list: Connaraceae (17 species), Leguminosae (32 spp.), Rosaceae (11 spp.), Rhizophoraceae (6 spp.), Combretaceae (4 spp.), Lecythidaceae (3 spp.). The range of *Abrus mollis* Hance is extended from China to Borneo.

Ridley, H. N. Notes on *Xylocarpus*. *Bull. Misc. Inform.*, No. 7, p. 288-292, 1938.—Taxonomic and distributional notes are given for the seven recognized species of the genus. *X. Granatum* Koen. and *X. moluccensis* (Lam.) Roem. sec. Merr. occur in Cochinchina.

Russell, Paul. A new variety of *Cotoneaster conspicua*. *Proc. Biol. Soc. Washington* 51 :183-184, 1938.—The new variety *C. c.* var. *decora* was collected in Tibet by Capt. F. Kingdon Ward, in 1924. It is an erect or prostrate shrub growing 3 to 4 feet high and profusely covered with scarlet berries in winter. It may form a dense evergreen mat under favorable conditions. Solitary flowers, terminating very short spurs on branchlets, have wide-spreading white petals 3 mm. long, 4 mm. wide.

Sata, T. Tannin and tanning materials, with an enumeration of tanning plants of the world. (In Japanese with French résumé.) *Formosan Agri. Rev.*, No. 382, p. 474-486, No. 383, p. 566-598, 1938.—Two hundred and thirty-eight species are listed. In some cases family, common names and synonyms are indicated. The study is made with the view of introducing and acclimatizing tannin-bearing plants which may be grown profitably in Formosa.

Sawamoto, Takahisa. Die Oenochrominen Japans (Beitrage zur Kenntnis der Systamatik der Geometriden Japans, II). *Ins. Matsumurana* 12(4) :181-198, *3 text-fig., 1 pl.*, 1938.—Keys and distribution records are given for 18 species in 10 genera. Four are also from mainland China, 2 from Hainan Island, 2 from Korea and 10 from Formosa. There is a bibliography of 50 titles.

Schmidt-Schaumburg. Chinesische Grosskopfschildröten. *Woch. Aqua. Terrar.* 35(33) :522-525, *3 fig.*, 1938.—Biological notes on *Platysternum megacephalum*.

Schmitz, H. *Megaselia* (S. str.) *laticosta* n. sp. *Arb. morph. tax. Ent. Berlin-Dahlem* 5(3) :292-293, *1 fig.*, 1938.—The new species is described from Hoozan, Formosa. It is compared to the Philippine *bihamulata* and *appendiculata*. The wing is figured.

Shinji, O., and **Kondo, T.** Aphididae of Manchoukuo with the description of two new species. *Kontyu* 12(2) :55-59, *1 fig.*, 1938.

Silvestri, Filippo. Descrizione di un nuovo genere di Margarodinae (Insecta, Coccidae) della Cina. *Notes Ent. Chin.* 5(3) :21-27, *1 fig.*, 1938.—*Promargarodes sinensis*, n. gen. and sp., is described from Foochow and Hankow.

Smith, Malcolm. Un nouveau Lézard de Cochinchine. *Bull. Mus. Nat. Hist. Nat.*, ser. 2, 9(6) :366-369, 1937.—*Riopa angeli* n. sp., related to *Riopa isodactyla* of Siam, is described, the type is in the Museum of Paris.

Sonan, J. The cherry tree Notodontid moth. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 384, p. 632-635, *3 fig.*, 1938.

Sonan, J. On the *Phassus signifer* Walker and the *Palpifer sexnotatus* Moore. (In Japanese with English title.) *Formosan Agri. Rev.*, No. 378, p. 410-417, *8 fig.*, 1938.

Stern, F. C. A geographical survey of the genus *Lilium*. *Proc. Linn. Soc. London*, 151st Session, Part 1, p. 29-34, 1938.—The genus is distributed only in the Northern Hemisphere and follows the same lines of distribution as *Primula* and *Gentiana*. "The greatest concentration of these genera is in Eastern Asia and from there they radiate mostly east and west with a few attempts to go north and south." All sections of lilies are found in Eastern Asia and the allied genera *Nomocharis* and *Notholirion* are not found elsewhere. The Cardiocrinum group, indigenous to E. Asia, is composed of *L. giganteum* from the Himalayas, *L. yunnanense* in the Chinese mountains and *L. cordatum* in Japan. In western China to Siam is found *L. ochraceum*. The trumpet lilies *L. Sargentiae* and *L. regale* are found in Szechwan, *L. leucanthum* var. *centifolium* in Hupeh. Several species of the Martagon type are found throughout China and Korea. *L. pumilum* extends from N. China to Siberia. *L. Brownii* is from S. China, *L. formosanum* from Formosa and *L. Poilanei* from N. Indo-China.

Straneo, S. L. Nuova specie del genere *Aristochroa* Tschit. (Col. Carab.). *Boll. Soc. Ent. Ital.* 70(6-7) :122-123, 1938.—*A. Freyi* n. sp. is described from a male specimen collected in Tibet. It is compared with *A. casta* Tschit.

Su, Tsu-fei. Studies on Hunan local food products. III. The vitamin C content of "vegetable water." *Chinese Med. Jour.* 54(4) : 351-357, *2 tab.*, 1938.—The vitamin C content of "vegetable water" prepared from 14 varieties of vegetables was determined colorimetrically. *Pai ts'ai* yielded the highest value (about 1/5 of Sunkist orange juice); New Zealand spinach, cabbage, mallow and *chia ts'ai* the next (about 1/10 orange juice); *chia lai ts'ai*, green amaranth, spinach and turnip leaves ranked lower (about

1/10 to 1/20 orange juice); while lettuce, Paris daisy and ipemea had the lowest (about 1/50 orange juice). The effect of heat and soaking on the vitamin C content was not noticeable. Water prepared from the 5 vegetables with higher ranking vitamin C content is recommended for infant feeding.
FROM AUTHOR'S SUMMARY

Sun, Tzu-yuan, 孫宗媛. The appendages of the large marine prawn, *Penaeus orientalis*. *Peking Nat. Hist. Bull.* 13(1):35-38, *1 pl.*, 1938.—The study was made with a view to substituting the large marine prawn for the fresh-water prawn, *Palaemon sinensis* (Sollaud), as a laboratory type. *P. orientalis* Kishinouye has 19 pairs of appendages, which are mostly of the biramous type and are all composed of a basal stem, an inner branch, and an outer branch. It differs from *Palaemon* in the following respects: Presence of rudiments of exopodites in all the chelipeds and pareiopods; presence of epipodites on the last two pairs of maxillipeds and all the chelipeds; evidence of sexual dimorphism in the dactylopodites of the third maxillipeds and the first two pairs of pleopods. All appendages are described.

Sun, Y. C. Two new species of Devonian trilobites from Hunan. *Bull. Geol. Soc. China* 17(3-4):349-354, *1 pl.*, 1937.—No trilobites have been previously recorded from the Devonian of SW. China. The species described are *Cyphaspis tiaomachienensis* from Tiaomachien formation, Changsha, and *Proetus chengi*, related to *P. chitralensis* Reed from Chitral, from the Hsikuangshan formation, Chaling district.

Svenson, H. K. Monographic studies in the genus *Eleocharis*—V. *Rhodora* 41(481):1-19; (482):43-77, *52 maps, 9 pl.*, 1939.—(To be cont.) This paper concludes the purely taxonomic treatment of *Eleocharis* and includes species not previously or adequately discussed, together with illustrations, distributional maps, and indexes to all species. "To the groups into which the genus has been divided (Rhodora 31:127-129, 1929), the old-world *Multicaules* have been added; the incongruous series *Intermediae, Melanocarpeae* and *Tuberculosae* have been eliminated." *Eleocharis nuda* C. B. Clarke is recorded from Hainan; *E. spiralis* (Rottb.) R. & S. from China, in water near the sea, Hainan; *E. fistulosa* (Poir.) Link from Annam; *E. mitracarpa* Steud. from Yunnan, Shantung, Kweichow, Peking, Mongolia, and Shansi.

Tagawa, M. On *Lindsaya heterophylla* Dry. and *L. ensifolia* Sw. (In Japanese with English résumé.) *Acta Phytotax. Geobot.* 7(3):196-198, 1938.—These two species are added to the 10 originally enumerated from Japan. Both are also recorded from Formosa.

Tagawa, Motozi. Spicilegium Pteridographiae Asiae orientalis 16. *Acta Phytotax. Geobot.* 7(3):184-191, 1938.—Species No. 207 to 219 are treated in this section of the series. *Gymnopteris bipinnata* var. *auriculata* (Franch.) Ching is listed from China and Manchuria; *Diplazium Doederleinii* (Luerss.) Makino and *D. virescens* Kunze from Indochina, S. China and Formosa; *Athyrium otophorum* (Miq.) Koidz. from China; *Woodsia Rosthorniana* Diels from China and Manchuria; *W. Okamotoi* n. sp. from Formosa; *Dryopteris kwanzanensis* n. sp. from Formosa; *D. kinkiensis* Koidz. from Korea; *Polypodium argutum* Wall. from China, Indochina and Formosa; *Phymatodes Okamotoi* n. sp. from Formosa; *Lepisorus morrisonensis* (Hayata) H. Itô from China and Formosa.

Takahashi, H. On the outbreaks of *Hieroglyphus annulicornis* Shiraki and methods for its control. (In Japanese.) *Jour. Formosan Sug. Plant. Assn.* 16(9):205-218, *2 pl.*, 1938.—The Acridid, *H. annulicornis* Shir., all stages of which are described, usually breeds on *Miscanthus* in Formosa, but sometimes migrates to sugar-cane and causes serious damage. The outbreaks occur in the southern part of the island, and a very severe one developed in 1938, when over 80,000 hoppers per acre were observed in the cane fields in June. Rainfall in May appears to exercise some control on the hoppers and outbreaks may be partly attributable to lack of rain in that

month. There is one generation a year, the hoppers hatch in April or May and become adult about the end of June, and the females deposit 80-90 eggs in the soil from July to September. Varieties of sugar-cane having erect leaves are preferred; *Imperata, Phragmites,* bamboo and maize are also attacked. Control measures include crushing the hoppers found on sugar-cane, ploughing infested fields before the eggs hatch, and the destruction of wild food-plants near cane fields. REV. APPL. ENT.

Takahashi, R. Some Coccidae from Formosa and Japan (Homoptera) III. *Mushi* 11(1):42-45, *3 fig.*, 1938.—The new species *Kuwanaspis arundinariae*, on *Arundinaria* sp., is described from Formosa.
REV. APPL. ENT.

Takano, S., and **Noda, I.** A morphological and ecological study of *Synonycha grandis* Thunberg in Formosa. (In Japanese with English summary.) *Rept. Govt. Sug. Exp. Sta. Formosa,* No. 5, p. 116-138, *1 pl.*, 1938.—The Coccinellid, *Synonycha grandis* Thnb., all stages of which are described, is predacious on various aphids in Formosa, particularly *Oregma* (*Ceratovacuna*) *lanigera* Zehnt., a serious pest of sugar-cane. It has about 11 generations a year, the egg, larval and pupal stages lasting 4-9, 9-20, and 4-13 days, respectively. Adults lived 30-70 days in summer, 60-90 in winter, and up to 6 months when the sexes were separated. Pairing, which takes place more than once during life, began 3-7 days after emergence, and females began to oviposit 5-16 days after emergence, chiefly near aphid colonies. The oviposition period lasted 1-2 months. The average number of eggs laid was 673, in masses of about 27. Females fed solely on sugar solution or wheat flour did not oviposit. The eggs did not hatch at temperatures above 29.5°C.; the percentages hatching at 29.1, 23 and 19-22°C. were 2, about 50 and 61-66, the last temperature being the optimum. Newly hatched larvae were gregarious for 3 or 4 days at about 15°C. but separated in less than a day at 20-25°C. A larva consumes a total of about 720 aphids, and the adults several thousands. *O. lanigera* is most abundant on sugar-cane from October to May, but the Coccinellid does not appear until November or December and is most numerous at the end of the period, after which it suffers great mortality for lack of food. The adults, however, can be kept in cold storage until the aphid becomes abundant, and liberated at outbreak centres. REV. APPL. ENT.

Tamanuki, Koichi. New longicorn beetles occurring in Japan and Korea (Col., Cerambycidae). (In English with Japanese summary.) *Ins. Matsumurana* 12(4):166-168, *2 fig.*, 1938.—Two new species, two new forms and one unrecorded species of Lepturinae occuring in Japan and Korea are described. Those from Korea are: *Gaurotes kozhevnikovi* Plavilst. f. *komensis* n. f., *G. thalassina* Schrank f. *nigriventris* n. f., *Leptura* (*Anoplodera*) *rufihumeralis* n. sp., and *L.* (*A.*) *baeckmanni* Plavilst.

Tanaka, T. On certain sub-tropical citrus fruits. (In Japanese with English summary.) Reprinted from *Studia Citrologica* 8:68-84, 1937. *Comm. hort. Inst. Taihoku Imp. Univ.* 57.—In this publication descriptions and coloured illustrations are given of the Mosambi of India, *Citrus sinensis* Osbeck var. *rugoso-dulcis* var. nov.; the Chota Kitchlee of India, *Citrus Reshni* Hort. var. *canaliculata* var. nov.; and the Yuhikitsu (Taohung Kieh) of Formosa and South China, *Citrus oleocarpa* Hort. ex Tanaka sp. nov.
HORT. ABST.

Tang, F. F. The transmission of influenza virus "W. S." to the Chinese mink and the David's squirrel. *Brit. Jour. Exp. Path.* 19:179-183, *1 chart,* 1938.—Tang reports that Chinese minks (*Mustela sibirica* Milne-Edwards), which are closely related to the ferret or polecat, and are found in large numbers in central and eastern China, are "highly susceptible" to the intranasal instillation of the "W.S." strain of influenza virus. No opportunity has yet arisen to test the possibility of direct transmission of the virus to minks from human sources. The author suggests that should this prove possible minks would provide a satisfactory substitute for ferrets in the

study of epidemic influenza in places, like China for example, where the latter animals are not available. There is, however, as yet no evidence that the disease can be transmitted to mink by contact infection. Experiments were also made with David's squirrels (*Sciurotamias davidianus* Milne-Edwards) which appeared to be less susceptible to infection than Chinese minks. No success was attained in attempts to infect chipmunks (*Eutamias asiaticus senescens* Miller), Chekiang squirrels (*Callosciurus caniceps canigenus* Howell), rabbits, white rats, guineapigs and young chicks with the "W.S." strain of influenza virus. I. A. GALLOWAY *in* BULL. of HYGIENE

Tardieu-Blot, Mme., and **Christensen, Carl.** Fougères d'Indochine XI. Vittarieae-Woodsieae. *Not. Syst.* 7(1) :10-15, 1938.—Distribution notes in Indochina are given on five species of *Vittaria;* six species of *Antrophyum,* including the new species *A. annamense* and *A. callifolium* var. *Germainii* var. nov.; *Acrophorus sipellatus* (Wall.) Moore and *Diacalpe aspidioides* Bl.

Tardieu-Blot, Mme., and **Christensen, Carl.** Les Fougères d'Indochine. XIV. Dryopterideae. *Not. Syst.* 7(2) :65-104, 1938.—Twenty-one genera are noted from Indochina. In all, distribution notes are given for 137 species; 11 species and one variety are new to science. Nine of the species are also reported from Hainan Island.

Tikhonov, N. N. Usuri plum at the Barnaul Branch Station of fruit and small fruit production. (In Russian.) *Fruits and Vegetables,* No. 8-9, p. 75-6, 1938.—As a result of breeding work started in 1927 several hardy plum seedlings were raised at Barnaul (Siberia) from seeds obtained from the Vladivostok region. Descriptions of these seedlings are given. It is interesting to note that Usuri (Manchurian) plum, usually considered to be very susceptible to drought, became sufficiently hardy under Barnaul conditions, where there is only a small yearly rainfall.
FROM HORT. ABST.

Ting, Ju-nan, 丁汝南. Morphology and anatomy of the giant freshwater leech, *Whitmania laevis* (Baird). *Peking Nat. Hist. Bull.* 13(1) :29-33, *1 pl.,* 1938.—The leech occurs commonly in China. Its external and internal characters are described.

Tortonese, Enrico. Revisione degli Squali del Museo Civico di Milano. *Atti Soc. Ital. Sci. Nat. Mus. Civ. Stor. Nat. Milano* 77(4) :283-318, *5 fig.,* 1938.—A taxonomic discussion of specimens of 49 species in 18 families in the Civic Museum in Milan. A specimen of *Squalus mitsukurii* Jord. Fowl. is from Shanghai; one of *Pristiophorus japonicus* Gthr. from Shantung.

Uchii, S. A study of agricultural organizations. (In Japanese with English title.) *Formosan Agri. Rev.,* No. 382, p. 500-512, *1 fig.,* 1938.

Ueno, Masuzo. Scopuridae, an aberrant family of the order Plecoptera. (In English with Japanese summary.) *Ins. Matsumurana* 12(4) : 154-159, *2 fig.,* 1938.—"The formation of Scopuridae was fully justified by Kohno's recent discovery of the female imago of *Scopura* which, like the male, has no wings." The family is recharacterized and the present status of its distribution in Japan is discussed. The Scopuridae show a close relationship to the Leptoperlidae. *Scopura longa* Ueno, the type species, is redescribed. It is distributed in the middle and northern parts of Honsyu, Hokkaido and Korea. From the distribution and habits of the nymph, *Scopura longa* is probably one of the so-called "boreo-alpine" species defined by Holdhaus.

Uphof, J. C. Th. The temple manderin. (In Japanese with English title.) *Formosan Agri. Rev.,* No. 384, p. 629-631, *2 fig.,* 1938.

Wardlaw, C. W. The storage of tropical fruits. *Trop. Agriculture* 15(8) :171-173, 1938.—The overseas transport of tropical fruits is still comparatively undeveloped. The many factors involved in creating an export

industry based on the production and handling of delicate fruits notoriously subject to wastage are briefly discussed and illustrated by reference to bananas, citrus, avacados, mangoes, and papaws. AUTHOR'S SUMMARY

Wehrli, E. Neue Untergattungen, Arten und Unterarten von ostasiatischen Geometriden (Lepid.) *Mitteil. Münchner Ent. Ges.* 28(2) : 81-89, 1938.—Seventeen Asiatic species and subspecies are described. *Bapta asynapta* n. sp. and *B. tapaishana* n. sp. are from S. Shensi; *Phalaena albipuncta* Warr. is reported from W. China; *Plagodis niveivertex* n. sp. from N. Yunnan; *P. hypomelina* n. sp. and *P. excisa* n. sp. from Shensi; *P. propoecila* n. sp. and *Tephrina anostilpna* n. sp. from N. Yunnan; *Krananda peristena* n. sp. from Tibet; *Amblychia angeronaria* Guen. from Szechwan.

Weidenreich, Franz. The duration of life of fossil man in China and the pathological lesions found in his skeleton. *Chinese Med. Jour.* 55(1) :34-44, *2 fig.,* 1939.—From an examination of the available skulls it appears that in both the *Sinanthropus* population and late palaeolithic man, most individuals died either as juveniles or at a relatively young age. Bones so far found show that the individuals were killed and dismembered. Old age was not unknown, as some *Sinanthropus* fragments appear to be part of the skull of a woman between 50 and 60 years old, and one man of the palaeolithic family group of the Choukoutien caves seems to have been at least 60 years of age. In neither group are there traces of either caries or pyorrhea, although most of the teeth are badly worn. The torus mandibularis is present in some of the mandibles of *Sinanthropus* but is not regarded as of pathological origin. Some lumber vertebrae of the palaeolithic group exhibit exostoses which may indicate an arthritic condition. Healed bone fractures were also noted. The lack of tooth decay, together with extensive formation of secondary dentine in worn teeth, suggest that the teeth of fossil man were more resistant to bacteria and had a greater regenerative power than those of modern man. It is suggested that similar powers of resistance may have protected primitive man against infectious and organic diseases.

Williams, Louis O. Orchid studies, IX. *Bot. Mus. Leaf. Harvard Univ.* 6(7) :137-141, 1938.—Among the 9 species discussed is *Dendrobium strongylanthum* Reich. fil., which was said to be a native of India. It was cited from Yunnan by Kranzlin. A specimen in the Ames Herbarium was collected in Burma.

Winfield, Gerald F., and **Chin, Ta-hsiung.** Studies on the control of fecal-borne diseases in north China. VI. The epidemiology of *Ascaris lumbricoides* in an urban population. *Chinese Med. Jour.* 54(3) :233-254, *4 tab., 1 graph,* 1938.—This paper presents the results of egg count examinations of 2,751 civilians and 393 soldiers and environmental studies on two groups of selected families from, in, and around Tsinan, Shantung, China. The civilian series was made up of 895 primary school students, 133 students of the Provincial School of Dramatics, 502 middle school students, 173 college students, 47 nurses, 416 hospital patients, and 584 persons from a random group of city families. The egg count showed that 35.4% of the civilian group was parasitized by ascarids with mean counts of 10,600 and 3,800 eggs per cc. for the positives and group, respectively. The ascaris egg counts of the student groups graded from the relatively heavy infestations in the primary school children down through the Provincial School of Dramatics and the middle school group to the lightest infestations which were shown by the University students. The Hospital patients had the heaviest infestation of any group studied while the city family series had heavier infestations than were characteristic of the civilian series as a whole. In the city family and civilian total series the females had heavier counts in each age group than did the males. The city area civilian total series had an average egg count which was less than one third that of the rural group examined in Lungshan and reported on in a previous publication of this series. The results of the examination of the soldiers was particularly instructive since they exhibited

the least frequent and lightest ascaris infestation of any group studied. This light infestation was attributed to the good sanitary arrangements enforced in the army camp and serves to demonstrate that ascaris can be greatly reduced with proper sanitation without resorting to treatment. The environmental studies indicated that the pollution of the household environment is probably the most significant factor in maintaining the ascaris infestation of the city just as it is in the country. The important role of small children in causing this pollution is again emphasized. It is also evident that the families lightly infested with ascaris are less crowded and are economically better off than the heavily infested ones just as was the case in the country. The pollution in the city is less intense than in the country area as Lungshan. This is reflected in the lower level of infestation with ascaris which is characteristic of the city. On the other hand hookworm and trichuris are more prevalent in the city than they were in the rural area at Lungshan though they are still of no public health significance. This more frequent occurrence of hookworm and trichuris is probably due to more moisture in Tsinan provided by the many springs present. The soldiers were most frequently infested with hookworms of any of the groups studied. AUTHORS' ABSTRACT and SUMMARY

Wu, Chenfu F., 胡經甫. The stoneflies of China. (Order Plecoptera). *Peking Nat. Hist. Bull.* 13(1) :53-87, *46 fig.*, 1938.—The long series of discussions of the stoneflies is concluded with 4 appendices, as follows: A. Additions. Sixteen species are added to the Chinese list of which all but one are new to science. All are described. B. Corrections. Several typographical errors are corrected. In addition, there are new diagrams for the wing venation of Plecoptera and for the wings of *Perlodinella heteroptera* Wu. Corrected keys are given for the genera *Perlodinella, Isoperla, Kammimuria, Paragnetina,* and *Acroneuria.* C. Systematic index to the Order Plecoptera. D. Alphabetical list.

Wu, Hsien. Protein in nutrition in China. *Nutrition Notes,* No. 9, p. 2-7, *1 tab.*, 1938.—Although the average Chinese diet contains enough proteins for adult requirements, the relatively low digestibility of vegetable proteins may often result in a net protein deficiency. "Until more animal food is available to the average Chinese, it would seem wise to recommend a somewhat higher intake of protein, at least for children, than the standard in the West."

Yang, We-I. Genre nouveau et espèce nouvelle de la famille des Pentatomides. *Notes Ent. Chin.* 5(4) :29-32, *2 fig.*, 1938.—*Pielicoris caudatus,* n. gen. and sp., is described and figured from Tonkin. The new genus is dedicated to Père Octave Piel, Director of the Musée Heude. The genus is related to *Antestia* and *Compates* of the subfamily Pentatominae. The type is in the Musée Heude.

Yasumatsu, Keizô. Les Guêpes Solitaires de l'Ile Sakhaline (Hymenoptera : Eumenidae). *Ins. Matsumurana* 13(1) :14-16, 1938.—In a collection of 6 species, five species were new to Sakhaline and one new to science. Species in common with China are: *Eumenes coarctatus* (L.) from N. China, *Discoelius zonalis* (Panzer) from N. China and Korea. *Pseudepipona sachalinensis* n. sp. is related to *P. quadrifasciata* (Fabr.) from China, Formosa and Manchuria.

Yew, H. P., and **Watson, A. J.** Diseases of the central nervous system in Yunnan. *Chinese Med. Jour.* 52(6) :843-856, 1937.—About 800 cases of diseases of the central nervous system have been recorded at the Church Missionary Hospital in Yunnanfu. Of these, 21 affected the afferent system, 57 the efferent system, 3 the combined system, 32 the spinal cord; 30 were diffuse diseases of the central nervous system; 234 were diffuse and focal diseases of the brain; 120 cases were of diseases of the cerebral nerves, 300 of spinal nerves, 30 of Herpes Zoster; general and functional diseases accounted for 148 cases and mental diseases for 42.

Yin, T. H. A new *Gastrioceras* from Sinkiang. *Bull. Geol. Soc. China* 17(3-4) :355-362, *2 pl., 1 fig.*, 1937.—A few specimens of unknown geological age were collected in N. Sinkiang, near Chitai city. They are described as a new species, *G. mirabile,* which somewhat resembles *G. somoholense* Haniel, *G. hanieli* Smith, *G. kueichowense* Yin and *G. orientale* Yin.

Yin, T. H. Yehlangian, Upper Permian or Lower Triassic? *Bull. Geol. Soc. China* 17(3-4) :289-302, *1 pl.*, 1937.—The Yehlangian of Ting and Grabau includes the Paoan shale, the Yülungshan limestone, the Feihsienkuan shale and the Sanchiao limestone. In their opinion these formations would represent the Upper Permian of south-western China. The present paper tries to show that both by their stratigraphical relation and their faunal contents the Yülungshan limestone and the Feihsienkuan shale belong undoubtedly to the Lower Triassic and that the Sanchiao limestone is much younger, probably of Upper Triassic age. The Paoan shale is the only true Upper Permian formation. If the term Yehlangian is to be retained, it should be redefined as a general term for the Lower Triassic of south-western China, including only the Yülungshan limestone, the Feihsienkuan shale and their exact equivalents. AUTHOR'S ABSTRACT

Yokoo, T., and **Taguti, K.** Some observations on *Araeocerus fasciculatus* DeGeer, as a pest of Chinese yeast in Korea. (In Japanese.) *Ann. Agri. Exp. Sta. Tyosen* 10(1) :69-78, *3 pl.*, 1938.—Larvae of the Anthribid, *Araecerus* (*Araeocerus*) *fasciculatus* DeG., all stages of which are described, have been observed in Korea feeding on Chinese yeast, sometimes causing serious damage. All stages occur from June to December. Females survived for an average of 27.5 days, males somewhat less, pairing occurred 2-16 days after emergence, and females oviposited 3 days later. The larval stage lasted about 14-28 days and the pupal stage averaged 12.8. The larvae accepted cotton seeds in captivity, but preferred the yeast. In experiments, adults were killed by exposure to 50°C. for 30 minutes, and complete mortality of all stages in a room was obtained by keeping it at this temperature for 3 days, or by fumigation with chloropicrin at the rate of 1.6 oz. per 1,000 cu. ft. for 1 day. REV. APPL. ENT.

Yoneda, Yûichi. Cyanophyceae of Japan, III. (In English with Japanese summary.) *Acta Phytotax. Geobot.* 7(3) :139-183, *66 fig.*, 1938.—This paper includes 66 species of thermal and sub-thermal Cyanophyceae from Beppu and its vicinity. Many of the species are widely distributed in Asia. *Aphanocapsa thermalis* Brügg. is known from Manchukuo, *Calothrix brevissima* West from Formosa.

Young, C. C. On the Triassic Dicynodonts from Shansi. *Bull. Geol. Soc. China* 17(3-4) :393-411, *9 fig.*, 1937.—"The three localities with bone remains prove to be true sites of Dicynodonts. The best preserved part is derived from Shipi. It is a form resembling *Kannemeyeria* in general structure but one which shows also distinct differences in many respects. I propose to name it *Sinokannemeyeria pearsoni.* The age is Upper Triassic. The well preserved specimens of different localities suggest that the so far supposed barren Triassic formation may turn to be a good field for Permo-Triassic vertebrate palaeontology. The South African affinity of the fauna is highly interesting not only because we have the eastern extension of the Sinkiang Teromorpha fauna, but also because it raises many interesting problems of the palaeogeography as well as vertebrate palaeontology." AUTHOR'S SUMMARY

Zdansky, Otto. *Promephitis* aus dem ponticum von China. *Bull. Geol. Inst. Univ. Upsala* 26 :323-330, *8 fig.*, 1937.—Specimens are described from the Pontian formation of Shansi Province of *Promephitis* cfr. *maeotica, P. maeotica, P. Majori, P. Alexejewi, P. Lartetii,* and *P. malustenensis.*

Zumpt, F. Curculioniden-Studien XXV—Ergänzungen zu meiner "Revision der paläarktischen Arten der Gattung *Lepyrus* Germ." *Pub. Mus. Ent. "Pietro Rossi" Duino,* No. 2, p. 189-191, 1937.—Brief notes are given on the treatment in the "Revision" of *Lepyrus costulatus* Fst., from Siberia, Manchuria and Mongolia, and of *L. flavipunctatus* Zpt. from Japan.

[Issued and Mailed May 13, 1939]

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LINGNAN SCIENCE JOURNAL
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Volume 18 1939 Number 3

THE CHINESE SPECIES OF BAUHINIA[1]

By LUETTA CHEN (陳雪英)

History of the Genus

The genus *Bauhinia*, found in tropical and subtropical regions, was established and described by Plumier in the "Nova Plantarum" in 1703. This was named after two brothers, John and Casper Bauhin, sixteenth century herbalists in Switzerland, because of the two lobes of the leaf.

The genus redescribed by Linnaeus in the "Genera Plantarum" in 1737 was based on the flower specimens in "Rheed Hortus Malabaricus" in 1678. As these specimens were radically different from Plumier's specimen, Linnaeus thought these were either a new genus or Plumier's description was very poor. There were eight of Linnaeus' species published in the "Species Plantarum" in 1753. Since that time four of these eight species have been recorded from China: *B. acuminata* Linn., *B. purpurea* Linn., *B. tomentosa* Linn., and *B. variegata* Linn.

In the eighteenth century four more species from China were either described or recorded by different authors, namely, *B. glauca* Wall., *B. corymbosa* Roxb., *B. Championi* Benth. and *B. racemosa* Lam. (*B. parviflora* Vahl.).

The number of new Chinese species has been increased through recent botanical expeditions particularly in the south and southwest regions. Gagnepain published his "Classification des 'Bauhinia' d'Extrême-Orient" in the "Association Francese" in 1915. In the same year he also published his "Distribution geographique des 'Bauhinia' d'Extrême-Orient." Gagnepain mentioned sixty-six species known from the Orient. Of the sixty-six species, eight were recorded by Gagnepain as ranging into China and eight more have been since accredited to China by various authors. Later more new species were added from Kwangtung, Hainan, Yunnan and other provinces, but no comprehensive monographic treatment of the genus *Bauhinia* in China has been attempted.

The genus has no special economic value, except in horticulture and in some minor importance to the natives. For example, in *Bauhinia purpurea* Linn. the flower-buds are pickled and eaten as

[1] Submitted in partial fulfillment of the requirements for the Master of Arts Degree in Botany, Oberlin College, May 14, 1938.

a vegetable; the seeds of *Bauhinia tomentosa* Linn. are eaten in Punjab and leaves are eaten by the natives of the Philippines as a substitute for vinegar; in *Bauhinia variagata* Linn. the leaves and flower-buds are often eaten as a vegetable and the flower-buds are often pickled. Its bark is used medicinally and also for tanning leather in India.

Sections of the Genus

In 1825, De Candolle treated *Bauhinia* as a genus, under which five sections were established, differing in stamen number. According to Miquel's interpretation, in 1855, *Bauhinia* was a tribe under Papilionaceae, containing four genera: *Phanera*, *Lasiobema*, *Piliostigma* and *Bauhinia*. They were separated by the number of fertile stamens and by some other floral characteristics.

Twenty-four years after Miquel, Baker, in 1879, treated *Bauhinia* as a genus, dividing it into six sections. These sections were based upon the number of fertile stamens, form of calyx, dehiscence or indehiscence of fruit, and character of the leaves, entire or lobed, pubescent or glabrous. Engler and Prantl accepted Baker's interpretation in the main, but added five more sections in 1894.

The "Index Kewensis" ever since its first edition in 1895 has treated eighteen previously recognized genera and sections as synonyms of the genus *Bauhinia*.

Geographical Distribution

The geographical distribution of the genus *Bauhinia* offers a very interesting problem. The genus is often found between 15-30 degrees north latitude and 5-15 degrees south latitude. There are over two hundred species described and scattered all over tropical and subtropical regions such as Mexico, Cuba, Panama, Venezuela, Brazil, Egypt, India, Burma, Siam, Indo-China, Malayan Islands, Philippines, Formosa, Japan and China.

The accompanying map of China demonstrates very clearly that there are four distinct areas of distribution of Chinese species of genus *Bauhinia:* (1) southeastern, (2) southern, (3) southwestern, (4) western and central.

The southeastern area extending along the coastal plain from Fukien to Chekiang contains six species, namely *B. apertilobata* Merr. and Metc., *B. Championi* Benth., *B. hupehana* Craib., *B. Blakeana* Dunn, *B. purpurea* Linn., and *B. variegata* Linn. The first three species are wild in this region and the latter three species are introduced.

The southern area, extending from Hong Kong and adjacent islands to Kwangsi and Hainan Island, contains the greatest number of species. Of the thirty-two recognized species and two varieties of the genus *Bauhinia* in China, twenty-two and one variety, or more than half, are confined to this area as far as China is concerned.

Many species have a localized distribution only, such as *B. subrhombicarpa* Merr., *B. Howii* Merr. and Chun, *B. hainanensis* Merr. and Chun, *B. yingtakensis* Merr. and Metc., *B. didyma* Chen. Three species, namely *B. Kerrii* Gagnep., *B. pyrrhoclada* Drake and *B. touranensis* Gagnep., have been recorded in the southern area. The center of distribution in the southern region falls within Kwangtung and Hainan Island.

The southwestern area comprises Yunnan and Kweichow where thirteen species are known. Of the thirteen species, nine species were recently described from Yunnan: *B. yunnanensis* Fran., *B. Mairei* Harms, *B. comosa* Craib, *B. Delavayi* Fran., *B. Bohniana* Chen, *B. caterviflora* Chen, *B. pernervosa* Chen, *B. chalcophylla* Chen and *B. euryantha* Chen. This shows that the center of distribution in the southwestern area is Yunnan.

The western and central area includes the four provinces Szechuan, Hupeh, Hunan and Kiangsi. Two species, namely *B. hupehana* Craib and *B. Faberi* Oliv., and the variety *B. Faberi* var. *microphylla* Oliv. are found in this region.

The species of genus *Bauhinia* grow thickly in southern and southwestern provinces considerably below the Yangtze River. The number of species gradually decreases in those provinces near the Yangtze River. No species are found in the provinces above the Yangtze River, such as Shantung, Hopeh, Honan, Shansi, and Shensi, except for two collections of *B. Faberi* Oliv. var. *microphylla* Oliv. from southern Kansu and eastern Sikiang. No previous mention of the occurrence of *Bauhinia* north of the Yangtze River has come to the writer's notice.

Abbreviations

The names of herbaria from which cited specimens were seen, are indicated by abbreviations in parentheses; the abbreviations adopted being as follows:

Herbaria in United States

AA = Herbarium of Arnold Arboretum, Harvard University.
G = Gray Herbarium, Harvard University.
NY = Herbarium of New York Botanical Garden, New York.
US = United States National Herbarium, Washington, D.C.
O = Herbarium of Oberlin College, Oberlin.

Herbaria in China

F = Herbarium of Fan Memorial Institute, Peiping.
NR = Herbarium of National Research Institute, Nanking.
UN = Herbarium of University of Nanking, Nanking.
A = Herbarium of Amoy University, Fukien.
SYS = Herbarium of Botanical Institute, Sun Yatsen University, Canton.

LU = Herbarium of Lingnan University, Canton.

CCC = Herbarium of Canton Christian College (now Lingnan University), Canton.

Taxonomy

Bauhinia Linnaeus, 1737, Gen. Pl., ed. 1, 126; DC., 1825, Prodr. 2 :512; Benth., 1861, Fl. Hongk. 99; Miq., 1855, Fl. Ned. Ind. 1 :74; Hook., 1878, Fl. Brit. Ind. 2 :275; King, 1897, Fl. Malay. Penin. 175-176; Lec., 1913, Fl. Gen. L'indo-Chine 2 :119.

Unarmed erect trees, or shrubs or climbers with or without circinate tendrils, pubescent or glabrous. Leaves simple, alternate, deciduous, usually deeply cleft from the tip, rarely entire or fully divided into two leaflets, pubescent or glabrous; stipules rarely present, minute. Inflorescences simple or panicled, often corymbose racemes; bracts and bracteoles often linear in shape, pubescent or glabrous; flowers various in size and shade; calyx-tube long and cylindrical, short and turbinate, sometimes with a disk to the top; calyx entire and spathaceous or cleft into two or five teeth, pubescent or glabrous; petals five, pubescent or glabrous, subequal, usually with a distinct claw; stamens ten or reduced to five or three, if fewer than ten with sterile stamens absent or present; filaments free, filiform; anthers versatile, dehiscing longitudinally; ovary stalked, pubescent or glabrous, many-ovuled; style long or short; stigma small or large and peltate, subterminal or oblique. Pods linear or rarely oblong, flat, continuous within, dehiscent or indehiscent; seeds albuminous, sub-round, compressed.

Key to Groups

A. Fertile stamens usually three, rarely two or four; trees, shrubs, climbers
  B. Ovary glabrous .....Group I
  BB. Ovary pubescent .....Group II
 AA. Fertile stamens five; ovary pubescent; trees .....Group III
AAA. Fertile stamens ten; shrubs, climbers
  B. Ovary glabrous .....Group IV
  BB. Ovary pubescent .....Group V

Key to Group I

Fertile stamens usually three; ovary glabrous

A. Leaves glabrous on both surfaces (except at the base in some instances)
  B. Leaves entire; legumes castaneous or subrotund, 2.5-3 cm. long.....1. **B. subrhombicarpa** Merr.
  BB. Leaves bilobed to very base; legumes linear, 11-15 cm. long
    C. Tendrils stout, broadly flattened, usually paired, thrice involute; mucro 2.5-5 mm. long, stiff ...2. **B. yunnanensis** Fran.
    CC. Tendrils slender, filamentous, usually solitary, once involute; mucro minute, less than 1 mm. long, weak.....3. **B. didyma**[2] Chen

[2] Flowers not seen.

AA. Leaves glabrate or glabrous on upper surface, sparingly pubescent or pubescent on lower surface
  B. Leaves with acute or subacute lobes
    C. Leaves 8 cm. long or less; lobes usually one-half the length of the blade
      D. Petioles and tendrils glabrous or glabrate.....4. **B. yingtakensis**[2] Merr. and Metc.
      DD. Petioles and tendrils pubescent
        E. Flower-buds subglobose to ovoid .....5. **B. Delavayi** Fran.
        EE. Flower-buds ovoid-acuminate to lanceolate-acuminate .....6. **B. comosa** Craib
    CC. Leaves not less than 10 cm. long; lobes one-third to one-fourth length of the blade
      D. Woody vine; sterile stamens five .....7. **B. euryantha** Chen
      DD. Shrub; sterile stamens seven .....8. **B. chalcophylla** Chen
  BB. Leaves with rotund or subrotund lobes
    C. Largest leaves not less than 9-10 cm. long; nerves eleven-thirteen
      D. Inflorescence a loose panicle, with secondary axis racemosely branched; sterile stamens two .....9. **B. hainanensis** Merr. and Chen
      DD. Inflorescence a raceme; sterile stamens seven.....10. **B. pernervosa** Chen
    CC. Largest leaves not more than 7 cm. long; nerves nine or less
      D. Leaves 3 cm. or less long, cleft to the base; inflorescence corymbose .....11. **B. corymbosa** Roxb.
      DD. Leaves more than 5 cm. long, lobes one-half or less than one-half the length of the blade
        E. Inflorescence densely crowded, broad raceme 10 cm. long .....12. **B, hupehana Craib**
        EE. Inflorescence loose slender raceme, 15-20 cm. long .....13. **B. Mairei** Harms

Key to Group II

Fertile stamens usually three; ovary pubescent

A. Leaves five-seven-nerved
  B. Inflorescence long, slender, loosely flowered, raceme 15-30 cm. long
    C. Leaves lobed one-third their length or entire; pedicels in anthesis 10 mm. long .....14. **B. Championi** Benth.
    Leaves entire, long caudate-acuminate.....14a. **B. Championi** var. **acutifolia n. var.**
    CC. Leaves lobed one-half or less their length; pedicels in anthesis 3 cm. long .....15. **B. kwangtungensis** Merr.
  BB. Inflorescence densely flowered, corymbose raceme less than 10 cm. long
    C. Leaves entire, emarginate to obtuse; calyx-tube cylindrical, somewhat gibbous at the base.....16. **B. touranensis** Gagnep.
    CC. Leaves bilobed, lobes 10 mm. or more long; calyx-tube sulcate, prominently gibbous at the base...17. **B. genuflexa** Craib

AA. Leaves nine-thirteen-(rarely seven) nerved
B. Leaves entirely glabrous
C. Leaves acutely lobed; flower-buds 6 mm. long, short acuminate, ferruginous tomentose; fruit 3 cm. broad .....18. **B. Howii** Merr. and Chun
CC. Leaves rotund-lobed; flower-buds 2.5 cm. long, narrowly ellipsoid, grayish pubescent; fruit 1.5-2 cm. broad .....19. **B. purpurea** Linn.
BB. Leaves pubescent
C. Largest leaves not more than 8 cm. long, lobes rounded
D. Sterile stamens 2-3; ovary hirsute; inflorescence and lower leaf surface densely ferruginous tomentose .....20. **B. pyrrhoclada** Drake
DD. Sterile stamens 6-7; ovary pubescent; inflorescence and lower leaf surface not densely ferruginous tomentose
E. Year-old branchlets grayish-brown tomentose; inflorescence 8 cm. long; lenticels very prominent; claw villous.....21. **B. Bohniana** Chen
EE. Year-old branchlets closely appressed pubescent; inflorescence 10-15 cm. long; lenticels obscure; claw glabrous.....22. **B. caterviflora** Chen
CC. Largest leaves not less than 8.5 cm. long, usually 10 cm. or more, lobes acute
D. Lobes acuminate; ovary ferruginous villose .....23. **B. erythropoda** Haya.
DD. Lobes acute or occasionally somewhat obtuse; ovary pubescent or hirsute
E. Nerves usually nine; ovary pubescent; fruit glabrous.....24. **B. apertilobata** Merr. and Metc.
EE. Nerves eleven-thirteen; ovary hirsute; fruit pubescent
F Leaves membranaceous, on lower surface closely appressed brown pubescent; fruit velutinous.....25. **B. Kerrii** Gagnep.
FF. Leaves subcoriaceous, on lower surface ferruginous tomentose; fruit ferruginous tomentose .....26. **B. aurea**[3] Lévé.

Key to Group III

Fertile stamens five; ovary pubescent

A. Calyx bilobed, each lobe with two-three teeth at the tip; branchlets appressed velutinous .....27. **B. Blakeana** Dunn
AA. Calyx spathiform, cleft on one side, entire at the tip; branchlets sparingly pubescent .....28. **B. variegata** Linn.

Key to Group IV

Fertile stamens ten; ovary glabrous

Leaves grayish pubescent beneath; filaments barbate plumose; legumes falcate, firm .....29. **B. racemosa**[3] Lam.

Key to Group V

Fertile stamens ten; ovary pubescent

A. Calyx of two segments, each segment shallowly bilobed
B. Leaves not less than 3.5 cm. long .....30. **B. Faberi** Oliv.
BB. Leaves not more than 4.5 cm. long .....30a. **B. Faberi** var. **microphylla** Oliv.
AA. Calyx spathiform, opening to the base on one side
B. Calyx lobed, lanceolate, lobes entire at the tip; bracts scale-like; flowers yellow .....31. **B. Laui** Merr.
BB. Calyx slit on one side, five teeth at the tip, teeth filiform, pubescent; bracts filiform, pubescent, flowers white .....32. **B. acuminata** Linn.

[3] Flowers not seen.

1. **Bauhinia subrhombicarpa** Merr.

Bauhinia subrhombicarpa Merr., 1935, Ling. Sci. Jour. 14 :9.

Woody climber, glabrous, except inflorescence. Branchlets terete, about 1-2 mm. diameter; tendrils woody, up to 7 cm. long, coiled, coiling strongly increasing with age. Leaves glabrous on both surfaces, chartaceous, sub-olivaceous, broadly ovate, 4-7 cm. long and broad, base truncate or broadly truncate-rounded, sometimes cordate, seven-nerved, nerves small, distinct on lower surface, apex retuse, lobes broadly rounded, scarcely 2 mm. long; petioles 2-4 cm. long, glabrous or glabrate at the base. Flowers not seen by Merrill. Legumes castaneous, glabrous, shining, compressed subrounded, 2.5-3 cm. long, 1.5-2 cm. wide, dehiscent, valves tenuate, about 7 mm. long, lightly compressed, elliptic or obovoid, rounded.

HAINAN: Chiu Sam Tsuen, Ngai district, Lau S. K. 386, type, Aug. 7-25, 1932 (NY); isotype (AA. LU.); Yaichow, N. K. Chun and Tso, 44510, Dec. 24, 1932 (NY.AA.US.); Lok Mooi Shan, Chiangkiang district, Lau S. K. 1214, Feb. 27, 1933 (NY.AA.O.LU.); Kumyun, Liang 63122, Sept. 17, 1933 (O.SYS.); locality lacking, Wang 34890, Oct. 26, 1933 (NY.AA.); Liang 63822, Oct. 28, 1933 (NY.AA. US.); locality lacking, Liang 66172, Dec. 13, 1933 (NY.AA.); Ka Chik Shan, Lau S. K. 3098, Jan. 7, 1934 (AA.O.LU.); locality lacking, Liang 65367, Feb. 27, 1934 (NY.AA.); Kum-yun, Lau S. K. 27897, Sept. 17, 1936 (O.SYS.).

DISTRIBUTION: China.

This species, *Bauhinia subrhombicarpa* Merr., is closely allied to *Bauhinia Horsfieldii* Macb. A duplicate of a type of the latter species is L. 162 a (Horsfield), collected from Java and preserved in Gray Herbarium, which I have carefully compared with the type specimen of *B. subrhombicarpa* Merr. The leaves of *B. Horsfieldii* Macb. are pubescent on both surfaces; petioles are short, not more than 1.5 cm. long, pubescent. Branchlets are pubescent. The leaves of *B. subrhombicarpa* Merr. are glabrous; petioles 2-4 cm. long, glabrous.

Flowering material of *B. subrhombicarpa* Merr. was found during this study.

Inflorescences racemose, elongate, paniculate, pubescent; bracts linear-acuminate, about 2 mm. long; buds ovoid; flowers very small; calyx with five teeth at the tip; petals five, short unguiculate, about

2 mm. long; fertile stamens three; filament glabrous, 3-4 mm. long; anther elliptic; ovary glabrous, short stipitate; style short; stigma minute; disk fleshy, pubescent.

HAINAN: Locality lacking; climbing on tree, Wang 34890, Oct. 26, 1933, type of flower in Arnold Arboretum; duplicate of type (NY. SYS.); locality lacking, Liang 63822 paratype, Oct. 28, 1933 (NY. AA.US.SYS.).

2. **Bauhinia yunnanensis** Fran.

Bauhinia yunnanensis Fran., 1890, Pl. Delav. 190; Hook., 1902, Bot. Mag. vol. 58, tab. 7814; Wils., 1916, Pl. Wilson. 2 :89; Blades, 1929, Gard. Chron. 86 :402, no. 2239; Hand.-Mazz., 1931, Sym. Sin. 540; Rehd., 1932, Jour. Arn. Arb. 13 :322.

Bauhinia altifissa Lévé., 1914, Fl. Kouy-Tchéou, 226, proparte, excl. Esquirol n. 3056.

Climbing, glabrous, glaucous shrub. Branches very slender, angulate or terete; tendrils flattened. Leaves small, coriaceous, glabrous, bipartite, pale green, lobes 2.5-4 cm. long, 2-2.5 cm. broad, oblique ovate to obtuse at apex, truncate to cordate at base, three-four-nerved, mucro between lobes, about 3 cm. long; petioles 2-3.5 cm. long, slender, swollen at base. Inflorescences 10-15 cm. long, many-flowered; bracts falling off early; bracteoles 3 mm. long, ensiform; pedicels 2-2.5 cm. long, slender; flowers 2.5 cm. in diam.; calyx-tube 5-10 mm. long, cylindrical, terete; calyx bipartite with five segments, lanceolate, acute; petals five, spatulate, 2 cm. long, pale pink, three upper with three streaks of carmine from base to middle, two lower with one median streak; fertile stamens three; filament about 2.5 cm. long, glabrous, anther oblong, 4 mm. long; sterile stamens seven; filament short; anther imperfect, globose; ovary stipitate, glabrous, linear, narrow, contracted into a stout incurved style; stigma small, capitate. Legumes 11-15 cm. long, linear, many seeded; seeds ovoid.

YUNNAN: Mengtze, Henry 9670, Feb. 1, year unknown (NY. US.); locality unknown, Henry 13098, July 22, year lacking (NY. AA.); locality and date lacking, Forrest 10280, 10398 and 11671 (AA); Yungpeh, Hand.-Mazz. 3383, July 2, 1914 (AA); Yungpeh, Schneider 1748, July 2, 1914 (G); Tschuhsiung and Yungpeh, Hand.-Mazz. 6274, May 13, 1915 (US); Teyentsin, Ten. 102, May 19, 1916 (AA); Yangtze watershed, Rock 3884, May-Oct., 1922 (AA. US.); between Likiang and Yungpeh, Rock 5076, June 1922 (NY.AA.US.UN.).

KWEICHOW: Man-ci-cho, Schoch 406, Oct. 13, 1916 (US).

SZECHUAN: Wilson 3378, July 1908 (AA.US.); Opien Hsien, Yü 895, May 25, 1932 (AA.F.); collector, locality and date unknown, 3760 (SYS); west China, Wilson 3401, date 1903 (AA).

3. **Bauhinia didyma** Chen

Bauhinia didyma Chen, 1938, Jour. Arn. Arb. 19 :131.

Scandent with slender, glabrous branchlets. Tendrils small, involute, glabrous, solitary, less than 1.5 cm. long. Leaves divided to

the very base into two somewhat inequilateral segments, segments 1.3-2.2 cm. long, 1-1.5 cm. broad, wholly glabrous on both surfaces with the exception of the jointed portion between the blade and the petiole, on the lower surface having short, minute, rufous pubescence, rounded at the apex, truncate at the base, three-nerved, nerves conspicuous, reticulate on both surfaces; petioles slender, glabrous, 1-1.5 cm. long. Inflorescences racemose, solitary to two, terminal, sparingly pubescent; flower not seen. Legumes thin, glabrous, the surface smooth, lanceolate, margin entire, about 10 cm. long, 2.5 cm. broad, short acute at apex, obtuse and oblique at base, many-seeded; seeds small; pedicels about 1.2 cm. long.

KWANGTUNG: Yeungchun, C. Wang 38777, type, Nov. 16, 1935 (O); duplicate of type (SYS).

DISTRIBUTION: China.

4. **Bauhinia yingtakensis** Merr. and Metc.

Bauhinia yingtakensis Merr. and Metc., 1937, Ling. Sci. Jour. 16 (1) : 85.

A woody vine with sub-glabrous branches and tendrils, the older branches rather densely lenticellate. Leaves ovate to suborbicular, 4.5 cm. long, up to 4 cm. broad; glabrous on upper surface, subglabrous or obscurely pubescent on lower surface, usually nine-nerved, nerves reticulate on both surfaces, shallowly cordate at base, two-lobed at apex, lobes ovate, obtuse or subacute, approximate, extending to middle of the leaf; petioles slender, 2-3 cm. long, inflorescence racemose, sparingly pubescent, terminating short lateral branchlets and with a pair of tendrils at base of each; flowers not seen. Legumes coriaceous, glabrous compressed, lanceolate, margin entire or undulate, 4-8 cm. long, 2 cm. broad, apiculate, base acute; pedicels 13 mm. long, sparingly pubescent, the persistent calyx lobes ovate, acute or obtuse, slightly pubescent, about 2 mm. long.

KWANGTUNG: Ying-tak, Tso 22216, Aug. 5-Sept. 4, 1930 (O.SYS); Wen-tong Shan, W. Y. Chun 7008, Aug. 21, 1931 (O.SYS); Pat Tang Shek, Lau S. Y. 20721 type, Jan., 1935 (LU).

DISTRIBUTION: China.

This species, *B. yingtakensis* Merr. and Metc., is closely allied to *B. Championi* Benth. The outstanding feature is its leaves ovate to suborbiculate, usually nine-nerved, lobes extending to the middle of the blade.

5. **Bauhinia Delavayi** Fran.

Bauhinia Delavayi Fran., 1890, Pl. Delav. 192-193; Hand.-Mazz., 1933, Sym. Sin. 540.

Scandent shrub. Branches slender, scarcely angulate, cirrhiferous, thinly silky pubescent. Leaves coriaceous, pale below, suboblong, 6-9 cm. long, 4.5-6.5 cm. broad, apex acute, base broadly truncate, glabrous on upper surface, pubescent on the nerves on lower surface, nine-nerved, not deeply bilobed, lobes scarcely acute, short, 2-3.5 cm.

long, 2-3 cm. broad; petioles 2.5-4 cm. long, pubescent. Inflorescences racemose, closely rufous pubescent, simple or alternately branched, many-flowered; pedicals 10-15 cm. long, tomentose; bracts 5 mm. long; bracteoles minute, two alternate, 2 mm. long; flowers white; calyx tomentose, five-dentate, teeth short, triangular, 2-3 mm. long; petals five, elliptic ovate, 5 mm. long, up to 3 mm. broad, silky pubescent without at middle, claw three times shorter than limb; fertile stamens two; filament 5 mm. long; anther minute; sterile stamens two-three, very short, 0.5-1 mm. long; disk carnose, slightly raised, lobed; ovary glabrous, eccentric, stipitate; style short; stigma attenuate, incurved. Legumes compressed, slender, semi-ovate or oblong, obtuse, falcate, 2-5 cm. long, 1-2 cm. broad.

YUNNAN: Yangtze, without collector, 2165, Aug., 1914 (AA.G.); Ni Kou, Ten 406, June 9, 1917 (AA); Yungpeh, Forrest, without number, Aug. 1921 (AA.US.); Chien Chuan Mekong, Forrest, without number, Aug. 1922 (AA.US.); collector, locality and date lacking, 6677 (NY); Forrest 10718, locality and date lacking (AA); leaf and flower of type, 1055, have been seen (AA); also photograph.

DISTRIBUTION: China.

6. **Bauhinia comosa** Craib

Bauhinia comosa Craib, 1913, Kew Bull. 352; Merr., 1937, Sunyatsenia 3 :252.

Bauhinia saxatilis Craib, 1913, Kew Bull. 353.

Bauhinia Henryi Harms, 1921, Fedde. Repert. Nov. Sp. 17 : 134, non Craib, 1913.

Woody climber with short tomentose branchlets, tendrils in pairs. Leaves broadly ovate or suboblong, base broadly cordate, up to 7.5 cm. long, 6.5 cm. broad, bilobed, lobes divided half of whole length, obtuse, up to 3.5 cm. long and broad, rigidly chartaceous, glabrous on upper surface, first finely appressed pubescent, then becoming more or less glabrous on lower surface, nine-nerved, middle nerve excurrent, apiculate, 5 mm. long, nerves conspicuous, reticulate or somewhat projecting on upper surface, prominent on lower surface; petioles 1.7-2.5 cm. long. Inflorescences racemose, few-flowered; pedicels 6 mm. long; bracts deciduous, 6 mm. long; bracteoles filiform, 3-4 mm. long; calyx-tube 2 mm. long; calyx five-lobed, 5 mm. long, 2 mm. broad, appressed pubescent without; petals yellow (ex. Henry), angulate oblong, acuminate, 6.5 mm. long, 1.5-2 mm. broad, pubescent without, glabrous within; fertile stamens three; filament 6 mm. long, glabrous; anther 2 mm. long; sterile stamens two, minute; ovary glabrous, stipitate; style 3-4 mm. long. Legumes compressed, apiculate, 7.5 cm. long, 2 cm. broad, brownish, stipe 2.5 mm. long, glabrous, five-six-seeded; seeds black, compressed.

YUNNAN: Linan, Henry 13358, isotype, without date (NY.AA.); photograph of type (NY); Plain, N. Mengtze, Henry 10193, no date (NY.AA.); Yuan Chiang, Henry 13259, date unknown (AA.US.); same locality, Henry 13357, Oct. 28 (NY.AA.).

This species, *B. comosa* Craib, is closely allied to *B. Mairei* Craib. Isotypes of both were available to the writer for study. The petals of latter are unguiculate, obovate or obovate-oblong, obtuse or rounded. The petals of former are angulate, oblong, acuminate.

7. **Bauhinia euryantha** Chen

Bauhinia euryantha Chen, 1938, Jour. Arn. Arb. 19 :131.

Woody vine with erect, angular, pubescent branches and branchlets. Tendrils pubescent, solitary or in pairs, at the nodes of the branchlets. Leaves broadly ovate to ovate, 8.5-10 cm. long, 6.5-10 cm. broad, sparingly pubescent on upper surface, short, rusty pubescent on lower surface, deeply cordate at the base, bilobed at the apex, lobes more than one-third of the whole blade, acute, nine-eleven-nerved, nerves conspicuous, reticulate on lower surface; petioles strong, densely brownish tomentose, up to 4.5 cm. long. Inflorescences racemose, three, terminal, rufous pubescent; bracteoles linear, 3-4 mm. long, pubescent; pedicels 2-2.8 cm. long; calyx-tube more or less cylindrical, 7 mm. long; calyx lobes narrowly lanceolate, acute, about 7 mm. long, 2-2.5 mm. broad, pubescent without, glabrous within; petals white or slightly pale yellow, spatulate, claw 1-2 mm. long, limb about 7 mm. long, 6 mm. broad, glabrous within, except the limb, appressed pubescent without, but not at the margin; fertile stamens three; filament slender, glabrous, up to 3 cm. long; anther not seen; sterile stamens five, minute, about 5 mm. long; ovary stipitate, glabrous; style slender, 10 mm. long; stigma minute, capitate; stipe 2 mm. long. Legumes stipitate, oblanceolate, glabrous (immature).

YUNNAN: Yong Shan Hsien, Tsai 51222, type, July 27, 1932 (F).

DISTRIBUTION: China.

8. **Bauhinia chalcophylla** Chen

Bauhinia chalcophylla Chen, 1938, Jour. Arn. Arb. 19 :130-131.

Shrub with fine, short, ferruginous pubescent branchlets and inflorescences. Leaves ovate, bluntly acute, 9-11.5 cm. long, 7-9 cm. broad, thinly puberulent on upper surface, short ferruginous pubescent on lower surface and on the nerves, eleven-thirteen-nerved, nerves conspicuous, branching toward the ends, finely reticulate on lower surface, cordate at the base, margin undulate, bilobed at the apex, lobes one-fourth connate, bluntly acute, usually overlapping; petioles pubescent, 3-4 cm. long. Inflorescences racemose, usually three, terminal, many-flowered; bracteoles paired at the middle of the pedicel, pubescent, lanceolate, about 3 mm. long; pedicels 2.5-3 cm. long; flower-buds oval, pubescent; calyx-tube obconic, about 5 mm. long; calyx lobes lanceolate, reflexed in anthesis, 1 cm. long, 2-5 mm. broad, glabrous within, pubescent without; petals cream-white, spatulate, obtuse, claw about 4 mm. long, limb 9-10 mm. long, 7 mm. broad, margin crenate, glabrous within, densely appressed pubescent without; fertile stamens three; filament glabrous, 3-3.2 cm. long; anther not; sterile stamens seven, small, 4-7 mm. long; ovary stipitate

to subsessile, wholly glabrous; style about 1.5 cm. long; stigma small, capitate. Legumes oblong, abruptly acuminate at the apex, attenuate at the base, wholly glabrous, woody, about 15 cm. long, 4 cm. broad, five-seven-seeded.

YUNNAN: Talang, Henry 13240, type (NY); isotype (AA).

DISTRIBUTION: China.

9. **Bauhinia hainanensis** Merr. and Chun

Bauhinia hainanensis Merr. and Chun ex. Chen, 1938, Jour. Arn. Arb. 19 : 132.

Climber with erect, short, finely rufous tomentose branches, branchlets and inflorescences. Branches and branchlets erect, angular; tendrils stout, solitary in leaf axils on the branchlets, 3.5 cm. long. Leaves orbicular to broadly and more or less irregularly ovate, sub-coriaceous, with thick margin, slightly revolute, up to 16 cm. long, 18 cm. broad, glabrous on upper surface, except the thickened cushion-like insertion of the petiole, short, wooly pubescent on lower surface and densely pubescent on the nerves, eleven-thirteen-nerved, nerves prominent and secondary veins finely reticulate on lower surface, deeply cordate at the base, bilobed at the apex, lobes rounded, one-third connate; petioles stout, densely pubescent, up to 5.5 cm. long. Inflorescence a loose panicle, secondary axis racemose, branched densely, appressed, ferruginous tomentose; bracteoles short, about 3 mm. long; pedicels pubescent, 1-1.5 cm. long; flower-buds broadly ovoid, appressed tomentose; calyx-tube obconical, about 3 mm. long, 3 mm. broad at the top, narrow at the base, pubescent; calyx lobes ovate, short acute, about 6 mm. long, 3 mm. broad, tomentose without; corolla about 1.5 cm. in diameter; petals pinkish white, claw very short, about 1 mm. long, limb obtuse, 8-9 mm. long, 7 mm. broad, emarginate, glabrous within, except the very base of the limb, densely pubescent without; fertile stamens three, filament slender, glabrous, about 2.5 cm. long; anther oblong, 2.5 mm. broad; sterile stamens two, small, about 7 mm. long; disk fleshy; ovary stipitate, glabrous; style slender, about 11 mm. long; stigma capitate; stipe about 5 mm. long. Legumes not seen.

HAINAN: Yaichow, N. K. Chun and Tso 44559, type, Dec. 25, 1932 (AA); isotype (US.LU.).

DISTRIBUTION: China.

10. **Bauhinia pernervosa** Chen

Bauhinia pernervosa Chen, 1938, Jour. Arn. Arb. 19 :132-133.

Scandent. Branchlets angulate, more or less pubescent, soon becoming glabrous. Leaves orbicular-ovate, subcoriaceous, 8-9 cm. long, 9-10 cm. broad, glabrous on upper surface, more or less pubescent on lower surface and on the nerves, eleven-thirteen-nerved, nerves strongly elevated on lower surface, secondary veins more or less branching toward the margin, cordate at the base, bilobed at the apex, lobes one-fourth connate; petioles sparingly or finely pubescent,

3-4 cm. long, rarely 5 cm. long. Inflorescences racemose, two, terminal, short, ferruginous pubescent, many-flowered; bracts and bracteoles narrowly linear, acute, 5-7 mm. long, pubescent; pedicels 1.5-1.7 cm. long, pubescent; calyx-tube 2 cm. long, sparingly pubescent; calyx lobes lanceolate, short acute, about 6 mm. long, thin, appressed pubescent without, wholly glabrous within, glandular-like at the base of lobes; corolla 2.5 cm. in diameter; petals orbicular, glabrous within, pubescent without, claw 2-3 mm. long, limb about 11 mm. long, 10 mm. broad; fertile stamens three; filament about 11 mm. long, glabrous; anther oblong, 3.5 mm. long, sterile stamens seven, minute, about 4-5 mm. long; ovary subsessile, glabrous; style about 3 mm. long; stigma discoid. Legumes elliptical, obtuse at both ends, thin, glabrous, entire at the margin, 15-20 cm. long, 3-5 cm. broad, many-seeded.

YUNNAN: Mengtse, Henry 10763b, type, date unknown (AA); Henry 10763, date unknown (NY); isotype (US); Mengtse, Henry 10763a, date unknown (AA.US.).

DISTRIBUTION: China

11. **Bauhinia corymbosa** Roxb.

Bauhinia corymbosa Roxb., 1814, Hort. Beng. (Pl.). 31, nom. nud.; 1832, Fl. Ind. 2 :329-330; DC., 1825, Prodr. 2 :515; Anon., 1881, Gard. Chron. 16 : 204; Hook., 1882, Curt. Bot. Mag. 38 : tab. 6621; Forb. and Hemsl., 1887, Jour. Linn. Soc. 23 : 212; Hand.-Mazz., 1934, Beit. Bot. Contr. 52B : 157 (Pl. Mell. Sin. II).

Phanera corymbosa Benth., 1854, Miq. Fl. Jungh. 2 :264, nom. nud.

Phanera corymbosa Korth., 1855, Miq. Fl. Neder. Ind. 1A :69; Walp., 1858, Ann. Bot. Syst. 4 :606.

Woody climber with terete cirrhiferous branches, glabrous, except the young shoot and sometimes the inflorescences, covered with rusty shining scattered hairs. Tendrils opposite, revolute. Leaves nearly rounded, 2.5-5 cm. long and broad, cordate at the base, divided for about three-fourths, lobes semi-cordate, obtuse, two-three-nerved, sometimes rufous villous on lower surface along the nerves; petioles 1-1.5 cm. long; stipules ensiform. Inflorescences corymbose, terminal, on short subterminal branches, short peduncled, many-flowered; bracts small, filiform; flowers middle size, white or pinkish; pedicels slender, 1.5 cm. long, pubescent; calyx-tube slender, 1.5-2 cm. long; calyx lobed, margin with rusty hairs; petals five, equal, obovate-orbicular, spatulate, pubescent without, margin crisp, crenulate, spreading; fertile stamens three; filament 12-15 mm. long; anther oval, two-lobed; sterile stamens two-five, small, bright red, filiform with twisted tip; ovary pedicellate, linear, curved, smooth; style short; stigma large. Legumes smooth, dark brown, 10-18 cm. long, 1.5-2 cm. broad, many-seeded.

KWANGTUNG: Locality, number and date lacking, Millett (G).

HAINAN: Wong Chuk, CCC 9794 (McClure), June 1, 1922 (NY. AA.LU.); Poting, Lingshui, Ko 52203, Apr. 25, 1932 (NY.AA.); same

locality, Ko 62434, Apr. 28, 1932 (NY.AA.); locality lacking, Wang 35081, Nov. 11, 1933 (NY.AA.US.); and Wang 34756, Oct. 22, 1933 (NY) and Wang 33958, Sept. 15, 1933 (NY.AA.). The following cited specimens are not typical forms of this species: Poting, Lingshui, How 71903, Apr. 14, and 72974, June 9, 1935 (AA).

DISTRIBUTION: China; cultivated in tropical and subtropical regions as India and Calcutta.

This species, *B. corymbosa* Roxb., is often cultivated in tropical and subtropical regions. In Gray Herbarium of Harvard University is preserved a specimen of this species collected by Telfair which according to a mss. note was apparently verified by Hooker in 1835. I have not found that the species was recorded by Baker (Pl. Maurit. Seych., 1877). Bojer, however, listed it as a species introduced from India or China (Hort. Maurit. 124, 1837) and cultivated in several gardens.

12. **Bauhinia hupehana** Craib

Bauhinia hupehana Craib, 1914, Sargent, Pl. Wils. 2:89; Hand.-Mazz., 1931, Sym. Sin. 540.

Bauhinia glauca[4] non Wall. num. List no. 5785, 1832, nom. nud. **Syn. nov.**

Bauhinia hupehana Craib var. *grandis* Craib, 1914, Pl. Wils. 2:90. **Syn.nov.**

Scandent bushes about 7 m. tall (ex. Craib). Young branchlets rufous puberulent, sometimes glabrous. Leaves 5-6 cm. long, 6-7 cm. broad, pale, appressed, inconspicuously puberulent on upper surface, projected, short, rarely appressed, rufous pubescent on lower surface, chartaceous, seven-nine-nerved, nerves reticulate, base deeply cordate, apex bilobed, lobes about 11 mm. long, 26 mm. broad; petioles up to 4 cm. long, slender, strong. Inflorescences racemose, up to 7 cm. long; bracts deciduous, linear, setaceous, 5 mm. long; bracteoles in pairs, alternate, filiform, 5 mm. long; pedicels 2-3 cm. long; flowers rose; calyx-tube 1-2 cm. long, sulcate, rufous-puberulent; calyx lobes acuminate, 7 mm. long, 2 mm. broad, petals obovate or somewhat elliptical, 12 mm. long, long attenuate; fertile stamens three; filament glabrous, 1.8 cm. long; anther about 3 mm. long, elliptical; sterile stamens seven, short, 3-5 mm. long; ovary glabrous, stipitate; style 5 mm. long; stigma discoid. Legumes not seen by Craib.

CHEKIANG: S. Yentang, Hu 100, Aug. 26, 1920 (AA); Pang Yung, Ching 2060, July 10, 1924 (AA.US.LU.).

FUKIEN: Hongkong herb. no. 2570 (Dunn), Apr. to June, 1905 (AA.SYS.); Kulangsu, Chung 1528, May 6, 1923 (AA), cultivated form; Yengping, Buong Kang, Chung 3280, June 10, 1925 (AA.A.); Fung Huang Se, In Hok, Chen 95, Apr. 3-4, 1936 (LU); also Chen 145, May 3, 1936 (O.LU.).

[4] This species has been reported by Bentham, Fl. HK. 99 (1861), from Hong Kong but all specimens seen by the author so labeled represent other species, quite often *B. corymbosa*.

HONGKONG: Locality, number and date lacking, collector Ford (AA); also Wright, 1853-1856 (NY.G.US.); locality lacking, 1163 (Lindley), 1862 (NY); Hongkong herb. no. 9062, May 1, 1899 (AA); Happy Valley, Sargent, Nov. 5, 1903 (AA); Say Wan, Hongkong herb. no. 7494 (Gibbs), 1909 (AA); Lantau Island, Chun 4853, Apr. 24, 1927 (AA); Lantau, Tung Tsung, Tso 20091, Apr. 24, 1929 (F); Tai Ue, LU. 19434 (Fung), July 26, 1931 (NY); locality unknown, W. Y. Chun 8517, May 14, 1933 (O).

KWANGTUNG: Tsing Leung Shan, CCC. 6658 (McClure), July 30, 1921 (NY.AA.LU.); Tung T'au, CCC. 12335 (Peng, T'sang, and Ts'ang), June, 1924 (NY.AA.US.LU.F.); Yam Na Mt. CCC. 14105 (Chan), July 24, 1926 (LU); North River, Tsiang 1405, Oct. 18, 1928 (AA.F.SYS.); Lok Chong, Tso 20509, May 15, 1929 (NY); Loh Fau Shan, N. K. Chun 41115, May 26, 1930 (O); Tsing Yuen, Wang 30808, July 19, 1930 (O); Yingtak, Wentong Shan, Liang 60622, Apr. 7-May 21, 1931 (O); NY-Tung Shan, Tsui 251, Apr., 1932 (NY.O.); Sunyi, Wang 32282, March 21-July 4, 1932 (O); Lingnan University, Metcalf 18378, Jan. 27, 1937 (O); locality and date lacking, Chun 6709 (AA).

KWANGSI: Min Shan, N. Luchen, Ching 5991, June 14, 1928 (NY. AA.US.F.UN.); Shap Man Taai Shan, Tsang 22160, Apr. 29-30, 1933 (AA.LU.).

KWEICHOW: Esin-gay, Bodinier 2376, June 28, 1899 (NY); Tsunyi, Tsiang 5270, June 4, 1930 (NY.AA.LU.).

KWEITING: Tsiang 5551, July 3, 1930 (NY.AA.LU.).

SZECHUAN: Wilson 3400, June, 1903, and Wilson 4828, June, 1904 (AA); Nanchuan Hsien, Fang 1239, June 1, 1928 (NY.AA.F.); Kikiang Hsien, Fang 1310, June 11, 1928 (AA.F.); Nanchuan Hsien, Fang 1419, June 6, 1928 (AA); Mt.-Omei, Wang 23211, July 4, 1930 and Fang 2593, Aug. 6, 1928, and Fang 3301, Aug. 22, 1928 (AA.F.); locality unknown, Wang 368, 1930 (F); Omei-hsien, Tu 368, July 21, 1931 (F); Ping Shan Hsien, Yu 3006, June 10, 1934 (F); Tu 5555, June 25, 1934 (F); Omei Shan, Pong 6287, June 24 (F); Tung Valley, Wilson 3372, June, 1908 (AA.G.US.).

HUPEH: Ichang, Maire, 1880 (G); Henry 3551 (AA.G.US.); Henry 2938, 1885-1886 (G.US.); Wilson 834, June, 1900 (NY.AA.US.); Wilson 3373, isotype, May, 1907 (AA.G.US.); Wilson 107, isoparatype, July, 1907 (NY.AA.G.US.); Patung Hsien, Chow 546, June 16, 1924 (NY.AA.F.); photograph of type and paratype (NY).

HUNAN: Wulingan, Hand.-Mazz. 767, June 6, 1918 (AA); Yangshan, Fan and Li 172, July 7, 1935 (AA); Ma-Ling-Fung, Fan and Li 683, Nov. 8, 1935 (AA).

KIANGSI: Ping-hsiang, Hand.-Mazz. 203, 1920 (AA); Wan On, LU. 15303 (McClure), Dec. 12, 1926 (LU); Lienchushan, Singping, Lungchuan, Tsiang 9907, June 19, 1932 (NY.LU.).

Legumes oblong, dark-brown, thin, reticulate on surface, up to 20 cm. long, 3 cm. broad, many-seeded; seeds small.

WESTERN HUPEH: Chang-yang Hsien, Wilson 107, Sept. 1907, type of fruit in Arnold Arboretum, Harvard University.

The species *B. glauca* non Wall. and *B. hupehana* var. *grandis* Craib resemble this species in all respects. Both photograph of type and isotype material in Arnold Arboretum have helped in working out this species, therefore no discussion of this reduction is really necessary.

13. **Bauhinia Mairei** Harms

Bauhinia Mairei Harms, 1921, Fedde Repert. 17 :134.

Woody climber, with tendrils revolute. Branchlets terete, villose. Leaves sub-orbicular, 3-5 cm. long, 5-6 cm. broad, glabrous or glabrate on upper surface, pilose or villose at the base or glabrate later on lower surface, nine-nerved, base cordate or emarginate, apex bilobed, lobes broad or broadly ovate, obtuse, 2.5 cm. long, 2.8 cm. broad, nerves conspicuous, middle nerve ending in a mucro, about 6 mm. long; petioles 2-3 cm. long, villose. Inflorescences racemose, elongate, many flowered, apex with exserted bracts, comose, rachis more or less angulate, 10-15 cm. long or more, villose; bracts narrow-linear, villose, 7-8 mm. long; bracteoles narrow-linear, villose, 5-6 mm. long, opposite, at middle of pedicels; flower-buds ovoid, obtuse or acute, white, somewhat silky villose; calyx-tube short; calyx lobes broadly lanceolate, acute, reflexed, free or partly coherent, villose without, 5 mm. long; petals unguiculate, obovate, or obovate-oblong, obtuse or rounded, little silky pubescent without, 6-7 mm. long; disk crassus; fertile stamens three; filament glabrous, 8 mm. long; sterile stamens two, minute; ovary stipitate, glabrous, eccentric. Legumes not seen.

YUNNAN: Ma-hong, Maire 2819, isotype, Aug. 1910 and Maire 10090, (NY); Yunnanfu, Hand.-Mazz. 5064, Sept. 11, 1914 (AA); Chio-kia Hsien, Tsai 51996, Sept. 11, 1932 (F); locality and date lacking, 147 (Maire) (SYS).

DISTRIBUTION: China

14. **Bauhinia Championi** Benth.

Bauhinia Championi Benth., 1861, Fl. Hongk. 99; Hance, 1883, Jour. Bot. 21 :298; Forb. and Hemsl., 1887, Jour. Linn. Soc. 23 :212; Hand.-Mazz., 1934, Pl. Mell. Sin. 2(52) :157.

Phanera Championi Benth., 1852, Kew Jour. Bot. 4 :78.

Bauhinia hunanensis Hand.-Mazz., 1933, Sym. Sin. 541. Syn. nov.

Woody climber, branchlets and inflorescences with a thin, appressed, minute, whitish pubescence. Leaves broadly obtuse, otherwise acute, at the base broadly cordate, at the apex (if dividing) with lobes about two-thirds connate, semi-ovate, five-seven-nerved, shining, glabrous on upper surface, finely tomentose on lower surface, soon becoming glabrous, 6-10 cm. long, 5-6.5 cm. broad; petioles 1-2.5 cm. long, slender, sparingly pubescent; stipules minute. Inflorescences racemose, opposite to the leaf, becoming compound at the tip, flowering from the base; bracts minute, bristle-like; flowers pedicellate, white; pedicels about 10 mm. long; calyx-tube very short, 2 mm. long;

calyx lobes lanceolate, 3 mm. long, glabrous within, pubescent without; petals thin, alternate with calyx, 4 mm. long, 8-9 mm. broad, spatulate, pubescent without at the middle; fertile stamens three; filament as long as calyx; anther minute; sterile stamens two, abortive; ovary stipitate, oblong, tomentose; style short; stigma minute, obtuse. Legumes compressed, glabrous, about 7.5 cm. long, 2.5 cm. broad, three-five-seeded.

CHEKIANG: Swe-Chi, S. Yangtang, Hu 109, Aug. 26, 1920 (AA).

FUKIEN: Locality lacking, 753 (Carles), June 15, 1898 (NY); Kuliang, Foochow, Norton 1324, July-Aug., 1919 (AA.US.); Hing-hwa, Chung 957, Feb. 14, 1923 (AA.A.); Diongloh and vicinity, P. E. Chen 2389, July 24, 1925 (UN.A.); Kushan, Foochow, Chung 3773, Aug. 11, 1925 (AA); also Chung 7620, Aug. 16 and Chung 7827, Aug. 22, 1926 (AA); Foochow and vicinity, L. Chen 61, Apr. 1, 1936 (AA. O.LU.).

HONGKONG: Locality lacking, Wright 145, 1853-1856 (NY.G.US.); Happy Valley, 3425, Jan. 29, 1875 (NY); locality and number lacking, collector Wright, Nov. 9, 1893 (US); Victoria Peak, 1996, collector unknown, Jan. 25, 1905 (AA); road-side, W. Y. Chun 6825, Nov. 28, 1927 (O.SYS.); same locality, W. Y. Chun 7709, Oct. 24, 1929 (NY. AA.F.SYS.); locality lacking, N. K. Chun 40076, Dec. 27, 1929 (AA. SYS.); locality lacking, Wang 30346, Dec. 17-19, 1929 (O.SYS.); also W. Y. Chun 8242, spring, 1932 (O.SYS.); Lantau Island, LU. 16537 (Tsang), Dec. 23, 1927 (AA.F.LU.).

KWANGTUNG: Yiu-shan, Lungtou-shan, Mell 807, Sept. 10, 1917 (AA); Tai Tse Stone CCC. 3325, Sept., 1918 (NY.LU.); locality lacking, CCC. 3332 (Levine), Oct. 16, 1918 (NY.AA.G.LU.); Wat Naam district, CCC. 3622, Jan. 1, 1920 (LU); Shiukwan, CCC. 7044 (McClure), July 7-9, 1921 (LU); Ying-tak, CCC. 7090 (McClure), Sept. 7-9, 1921 (LU); Tsing Uen, CCC. 8764 (To), Jan. 20, 1922 (LU); Lo Fu Hang, Taai Tsan, Ying-tak, CCC. 14319 (Tsang and Wong), Oct. 5, and Wan Tong Shan, Tai Tsan, Ying-tak, CCC. 14411 (Tsang and Wong), Oct. 8, 1926, and CCC. 14767, Oct. 28, 1926 (LU); Lu Tse Tsun, Wong 493, Jan. 1928 (AA); Sie Luan, Loting, Tsiang 1157, Sept. 14, 1928 (AA.F.UN.LU.); Lo Fau Shan, Tsiang 1735, Dec. 24, 1928 (AA.F.); Sie-kun, Lokchong, Tsiang 1435, Oct. 23, 1928 (AA); Au Tsai, LU. 19101 (McClure), Nov. 3, 1928 (NY); North River, Wong and Ling 7444, Nov. 10, 1928 (O); same locality, Wang 30011 and 30120, Oct. 7 and Nov. 2, 1929 (O); Loh Fau Shan, Ko 50128, Feb. 24-28, 1930 (O); Lokchong district, N. K. Chun 42090, Nov. 5, 1930 (O); Pok Lor, Loh Fau, LU. 18918 (Fung), Aug. 11, 1931 (NY. LU.); Lokchong district, N. K. Chun 4177, Oct. 23, 1930-March 24, 1931 (O); Sunyi district, Ko 51816, July 14-Aug. 16, 1931 (O); Ying-tak, Tso 22380, Aug. 31, 1931 (O); Wentongshan, Liang 61304 and 61084, Aug. 28-Oct. 22, 1931 (O); Lokchong, Wang 31376, Nov. 16, 1931 (O); also Ko 51915, Nov. 28, 1931 (O); Yang-shan, Yang Shan district, Tsui 577 and 618, July-Sept., 1932 (NY.LU.); Ting Wu Shan, Liang

61830, Oct. 10, 1932 (O); Tieng Koo Shan, Tapu district, Tsang 21637, Sept. 8-29, 1932 (NY.AA.); Fu Tse Lin, Liang 9237, July 26, 1933 (SYS); Tsing Wan Shan, Lau 2156, Aug. 16-31, 1933 (AA); Yueyuen, Ko 53777, Nov. 20, 1933 (O); also N. K. Chun 10766, Aug. 14, 1935 (O); Loh Fau Shan, Naam Lu Monastery, Metcalf and Lau Fun 18299b, May 24-26, 1936 (LU); Tsung-fa, Metcalf 18359, Oct. 25, 1936 (O); locality lacking, W. Y. Chun 6004 (AA); Wuking-fu, 94 (Gilchrist) date lacking (SYS).

HAINAN: Sha Po Shan, Taan-chau district, LU. 16178 (Tsang), Aug. 29, 1927 (NY.AA.US.LU.).

KWANGSI: Tia Lian Shan, Luchen, Ching 5355, May 25, 1928 (NY.AA.US.F.); Seh Feng Dar Shan, Nanning, Ching 7975, Oct. 18, 1928 (NY.AA.F.); Au Tsai, LU. 19101 (McClure), March 11, 1928 (NY.LU.); locality lacking, Ching 6715, Aug. 5, 1928 (NY.US.); also 8676, Dec. 1932 (SYS); Tou Ngok Shan, Tsang 23108, Nov. 5, 1933 (AA); Tong-shan, Wait-sap district, Tsang 22824, Sept. 19, 1933 (AA); Ta Tseh Tsuen, Yung Hsien, S. and C. 1110, 1933 (AA); O-chishan, Lungnan district, Lau S. K. 4612, Oct. 1-25, 1934 (AA); Pai Shou district, Taam 100, Aug. 29-30, 1937 (AA); locality, collector and date lacking, 28682, 28683 and 91711 (SYS).

KWEICHOW: San-hoa, Mein-chang, Tsiang 6232, Aug. 3, 1930 (NY.AA.).

HUPEH: Locality lacking, Henry 7729, 1885-1888 (G.US.); Henry 4355a, 1885-1888 (NY.AA.G.US.); Ichang, Henry, number lacking, 1888 (NY.AA.G.); locality lacking, Wilson 1665, Aug. 1901 (NY.AA.).

HUNAN: Yungtschoufu, Hand.-Mazz. 414, Aug. 15, 1917 (AA); Hsin-hwa, Hand.-Mazz. 801, Sept. 27, 1918 (AA).

DISTRIBUTION: China, Formosa, Java, Indo-China and India.

This species, *B. Championi* Benth., is very widely distributed in China. Because of the climatic range, the form of leaves is very variable. According to Bentham's type description the leaves are broadly cordate, divided about one-third of whole length, with lobes broadly obtuse. There is a large series of specimens, and some of them were collected from type locality, showing the leaves entire or emarginate, but with the floral characteristics of the species. Handel-Mazzetti described *B. hunanensis* using the same characteristics as Bentham did for his *B. Championi*, except for the form of leaves. The distinction of form of leaves does not always hold.

14a. **Bauhinia Championi** Benth. var. **acutifolia** var. nov.

A typo primo intuito foliis caudato-acuminatis recedit.

This variety is easily distinguished by its entire, caudate-acuminate leaves.

KWANGTUNG: Tai Tse Stone, CCC. 3325 (Ng), Sept. 13, 1918 (LU); Teng Wo, CCC. 3097 (To), Sept. 22, 1918 (LU); Loh Fau Shan,

N. K. Chun 41512, May 2-Aug. 28, 1930 (O); Pok Lor, Loh Fau Shan, LU. 18918 (Fung), Aug. 1, 1931 (NY.LU.).

HAINAN: Poting, How 73306, in forested ravine, twining, July 25, 1935, type in Arnold Arboretum.

KWANGSI: Hin Yen, Ching 6739, paratype, Aug. 7, 1928 (NY.AA.US.F.UN.); Yung Hsien, S. and C. 1110, Oct. 10, 1933 (NY); San-min village and vicinity, Tsang 27995, Aug. 5-23, 1937 (AA.LU.).

Variety *acutifolia* is distinct from the species because of the caudate acuminate leaves. *B. Lecomtei* Gagnepain from Kweichow probably belongs here. Unfortunately there was no type material of *B. Lecomtei* available for study.

15. **Bauhinia kwangtungensis** Merr.

Bauhinia kwangtungensis Merr., 1934, Ling. Sci. Jour. 13 :29.

Woody climber with tendrils, glabrous except inflorescences. Branches and branchlets cylindrical, 2 mm. in diameter. Leaves ovate, 4-9 cm. long and broad, chartaceous, olivaceous, glabrous on both surfaces, seven-nine-nerved, distinct, reticulate, truncate to broadly truncate-cordate at the base, bilobed at the apex, lobes one-half connate, ovate, obtuse; petioles 3-4 cm. long, glabrous. Inflorescences racemose, terminal, broad with appressed sub-ferruginous pubescence, 10-20 cm. long, many-flowered; pedicels slender, 3 cm. long; bracts lanceolate-acuminate, 2 mm. long; bracteoles 1 mm. long; flower-buds obovoid, truncate-rounded, 5 mm. long; calyx-tube short, thick, 2 mm. long, 3 mm. in diameter; calyx lobes broadly ovate, obtuse, 2 mm. long, 3 mm. broad, densely pubescent without, glabrous or glabrate within; petals five, spatulate, up to 10 mm. long, 4.5 mm. broad, golden pubescent on both surfaces, limb elliptical obovate, rounded, base acute, 3-5 mm. long; fertile stamens three; filament glabrous, up to 11 mm. long; ovary oblong to oblong-lanceolate, densely pubescent, stipitate, short, thick. Legumes not seen by Merrill.

KWANGTUNG: Lui Chau Sin Kai near Chek Ham, Sin Tu Nin 103, type, June 25, 1928 (NY); isotype (LU).

HAINAN: Naam Shan Leng, Ngai district, Lau S. K. 361, Aug. 5, 1932 (NY.AA.F.LU.); Yaichow, N. K. Chun and C. L. Tso 44790, Jan. 6, 1932-1933 (NY.AA.US.); also Liang 63006, Sept. 10, 1933 (NY.AA.US.); also Liang 63051, Sept. 12, 1933 (NY.O.); Ka Chik Shan, Kau S. K. 1555, Apr. 15, 1933 (NY.AA.); Loktung, Lau S. K. 27082, June 11, 1936 (O.SYS.).

DISTRIBUTION: China.

Legumes falcate, silky pubescent, becoming glabrous with maturity, coriaceous, apex acute with persistant style about 3 mm. long, base obovate, 5-7 cm. long, 2-2.5 cm. broad, about three-seeded; peduncle about 1.5 cm. long, glabrous, stout.

HAINAN: Yaichow, Liang 63051, Sept. 12, 1933, type of fruit in New York Botanical Garden; Loktung, Lau S. K. 27082, June 11, 1936, paratype in Oberlin College.

This species, as Dr. Merrill noted, is indeed very closely allied to *B. japonica* Maxim. The latter species is represented in the material available to me for study by two specimens of the type collection (Maximowicz Iter secundum from Nagasaki, Japan), Masamume s. n. from Yakusima Island, and Yokohama Nursery Co. s. n. from the Riukiu Islands. The characters indicated in the original description of *B. kwangtungensis* Merr. for distinguishing that species from *B. japonica* Maxim. are not wholly constant. The Kwangtung and Hainan form differs from the Japanese one in its constantly glabrous leaves and in its much less densely pubescent inflorescences. There are less evident differences in the shape of the leaves and in that of the leaf lobes. A large series of specimens from Kwangtung and Hainan shows that the supposed differences in the length of the pedicels is not a dependable character and there is very great variation in the depth of the basal sinus. Because of the discontinuous distribution of these two manifestly very closely allied forms it seems best, for the present, to retain the southern one as distinct from the more northern one. More ample collections from intermediate areas may indicate the desirability of a reduction of *B. kwangtungensis* Merr. to *B. japonica* Maxim., or perhaps the assignment of the latter to varietal status.

(*To be concluded*)

STUDIES ON CHINESE STAUROMEDUSAE. II. FURTHER STUDIES ON SOME STAUROMEDUSAE FROM CHINA[1]

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Our present knowledge of the Stauromedusae of China is, indeed, rather scanty. Four species, namely *Haliclystus auricula*, *Haliclystus sinensis*, *Sasakiella cruciformis* and *Sasakiella tsingtaoensis* have so far been reported (Ling, 1937) to occur along the coast of Tsingtao. The present paper deals with further records and descriptions of five species: *Stenoscyphus inabai* (fig. 1-6), *Haliclystus auricula*, *Haliclystus steinegeri* (fig. 7-14), *Kishinouyea nagatensis* (fig. 15-21) and *Sasakiella cruciformis*. *Stenoscyphus inabai*, *Haliclystus steinegeri* and *Kishinouyea nagatensis* have not hitherto been reported from any part of China. A brief account concerning the distribution of the stalk-medusae of China will also be included.

The material upon which this paper is based was received from various sources. A valuable collection has been received from Professor Tchangsi (張玺) of the National Research Institute of Peiping, collected from Tsingtao and Chefoo. Specimens of *Haliclystus steinegeri* were collected from Chefoo by Mr. T. K. Liu, and specimens of *Kishinouyea nagatensis* were collected by Mr. H. C. Chen, Department of Biology, National University of Shantung, from the East Saddle Island, Chushan Islands (嵊山, 舟山群島). To the above-mentioned gentlemen the writer is greatly indebted for their kindness and generosity in either sending him specimens or in helping collect material from the various places. Thanks are due also to Mr. H. C. Liao for his assistance in the preparation of some of the illustrations.

The five species of Stauromedusae included in this report are listed below:

Fam. **Haliclystidae**

Stenoscyphus inabai Kishinouye
Haliclystus auricula Clark
Haliclystus steinegeri Kishinouye

Fam. **Kishinouyeidae**

Kishinouyea nagatensis Oka
Sasakiella cruciformis Okubo

[1] The present investigation was started at the Marine Biological Laboratory, National University of Shantung, Tsingtao, and completed at the National Kweiyang Medical College.

Stenoscyphus Kishinouye, 1902

Haliclystidae with four more or less symmetrical planes. Marginal anchors present, eight in number, four perradial and four interradial. Marginal notches shallow. Arms short, each with a cluster of hollow secondary tentacles. Coronal muscle entire. Stomach with four radial chambers, mesogonial pockets wanting. Gonads in four interradial pairs. Peduncle four-chambered, interradial muscles four in number.

The type species of this genus, *Stenoscyphus inabai*, is a typical Japanese form, has been reported so far only from Japan. Morphologically *Stenoscyphus* stands very close to *Haliclystus*, with the chief difference in the character of the coronal muscle which is entire in the former and divided in the latter.

Stenoscyphus inabai Kishinouye (fig. 1-6)

Stenoscyphus inabai Kishinouye, 1902, p. 2, pl. 1, fig. 1-2; Mayer, 1910, p. 525, fig. 334; Uchida, 1929, p. 107, fig. 1-8, pl. III, fig. 1-2.

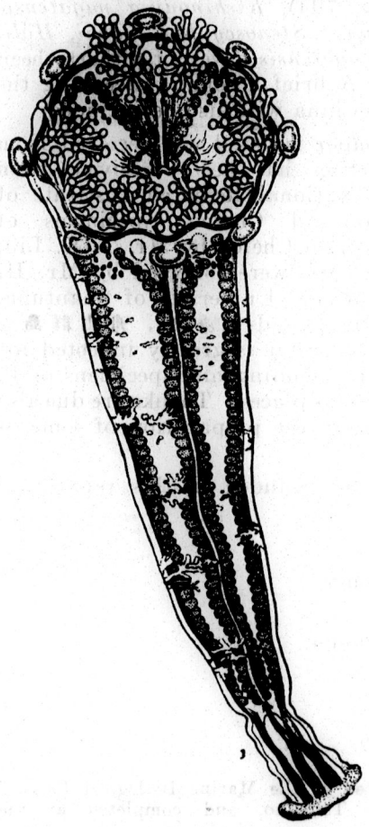


Fig. 1, *Stenoscyphus inabai*, side view.

Coloration.—The color is almost creamy white in preserved specimens. When living they are variously colored, ranging from light brown to coffee brown, sprinkled with many white spots of various size. According to Uchida (1929) the Japanese specimens are "generally reddish brown with white spots but occasionally deep blue with white spots. Manubrium and perradial parts of the calyx near the bell margin yellowish; marginal portion with a row of white spots. Tentacles' stems yellowish, head brown; anchors brown with brown spot in center."

Peduncle.—Peduncle short, measures about 2.5 mm. in length, which is only about one-fifth the length of the bell; basal disk thick and broad, almost rounded with slight constrictions in each interradius; the rest is more or less cylindrical, only slightly quadrate, and tapering gradually upward. In cross-sections the four chambers are completely separated. Interradial muscles well developed. Mesoglea thick.

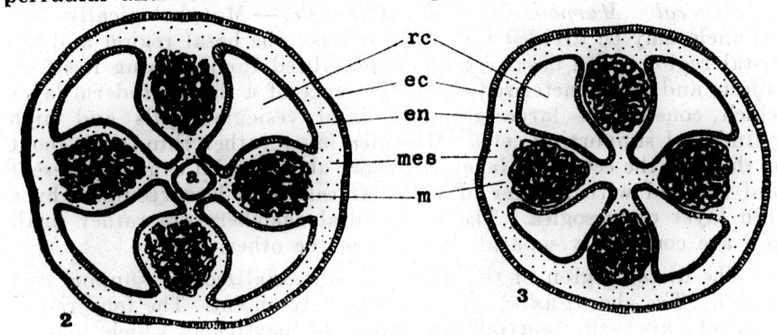
Measurements.—

Length of bell	12 mm.
Diameter of bell margin	5 mm.
Length of peduncle	2.5 mm.
Width of base of peduncle	1.5 mm.
Number of tentacles on each arm	22-28

Bell.—Bell trumpet-shaped, very long, about five-six times as long as the peduncle, small at base where it joins the peduncle and widened gradually upward toward the margin. Margin of bell measures about 5 mm. in diameter, about half the length of bell.

Aboral surface generally smooth, warts of nematocyst and gland cells are grouped into flower-like markings scattered sparsely over the entire surface, especially abundant near the margin of bell. Oral surface of bell is provided with a row of rounded nematocyst warts distributed around the margin.

Bell margin rectangular, slightly divided into eight lobes by four perradial and four interradial marginal notches. The perradial



Stenoscyphus inabai, cross-sections

Fig. 2, Through basal portion of peduncle; fig. 3, through middle of peduncle. ec-ectoderm, en-endoderm, m-muscle stand, mes-mesoglea, rc-radial chamber.

notches are deeper and wider than the interradial. Marginal anchors present, eight in number, large and cushion-shaped, each consists of a short stalk and a large knob. The stalk is broad, cylindrical and hollow. The knob is ovoid cushion-shaped with a slight depression at apex. The four interradial anchors are located at a slightly higher level than the four perradial.

Adradial arms inconspicuous, may retract completely into the bell cavity. Base of adradial arms may be seen as oval rings located at the sides of each interradial marginal anchor. Each adradial arm bears on its oral surface a cluster of twenty-twenty-five secondary tentacles arranged in radial rows, two regular rows at the middle, consisting of full grown tentacles and one or two rows of irregularly arranged young ones at each side. All the secondary tentacles are rather short but broad, each is provided with a hollow stalk and a globular knob.

Gonads eight in number, arranged in four pairs, extending from the base of bell to base of arms; being interradially located for most of the length and separate adradially near margin of bell. Each gonad consists of about fifty-seventy small rounded vesicles arranged in a single row when seen from the outside.

Interradial muscles well developed, each bifurcating into a pair of adradial muscles near the distal fifth of bell. Coronal muscle prominent, entire, surrounding the margin of bell completely.

Manubrium four-sided; mouth with four simple lips. Stomach long, cone-shaped, with four conspicuous lobes. Gastric filaments numerous, arranged in eight interradial rows.

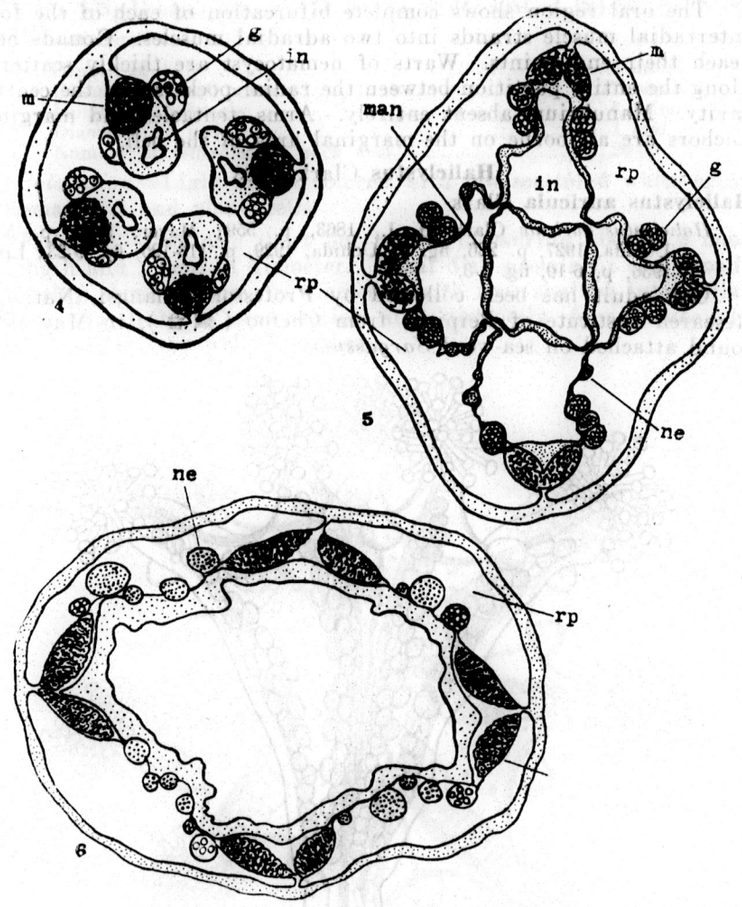
Locality and date.—Three specimens of about the same size have been examined; one was collected by Professor Tchangsi from the "Little Tsingtao" (小青島) on July 19, 1934, the other two were collected by the writer from the same locality on July 10, 1936, found attached on *Sargassum*.

General Morphology: *a. Peduncle.* — Morphologically the peduncle may be divided into two regions: the basal region and the distal region. The basal region is specialized for attaching itself on objects and is characterized by the presence of a thick ectoderm layer which consists of large glandular and vesicular cells and high cylindrical supporting cells. Mesoglea layer rather thin, only about as thick as the ectoderm layer. A short aboral axial canal is present and is lined with a layer of vesicular cells and is surrounded by a thin layer of mesoglea. The four radial chambers are rather small and are completely separated one from the other.

The distal region of the peduncle is specialized for support and motion. The aboral axial tube is completely absent. The four radial chambers are wide, entirely separated by partitions which join at the center forming the central jelly. Interradial muscles are very well developed, almost rounded in outline, unbranched, and are interwoven with a net-work of mesoglea substance. Mesoglea layer is thick, slightly differentiated into an outer more or less vacuolated layer and an inner dense layer which generally takes deeper stain. The ectoderm layer is much thinner than the mesoglea layer and consists of few secreting cells.

b. Bell.—The bell may be divided into three regions: the basal region, the manubrial region and the oral region. The basal region contains the bottom portion of the infundibuli and the beginning of the gonads. Ectoderm comparatively thin, consisting of small glandular cells and with scattered nematocyst mass. Mesoglea much thickened, with the differentiation of outer and inner layers much advanced, the outer layer is about three times as thick as the inner layer. The central jelly of the peduncle is completely wanting and the chambers are unpartitioned. Infundibuli rather small, with thick walls. Muscle strands become smaller but still rounded and unbranched, and are connected to the body wall by very thin and

narrow partitions. Gonads closely set on the sides of each infundibulum.



Stenoscyphus inabai, cross-sections

Fig. 4, Through basal portion of bell; fig. 5, through middle portion of bell fig. 6, through distal region of bell.

g-gonad, in-infundibulum, m-muscle strand, man-manubrium, ne-nematocyst cluster, rp-radial pocket.

The middle or manubrial region is characterized by the complete union of the walls of infundibuli to form the manubrium, which is four-sided and occupies a large part of the central cavity of the bell. The four radial pockets are now completely separated while the four infundibuli are continuous. Warts of nematocyst are present here and there on the partitions between the radial pockets and central cavity. Muscle strands begin to bifurcate. Ectoderm and mesoglea

layer is the same as that of the basal region. Manubrium is provided with rather thick mesoglea layer.

The oral region shows complete bifurcation of each of the four interradial muscle strands into two adradial muscles. Gonads here reach their end points. Warts of nematocyst are thickly scattered along the entire partition between the radial pockets and the central cavity. Manubrium absent entirely. Arms, tentacles and marginal anchors are all borne on the marginal area of the bell.

Haliclystus Clark, 1863

Haliclystus auricula Clark

Haliclystus auricula Clark, H. J., 1863, p. 559; Mayer, 1910, p. 532; Uchida, 1927, p. 226, fig. 3; Uchida, 1929, p. 113-125, fig. 9-23; Ling, 1936, p. 6-10, fig. 1-3.

One adult has been collected by Professor Tchangsi, National Research Institute of Peiping, from Chefoo (烟台), in May 1933, found attached on sea-weed *Sargassum*.

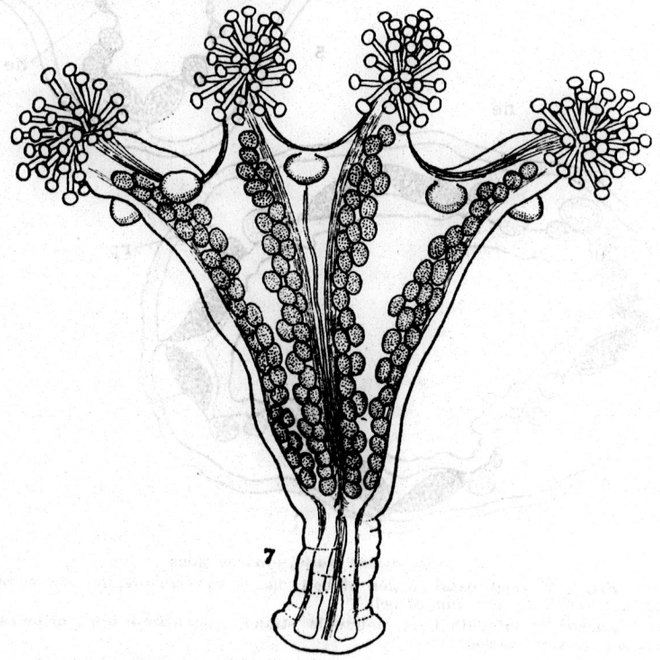


Fig. 7, *Haliclystus steinegeri*, side view.

This is a cosmopolitan species, widely distributed in many parts of the world. It occurs quite abundantly along the coast of Tsingtao. Its presence at Chefoo was first reported by Tchangsi (1934) but no description was given. A detailed specific description of this animal has been given by the writer (Ling, 1937).

Haliclystus steinegeri Kishinouye (fig. 7-14)

Haliclystus steinegeri Kishinouye, 1899, p. 125-129, fig. 1-3; Mayer, 1910, p. 535; Uchida, 1927, p. 125-130, fig. 28-34; 1934, p. 224-236, fig. 17-27.

Measurements.—

Length of bell	5 mm.
Diameter of bell margin	7 mm.
Length of peduncle	1.5 mm.
Diameter of peduncle	1 mm.
Number of tentacles on each arm	20-30

Coloration.—Light brown colored with few scattered white spots of nematocyst and gland cells.

Peduncle.—Peduncle short but broad, measuring about 1.5 mm. in length and 1 mm. in diameter. Basal disk prominent and broad, measuring about 1.3 mm. in diameter, with four shallow interradial furrows, quadrate in cross-section and distinctly four-chambered; radial muscles very well developed.

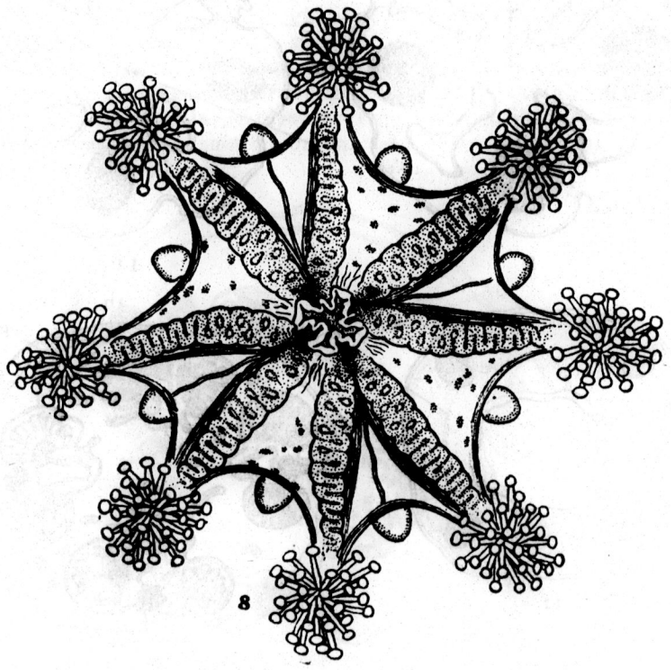


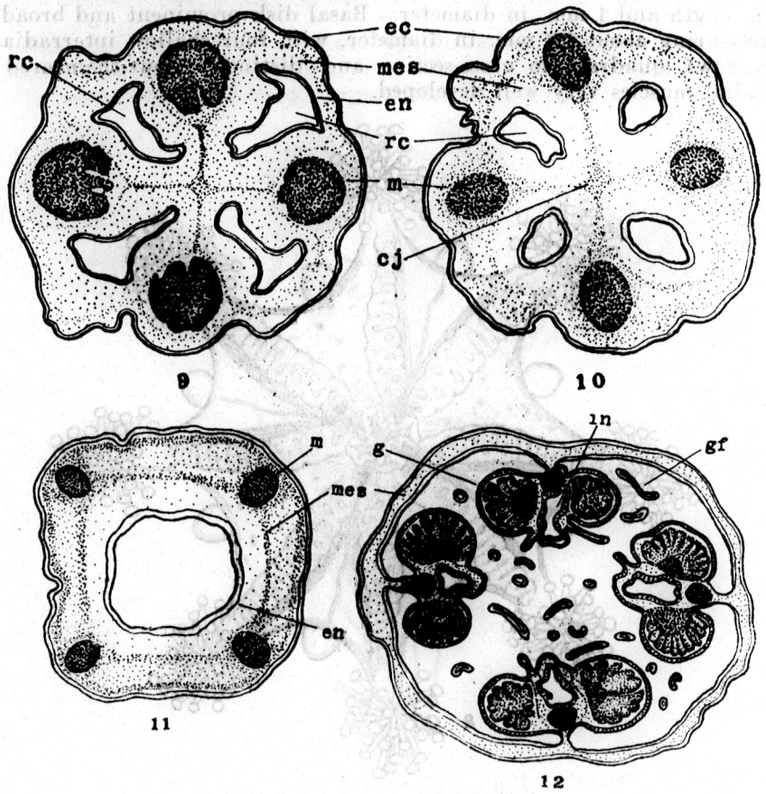
Fig. 8, *H. steinegeri*, oral view.

Bell.—Bell conical in shape, slightly wider than high. Margin of bell octogonal, measuring about 7 mm. in diameter. Marginal notches deep, the four perradial slightly deeper than the interradial. Adradial arms prominent, almost equidistantly placed, each bearing on its tip a cluster of 20-30 hollow tentacles. Each tentacle consists

of a short stalk and a hollow discoid cushion-like knob. The eight marginal anchors are well developed, conical in shape, being slightly higher than broad and with a bluntly pointed apex. The four interradial marginal anchors are located at a slightly higher level than the four perradial.

Aboral surface of bell rather smooth, with only few warts of nematocyst and gland cells. Mesoglea thick.

Gonads eight in number, adradially located, each consisting of about thirty-fifty small rounded vesicles arranged in two-four rows. The vesicles of the gonads are closely interpacked near the proximal half, giving a sinuous appearance.



Haliclystus steinegeri, cross-sections

Fig. 9, Through basal region of peduncle; fig. 10, through middle region of peduncle; fig. 11, through tip of peduncle; fig. 12, through basal portion of bell.
cj-central jelly, ec-ectoderm, en-endoderm, g-gonad, gf-gastric filament, in-infundibulum, m-muscle strand, mes-mesoglea, rc-radial chamber.

Manubrium long, four-sided, thick and plainly folded. Mouth with four simple lips. Stomach divided into four lobes. Gastric

filaments numerous, arranged in eight adradial rows extending from base to about the distal third of bell.

Coronal muscle divided into eight prominent sectors. Interradial muscle strands bifurcate into adradial muscles, each of which extends upward to the tip of each adradial arm.

Locality and date.—One specimen was collected by Mr. T. K. Liu from Chefoo (烟台) July 25, 1935, found attached to *Sargassum*.

General Morphology: *a. Peduncle.*—Peduncle with very thick and rigid mesoglea layer. Endoderm in general is thicker and more granulated than ectoderm. The four radial muscles, as seen in cross-sections through the basal portion of peduncle, are massive, almost rounded in outline, with a few short indentations on the inner margins. The muscles become smaller gradually toward the proximal end. Radial chambers are completely separated and are lined with high endoderm cells. The cavities of the chambers are large near base but gradually become smaller toward tip of peduncle. Mesoglea layer is not only thick and rigid but also greatly fibrillous; the fibrous tissue is more deeply stained with haemotoxylin than its surrounding. The fibrous tissues are seen, in cross-section, forming eight circular rings each surrounding one of the radial muscles and radial chambers, one large circular ring at about the center of the mesoglea layer and a small more or less rectangular mass at the center of the central jelly.

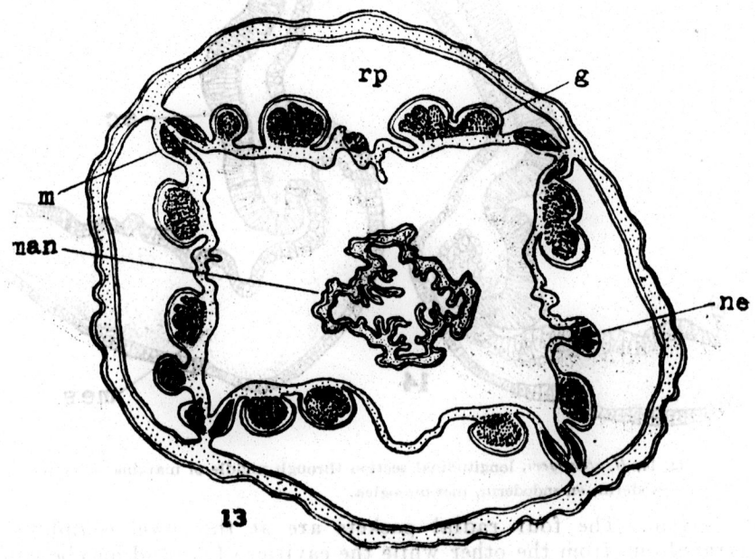


Fig. 13, *H. steinegeri*, cross-section through upper portion of bell.
g-gonad, m-muscle strand, man-manubrium, ne-nematocyst cluster, rp-radial pocket.

b. Bell.—The bell is provided with comparatively thin mesoglea. The endoderm and ectoderm layers in general are similar to those of the peduncle. At the basal portion the central jelly and taenoiles are completely wanting; the four radial chambers of the peduncle have now united into a circular cavity without any partition but lined with a thick layer of endoderm. The four radial muscles are small and are ovoid shaped.

The middle region of bell is characterized by the presence of four infundibuli. All the infundibuli are lined with especially thick cells and bounded on both sides by the vesicles of gonads. Radial muscles begin to show signs of flattening and bifurcation. Gastric filaments numerous, each is lined with a layer of flat granulated cells on one side and a layer of high granulated cells on the other.

The four infundibuli increase gradually in size toward the oral end. At about the distal fourth of the bell the walls of the infundibuli meet and fuse. The fused central portion now forms the

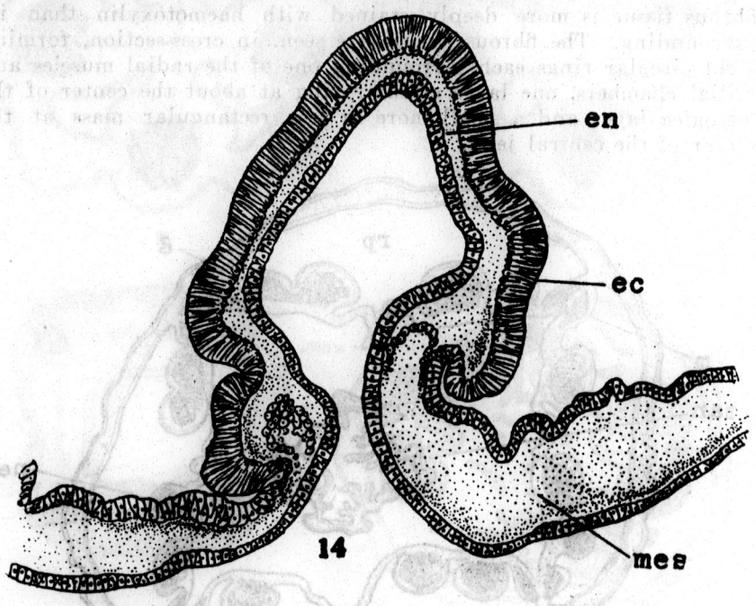


Fig. 14, *H. steinegeri*, longitudinal section through middle of marginal anchor. ec-ectoderm, en-endoderm, mes-mesoglea.

manubrium. The four radial pockets are at this level completely separated one from the other while the cavities of infundibuli become one continuous cavity. Mesoglea thin, rigid, fibrillous tissue well differentiated, deeply stained and is present in the inner portion of mesoglea.

Manubrium four-lipped, with rather thick mesoglea. The inner ectoderm cells are thick, highly grandulated and more deeply stained with haemotoxylin than the outer ectoderm layer which consists of low cells and is less granulated.

Marginal anchors conical shaped, with bluntly pointed apex. Ectoderm thick, consisting of narrow but high supporting cells, large granulated cells and nematocysts. Endoderm thin, cells almost cubical in shape. Mesoglea layer slightly fibrillous.

(*To be concluded*)

TETTIGONIIDEN (ORTHOPTERA) AUS CHINA

Von Dr. R. Ebner
Wien.

Vor längerer Zeit erhielt ich von meinem Freunde H. H. Karny eine Anzahl Tettigoniiden aus China. Da ich bei der Determination mehrere sehr interessante Arten feststellen konnte, erscheint mir eine Publikation darüber sehr nützlich.

Ausser 16 Arten Tettigoniiden waren auch 2 Gryllacrididen und 1 Gryllide in dem Material vorhanden. Von *Gryllacris laeta* Walk. liegt 1 ♂ von Foochow vor, von *Gryllacris permodesta* Griff. 1 ♂ von Chekiang; beide Arten sind nach Karny aus China schon bekannt (Mt. zool. Mus. Berlin 12, p. 366, 367, 375, 1926; Lingnan Sci. Jour. 7, p. 743, 744, 1929). Das gilt auch für *Euscurtus sigmoidalis* Sauss., von dem 1 ♀ aus Shanghai vorliegt (Chopard, Mus. Heude, Not. Entom. Chin. 3,p.13,1936).

Vor wenigen Jahren erschien ein Index der chinesischen Tettigoniiden von Chang (Mus. Heude, Not. Entom. Chin. 2, p. 25-77, 1935) mit ausführlichen Literatur-Angaben. Doch bemerkt der Autor mit Recht, dass die Artenzahl in dem grossen Gebiet sicherlich viel bedeutender sein muss, als er angeben konnte; tatsächlich sind auch seither schon wieder einige Arten neu hinzu gekommen. Von den 16 Arten, die mir jetzt vorliegen, sind nur wenige hier zum erstenmal für China genannt. Einige Arten sind recht wenig bekannt, sodass Ergänzungen der Beschreibung nötig waren; endlich erwiesen sich 3 Arten als neu.

In tiergeographischer Beziehung weist das kleine Material recht verschiedene Elemente auf: neben wenigen paläarktischen Gattungen und Arten finden sich vorwiegend Vertreter der orientalischen Region. Diese Verschiedenheit ist wenigstens teilweise in den Küstengebieten durch das Fehlen von Verbreitungs-Hindernissen und von tiergeographischen Grenzen zu erklären.

Die beiden *Gryllacris*-Arten befinden sich in der Sammlung Karny, alle anderen Arten in meiner Sammlung. Ich danke hier meinem Freunde Karny nochmals für das sehr interessante Material.

Subfam. **Decticinae**

Gampsocleis ussuriensis Ad. (fig. 1)

Uvarov, Trans. Ent. Soc. London, p. 523, f.B, 1923(1924).
Dirsh, Mém. Cl. Sci. Phys. Math. Acad. Sci. Ukraïne 7 : 152, f.18, Kiev, 1927.

Chekiang, 1♂ 1♀.

Cerci des ♂ hinter dem grossen Zahn noch mit 2-3 ganz kleinen Zähnchen, wie bereits Dirsh erwähnt. Auch von Uvarov determinierte ♂ im Wiener Museum besitzen diese Zähnchen.

Gampsocleis gratiosa Br.-W.

Uvarov, Trans. Ent. Soc. London, p.524, t.28, f.21, 1923 (1924).
Dirsh, Mém. Cl. Sci. Phys. Math. Acad. Sci. Ukraïne 7 : 154, f.21-22, Kiev, 1927.
Hsüeh, Peking Nat. Hist. Bull. 13 (1) :19-27, 1938.

Foochow, 1♂; Chefoo, 1♂; Peking, 1♂.

Die Tiere sind namentlich in der Grösse etwas von einander verschieden.

	Foochow	Chefoo	Peking
Körperlänge	34,5 mm.	37,5 mm.	43,5 mm.
Pronotum	12 ,,	14 ,,	14 ,,
Elytren	15 ,,	21 ,,	18 ,,
Hinterschenkel	32 ,,	33 ,,	34,5 ,,

Ich bin nicht ganz sicher, ob das kleine ♂ von Foochow auch hieher gehört. Die Cerci zeigen allerdings den gleichen Bau wie bei den zwei grossen Exemplaren, aber das letzte Tergit und die Subgenitalplatte weisen einige Unterschiede auf (das letzte Tergit ist stärker eingeschnitten). Keinesfalls handelt es sich um *G. miramae* Dirsh 1927. Die Type von *G. gratiosa* stammt nach Brunner v.W. eigentlich aus Hongkong.

Atlanticus karnyi n. sp. (fig. 2-3)

Chekiang, 2 ♀.

Letztes Glied der Maxillartaster weniger als zweimal so lang wie das vorletzte. Pronotum länger als die Vorderschenkel, sein Diskus ziemlich schmal (die grösste Breite nahe dem Hinterrand; 4,3-5 mm.), Hinterrand abgerundet. Elytren nur teilweise vom Pronotum verdeckt, Längsadern deutlich hervortretend und meist dunkel. Hinterschenkel an der Unterseite aussen unbedornt, innen mit 5 Dornen. Subgenitalplatte breit, gewölbt, in der Mitte stumpfwinkelig eingebogen, ohne Längskiele und ohne Furchen. Ovipositor viel kürzer als die Hinterschenkel, namentlich in der distalen Hälfte leicht nach oben gebogen.

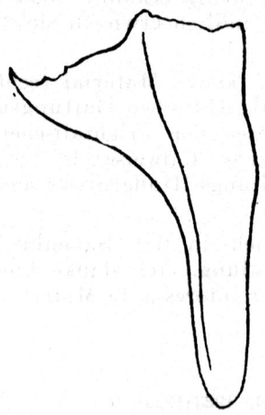


Fig. 1. *Gampsocleis ussuriensis*, ♂ linker Cercus von unten.

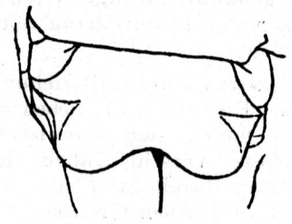


Fig. 2. *Atlanticus karnyi*, ♀ Subgenitalplatte.

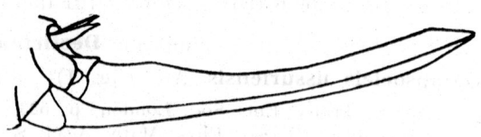


Fig. 3. *A. karnyi*, Ovipositor.

Graubraun. Stirn fein marmoriert, Fastigium verticis und Ocellus hell. Pronotum-Seitenlappen oben dunkel, unten und hinten heller. Diskus des Pronotums ebenfalls etwas heller. Mitteltibien innen teilweise oder ganz verdunkelt. Hinterschenkel oben an der Basis dunkel, aussen in der Mitte ein heller Längsstreif, der etwa bis zur Hälfte des Schenkels reicht; darunter bei dem grösseren Exemplar wieder fast schwarz, bei dem kleineren Exemplar kaum verdunkelt.

Körperlänge	24	–	28	mm.
Pronotum	9	–	9,5	,,
Elytren (seitlich gemessen)	3,5	–	4	,,
Vorderschenkel	7,5	–	7,7	,,
Hinterschenkel	29	–	28,5	,,
Ovipositor		19,5		,,

Nach der Tabelle von Uvarov (Ann. Nat. Hist. 17 (9): 278, 1926) zweifellos am nächsten verwandt mit *A. brunneri* (Pyln.) (Ussuri-Region, Russian Island). Obwohl mir von der neuen Art nur 2 in der Färbung etwas abweichende ♀ vorliegen, von denen das eine den Ovipositor und die Subgenitalplatte etwas beschädigt hat, ergeben sich doch ausreichende Unterschiede und Kennzeichen. Unterschiede gegen *A. brunneri*: Form des Pronotums, Länge der Elytren, Form der Subgenitalplatte, Form und Länge des Ovipositors, verschiedene Färbungsmerkmale. Unterschiede gegen *A. sinensis* Uv.: Länge der Elytren, Bedornung der Hinterschenkel, Längenverhältnis zwischen Hinterschenkel und Ovipositor.

Uvarov hat mit Recht vermutet, dass in Ost-Asien wahrscheinlich noch mehr Arten dieser namentlich durch ihre Verbreitung so interessanten Gattung vorkommen dürften (Trans. Ent. Soc. London p. 514, 1923 (1924)).

Subfam. **Copiphorinae**

Pyrgocorypha velutina Redt.

Foochow, 1 ♀.

Mit der Type im Wiener Museum verglichen. Von der aus China bereits bekannten *P. subulata* (Thunb.) gut verschieden.

Neu für China. Bisher bekannte Verbreitung: Ost-Indien, Cambodja.

Homorocoryphus lineosus (Walk.) (= *fuscipes* Redt.)

Foochow, 1 grünes ♀; Chekiang, 1 grünes ♀, ferner 1 braunes ♂ und 1 braunes ♀.

Bei den braunen Exemplaren ist das Fastigium verticis in der unteren Partie dunkler. Das ♂ ist sehr klein: Körperlänge 25 mm., Elytren 28,5 mm., Hinterschenkel 22 mm.

Subfam. **Conocephalinae**

Conocephalus (Xiphidion) melas (De Haan)

Amoy, 1 ♀-Larve; Chekiang, 1 ♀.

Distales Ende der Hintertibien und der grösste Teil der Hintertarsen schwarz. Bei der Larve sind auch die Vorder- und Mitteltibien im distalen Teil schwarz, ebenso der Basalteil der Hinterschenkel. Exemplare von den Sunda-Inseln scheinen solche Verdunkelungen nicht zu besitzen, auch Redtenbacher erwähnt nichts davon (1891, p. 511).

Conocephalus (Xiphidion) maculatus (Le Guill.)

Foochow, 1♀; Chekiang, 1♀; Shanghai, 1♀; Peking, 1♂ 1♀.

Conocephalus (Xiphidion) gladiatus (Redt.)

Matsumura & Shiraki, Jour. Coll. Agri. Sapporo 3 :50, 52, 1908-09 (*Xiphidium*).
Hirayama, Orth. *in* Fauna Musashinensis, nr. 1, p. 9, Tokyo, 1929 (*Xiphidium*).
Mori, Jour. Chosen Nat. Hist. Soc., nr. 16, p. 55, 1933 (*Xiphidion*).
Ma, Ent. & Phytopath. 3 :199, Hangchow, 1935 (*Conocephalus*).
Tinkham, Lingnan Sci. Jour. 15 :213, Canton, 1936 (*Conocephalus gladiator*).

Chekiang, 1♂ 2♀; Shanghai, 1♂; Peking, 2♀.

Das ♂ von Shanghai ist aussergewöhnlich klein: Körperlänge 14 mm:, Elytren 13,5 mm., Hinterschenkel 12 mm.

Verbreitung: Japan, Korea, China (aber von Chang noch nicht angeführt).

Conocephalus (Xiphidion) divergentus (Mats. & Shir.) (fig. 4)

Matsumura & Shiraki, Jour. Coll. Agri. Sapporo 3 :51, 61, t.1, 1908-09, f.5 (*Xiphidium*).
Karny, Gen. Ins. 135, Conoceph., p.12, 1912.

Chekiang, 3♂ 1♀; Shanghai, 1♀.

Elytren das Abdomen-Ende fast erreichend oder etwas überragend.

Hinterschenkel unten mit wenigen schwarzen Dornen. Hintertibien distal mit 3 Paaren von Spornen (cf. Rehn & Hebard, Trans. Amer. Ent. Soc. 41, p. 226, 1915).

Das ♂ war noch nicht bekannt. Cerci des ♂ lang, gegen das Ende zu etwas depress, innen in der Mitte mit einem kräftigen Zahn. Analsegment in der Mitte leicht eingebuchtet, mit feiner Längsfurche. Subgenitalplatte in der Mitte leicht winkelig eingeschnitten, Styli kurz.

Das ♀ von Shanghai weicht durch dunklere Färbung (namentlich am Abdomen), kürzere Elytren (9 mm.) und längeren Ovipositor (16,5 mm.) von den Exemplaren von Chekiang ab.

	♂			♀		
Körperlänge	14	–	16 mm.	16,5	–	17 mm.
Pronotum	3	–	3,5 ,,		3,5	,,
Elytren	10,5	–	12 mm.	9	–	12 mm.
Hinterschenkel	14	–	14,5 ,,	15	–	15,5 ,,
Ovipositor				14	–	16,5 ,,

Neu für China. Bisher nur von Formosa bekannt.

Subfam. **Listroscelinae**

Hexacentrus unicolor Serv.

Foochow, 1♂; Chekiang, 1♀; Shanghai, 1♀.

Die Elytren der ♀ sind ziemlich kurz (bei dem Stück von Chekiang 28 mm., bei dem von Shanghai nur 25 mm. lang), der Ovipositor misst 12 mm.; diese Tiere sind also relativ klein.

Von *H. japonicus* Karny sicher verschieden, ich habe die Typen gesehen. Die Hinterleibs-Enden beider Arten sind bei den ♂ nicht so sehr von einander abweichend, wie Karny angibt. Aber die Skulptur der Elytren in beiden Geschlechtern und der längere Ovipositor von *japonicus* bilden genügend Verschiedenheiten gegen *unicolor*.

Subfam. **Meconeminae**

Xiphidiopsis bituberculata n. sp. (fig. 5)

Chekiang, 1 ♀.

Sinus humeralis am Pronotum noch erkennbar. Prothorakales Foramen frei. Elytren die Hinterknie weit überragend. Alle Schenkel unbedornt. Vordertibien aussen mit 5, innen mit 4 langen

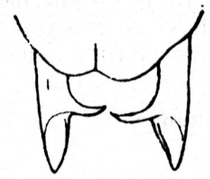


Fig. 4. *Conocephalus divergentus*, ♂ Abdomen Ende von oben.

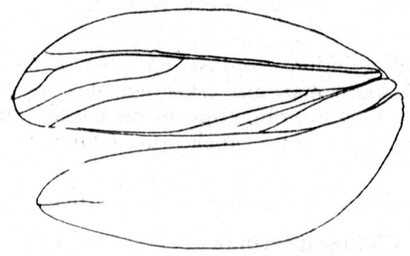


Fig. 6. *Isotima chinensis*, ♀ Kontur der linken Flugorgane, Elytre mit Hauptadern.

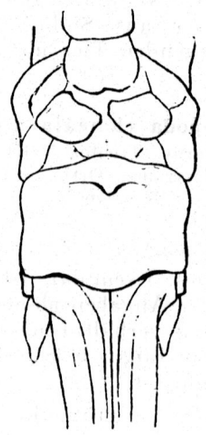


Fig 5. *Xiphidiopsis bituberculata*, ♀ Abdomen-Ende von unten.

Dornen. Innere und äussere Tympana offen. Mitteltibien aussen mit 4 Dornen und 2 kleineren nahe der Spitze, innen mit 3 Dornen

und ebenfalls 2 kleineren nahe der Spitze. Hintertibien unten in der distalen Hälfte mit ziemlich vielen feinen Dornen. Letztes Abdominal-Sternit mit 2 etwas querstehenden, stumpfen und leicht lappenförmigen Erhebungen. Subgenitalplatte breit, an der Basis mit einem kleinen Höcker, am Ende abgerundet. Ovipositor an der Basis verdickt, leicht nach oben gebogen.

Gelbbraun. Augen grösstenteils schwarz, Antennen im basalen Drittel einfärbig. Pronotum fast einfärbig. Hinterbeine teilweise grünlich.

Körperlänge	10,5 mm.
Pronotum	3,5 ,,
Elytren	18,5 ,,
Hinterschenkel	11 ,,
Ovipositor	9 ,,

Aus China wurden bisher nur 3 *Xiphidiopsis*-Arten angeführt (Uvarov, Ark. Zool. 26 A(1):7, 1933; Tinkham, Lingnan Sci. Jour. 15:213, 410, 1936), doch ist keine der beschriebenen Arten mit dem vorliegenden Tier identisch. Nach der Tabelle von Karny (Treubia 5:110, 1924) kommt man in die Verwandtschaft von *X. fallax* Redt. Durch die Beschaffenheit des Abdomen-Endes scheint meine Art auch an *X. longicercata* I. Bol. von Neu-Guinea zu erinnern; die Unterschiede wären: geringere Grösse, kürzere Cerci, Färbung des Pronotums und der Antennen.

Obwohl mir nur 1 ♀ vorliegt, halte ich die Art doch für neu; als besonders charakteristisch betrachte ich die Unterseite des Abdomen-Endes. Keine der zahlreichen, namentlich von Hebard, Karny und Kästner aus Südost-Asien beschriebenen Arten scheint mit dem vorliegenden Tier überein zu stimmen.

Subfam. **Mecopodinae**

Mecopoda elongata niponensis De Haan

Karny, Treubia 5:159, 1924.
Hirayama, Orth. *in* Fauna Musashinensis, nr.1, p.9,f.10, Tokyo, 1929. (*Mecopoda niponensis*).
Willemse, Natuurhist. Maandblad 22:17, Maastricht, 1933.

Chekiang, 1 ♂.

Das Exemplar ist schlecht erhalten, sodass ich von genauen Grössen-Angaben absehe. Doch kann man gut erkennen, dass es sich um eine verhältnismässig kleine und kurzflügelige Form handelt, wie sie aus Japan beschrieben worden ist und auch aus China schon bekannt ist.

Elytren grün, ihr Tympanalfeld sehr gross und bräunlich.

Subfam. **Phaneropterinae**

Ducetia japonica (Thunb.)

Chekiang, 1 ♀.

Die Nomenklatur dieser weit verbreiteten Art wurde von Uvarov richtig gestellt (Spolia Zeyl. 14:95, 1927).

Isotima chinensis Br.-W. (fig. 6-8)

Chang, Mus. Heude, Not. Entom. Chin. 2:30, 1935.
Uvarov, Ark. Zool. 26 A, nr. 1, p. 8, 1933 (*chinensis* ?).

Chekiang, 2 ♀.

Hieher glaube ich am besten die beiden Tiere zu stellen. Die Art wurde von Brunner v.W. nur äusserst unvollkommen beschrieben, als Fundort wird nur China genannt. Nachher wird sie noch einmal als fraglich von Kansu angeführt.

Fast einfärbig grün, matt; bei dem einen Exemplar ist der vordere Teil des Körpers gelblich. Pronotum in der Mitte mit gelblicher Längslinie. Elytren deutlich kürzer als die Hinterknie;

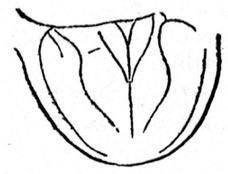


Fig. 7. *Isotima chinensis*, ♀ Subgenitalplatte.

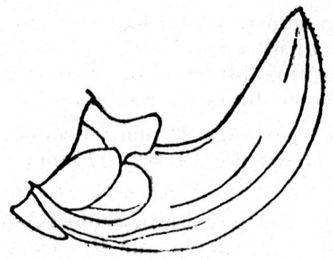


Fig. 8. *I. chinensis*, Ovipositor.

Radii Sector deutlich hinter der Mitte entspringend, einfach. Die Hinterflügel sind schmal und überragen die Elytren um 1 mm. Alle Schenkel unten bedornt, nur die Vorderschenkel bei dem kleineren Tier unten ganz unbedornt. Subgenitalplatte stumpf-dreieckig und am Ende abgerundet. Ovipositor grün, gegen die Spitze zu rotbraun und daselbst deutlich gesägt.

Körperlänge	25	–	27	mm.
Pronotum	5	–	5,5	,,
Elytren	24	–	25	,,
Hinterschenkel	26	–	27,5	,,
Ovipositor	7,5	–	8	,,

Beide Tiere sind stark gestopft und dadurch vielleicht etwas länger als normal.

Die von Brunner v.W. hervor gehobene Aehnlichkeit mit *Acrometopa macropoda* ist wirklich auffallend, nur ist die vorliegende Art etwas gedrungener.

Queradern der Elytren dichter und regelmässiger als bei *I. javanica*. Die Elytren sind an der Spitze abgerundet; dadurch sind meine beiden Exemplare von *I. rufomarginata* Br.-W. und *I. javanica* Br.-W., deren Typen ich gesehen habe, vielleicht sogar generisch zu trennen. Auch die gut entwickelten Hinterflügel würden dafür sprechen. Da aber das ♂ der chinesischen Art noch unbekannt ist,

kann diese Frage vorläufig nicht näher geklärt werden. Die vorliegenden Tiere scheinen mir sowohl von *I. japonica* Mats. & Shir., als auch von der Gattung *Kuwayamaea* Mats. & Shir. aus Japan gut verschieden zu sein.

Holochlora japonica Br.-W.? (fig. 9-10)

Matsumura & Shiraki, Jour. Coll. Agri. Sapporo 3 :16, 1908-09.
Hebard, Proc. Acad. Phila. 74 :156, t.13, f.19, 1922.
Hirayama, Orth. *in* Fauna Musashinensis, nr. 1, p. 9, f. 12, Tokyo, 1929.
Mori, Jour. Chosen Nat. Hist. Soc. 16 :56, 1933 (*Holochloa*).
Chang, Mus. Heude, Not. Entom. Chin. 2 :31, 1935.
Furukawa, Annotat. Zool. Japon. 17 :559, 1938.

Foochow, 1 ♀.

Antennen einfärbig hellbraun. Subgenitalplatte dreieckig, am Ende nicht ausgerandet, in der Mitte gekielt. Plica basalis des Ovipositors hinten und oben spitz ausgezogen, fast einfärbig (nur am oberen Rand etwas dunkler). Cerci einfärbig.

Körperlänge 26 mm., Pronotum 7,5 mm., Länge der Elytren 48 mm., Breite der Elytren 12 mm., Hinterschenkel 31,5 mm., Ovipositor 10,5 mm.

Die Gattung ist in Südost-Asien durch viele Arten vertreten, aus China ist vorläufig nur *H. japonica* bekannt. Diese Art wurde nach

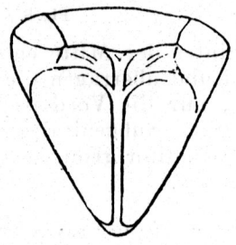


Fig. 9. *Holochlora japonica* (?), ♀ Subgenitalplatte.

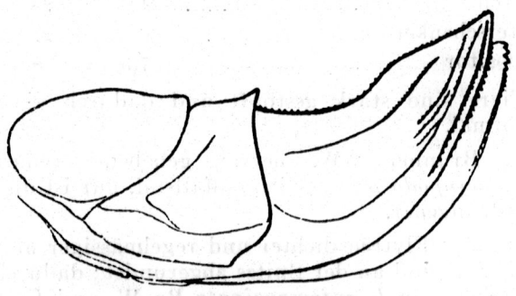


Fig. 10. *H. japonica* (?), Ovipositor.

1 ♂ aufgestellt, das ♀ ist noch nicht genau beschrieben. Meine Determination ist daher etwas unsicher, da es ohne ein zugehöriges

♂ kaum möglich ist, die Art sicher zu bestimmen. Nach Brunner v.W. kommt man am ehesten auf *H. venosa* Stål, doch ist bei den Exemplaren seiner Sammlung aus Java die Subgenitalplatte viel stumpfer und nicht so zugespitzt wie bei meinem Exemplar.

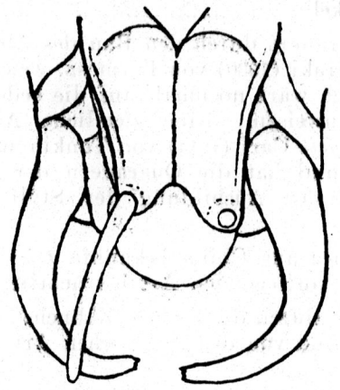


Fig. 11. *Isopsera denticulata*, ♂ Abdomen-Ende von unten.

Verbreitung von *H. japonica*: Japan, Korea, China, Tonkin, Hawaii.

Isopsera denticulata n. sp. (fig. 11)

Chekiang, 1 ♂.

Seitenlappen des Pronotums winkelig abgesetzt. Vordercoxen deutlich bedornt. Vorder- und Mittelschenkel unten an der Vorderseite mit mehreren schwarzen Dornen. Tympana der Vordertibien beiderseits gleichmässig offen. Elytren mit deutlichen Queradern. Radii Sector etwas vor der Mitte der Elytren entspringend und etwas vor seiner Mitte gegabelt. Analsegment gerade abgeschnitten, in der Mitte leicht eingedrückt. Supraanalplatte dreieckig, in der Mitte mit Längseindruck. Cerci fast halbkreisförmig gebogen, behaart, ganz am Ende fast schwarz mit wenigen feinen Zähnchen. Subgenitalplatte nach hinten verschmälert, mit deutlichen Seitenkielen und sehr schwachem Mittelkiel, am Ende eingeschnitten. Der rechte Stylus ist ziemlich lang, dünn, sehr schwach gebogen und drehrund, aber für die Gattung verhältnismässig kurz; er überragt in Seitenansicht die Cerci nicht. Der linke Stylus ist abgebrochen. Oberhalb der Subgenitalplatte sind anscheinend Teile eines Spermatophors zu sehen.

Einfärbig grün. Antennen dunkel geringelt. Seitenkiele des Pronotums heller. Hinterrand der Elytren im distalen Teil etwas bräunlich. Vorragender Teil der Hinterflügel oben bräunlich. Abdominalsegmente oben in der Mitte dunkelrot. Supraanalplatte grösstenteils dunkelrot.

Körperlänge	24	mm.
Pronotum	5,2	,,
Länge der Elytren	32	,,
Breite der Elytren	8,5	,,
Hinterschenkel	21,5	,,

Die neue Art erinnert durch den Bau des Abdomen-Endes etwas an *I. brevissima* Shiraki (1930) von Formosa; weicht aber doch davon sicher ab; namentlich wäre nochmals auf die bedornten Vorder- und Mittelschenkel hinzuweisen. Eine ziemliche Aehnlichkeit scheint auch mit *I. tonkinensis* Carl (1914) von Tonkin zu bestehen; doch ist meine Art kleiner und hat die Queradern der Elytren deutlicher ausgebildet, auch in der Ausbildung der Styli sind Unterschiede vorhanden.

Die einzige bisher aus China bekannte *Isopsera*-Art (*I. stylata* Br.-W.) ist von der vorliegenden Art beträchtlich verschieden.

I. denticulata ist durch die kleinen Zähnchen am Ende der Cerci gut gekennzeichnet und von den zahlreichen Arten aus Südost-Asien recht abweichend.

中國之螽斯科(直翅目)

怡保

德國維也納

(摘要)

作者研究由閩浙及其他省份採集之螽斯科共七亞科凡六十種，其中 *Pyrgocorypha velutina* 與 *Conocephalus* (*Xiphidion*) *divergentus* 在中國爲新紀錄 *Atlanticus karnyi*, *Xiphidiopsis bituberculata*, 及 *Isopsera denticulata* 爲新種。

GENUS ALEURITES IN KWANGTUNG AND KWANGSI[1]

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Introduction

Of the genus *Aleurites*, three species are known to be grown in this area, namely *Aleurites Fordii* Hemsl., *A. montana* (Lour.) Wils., and *A. moluccana* Willd. The last-named species is an exotic, apparently of relatively recent introduction. No mention is made of it in the early Chinese literature. This species is not included in Dunn and Tutcher's "Flora of Kwangtung and Hongkong (China)" published in 1912, though specimens are known to have been planted in Canton as early as 1874. The first two species are apparently

[1] Submitted to the Department of Plant Industry of the College of Agriculture, Lingnan University, in partial fulfillment of the requirements for the degree of Bachelor of Science in Agriculture.

native to China, and, although the early Chinese references do not distinguish them clearly, it is probable that both have been in cultivation here since very early times.

According to the Ku Chin T'u Shu Chi Hsing[2] (古金圖書集成), the name *T'ung* (桐) as applied to this tree appeared in print for the first time in Ch'en Ts'ang Chi's (陳藏器) Pen Ts'ao Shih I (本草拾遺), published during the T'ang Dynasty (唐朝). The author mentions *Ying Tzu T'ung* (鸎子桐) and *Hu Tzu T'ung* (虎子桐) and says, "*Ying Tzu T'ung* grows in the mountains and has an appearance similar to *Wu T'ung* (梧桐)." *Wu T'ung* is a well-known tree identified as *Firmiana Simplex* (L.) W. E. Wight (*Sterculia platanifolia* L.). Kou Tsung Shih (寇宗奭), Sung (宋) Dynasty, says, "*Yen T'ung* (荏桐) puts forth in the early spring the slightly reddish and tubular flowers which look like those of *Ku Tsz* (鼓子). The fruits from such blossoms can be used in making T'ung oil." Lee Shi Chen (李時珍), Ming (明) Dynasty, states that *Ying Tzu T'ung* was so named because it has a resemblance to the fruit of the opium poppy; *Hu Tzu* means poisonous; and *Yen* means an oil, as Yen oil.[3] Wu Chi Hsun (吳齊濬) made a synthesis of all the available information and concluded that, "*Ying Tzu T'ung*, *Yen T'ung*, *Hu Tzu T'ung* are synonymous with *Yu T'ung* (油桐), names common in current usage." The same author quotes Su Sung (蘇頌) as saying that the people of southern China derive an oil from the fruits of a tree called *Kang T'ung* (岡桐) or *Pai T'ung* (白桐). This he apparently takes to be congeneric with *Yu T'ung* (油桐), for he draws a comparison between the two. But the characters he gives for his *Kang T'ung* or *Pai T'ung*, purple flowers and fruits (?) (葉) the size of those of *Wu T'ung* (梧桐), suggest *Paulownia*. Indeed, T'ang (1935) lists *Pai T'ung* as *Paulownia Fortunei* Hemsl., a species found all the way from Kwangtung to Manchuria. It is probable that *Aleurites montana*, the southern species, was the tree really referred to in the statement that "the people of southern China derive an oil from the fruits of a tree....." But confusion arose in the matter of names (the term *T'ung* having been loosely used) and in the characters ascribed to the tree.

So, although it is difficult to disentangle the references, it is probable that both *Aleurites montana*, the southern species, and *A. Fordii*, the northern species, were under cultivation in China as a source of oil in very early times.

The writer has chosen for the scope of the present study the following objectives: (1) The preparation of a key to the species of *Aleurites* already being grown in Kwangtung and Kwangsi. (2) A detailed botanical description of each of these species followed by

[2] Unless quoted verbatim from the literature, the romanized forms follow the system used in Giles (1912).

[3] Identified by the author (Hsu Chik-fong, 1932) as Pilrillar oil by which he probably intended Perilla oil.

notes on origin, history of cultivation in China, relative importance, distribution, longevity, productivity, composition of oil, and varieties. (3) Cultural and environmental requirements. (4) Discussion of the bad features of current practices and suggestions for improvement. (5) Suggestions concerning the possibilities for improvement of production through: (a) introduction of other species and new varieties, (b) experiments on interspecific and intervarietal crosses, (c) effect of pollen on the fruiting behavior, (d) possibilities of influencing the proportion of female flowers in the inflorescence through nutrition.

Uses of T'ung Oil

According to W. Newell (1924), T'ung oil is used in foreign countries for making varnish, enamel paints, paint driers and, combined with rosin, to make water-proof or spar varnish. It is also used in the manufacture of oil-cloth and linoleum. Combined with aluminum, it forms aluminum tungate, which is used as a fire-proofing and water-proofing material. The oil is also used as a dressing for leather and in the manufacture of soap.

In China, T'ung oil has been for many centuries a well-known and important commodity. It is used here primarily as a water-proof covering for wood and other materials for protecting them from the weather. It is the principal paint oil in China and is used as an ingredient in water-proofing masonry. The submerged parts of junks are dressed regularly with raw T'ung oil and the superstructure varnished with processed T'ung oil, which is known as the *Ming Yu* (明油) or *Kuang Yu* (光油), and calked with a mixture of T'ung oil, lime and oakum or bamboo fiber. According to Gardner (1935), T'ung oil, after heat treatment, is added to native lacquer, and has the effect of changing the color from black to brown, and making the lacquer dry much faster. The oil is also used for varnishing furniture and floors, and as an ingredient in dressings for leather. According to the same author, the oil is also used to some extent in making soap. It is still used as an illuminant in some places in the interior of China, but the flame given by it is too smoky to be satisfactory. When burned to a soot, T'ung oil makes a finely divided carbon from which the so-called India ink is made. Slaked lime mixed with T'ung oil is the common Chinese "putty," and this mixture also serves as the matrix for bamboo fiber which is commonly employed for calking boats. The soot formed when the pomace is burned is sometimes combined with the oil to make a paste for calking purposes.

Although the use of T'ung oil is very widespread in China, the total domestic consumption is relatively small because of the lack of basic industries, and the almost total absence of the highly specialised industries such as have grown up in the West around T'ung oil as a raw material. The Western demand, therefore, must draw a large

share of our annual output, though there is yet no way of knowing just how much we do produce. All we have is the record of exports kept by the Chinese Maritime Customs. (See table 1.) It is clear

TABLE 1

Total exports of T'ung oil, 1912-1936

YEAR	TOTAL AMOUNT EXPORTED IN PICULS[6]	VALUE IN DOLLARS[6]
1912	582,815	8,734,806
1913	463,467	6,002,806
1914	438,867	5,604,412
1915	430,344	4,518,514
1916	515,173	8,267,127
1917	401,361	7,258,862
1918	488,852	8,963,889
1919	613,455	11,941,452
1920	540,716	10,105,789
1921	419,549	8,199,645
1922	745,565	16,332,195
1923	836,887	26,216,130
1924	896,038	26,572,070
1925	894,073	26,173,156
1926	748,184	22,443,470
1927	901,294	32,956,421
1928	1,094,299	34,953,332
1929	1,096,650	35,279,553
1930	1,167,255	45,820,208
1931	864,864	28,322,075
1932	802,769	23,161,233
1933	1,246,847	30,361,269
1934	1,079,591	26,216,683
1935	1,222,083	41,582,897
1936	1,434,651	73,378,654

from these figures that wood oil is one of China's major economic plant products and that it is a very important source of national income.

T'ung Oil Production in Kwangtung and Kwangsi

Kwangtung and Kwangsi constitute a productive region of considerable extent and importance. (See tables 2, 3.)

[6] Before 1934, the quantity was expressed in terms of piculs and value in Haikwan Taels; but after 1934, quantity is given in quintals, value in dollars (national currency). For the sake of uniformity, I have converted all figures at the rates: 1.654 piculs=one quintal; one Haikwan Tael = $1.558.

TABLE 2

Exports of wood oil from Kwangtung and Kwangsi, via Hong Kong and Macao during years 1928-1936[4]

DATE	HONG KONG[5]		MACAO[5]	
	QUANTITY IN[6] QUINTALS	VALUE IN[6] DOLLARS	QUANTITY IN[6] QUINTALS	VALUE IN[6] DOLLARS
1928	83,654	3,580,826	7	386
1929	75,495	3,320,974	—	——
1930	33,511	1,419,717	13	687
1931	50,533	2,064,850	51	2,901
1932	49,810	1,893,450	81	3,619
1933	67,818	2,639,193	104	3,845
1934	86,545	3,466,737	60	2,852
1935	87,431	4,129,109	153	7,383
1936	60,169	2,934,674	110	7,220

TABLE 3

Amounts of Kwangsi wood oil passing through Wu-chow, 1928-1936[4]

YEAR	QUANTITY IN QUINTALS[6]	VALUE IN DOLLARS[6]
1928	68,780	2,911,848
1929	61,363	2,609,133
1930	34,518	1,423,189
1931	37,302	1,538,008
1932	42,226	1,605,527
1933	63,704	2,472,776
1934	83,704	3,341,329
1935	42,971	1,715,949
1936	53,858	2,476,844

Description of the Genus *Aleurites* Forst.[7]

Aleurites Forst, 1776, Char. Gen. ii. t. 56.
Camirium Gaerth., 1791, Fruct. ii. 194. t. 125.
Dryandra Thunb., 1784, Fl. Jap. 13. t. 27.
Elaeococca A. Juss., 1824, Euph. Tent. 38. t. 11.
Telopea Soland. ex Baill., 1858, Etud. Gen. Euph. 345.
Vernicia Lour., 1790, Fl. Cochinch. 586.

[4] China, Annual Trade Returns, issued by the Chinese Maritime Customs, 1930-1936.

[5] The only outlet to foreign markets from Kwangtung and Kwangsi is through Hong Kong and Macao. Before completion of the Hankow-Canton railway in 1935, the exportation of goods to foreign markets from these two provinces via Hankow was impossible, so the oil that passed through Hong Kong and Macao may be presumed to represent the total oil export from these two provinces.

[7] The synonymy is quoted from Index Kewensis 1:75, 1895. The description is taken verbatim from Bailey (1924), the original being unavailable.

"Four species native in East Asia and Pacific Islands yielding oil and sometimes grown as shade trees—juice milky; lvs. alternate [really spirally arranged! H. C. H.], large, 5- to 7-veined from the base, entire or lobed, the long petioles with 2 glands at apex; usually monoecious; fls. [imperfectly unisexual! H. C. H.] in lax terminal panicled cymes; calyx splitting into 2-3 valvate lobes at flowering time, petals 6, longer than the calyx; stamens 8-20, inserted on a conical receptacle, in 1-4 rows, the 5 outer opposite the petals and alternating with 5 glands [really staminodes! H. C. H.] of the disk; ovary 2-5 celled with 1 ovule in each cell, the style divided into 2 linear branches; fr. an indehiscent drupe. (*Aleurites*: Greek for farinose or floury)."

Key to the Species of Aleurites Found in Kwangtung and Kwangsi

A. Young tip of stem rusty gray, stellate pubescent; leaves pubescent, usually entire on adult tree, persistent, the glands on the petiole at base of leaf blade small; flowers smallish, fruit usually with one, or at most two, seeds. .....**Aleurites moluccana** Willd.

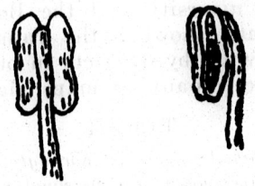
AA. Young tip of stem olive green to green or brown, glabrous; upper surface of mature leaves glabrous, entire to deeply lobed on adult tree, deciduous, the glands on the petiole at base of leaf blade large; flowers larger, more showy, appearing before or after the leaves have expanded; fruit usually with three or more seeds.

B. Monoecious tree without a central trunk (stem deliquescent); leaf glossy green, the blade entire or with one-two shallow lobes, with a cup-shaped gland at the base of the lobes, the glands on the petiole at base of leaf blade brownish, convex, sessile; flowers smaller, appearing before the leaves are fully expanded, the pistillate ones with a single whorl of staminodes, the petals glabrous and tinted with red and yellow at the base, the styles four, the stigmas short; staminate flowers with anthers apicifixed and filaments very slender and weak, the petals pink to red; fruit with surface smooth or slightly, not prominently, striate, the base nipped; seeds three or more .....**A. Fordii** Hemsl.

BB. Monoecious (or, more rarely, dioecious) tree with strong central excurrent trunk; leaf dark green, the blade entire or with two-four deep sinuses with a disk-like gland at the base of each, the glands on the petiole at base of blade greenish, concave, stalked; flowers larger, appearing after the leaves are fully expanded, the petals white, or tinted with red, and tomentose at the base, the pistillate ones with two alternate whorls of staminodes, styles three, curved, the stigmas long, strongly recurved; the staminate flowers with anthers basifixed on coarse, stiff, reddish or green filaments; fruit with surface marked by three prominent, narrow ridges extending from the base to the apex, with reticulate wrinkles between, the base flattened or depressed; seeds three.....
.....**A. montana** (Lour.) Wils.

1. **Aleurites Fordii** Hemsl.

A flat-topped much-branched tree, 3-12 m. high, without a central trunk, the stem deliquescent, the young tip of stem dull, olive green, somewhat mottled with darker areas, glabrous, not glaucous; leaves deciduous, the petiole 17.3-21.5 cm. long, yellowish, sparsely hispidulous at the base, the blade glossy, ovate to heart-shaped, 19-21.5 cm. long, 22-24 cm. wide, the apex acuminate, the base cordate, the upper surface yellow pubescent in young leaves, later glabrous, the lower surface tomentose in young leaves, later sericeous, the margin entire or with one-two lobes, the shallow sinus between the lobes usually with a cup-shaped gland at its base, the veins seven, prominent, palmately arranged, the two glands on the petiole at base of blade large, brownish, convex, sessile; flowers appearing on shoots of



Lateral view Dorsal view

Fig. 1, Apicifixed anthers of *A. Fordii* (x7)

previous season's growth, before the leaves, in panicled cymes, chiefly staminate, (the pistillate ones occurring typically as the solitary, terminal blossom in each mixed panicle, *teste* Newell, 1931), the pedicel 1.1 cm. long, wooly at apex, the sepals two, equal, distinct above, but united at the base into a cup-shaped calyx, the corolla regular, showy, rotate, (larger in the pistillate flowers than in the staminate flowers, *teste* Newell, 1930), the petals five-eight, distinct, obovate, white in the pistillate flowers, tinted with red and yellow at the base in the staminate flower, 2.1-2.3 cm. long; stamens (only staminodes in pistillate flower) in three whorls, the outermost consisting of four-five distinct staminodes, the intermediate whorl of five-six distinct, fertile ones, the inner whorl, of four-eight longer, monadelphous, fertile ones; anthers dorsifixed (pistil entirely lacking in staminate flowers), the ovary wooly, with four-six staminodes in a single whorl, three- or more celled, the ovules axile, one in each cell, the style (in pistillate flowers) four, the stigmas bifid; fruit a subglobose nut, the apex pointed, the base nipped, the surface rather smooth or slightly, not prominently, striate; seeds three or more.

Bailey (1919) states that the wood oil tree, by which we assume that he means *A. Fordii* since he treats but a single Chinese species, is native to Central Asia, where it is extensively cultivated as a source of oil. It is said to be hardy in central Florida and is resistant to drought. According to the Kew Index (1906-1919) *A. Fordii* is native to China.

According to Ch'en Chien (陳翦) in T'ung Pu (桐譜), the T'ung tree was already under cultivation in the T'ang Dynasty (唐朝) and was extensively grown as an economic tree during the Sung Dynasty (宋朝). Gradually it became a national enterprise and during the Ming Dynasty (明朝) Emperor Hung Moo (洪武帝) ordered the planting of T'ung trees, varnish trees, and palms at the

eastern part of Chung Shan (鐘山), outside the Ch'ao Yang gate (朝陽門). Since this planting took place at Nanking (then Chin Ling, 金陵), we are fairly safe in assuming that the T'ung tree referred to was *A. Fordii*, for none of the other species is adapted to the climate of that temperate region.

A. Fordii is the most important species in China, as it is estimated (Wilson, 1913) to produce nine-tenths of the wood oil used in the industries. The author has compiled (table 11) from the herbaria of Lingnan University and the Botanical Institute, Sun Yat-sen University, data showing the range of this species, in cultivation and in the wild, by districts in our area (see also tables 4, 5, and 12, and the accompanying maps, fig. 2 and 3).

TABLE 4

Occurrence of the species of Aleurites in Kwangtung, by districts, as shown by herbarium specimens and personal observation (*)

MANDARIN (RICHARD)		CANTONESE (COWLES)	LOCATION ON MAP	SPECIES
Chung-shan	中山	Chung-shaan	10-Q	moluccana*
Ho-yuen	河源	Hoh-uen	6-U	montana
Jao-p'ing	饒平	Iu-p'ing	5-&	montana
Kao-yao	高要	Ko-iu	8-N	montana, moluccana
K'uh-kiang	曲江	K'uk-kong	2-P	montana, Fordii
Lo-ting	羅定	Loh-ting	9-K	montana
Loh-ch'ang	樂昌	Loh-ch'eung	1-O	montana, Fordii
Mei-hsien	梅縣	Mooi-uen	4-Y	montana
Meu-ming	茂名	Mau-ming	13-I	montana
P'an-yu	番禺	P'oon-ue	8-Q	montana, Fordii, moluccana
Pao-an	寶安	Po-on	10-S	Fordii, moluccana
Sin-i	信宜	Sun-i	11-I	montana
Ta-pu	大埔	Taai-po	3-&	montana
Tseng-ch'eng	增城	Tsang-sheng	7-R	montana
Ts'ing-yuen	清遠	Ts'ing-uen	6-O	Fordii
Wu-hwa	五華	Ng-wa	6-W	montana, Fordii
Ying-teh	英德	Ying-tak	4-P	montana, Fordii
HAINAN				
Ch'ang-kiang	昌江	Ch'eung-kong	14-U	moluccana
Ch'eng-mai	澄邁	Ch'ing-maai	12-X	montana
Ling-shui	陵水	Ling-shui	16-X	moluccana
Tan-hsien	儋縣	Taam-uen	13-V	montana
Ting-an	定安	Ting-on	13-X	montana, moluccana
Yai-hsien	崖縣	Ngaai-uen	16-V	moluccana

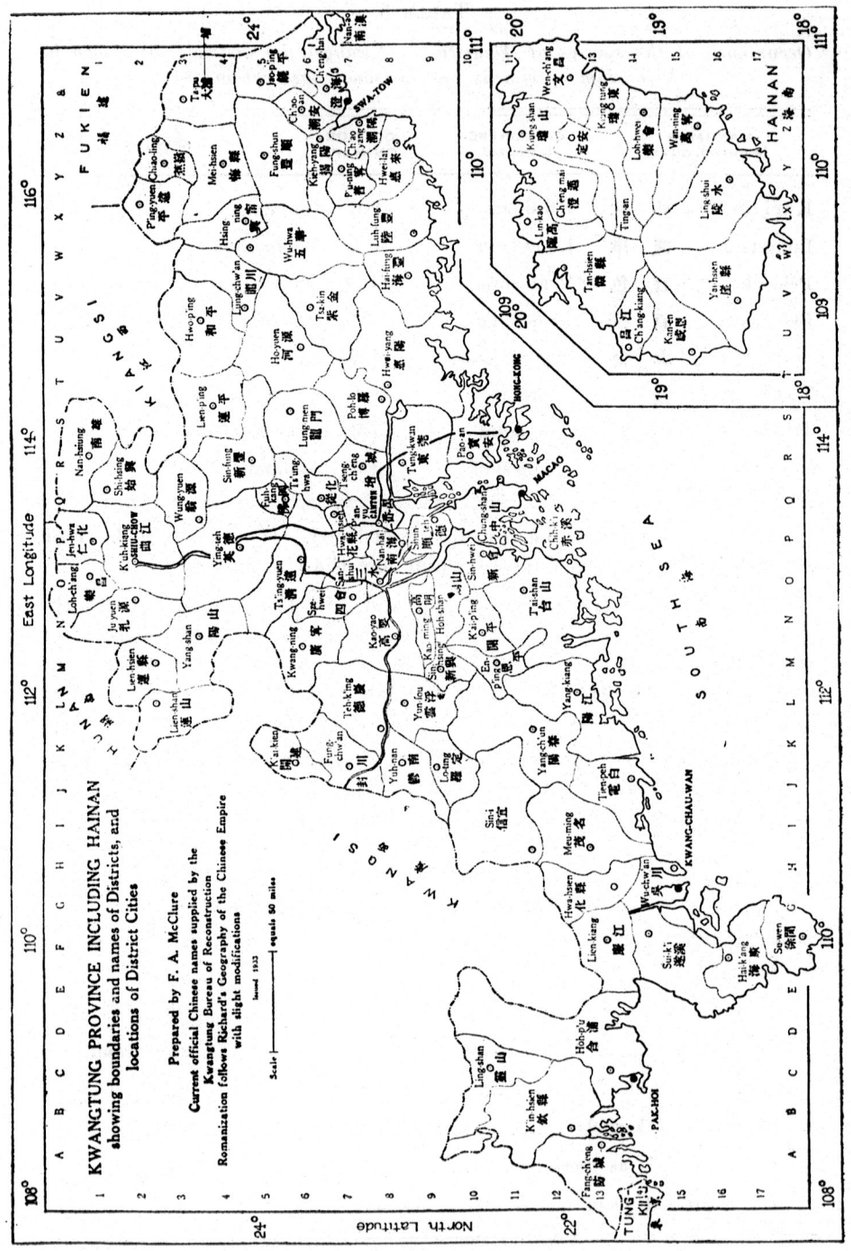


Fig. 2. Map of Kwangfnug

TABLE 5

Occurrence of the species of Aleurites in Kwangsi, by districts, as shown by herbarium specimens and personal observation (*)

MANDARIN (RICHARD. GILES)		CANTONESE (COWLES)	LOCATION ON MAP	SPECIES
Kwei-lin	桂林	Kwai-lam	2-K	montana
Lung-tsin	龍津	Lung-tsun	8-E	moluccana
Peh-seh	百色	Paak-shik	4-D	moluccana
Peh-sheu	百壽	Paak-shau	3-J	Fordii
Shang-kin	上金	Sheung-kam	8-F	moluccana
T'eng	縢	T'ang	6-L	montana
Ts'ang-wu	蒼梧	Ch'ong-ng	5-M	montana, moluccana
Yang-shoh	陽朔	Yeung-shok	3-K	montana, Fordii

The tree is said to be usually short-lived. It comes into bearing in southern China at a more tender age than *A. montana*.

According to Ho K'ai (賀闓) and Liu Hu (劉瑚) (1934) the growth of the tree is very rapid. In the third or fourth years after planting, it begins to blossom and set fruits, and bears during the fifth or sixth to eleventh or twelfth year, after which the yield is gradually reduced till the age of thirty years.

Three samples of the nuts of *A. Fordii* were examined at the Imperial Institute, London, which reports the characteristics and properties shown in tables 6 and 7 (Bull. Imp. Inst. 28: 268, 1930).

TABLE 6

Average of analyses of the nuts of A. Fordii

Shell	46%
Kernel	54%
Average weight of nuts	2.3 grams.
Average weight of kernels	1.3 "
Moisture in kernels	4.5%
Oil in kernels as received	55.9%
Oil expressed from moisture-free kernels	58.5%

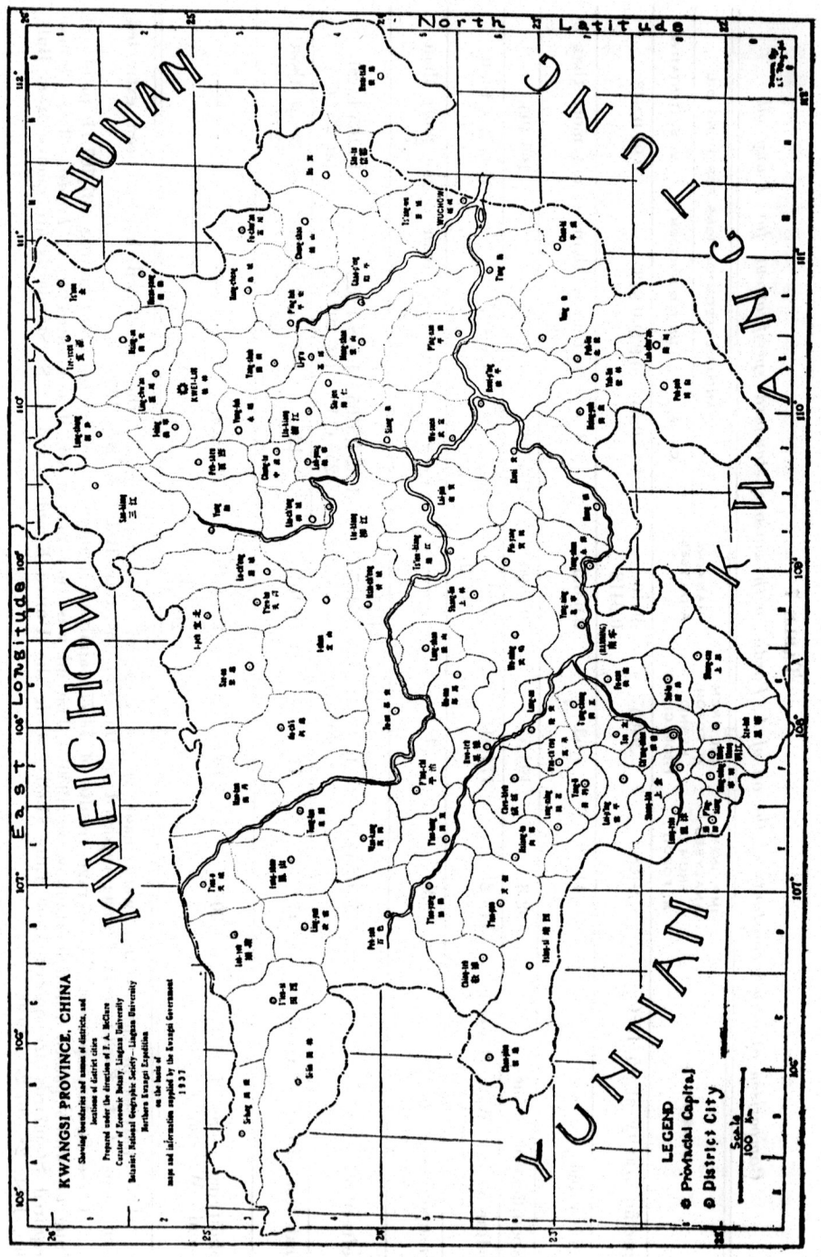


Fig. 3. Map of Kwangsi.

TABLE 7

Comparison of actual constants of the oil of A. Fordii with various standard specifications for T'ung oil

CONSTANTS	IMP. INST. ANALYSES FROM A. FORDII[8]	OIL FROM A. FORDII KERNEL FROM CHINA	HANKOW ANALYSES[9]	STANDARD SPECIFICATIONS FOR T'UNG OIL	
				CHINA	UNITED KINGDOM
Specific gravity at 15/15°C.	.9428	.9405	.9410-0.9418	0.943-0.94	0.939-0.943
Acid value	.44	.63	2.6-6.5	8	not more than 5.0
Saponification value	192.3	193.5	195-190	195-190	189-195
Iodine value (Wijs. 3 hrs.) per cent.	179.2	174.81	166.2-166.9	163	155-167
Unsaponifiable matter per cent.	.9	.3	——	——	not more than 0.75
Refractive index	1.5155 at 40° C.	1.513 at 40° C.	1.5164-1.5157 at 25° C.	1.52-1.5165 (25° C.)	1.518-1.522 (at 20° C.)
Heat test (Browne) mins.	11	11	10-10½	12	not more than 12
Solidifying point of fatty acid (Worstall's test)	30	36.8	6 mins. 26 sec.-7 mins. 20 sec.	7½ min.	——

[8] The analyses in this column were made at the Imperial Institute, London, the oil tested having been extracted from seeds of *A. Fordii* from China; reported in Imperial Institute Bull. 28 : 268, 1930.

[9] These figures represent the average results of 74,774 analyses (samples from shipments totalling 937,707.11 piculs of T'ung oil which passed through Hankow in 1930). The oil was very nearly all, if not entirely, *A. Fordii*. The Chinese Required Standards are quoted from Ling (1931), while the United Kingdom and U. S. Standards are quoted from Bull. Imp. Inst. 28 :267-271, 1930.

Little is known with regard to the varieties of *A. Fordii*. However, according to Chun (1937), Lin Pen (林本) on the basis of field observation in Kien Teh (建德), Chekiang Province, has described the following varieties:

(1). *Saam Nin T'ung* (三年桐), i. e. Three-Year-T'ung. A small tree, about 3 m. high, which begins to flower in the second year after planting. Usually these flowers are picked away and the plants are not allowed to set fruit until the third year. So the name Three-Year-T'ung is reasonably derived. The fruits are small, pendulous on long peduncles, in clusters of from three or four to ten or more, usually five or six on each twig. By the eleventh or twelfth year, the tree has become debilitated and the fruits are said to be reduced to one or two on each twig.

(2). *Wu Nin T'ung* (五年桐), i. e. Five-Year-T'ung. Begins to flower in the fourth year after planting, the yield of whole tree being from two or three to three or four fruits in the fifth year. Thus, the name Five-Year-T'ung is obtained. The tree reaches a height of 7-10 m. at maturity. The fruits are large, being borne usually solitary but sometimes clustered on short, erect peduncles. The average longevity of the tree is about twenty years.

2. **Aleurites montana** (Lour.) Wils.

A tree about 8 m. high, with strong, central, excurrent trunk, the young stem tips dull green to brown, glabrous, glaucous; leaves evergreen or partially deciduous, the petiole 3-34 cm. long, both extremities hispidulous, the blade dark green, broadly ovate, 12.3-28 cm. long, 8.3-24 cm. wide, the apex acuminate, the base cordate, the upper surface in young leaves shiny, brown-pubescent, the lower surface glabrous, both surfaces ultimately glabrous, the margin entire or with two-five deep lobes, each sinus with a disk-like gland at the base, veins five-seven, prominent, palmately arranged, the two glands on the petiole at base of leaf blade large, greenish, concave, stalked; flowers typically monoecious, sometimes dioecious, borne in terminal inflorescences on shoots of the current season's growth after the leaves have fully expanded, "the male inflorescence is many flowered, much-branched, corymbose, 15-20 cm. long and 20-30 cm. wide, the female inflorescence is relatively few-flowered, racemose, and 8-12 cm. long" (Wilson, 1913), the pedicel 1.5 cm. long, glabrous, the sepals two, regular, distinct above, but united at the base into a cup-shaped calyx, the corolla large, regular, showy, rotate, the petals usually five, distinct, obovate, 1.8-2.3 cm. long, tomentose at the base; white in the pistillate flower, tinted with red at the base in staminate flowers; staminate flowers with staminodes five-seven, distinct, in a

single whorl, the fertile stamens eight-ten, in two whorls, outer five, shorter, usually connate at the base, the inner three-five, longer, monadelphous, filaments red, anthers basifixed, pistil entirely lacking; the pistillate flowers with staminodes five-seven, distinct, in a single whorl, the ovary strigose, marked by three prominent ridges, with wrinkled surface between, three-celled, with one axile ovule in each cell; the styles three, curved, each ending in two long, strongly recurved stigmas; fruit ovoid with surface marked by three prominent, narrow ridges extending from the base to the pointed apex, with reticulate wrinkles between, the base flattened or depressed; seeds three.

The writer's preliminary study of the inflorescence in this species has revealed some gross characters by means of which the typical pistillate inflorescences may readily be distinguished from the typically staminate ones, even in the bud stage. The buds of pistillate inflorescences are green, pubescent, narrow, with the surface typically marked by four or more prominent ridges extending to and beyond the tip, while those of staminate inflorescences are yellowish with brown tips, glabrous, oblanceolate and smooth (not ridged). The intermediate form (consisting of buds yielding mixed inflorescences) remains to be studied. Pistillate inflorescences are typically few-flowered (usually triflorous) while the staminate ones are many-flowered.

Hemsley states (1914) that this species is indigenous to south-eastern China, being found in the province of Fukien and southward to Tongking.

The early Chinese literature does not give us a clear idea either as to when this species came into cultivation, or as to early distribution. Whereas *A. Fordi* is more or less limited to temperate regions, this species is sub-tropical in its climatic adaptation. In our region, therefore, *A. montana* has far more economic importance than *A. Fordii*, although it is estimated to yield but 10% of the total output of T'ung oil for China (McClure, 1930). The known distribution of this species by districts, in the two provinces, as revealed by specimens in the herbaria of Lingnan University and the Botanical Institute of San Yat-sen University, is shown in tables 4, 5, 11 and 12, and the maps, fig. 2 and 3.

Three samples of the nuts of this species were examined at the Imperial Institute, London, which reports the characteristics and properties shown in the following table (Bull. Imp. Inst. 28: 270, 1930).

TABLE 8

Average of analyses of the nuts of A. montana

	1929 crop.	1930 crop.
Shell	43.5%	47.5%
Kernel	56.5%	52.5%
Average weight of a nut	2.8 grams.	2.8 grams.
Average weight of a kernel	1.6 "	1.5 "
Moisture in kernels	4.5%	5.9%
Oil in kernels as received	59.8%	56.3%
Oil expressed from moisture-free kernels	62.6%	59.8%

According to Chun (1933), the tree begins to set fruits at the age of seven or eight years, but usually does not reach its peak of production until some twenty years later. It may live to the ripe old age of a hundred years. The yield per tree is said to be higher, on the average, than that of *A. Fordii*, the production of a mature tree, varying from one to several piculs (133 lb.). Moreover, the oil content of the seeds, as revealed by actual analyses (compare tables 6 and 8) is somewhat higher, on the average, than that of *A. Fordii*. Judging from available analyses, the quality of the oil of *A. montana* is poorer in certain important respects (namely, heat test, refractive index and iodine value) than that of *A. Fordii* (compare tables 7 and 9).

3. **Aleurites moluccana** Willd.

Tree up to 10 m. high, with strong central trunk, the tip of young stem rusty gray, stellate pubescent (silvery green and shining when pubescence has been removed), not glaucous; leaves persistent, the petiole 7.7-13.1 cm. long, both extremities stellate-pubescent and rusty gray, the blade dark shiny green, narrowly ovate, 14.5-19 cm. long, 13.2-14.7 cm. wide, the apex acute to acuminate, the base cordate on young trees, slightly rounded to attenuate on adult trees, the upper surface glabrous, the lower stellate-pubescent, both surfaces heavily pubescent and buff-colored in young leaves, the margin usually entire on leaves of adult trees, but two-four-lobed on those of young trees, and sometimes on adult trees, glands wanting at the base of the lobes, the principal veins three-five, plamately arranged, not prominent, the two glands on the petiole at base of blade small, reddish, convex, sessile; flowers monoecious, unisexual, in large, mixed or purely staminate, paniculate cymes, the pistillate flowers terminal to the main branches of the mixed inflorescence, usually opening before the staminate; sepals two, distinct, but united at the base into a cup-shaped calyx; corolla regular, the petals usually five, distinct,

TABLE 9

Comparison of actual constants of the oil of A. montana with various standard specifications for T'ung oil

CONSTANTS	WUCHOW ANALYSES[10]		IMP. INST. ANALYSES[11]	STANDARD SPECIFICATION FOR T'UNG OIL	
	MAXIMUN	MINIMUM	1929 CROP	1930 CROP	UNITED KINGDOM	U. S. (TENTATIVE)
Specific gravity of 15/15°C.	0.9406	0.9418	0.9381	0.9405	0.939-0.943	0.940-0.943
Acid value	4.0	7.0	12.1	1.5	not more than 5.0	not more than 8.0
Saponification value	191.8	193.3	191.5	192.6	189-195	190-195
Iodine value (Wijs. 3 hrs.) per cent.	166.8	169.9	163.1	170.0	155-167	not less than 163
Unsaponifiable matter per cent.			0.6	0.7	not more than 0.75	not more than 0.75
Refractive index	1.5185 (20°C.)	1.5203 (20°C.)	1.506 (40°C.)	1.509 (40°C.)	1.518-1.522 at 20° C.	1.5165-1.520 at 25° C.
Heat test (Browne) mins.			24	20.5	not more than 12	not more than 12
Solidifying point of fatty acid (Worstall's test).	5 mins. 55 sec.	60 mins. 40 sec.	———	38.2°C. 41.1°C.	———	———

[10] Wen (1936).

[11] Bull. Imp. Inst. 28 (3) :271, 1930.

oblong; gland-like staminodes five-eight, very distinct; styles four, claw-like, centripetal, each terminating in a minute stigma; ovary oval, tomentose, two-celled, with one axile ovule in each cell; fruits laterally compressed, subglobose, pubescent, the surface smooth, with usually four sutures extending from the depressed base to the usually pointed apex; seed usually solitary, at most two; staminate flowers occurring either in mixed, or in purely staminate inflorescences, and differing from the pistillate in the following characters: opening later, pedicels longer, corolla smaller and expanding more fully, the petals five-six; gland-like staminodes five-eight, irregular, usually with their adjacent points contiguous, fertile stamens fifteen-twenty in three whorls, the central whorl with one-two stamens not united, the intermediate with five-seven, connate at the base, the outer with ten-twelve, distinct; the filaments tomentose, rudimentary ovary present.

Bailey (1925) says that this tree is probably a native of Malaya and Polynesia but is now widely distributed, both in the wild, and in cultivation in tropical regions.

According to Chen (1933) *A. moluccana* is said to have a rapid rate of growth. Under favorable conditions, it usually starts to flower in three to four years from the time of planting.

The seeds yield 60% of oil (Lord and Williamson, 1924), which is used in the Philippine Islands as an illuminant and in the making of varnish. In China, the tree is grown principally as a roadside tree for shade, and has not yet been exploited as a source of oil.

For distribution, see tables 4, 5, 11, and 12, and maps, fig. 2 and 3.

TABLE 10

Constants of Lumbang oil[12] *(A. moluccana)*

CONSTANTS	SAMPLE NUMBER		
	1	2	3
Specific gravity 15°C.	0.925	.92-.926	0.925
Acid value	1.720		
Saponification value	204.2	184-187.4	192.6
Iodine value	139.7	136.3 -139.3	163.7
Hehner value	96.4		95.5
Volatile acids	1.98		
Titer	1.78		
Butyro-refractometer		76-75.5	76 (25°C.)

[12] Quoted from Brown, 1921, p. 130.

TABLE 11

Notes on distribution from herbarium specimens

I. *Aleurites montana* (Lour.) Wils.

COLLECTOR AND HERBARIUM[13]		FIELD No.	PROVINCE	DISTRICT	LOCALITY	REMARKS
Chiang I-hsun	(SYS)	9314	Kwangtung	Mow-ming	Ching Yu-hsiang	Sterile for many years
,,	,,	71694	,,			Hainan Island
Chiang Ying	(SYS)	558	,,	Ying-teh		
,,	,,	2282	,,	Mow-ming		
,,	,,	833	,,	Kao-yao	T'ing Hu Shan	
,,	,,	1123	,,	Lo-ting		
Chiang Y.	(SYS)	1947	,,	Ying-teh	Ch'a La Shan	
Ching R. C.	(SYS)	6354	Kwangsi		Won Bin	
Chou Hung on	(SYS)	2108	Kwangtung	Kao-yao		
Chun Nien-ch'u	(LU)	41104	,,	Tseng-Ch'eng	Lo Fou Shan	
,,	,,	42675	,,	Jao-ping	Feng Huang Shan	
Chun Woon Yung	(SYS)	6597			Botanic garden	Hongkong
,,	,,	4924			Sha Tin	New Territories
,,	,,	4927			Botanic garden	Hongkong
Fung H.	(LU)		Kwangsi	Yang-shoh		
,,	,,		,,	Kwei-lin		
Groff, G. W.	(LU)	23	,,	T'eng		
Hou Kuan-chao	(SYS)	71694	Kwangtung		Ta'i P'ing Keng	Hainan Island

Hou Kuan-chao	(SYS)	72684	Kwangtung		Tai Ping Keng	Hainan Island
,,	,,	72085	,,		,,	,,
Huang Chih	(SYS)	32321	,,	Sin-i	Ho Shui Keng	
,,	,,	31923	,,	,,	Shang Shih T'ung	
Kao Hsi-peng	(SYS)	50529	,,	Kao-yao	Ting Hu Shan	
,,	,,	50493	,,	Ying-teh	Hua Shui Shan	
,,	,,	50430	,,	,,	,,	
Lau Shau Yan	(LU)	2000	,,	Pan-yu	C. C. C. nursery	
Lei C. I.	(LU)	492	,,	Ch'eng-mai	Pak Shih Ling	Hainan Island
,,	,,	759	,,	Tan	,,	,,
Liang Hsiang Jih	(SYS)	61079	,,	Ying-teh	Wen T'ang Shan	"in forest ravine"
,,	,,	60693	,,	,,	,,	
,,	,,	61080	,,	,,	,,	
McClure, F. A.	(LU)	1145	Kwangsi	Ts'ang-wu	Wu-chow	
,,	,,	1135	,,	,,	Kung Yik Shan	Near Wu-chow
,,	,,	1138	,,	,,	,,	,,
,,	,,	1140	,,	,,	,,	,,
,,	,,	1133	,,	,,	,,	,,
,,	,,	1147	,,	,,	,,	C. M. A. compound
,,	,,	1148	,,	,,	Baptist Hospital	
,,	,,	1145	,,	,,	Pak Hok Koon Shan	
,,	,,	1132	,,	,,	Wu-chow	C. M. A. compound

McClure, F. A.	(LU)	1146	Kwangsi	Ts'ang-wu	Wu-chow	C. M. A. compound
,,	,,	1144	,,	,,	Pak Hok Koon Shan	
,,	,,	1131	,,	,,	Kung Yik Shan	
,,	,,	1139	,,	,,	,,	
,,	,,	1129	,,	,,	,,	
,,	,,	1130	,,	,,	,,	
,,	,,	1149	,,	,,	,,	
,,	,,	41	Kwangtung	Wu-hwa	Taai Yeung Shan	
,,	,,	308	,,	Mei	T'sing Leung Shan	
,,	,,	191	,,	Wu-hwa	Keung Tse P'aai	
,,	,,	3189	,,	Ting-on	Yik Tsok Mau	Hainan Island
To and Tsang	(LU)	12269	,,	K'uh-kiang	Lung T'au Shan	
,,	(SYS)	12269	,,	,,	,,	
Tsang Wai Teh	(SYS)	72	,,	Tan	Nodoa	Hainan Island
,,	(LU)	72	,,	,,	,,	,,
,,	,,	628	,,	,,	Sha Po Shan	,,
,,	,,	21043	,,	Ta-pu	Tai Mo Shan	
Tso Ching Lieh	(SYS)	20238				Hongkong
,,	,,	21533	Kwangtung	Ho-yuen	Hsiang Shui Keng	
,,	,,	20478	,,	Loh-Ch'ang		
Tutcher	(SYS)		,,		Kou Wong Shek	

II. *Aleurites Fordii* Hemsl.

COLLECTOR AND HERBARIUM		FIELD No.	PROVINCE	DISTRICT	LOCALITY	REMARKS
Chiang Ying	(SYS)	1350	Kwangtung	Loh-ch'ang	Ta Lang	Leaf and fruit very large
Chun Nien Ch'u	(SYS)	42131	,,	,,		
,,	,,	42292	,,	,,		
Chun Woon Yung	(SYS)	5090			Botanic garden	Hongkong
,,	,,	7299	Kwangtung	Ts'ing-yueng	Ta Keng Kou	Misidentified as A. montana
Fung Hom	(LU)		Kwangsi	Yang-shoh		
Hsu Wei Tung	(SYS)	8575	Kwangtung	Ying-teh	Hua Shui Shan	
Levine	(LU)		,,	Pan-yu		Agri. Expt. Sta.
Liang Hsiang Jih	(SYS)	60283	,,	K'uh-kiang	Lung Tou Shan	Fruit and leaf very small
McClure, F. A.	(LU)	196	,,	Wu-hwa	Keung Tse P'aai	
,,	,,	188	,,	Ts'ing-yueng	Chung Sam Tsuen	
,,	,,	194	,,	,,	Chung Kang Pa	
,,	,,	539	,,	Wu-hwa	Taai Yeung Shan	
Siu In-nin	(LU)	Y-105	,,	P'an-yu	Honan	Seeds from Hwei-yang district
To Kang-peng	(LU)		,,	K'uh-kiang	Ma Paai	
Tso Ching Lieh	(SYS)	22236	,,	Ying-teh		
Tsui T. M.	(LU)	260	,,	Pao-on	Ng Tung Shan	

III. *Aleurites moluccana* Willd.

COLLECTOR AND HERBARIUM		FIELD NO.	PROVINCE	DISTRICT	LOCALITY	REMARKS
Chiang Ying	(SYS)	405	Kwangtung	Pan-yu	Tung Shan	
Ching R. C.	(SYS)	7397	Kwangsi	Peh-seh	Bako Shan	
,,	,,	7413	,,	,,	,,	
Chun Woon Yung	(SYS)	6599			Botanic garden	Hongkong
Fen Tzu Erh	(SYS)	22	Kwangtung			
Fung Hom	(SYS)	20050	,,	Yai		Hainan Island
,,	(LU)	,,	,,	,,	Paai Poon T'sun	,,
Hou Kuan Chao	(SYS)	70025	,,	,,		,,
Huang Chih	(SYS)	70593	,,	,,		,,
,,	,,	30830	,,	Pan-yu	Tung Shan	
,,	,,	33216	,,	Yai		Hainan Island
,,	,,	34002	,,	,,		
Huang Shan Tou	(SYS)	1111	Kwangsi	Ts'ang-wu	Wu-chow	Kwangsi University campus
Kao Hsi Peng	(SYS)	55297	,,	Lung-chin		
Liang Hsiang Jih	(SYS)	61682	Kwangtung	Ling-shui	Ch'i Chih Shan	Hainan Island
,,	,,	64049	,,	Ting-an	Tung Chia Ts'un	,,
,,	,,	66693	Kwangsi	Shang-chin	Tzu Hsia T'ung	
,,	,,	61683	Kwangtung	Ling-shui	Ch'i Chih Shan	Hainan Island
Li Yao	(SYS)	9624	,,	Pao-an	Shen Chin	
Liu Hsin Chi	(SYS)	26083	,,	Peh-sha		Hainan Island

Liu Hsin Chi	(SYS)	83	Kwangtung	Yai		Hainan Island
,,	(LU)	83	,,	,,		,,
,,	,,	1822	,,	Ch'ang-kiang	Ng Ko Shan	
Mai Hsiao Pang	(SYS)	5387	,,	Pan-yu	Shek P'ai	
McClure, F. A.	(LU)	2617	,,	Tan (?)	Fan Lun	Hainan Island
,,	,,	1113	,,	Pan-yu	Honan	
,,	,,		,,	Tan (?)	Fan Lun	Hainan Island
To Kang Peng	(LU)		,,	Pan-yu	Honan	
,,	,,		,,	Kao-yao	T'ing Hu Shan	
Tsang Wai Teh	(LU)	614	,,	Tan	Sha Po Shan	Hainan Island
,,	,,	498	,,	,,	Shui Mei Shan	Hainan Island
,,	(SYS)	614	,,	,,	Sha Po Shan	,,
Tsang and Fung	(LU)	480	,,	,,	Hung Mo Shan	,,
,,	(SYS)	,,	,,	,,	,,	,,
,,	(LU)	641	,,	,,	,,	,,
,,	(SYS)	,,	,,	,,	,,	,,
Tso and Chen	(SYS)	4440	,,	,,	,,	,,
Wong Ying Chih	(SYS)	9	,,	Pan-yu	Shek P'ai	

[13] For economy of space the abbreviation "SYS" is used in the tables for the herbarium of Botanical Institute, Sun Yat-sen University, "LU" for the herbarium of Lingnan University.

The writer's notes on specimens in the herbarium of Lingnan University bring the records for *A. Fordii* and *A. montana* up to April 3, 1938, and those of *A. moluccana* up to May 14, 1938. Those for all material in the herbarium of Botanical Institute, Sun Yat-sen University, are complete to May 1, 1938.

TABLE 12

Additional notes on distribution from literature and personal observation

I. *Aleurites montana* (Lour.) Wils.

SOURCE OF INFORMATION	SAID TO OCCUR IN		REMARKS
	PROVINCE	DISTRICT	
Chen Yung, 1933	Kwangtung	Tsz-kin	Apparently wild on a mountain
Hoh Hin-cheung, 1938			Personal observation in Kowloon, New Territories
Liu Sung Pin, 1938			Apparently wild on a mountain in Kowloon
Luk Yi-ching, 1937	Kwangtung	Sin-i	

II. *Aleurites Fordii* Hemsl.

SOURCE OF INFORMATION	SAID TO OCCUR IN		REMARKS
	PROVINCE	DISTRICT	
Chen Yung, 1933	Kwangsi	Ho, Yang-shoh, Kwei-lin, Chao-p'ing, Liu-ch'eng, San-chiang, I-pei, Yung-ning, Peh-seh, Yung, Ts'ang-wu, Liu-kiang, Peh-shou	
Hoh Hin-cheung, 1937	Kwangsi	Kwei-lin, Yang-shoh, Peh-shou	Personal observation
Hoh Hin-cheung, 1938			Personal observation in Kowloon, New Territories

III. *Aleurites moluccana* Willd.

SOURCE OF INFORMATION	SAID TO OCCUR IN		REMARKS
	PROVINCE	DISTRICT	
Hoh Hin-cheung, 1938	Kwangtung	Chung Shan	Personal observation
Luk Yi-ching, 1937	,,	Sin-i	

IV. *Aleurites* (*species undetermined*)

SOURCE OF INFORMATION	SAID TO OCCUR IN		REMARKS
	PROVINCE	DISTRICT	
Chu Chih Hsiung, 1937	Kwangtung	Lung-chw'an, Tsz-kin, Chiao-ling, Ts'ung-hwa, Poh-lo, Tseng-ch'en, Kao-yao, Ling-shen, Loh-ch'eng, K'in-hsien.	
Hoh Hin-cheung, 1923	Kwangsi	Ching-teh	Personal observation
Hoh Hin-cheung, 1937	Kwangtung	Hwa	Personal observation
Hui Ping Hsi, 1927	Kwangsi	Yung-ning, Peh-seh, Ts'ang-wu, Yung, Ho, Yang-shoh, Kwei-lin, Chao-p'ing.	
Wen Hsiang Hsing, 1937	Kwangsi	Ts'uen, Hsing-an, Lung-sheng, I-ning, Kwei-lin, Peh-shou, Yung-fuh, Yang-shoh, Kung-cheng, Fu-chw'an, Ho, Chung-shan, Ping-loh, Li-pu, Liu-chiang, Sin-jen, Meng-shan, Chao-p'ing, Hsin-tu, Ts'ang-wu, Chen-ki, Ping-nan, Kwei-p'ing, Kwei, Luh-chw'an, San-chiang, Yung, Lo-ch'eng I-pei, T'ien-ho, Nan-tan, Ho-ch'i, I-shan, Liu-chiang, I-shan, Hsin-ch'eng, Ts'ien-kiang, Tu-an, Lung-shan, Lung-an, Shang-lin, Yung-shun, Si-lin, Ling-yun, Feng-shan, Tung-lan, Peh-seh, T'ien-pao, Hsiang-tu, Chen-pien, Ching-hsi, Lei-p'ing, Lung-ming, Chen-chieh, Wan-cheng, Tien-yang, P'ing-chih, Tien-tung.	

(*To be concluded*)

REVISION OF THE GENERA RHOPALOTETTIX HANCOCK, ROSTELLA HANCOCK AND ALLIED AND SIMILAR GENERA (ORTHOPTERA, ACRIDIDAE, ACRYDIINAE)[1]

By E. R. Tinkham

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In the course of studies on the Acrydiinae of south China, the writer was forced to attempt a clarification of certain groups of these small acrydiinids before much progress could be made in his revisionary work on the Chinese Acrydiinae. This paper is the outgrowth of one of these studies on certain rare Acrydiinids of south China that have been known erroneously under the name of *Paramitraria* Willemse. The scope of this study was enlarged to straighten out the taxonomies of certain additional genera having apparent morphological similarities due principally to conditions of parallel development, and these studies are here reported. Finally, this paper assumed its present form to include all that group of genera which have the antennae placed below the middle portions of the eye and the fastigium of the vertex produced forward to a considerable extent, this latter character giving a distinctive feature to this group of grouse locusts. Whether this feature indicates any relationship between the various genera will be discussed in the body of this report.

The preparation of this paper would not have been possible without access to the Hancock Collection now deposited in the Hebard Collection at the Academy of Natural Sciences of Philadelphia. The study of Hancock's types as well as those of Hebard in the Hebard Collection and of Rehn in the collection of the Academy of Natural Sciences of Philadelphia have been invaluable to the completeness of this manuscript.

The writer wishes to express his gratitude to Mr. Morgan Hebard and to Mr. James A. G. Rehn for permission to study these collections and for their kind and ready advice on certain problems and questions that have arisen during the course of these investigations.

The type specimens of new genera and species will be designated and deposited in the collections to which they belong; those from south China pertain to the Lingnan Natural History Survey and Museum of Lingnan University, Canton, China, and will later be deposited there.

Any irregularities noted in locality citations are due to reporting the locality as it is given on the label.

[1]Contribution from the Lingnan Natural History Survey and Museum.

All the genera herein discussed are considered as belonging to the group Metrodorae of the Acrydiinae, except *Formosatettix* Tinkham, recently described, and it is included here with others, such as *Procytettix* Bolivar, which on account of the produced fastigium fall in the group of genera being discussed. Remarks concerning their relationships, if any, will be included under each genus and summarized in the conclusions.

Group **Metrodorae**

Rhopalotettix Hancock

Rhopalotettix Hancock, 1910, Trans. Ent. Soc. London, p. 356 (W. Sumatra).

Rhopalotarsus Hancock, 1913, Sarawak Mus. Jour. 1(3) :51 (misspelling).

Paramitraria Willemse, 1928, Jour. Malayan Br. Asiat. Soc. 6(1) :4, pl. 1; pl. 2, fig. 2 (Siberut I.). (**n. syn.**).

Rhopalotettix Willemse, 1930, Tijdschrift voor Ent. 73 :22-23 (cited).

The genus *Rhopalotettix* Hancock is known today from few and isolated localities, being confined to the Indo-Chinese and Malayan faunal subregions. Of the seven known specimens, six are before me. They represent three species and one subspecies. The seventh specimen represents the type of *Paramitraria gracilis* Willemse from the Mentawi Islands and this specimen is well figured in Willemse's paper. A glance at the genotypic specimen of *Rhopalotettix clavipes* was enough to make me strongly question the validity of Willemse's genus and after a close comparison of type and drawings I unhesitatingly place *Paramitraria* Willemse as a pure synonym of *Rhopalotettix* Hancock.

A study of the species which have been illustrated clearly indicates that there are two main types or groups present. The first, or Malayan type, is characterized by the inner margin of the eye converging forward and producing a rather narrow vertex, especially forward; also by having the acute apex of the greatly produced fastigium strongly deflexed. The Chinese type exhibits a broader vertex with subparallel inner margins of the eye and greater development of the fastigium with hardly any deflection of the tip. Both groups possess species having keeled and unkeeled fastigia. The species appear to be related in the following manner. *R. clavipes borneensis* n. subsp. is undoubtedly the most primitive form, developing into *clavipes clavipes* Hanc. from west Sumatra, with *R. gracilis* (Will.) from Siberut, one of the Mentawi group of islands off the west coast of Sumatra, perhaps next in line. *R. gracilis* and *R. chinensis* n. sp. appear to be related as both possess median fastigial keels, but in the broadened vertex, as broad as an eye, *chinensis* appears to be the final development. It may be that *R. hainanensis* n. sp. is directly derived from the *clavipes* stock *via* insular connections of the past ages and *chinensis* from the *gracilis* stock *via* the mountain systems of the Malay Peninsula and French Indo-China. Further material from French Indo-China and the

Malay Archipelago will undoubtedly aid in tracing more clearly the lines of development in this most interesting genus. As to the origin of the genus, *Rhopalotettix* may have arisen from *Rhopalina* n.g. here described, but the size and contour of the eye is quite different. The presence of *R. clavipes borneensis* would seem to indicate that the genus developed from some other stock that probably exists in the Malay Archipelago but has not yet been discovered.

The genus *Rhopalotettix* is characterized as follows: Body smoothly granulose; eyes globose; face strongly retreating; fastigium of the vertex triquetrous, strongly and obliquely produced in an elongate cephalic process from one to almost two times the length of an eye, cuspidate at the apex, which is or is not deflexed at the tip, and viewed from above longitudinally sulcate or only slightly concavely depressed, carinate or not carinate, with the sides entire and often minutely serrulate. Vertex from narrower than the width of an eye to about one and one-half times the width of an eye. Inner ocular margins of vertex narrowed forward or subparallel. Antennae longer than the head, twelve-segmented, and inserted just below the lower margin of the eyes; frontal costa narrowly sulcate, superior paired ocelli placed about the middle of the eyes; median ocellus placed far below the eyes. Pronotum anteriorly truncate, posteriorly long acuminate, extended beyond the femoral apices; dorsum moderately narrow at the humeral angles, deplanate. Median carina low and scarcely elevated to moderately raised and slightly tectate, prozonal carinulae short and usually parallel; lateral carinae well defined and the humeral angles nearly straight. Posterior angles of the lateral lobes turned down obtusely, yet obliquely excised. Tegmina small and widened posteriorly with well-rounded apex; wings perfectly explicate. Anterior femora strongly elongate with the upper keel basally compressed, acute and minutely serrulate; middle femoral carinae above compressed, terminating in an apical denticle; posterior femoral carinae above ending in a denticle, below longitudinally curvate and minutely serrulate; genicular denticle produced. Posterior tibiae narrow, the canthi minutely serrulate and bearing many small feeble denticles. First and third joints of the hind tarsi equal in length with the last joint either distinctly clavate or not at all.

Key to the Known Species of Rhopalotettix

1. Vertex between the eyes narrowed forward by the strongly converging inner eye margins; vertex narrower than the width of an eye. Fastigium rather narrow with a distinct deflexed tip. Median carina of the pronotum only slightly raised. **Malayan species** **2**

   Vertex broad forward; broader than the width of an eye with the inner eye margins subparallel. **Fastigium broad, the apex with scarcely a trace of deflection. Median carina of the pronotum strongly raised. Chinese species** **4**

2. Fastigium keeled in the apical half ..... **gracilis** (Willemse)
   Fastigium not keeled above **3**

3. Fastigium very narrow and only slightly longer than length of an eye..... .....**clavipes borneensis** n.subsp.
   Fastigium broader and at least one and one-half times the length of an eye .....**clavipes clavipes** Hancock
4. Fastigium feebly keeled in the apical half and broad and flat above..... .....**chinensis** n. sp.
   Fastigium not keeled, its dorsal surface more concave.....**hainanensis** n.sp.

Rhopalotettix clavipes clavipes Hancock (pl. 13, fig. 1)

Rhopalotettix clavipes Hancock, 1910, Trans. Ent. Soc. London, p. 35.

The single specimen before me in the Hebard Collection from Padang Pandjang, West Sumatra, is the genotype and unique. Measurements in millimeters for the genotype are: total length from the tip of the fastigium 16.9; body length 14.2; length of the pronotum 14.0; tegmen 1.3; hind femur 6.5; fastigium 1.6. Willemse gives the length as 21.2 for the type but Hancock, much earlier, had corrected the measurement and given it as 16.2 mm. in his paper appearing in the Sarawak Museum Journal for 1913. The species is restricted to Sumatra.

Rhopalotettix clavipes borneensis n. subsp. (pl. 13, fig. 4, 5)

Rhopalotarsus clavipes Hancock, 1913, Sarawak Mus. Jour. 1(3) :51 (misspelling of name).

Type.—1 ♀, Kuching, Borneo, Aug. 15, 1899. Measurements in millimeters: total length 16.5; body length 13.5; length of pronotum 14.0; tegmen 1.3; hind femur 6.6; fastigium 1.1. Type No. 1320 in the Hebard Collection.

Very closely related to the genotype *R. c. clavipes* from Sumatra, differing principally in the slightly shorter fastigium of the vertex (see fig. 1 and 4, 5). This difference appears to be constant and worthy of racial recognition. Size closely similar to *R. c. clavipes;* the lateral carinulae on the front of the pronotum, however, slightly longer. The pronotum is longer and slenderer than in the Indo-Chinese species (to be described later) and all the carinae are less conspicuous.

This subspecies is especially interesting as it indicates most clearly the origin of the genus and itself appears to be the most primitive member of the genus.

Paratype.—1 ♀, Sandakan, Borneo (Baker). Measurements in millimeters: total length 16.5; body length 13.2; length of the pronotum 14.0; tegmen 1.2; hind femur 6.3; fastigium 1.0. Paratype in the Hebard Collection.

Rhopalotettix gracilis (Willemse) (pl. 13, fig. 2, 3, redrawn after Willemse)

Paramitraria gracilis Willemse, 1928, Jour. Malayan Br. Asiat. Soc. 6(1) : 4-5, pl. 1; pl. 2, fig. 2. (Siberut I.).
Paramitraria gracilis Willemse, 1930, Tijdschrift voor Ent. 73 :207.

It is strange that Willemse in his "Fauna Sumatrensis" failed to recognize from the description that *Rhopalotettix* was the valid name for his newly described genus *Paramitraria* and thus rectify his error. *R. gracilis* is the third species of the genus and differs from the Bornean and Sumatran ones in possessing a median carina in the apical half of the vertex. Otherwise the species are closely similar but the Siberut one differs from the Indo-Chinese species (to be described herein) by having a narrower fastigium and possessing less prominent median and lateral carinae of the pronotum. *R. gracilis* is at present known only from Siberut Island, the most northern of four composing the Mentawi Group, lying off the west central coast of Sumatra. It will probably be found in the other islands of the Mentawi cluster. The type is a male and is the only known male of the Malayan species of *Rhopalotettix.* Although no type deposition is indicated, the type is probably deposited in the Raffles Museum at Singapore.

Rhopalotettix chinensis n. sp. (pl. 13, fig. 8, 9)

More closely related to *R. hainanensis* n. sp. (to follow) than to the Malayan species from which it differs by the broader vertex and much broader fastigium. From *R. hainanensis* it is distinguished by having the apical half of the fastigium with a median keel, the fastigium of the vertex slightly shorter and broader and almost flat above and with the median carina of the pronotum more prominently raised. The depth of the fastigium is less than that observed in *R. hainanensis.* Both *R. chinensis* and *R. gracilis* (Willemse) have the apical half of the fastigia with median carinae but in the former species the interocular and fastigial widths are much greater and the median carina and lateral carinae of the pronotum much more strongly raised than in the Malayan species. The pronotum is slightly shorter and stouter than in *hainanensis* and considerably shorter and much stouter than in the Malayan species.

Type.—1 ♀, S. China, Kwangtung Province, Taam Yuen Tung, Lien Dist., June 15-19, 1934 (F. K. To). Measurements in millimeters: total length from tip of fastigium 14.7; body length 12.0; length of pronotum 12.6; tegmen 1.5; hind femur 5.8; fastigium 1.5. Type to be deposited in the Lingnan Natural History Survey and Museum.

Fastigium broad, almost twice the width of an eye seen from above, the margins minutely serrulate, gently convex, subparallel for two-thirds their length, then converging to the slightly deflexed apex. Upper surface of the fastigium flat with a slight median keel in the apical two-thirds. Lower fastigial keel serrulate and less arcuately curved than in *R. hainanensis* (compare fig. 6, 7 and 8, 9). Lateral carinulae on the fore part of the pronotum longer than in the other species and subparallel, diverging slightly to the rear; in all the other species shorter, parallel and of the same length. Entire body surface smooth, dark brown, with sparsely scattered minute pale-colored granules. The extreme tips of the tegmina and the

metepimeron whitish; the outer upper basal portion of the hind femora grayish white. Mesofemora with gently undulate keels terminated caudally in a bluntly produced tooth. Metatarsal joint slightly longer than the third tarsal segment. Greatest depth of the pronotum is at the posterior angles of the lateral lobes. Antennae situated just below the line connecting the lower margins of the eyes. Frontal costa commencing in the center between the eyes, narrow, and continuing parallel to the median ocellus below the antennal scrobes.

Rhopalotettix hainanensis n. sp. (pl. 13, fig. 6, 7, 13, 15)

Differs from *R. chinensis* n. sp., its nearest relative, by possessing a slightly longer, narrower and distinctly deeper fastigium of the vertex, which is slightly concave above and devoid of median carina (compare fig. 7 with 9). Median carina of the pronotum less strongly raised than in *R. chinensis* but slightly more prominent than in the Malayan species of the genus. Lateral carinulae shorter and parallel and not longer and subparallel as observed in *chinensis*. *R. hainanensis* differs from *R. c. clavipes* and *R. c. borneensis* n. sulsp. in the much longer and broader fastigium and the greater interocular width but agrees in that the fastigia are unkeeled.

Holotype.—1 ♀, Hainan Island, Kwangtung, south China, Nai Sun, Sept. 2, 1932 (F. K. To). Measurements in millimeters: total length 16.0; body length 11.2; length of pronotum 13.9; tegmen 1.6; hind femur 6.5; fastigium 1.8. Type to be deposited in the Lingnan Natural History Survey and Museum.

The fastigium of the vertex in the type is longer than in the type female of *R. chinensis*, more concave above, lacking traces of a median carina in the apical two-thirds and with the lateral margins subparallel and converging to the acute apex (compare fig. 7 with 9). Compared with the allotype male of *R. hainanensis* the fastigium of the type female is narrower and shorter in relation to the head proportions than in the male, which has the lateral margins parallel for the basal four-fifths, thus producing a much broader fastigium. The lower keel is also less arcuately rounded, the basal half parallel with the upper surface of the fastigium (seen from the side), thence converging to the apex. In the male allotype the lower keel bows gently arcuately outward so that the fastigium, in profile, is deepest in the middle portions. Upper keels of the fore femora slightly flanged and slightly undulate and minutely serrulate; lower keels almost straight and minutely serrulate. Middle femora with upper and lower keels minutely serrulate, flanged and gently undulate; the upper keel ending in a prominent apical toothed lobe. Upper keels of the hind femora arcuate, and minutely serrulate with a blunt pregenicular and an acute genicular lobe. Metatarsal segment longer than the third, about equal to the second and third segments together. Tegmina oval, dark brown, with the extreme apex tipped with cream color. Remainder of the body surface dark brown.

Allotype.—1 ♂, Hainan Island, Chung-kon-t'seun, Ka-luk-kong (18 mi. E. Nam Fung), Kiung-shan District, April 8-9, 1935 (F. K. To). Measurements in millimeters: total length to tip of fastigium 15.0; body length 10.0; length of pronotum 12.3; tegmen 1.3; hind femur 5.7; fastigium 1.9. Allotype to be deposited in the Lingnan Natural History Survey and Museum.

Closely similar to the type but slightly smaller and differing principally in the form of the fastigium. Fastigium of the male triquetrous, considerably longer than in the type female, with the lateral margins indistinctly serrulate and parallel for four-fifths their length, then converging abruptly to the acute apex. Length of the fastigium about equal to that of the face and two and one-quarter times the length of an eye seen from above. Upper surface of the fastigium concave, especially in the apical half. Lower keel of the fastigium more evenly arcuate and minutely crenulate than in the female type with the greatest depth midway of the fastigium. Male subgenital plate long, acute triangular, with a minute notch at the extreme apex. In other features the allotype male closely resembles the type female.

Key to Rhopalotettix and Allied Genera

1. Fastigium of the vertex greatly produced, its length much greater than the length of an eye; if about equal to the length of an eye the fastigium is narrowly triangular with cuspidate apex and lacks median carina 2

   Fastigium of the vertex only slightly produced, its length usually less than that of an eye although occasionally equal to it..... 4

2. Lateral margins of the fastigium entire, not excised nor with the margins flanged. Fore femora with the keels parallel 3

   Lateral margins deeply notched and greatly flanged with the apex squarely truncate. Fore femora with the upper keel strongly arcuate. Malayan. .....**Rostella** Hanc.

3. Lateral lobes not spined nor produced. Wings fully developed. Fastigium triquetrous, lengthily produced forward and upward with cuspidate apex and lacking well defined carinae. Malayan....**Rhopalotettix** Hanc.

   Lateral lobes delicately spined and curved cephalad. Wings absent. Fastigium triquetrous, lengthily produced forward and upward with rounded apex, with median carinae present. Malagasy..... ..... **Rhynchotettix** Hanc.

4. Fore and middle femora with two teeth on both upper and lower keels. Fastigium with the lateral margins strongly notched. Antennae placed considerably below the eyes. Neotropical.....**Miriatra** Bolivar

   Fore femora with the margins entire and parallel. Fastigium with the lateral margins entire. Antennae not placed below the eyes..... 5

5. Fastigium triangularly produced and broader at the base than the interocular width, with flanged lateral margins; body form slender. African .....**Pseudomitraria** Hancock

   Fastigium not broader than the interocular width 6

6. Forms entirely apterous; pronotum not reaching apex of abdomen..... 9

   Forms fully winged; pronotum surpassing apex of abdomen..... 7

7. Median keel of the fastigium strongly laminately produced in front of the fastigium for a distance equal to the length of the fastigium. Size small and slender; eyes very large. Polynesian.....**Thyrsus** Bolivar

   Median keel of the fastigium not strongly laminately produced in front of the fastigium 8

8. Lateral lobes of the pronotum depressed with acuminate reflexed process. Vertex broad, slightly broader than an eye; fastigium four-angled with the median carinae projecting knob-like in front. Eyes of normal size. Indian .....**Indomiriatra** n. nom.

   Lateral lobes of the pronotum depressed. Vertex narrower, about equal to the width of an eye, triangular. Eyes very large. Malayan..... .....**Rhopalina** n. gen.

9. Pronotum strongly tectate with sharply defined median carina; in profile gently arcuate 11

   Pronotum not strongly tectate, but almost flat; in profile not gently arcuate 10

10. Fastigium triangularly produced; pronotum abruptly truncate at about the middle of the abdomen. Polynesian.....**Thyrsus** Bolivar

    Fastigium produced forward with the fore margin transverse, the median carinae projecting in front as a rounded ridge. Apex of the pronotum acute. Singalese .....**Spadotettix** Hancock

11. Pronotum with distinct lateral carinae; in lateral profile evenly arcuately convex. Malagasy .....**Procytettix** Bolivar

    Pronotum lacking lateral carinae, in lateral profile unevenly arched having an anteriorly placed hump. Formosan.....**Formosatettix** Tinkham

Rostella Hancock

Mitraria (in pt.) Bolivar, 1887, Ann. Soc. Ent. Belg. 31 :253.
Mitritettix (in pt.) Hancock, 1906, Gen. Insect., fasc. 48, p. 51.
Rostella Hancock, 1913, Sarawak Mus. Jour. 1 (3) :30.
Mitrariella Willemse, 1928, Zool. Meded. 11(1) :18, pl. 6, fig. 25, 26 (**n.syn**).
Mitrariella Willemse, 1930, Tijdschrift voor Ent. 83(62) :24.

Hancock created *Rostella* in 1913 for (*Tetrix*) *phyllocerum* De Haan, including his *Mitritettix processus* described in 1907 in the new genus, as *productus* Bolivar had been designated as the type of the neotropical (*Mitraria*) *Miriatra* by Rehn in 1904 and recognized as such by Hancock in 1913. Willemse's unfamiliarity with Hancock's work led him to describe the synonymous *Mitrariella* early in the year 1928. Hence Hebard's *Mitrariella* with type *Spadotettix provertex* Hancock from India, described in 1929, must receive a new name. Willemse, in 1928, designated *phyllocerum* De Haan as the genotype of *Mitrariella* but in 1930 gave *sumatrana*, described in 1928, as the genotype. There are three known species of the genus, of which De Haan's species is the genotype.

Rostella phyllocera (De Haan)

Acridium (*Tetrix*) *phyllocerum* De Haan, 1843, Bijdrag. Orth., p. 166, 168, fig. 10, pl. 22 (Java).
Tettix phyllocera Walker, 1871, Cat. Derm. Salt. B.M., p. 831.
Mitraria phyllocera Bolivar, 1887, Ann. Soc. Ent. Belg. 31 : 253.
Miriatra phyllocera Bolivar, 1906, Bol. Soc. Esp. Hist. Nat. 6 :392 (July).
Mitritettix phyllocera Hancock, 1906, Gen. Insect. (Tetriginae), fasc. 48, p. 51 (Nov.).

Miriatra phyllocera Kirby, 1910, Syn. Cat. Orth. 3(1) :30.
Rostella phyllocera Hancock, 1913, Sarawak Mus. Jour. 1(3) :50.
Mitrariella phyllocera Willemse, 1928, Zool. Meded. 11(1) :18, fig. 25, 26, pl. 6.

This species is Javan and is very closely allied to the Bornean species. I have not seen any Javan specimens and hence I am not able to compare the species.

Rostella processus (Hancock)

Rostella processus Hancock, 1907, Trans. Ent. Soc. London, p. 229, pl. 21, fig. 8 (Kuching, Borneo).
Rostella processus Hancock, 1913, Sarawak Mus. Jour. 1(3) :50.

I here select a pair of cotypes contained in the original Hancock Collection and now in the Hebard Collection, from Kuching, NW. Borneo, captured April 30 and Dec., 1900, by Dyak collector, pres. by R. Shelford, as the type male and allotype female of *Mitritettix processus* Hancock. The male type is No. 1321 in the Hebard Collection. There is also before me a series of ten topotypic specimens in the Hebard Collection. I am considering this species as distinct from *R. phyllocera* as the fastigium shows characters warranting specific recognition.

Rostella sumatrana (Willemse)

Mitrariella sumatrana Willemse, 1928, Zool. Meded. 11(1) :19, pl.6, fig. 27.
Mitrariella sumatrana Willemse, 1930, Tijdschrift voor Ent. 73(62) :25, fig. 12.

This species is distinguished from *R. processus*, which is uniformly dark reddish brown, by its lighter coloration, by the much deeper keeling of the fastigium of the vertex and by the more dentate nature of the upper and lower keels of the fore femora. The species was described from a pair of specimens from Sumatra with a paratypic female from Buo, in Pedang Bovenland. There is a single female in the Hebard Collection from Padang Pandjang, West Sumatra. These are the only known specimens.

Miriatra Bolivar

Mitraria Bolivar, 1887, Ann. Soc. Ent. Belg. 31 :187 (preoccupied).
Miriatra Bolivar, 1906, Bol. Soc. Esp. Hist. Nat. 6 :392 (July).
Mitritettix Hancock, 1906, Gen. Insect., fasc. 48, p. 51 (Nov.).
Mitritettix Bruner, 1910, Ann. Carnegie Mus. 7(1) :118 (listed only).
Miriatra Kirby, 1910, Syn. Cat. Orth. 3(1) :29.

Rehn, in 1904, selected *productus* as the type and Hancock, in 1913, gave the same designation, although he considered his *Mitritettix* as a valid substitute for the preoccupied *Mitraria*. However, *Mitritettix* was replaced by Bolivar's *Miriatra* which appeared earlier in the year 1906. The Malayan species (*Tetrix*) *phyllocerum* De Haan that had been included by Bolivar in (*Mitraria*) *Miriatra*, Hancock placed in his new genus *Rostella*, in 1913.

I have been fortunate in being able to study material of *Miriatra* in the collection of the Academy of Natural Sciences of Philadelphia and probably representing a new species, and can definitely say that that genus is distinct from all genera herein discussed and quite characteristic of the neotropical region. The pronotum bears strongly raised rugae on the humeral areas and the lateral carinae are sharply and narrowly defined. The vertex is about one and one-half times the width of an eye and the fastigium of the vertex is narrowly produced forward, its width at the base equal to the width of an eye and its length produced forward about equal to the length of an eye. The lateral margins of the fastigium are strongly notched about midway, and at the apex the median carina projects narrowly forward. In *Rostella* the lateral margins are similarly notched but the fastigium has flanged margins and at its base its width is equal to that of the vertex, its length is produced forward twice the length of an eye. The antennae are located considerably below the eye in *Miriatra* and in line with the lower level of the eye in *Rostella*. Furthermore, the bitoothed keels of the fore and middle femora in *Miriatra* are distinctive and indicate that the relationships to the other genera are only very slight. The form of the produced fastigium is definitely a case of parallel development and aside from this character *Miriatra* has little in common with other genera. On the other hand I have not been able to associate *Miriatra* closely with any other neotropical genus although in certain features it seems best placed between *Chiriquia* Morse and *Otumba* Morse. Only one species is known at present.

Miriatra producta (Bolivar)

Mitraria producta Bolivar, 1887, Ann. Soc. Ent. Belg. 31 :187,253.
Mitraria producta Rehn, 1904, Proc. Acad. Nat. Sci. Phila. 56 : 664 (type designation).
Miriatra producta Bolivar, 1906, Bol. Soc. Esp. Hist. Nat. 6 :392.
Mitraria producta Bolivar (*Mitritettix* Hancock proposed in footnote), 1906, Gen. Insect., Orth., fasc. 48, p. 51.
Mitritettix productus Bruner, 1910, Ann. Carnegie Mus. 7(1) :118 (listed only).
Miriatra producta Kirby, 1910, Syn. Cat. Orth. 3(1) :29.

I have seen no specimens of this species, which is known only from the Amazonian region.

Rhynchotettix Hancock

Rhynchotettix Hancock, 1907, Trans. Ent. Soc. London, p.228, pl.21, fig.7.

This remarkable genus appears to have no close relatives. The genus bearing the closest resemblance is perhaps *Rhopalina* n. gen., herein described from Java, but I doubt whether the resemblance is more than superficial. These two genera are the only ones, of those dealt with in this paper, that have the fastigia with rounded apices, but in *Rhynchotettix* the fastigium is more lengthily produced. Aside from this character there seem to be few features common to both. *Rhynchotettix* lacks wings whereas *Rhopalina* possesses fully

formed wings. Without reference to the actual types of the two described species it is impossible to ascertain whether they are conspecific. As the genus now stands it is composed of two species of which *Rhynchotettix rostatus* Hancock is the genotype.

Rhynchotettix rostatus Hancock

Rhynchotettix rostatus Hancock, 1910, Trans. Ent. Soc. London, p. 228, pl. 21, fig. 7.

The unique specimen upon which the description is based is from the Bay of Antongil in NE. Madagascar and is deposited in the Oxford Museum. I wish to thank Mr. Morgan Hebard, who has kindly furnished me some remarks concerning specimens of *R. rostatus* recently acquired by the Academy of Natural Sciences of Philadelphia. He writes, "The delicate produced spine on each side is curved forward in each specimen. The antennae are placed well before the caudal (proximal) portion of the eyes ..... Hancock's description of this feature is wholly unsatisfactory to me but the figure shows just what our specimens do."

Rhynchotettix hancocki Bruner

Rhynchotettix hancocki Bruner, 1910, Voeltkow Reise *in* Ostafrika in den Jahren 1903-1905, Stuttgart, 2 :624, pl. 27, fig. 3.

Only one male is known. It is the type and is from Sakana, Madagascar, Urwald, September 1904 (Voeltzkow). No type deposition has been given. The measurements in millimeters are given as: total length 14.5; length of pronotum 13.0; body length 12.0; hind femora 7; fastigium of vertex 1.2. Hebard informs me that Bruner's description agrees closely with the character observed in *R. rostatus* in that the antennae are placed just above the level of the lower margins of the eyes. Bruner's figure of his species in every way could hardly be worse. Evidently, *R. hancocki* has a widely different vertex from *R. rostatus* but until the types are studied it is impossible to decide whether *R. hancocki* truly represents *Rhynchotettix*, as based on *rostatus*, or a new genus.

(*To to concluded*)

YAO SOCIETY

A Study of a Group of Primitives in China

Edited by

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INTRODUCTION TO YAO CULTURE

By R. F. Fortune

There live in the mountainous regions of south China and north Indo-China various minority peoples, who maintain their own distinctive languages, modes of dress, manners and customs. No rice growers live voluntarily in the hills, where the poor land has to be terraced and irrigated foot by foot, and where the winter climate is too severe for the growth of crops. The fortunes of past wars, some of them recorded, have driven these peoples on to the heights, where the land is too infertile for their increase in population, for their release from comparatively unrewarding toil, or for time and money to spare for education. It is for these reasons that the market towns at the foot of the hills are usually ethnic frontiers.

The hill peoples have been very little assimilated either by the Chinese or by the Annamites, within whose empires they have lived. There exists a reason for this. When there is trouble on the ethnic frontier between the highlanders and the lowlanders, the highlanders lack both the numbers and the material resources of the lowlanders, and they get beaten, either on the plain, or in their own mountains. The Miao (苗) people, for example, have in their history tried war against the Emperor of China many times, against the elephant-mounted troops of Annam, and even come to grips with the French in Indo-China, without chance of success. There is no doubt that the hill peoples have been beaten in war. Assimilation is, however, another matter. The lowland Chinese and Annamites have not coveted the cold and barren hills, and they have not cared to spend money and time in maintaining magistrates and soldiers there.[1]

Only a few adventurous traders of the dominant lowland people live with the highlanders in their hills. In Indo-China, French magistrates, soldiers, priests and medical outposts, as well as Chinese and Annamite traders, advance into the mountains amongst the hill peoples. That is a new experience in the long history of the hill men. In China they are accustomed to being alone on their hills, with a few Chinese traders (who often marry their women), masters of their own hills on probation, on a basis of live and let live tolerance between them and the stronger lowlanders.

In earlier history the present day highlanders were decisively conquered and driven into their present positions, or into positions like them, by the southward expansion of the Han, the Chinese proper. They gave ground, of necessity, but they gave little else,

[1] See, however, mention below of the money spent by China since the founding of the Republic on the beginnings of education amongst the Yao.

neither recognition, obedience, compliance nor willingness to pay taxes, or to receive education[2] or medicine. They kept their own national spirit, and they paid for it in some disadvantages. The Chinese, on their part, have not been overinsistent in imposing their own culture, for reasons that we have noted. To the present day the hill peoples wear their own finely embroidered folk costumes in the hills, and down to the market towns on market days. They meet the richer and more advantageously placed peoples of the fertile and heavily populated lowlands in the market towns, and they deal with them from an inferior bargaining position. They are illiterate for the most part, but they have kept their own languages alive on the lips of a comparatively few people.

These mountain peoples are the scattered remnants of what were once independent nations upon the Chinese plains and rivers, before the expansion of the Chinese. The early history of some of these peoples in their national state is known.[3] The early history of the Yao (猺), the people who are the object of the present study, is not recorded at length. All that is known is that in the twelfth and the early thirteenth centuries of our era they were driven south from fertile country in Hunan Province, between the Yangtze Kiang and the Si-Kiang river systems, by the invading armies of the Sung emperors. They were forced into the mountains that fringe the basin of the Si-Kiang, the southernmost river system of China. So much only is known, and, in addition, some little local history of the subsequent fortunes of scattered groups of Yao in different and widely parted localities.

The Yao, who are often also termed in Chinese "Man," or barbarians, and who are referred to in the French literature on the subject as "Man," call themselves "Mien" or "Men," after their own word which means in English "men." They are found today in the mountains in the four southern provinces of China, in Kwangtung, Kwangsi, Kweichow and Yunnan, and in the French province of Tonkin further south. In their dispersion after their defeat at the hands of the Chinese of the Sun Dynasty they lost more power of combination than some other defeated peoples who are present day mountaineers, such as the Miao,[4] for example.

As we have indicated, different groups of Yao have had widely differing histories since the dispersion of their people. The Yao of northwest Kwangtung Province, who are the particular object of the present study, are notably influenced by a long period of settled life

[2] As we shall see later, there has occurred some reception of Han or Chinese sacerdotal education, but not of secular state education.

[3] See : *Histoire des Miao*, by F. M. Savina, Imprimerie de Nazareth, Hongkong, 1930. *Dictionaire Etymologique Français-Nung-Chinois*, by F. M. Savina, Imprimerie de Nazareth, Hongkong, 1924. *Les Races du Haut Tonkin*, by Maurice Abadie, Société d'Editions *Géographiques, Maritimes et Coloniales*, Paris, 1924.

[4] See : Abadie, above cited, p. 106-7.

in the one place, when compared with the Yao who migrated over most of the mountains of southwest China, furthest west, and furthest south into Tonkin. These latter are ruthless destroyers of forest, which they burn to make clearings for crops. The clearings are used for a year or two only, and then abandoned for new ones. The migratory Yao and Miao peoples have laid bare most of the hills of south China in this manner. The mountains of Tonkin, however, are not yet deforested by them, and the French are attempting to keep the process within limits.

Meanwhile in northwest Kwangtung a group of Yao have been settled since the twelfth century of our era. They deforested their hills long ago, and today they plant trees, conserve them, and cut and carry timber to the riverside for sale. They possess limited hill land, at no overgreat altitude, which has proved itself capable of standing constant cultivation. They have entered into commerce with the Chinese, who live on the rich river plains below. They do not appear to have held a strong hand in this commerce, for they have failed to maintain their own manufactures.

In contrast, the Yao of Tonkin (those who destroy forests, making changing cultivations, and who have been great travellers after new land) have developed less commerce and have maintained their own manufactures. They make their own tools, weapons, clothing, jewels, paper and alcohol, and they have their own smiths and armorers.[5] Their folk costumes are finer than those of the Kwangtung Yao. They have retained silver ornaments, where the Kwangtung Yao wear nickel imitations. They have kept their former economic self-sufficiency in manufactures, although they have not found good land to keep, unless indeed some of them have had better luck comparatively recently in Tonkin.[6] The sequel to conquest has been loss of native manufactures, where settled land was found and kept, and loss of settled land, where native manufactures were kept.

The Yao have had varying experiences with local and central lowland authorities in various places, often in defiance and rebellion, when taxation or census or education were threatened, or when an opportunity offered of joining a local Chinese rebellion; but often also aiding the authorities to round up Chinese bandits.[7] There are no bandits or beggars in Yao country. The Yao do not make trouble for the lowland authorities, when trouble occurs, as individuals, but

[5] See : Abadie, above cited, p. 115-7, for an account of Yao methods of manufacture.

[6] But they have found no land in High Tonkin where any large settlement could live. They live in groups of three or four houses, in contrast to the Kwangtung settlement, where communities of well over a thousand persons live in the one village.

[7] See an instance mentioned in a note on a small number of Yao in the hills near Canton, who are now on the verge of extinction, Wong Sik-Ling, *Lingnan Science Journal* 17 (3) :477-481, 1938.

collectively upon a point of nationality. Everywhere the Yao have resisted any movement towards their assimilation. It even proved impossible to work properly upon social organization amongst the Kwangtung Yao, as an unofficial census was suspected, despite all reassurances to the contrary. Upon such points as census and taxation threats of violence are still made.

Since the founding of the Republic, China has been spending some money towards the assimilation of the Yao. The Bureau for Civilizing the Yao builds secular school houses in the Yao villages, takes a few Yao children away from the mountains, educates them in the Chinese secular schools, and returns them to the mountains as future school teachers. The Yao prefer for the present to decline the facilities offered their children by these school teachers and school houses. They prefer their children to work in the fields, and for some of them to acquire a non-secular education offered by Yao priests, in recitals of the names of the gods, and of books of incomprehensible nonsense, which, in the mouths of priests, is believed to cure the sick. There is money made by priests and an opening for the successful pupil as a priest. The priestly "education" is compatible with children's work in the fields, moreover, and it is not realized by the Yao to be nonsense. It is their own, by previous adoption, and they prefer it. Secular education would take more time, and an opening for a successful pupil in the Yao hills is not visible.

The Chinese Republic in the south is partly constituted of citizens who have been thoroughly assimilated, but who once belonged to somewhat different ethnic stocks. These citizens are all lowlanders. An interesting question is posed. Who are these Yao highlanders who have maintained so hardy a resistance against their national extinction and their assimilation within the Chinese power?

The Yao have no system of writing of their own, and no written records which might throw light upon their early origin. The Chinese regard the Yao as *Man*, barbarians, and it is certainly true that the Chinese were far advanced beyond the Yao in the techniques of civilization at the time of the first recorded clash between them. But it remains to be seen how wide or how narrow the underlying ethnic differences between the Chinese and the Yao may be. Are the Yao of some other stock than the Chinese? Or are the Yao a comparatively backward branch of the same stock as the Chinese? We cannot answer this question by stressing the obvious ethnic differences of language, costume and manners such as can be observed in any mountain foot market town on a market day. The obvious ethnic differences, and the differences over government, may have been conserved in the nationalism kindled by the struggle for land alone. The question, what lies behind the more obvious ethnic differences, over and above the recorded history of conquest and defeat, can only be answered by a deeper examination of the social culture of the Yao people. Such an examination the present work offers.

In physical type the Yao have a greater percentage of types with chestnut and slightly waving hair than the Chinese, and also a greater percentage of types with a longer trunk and correspondingly shorter legs. Without exact anthropometric measurements, and exact physical studies in hair color and pattern, it is possible to observe and to define clearly these two striking characteristics in which the Yao vary away from the norm, more or less common between them and the Chinese, in plain divergence from Chinese variation from the same norm. The Yao norm of physical type certainly overlaps the Chinese norm, and, at the same time, points away from it in the direction of the Yao variations named. There may also be other differences not perceptible without more refined methods of observation.[8]

The Yao speak a tone language which has its own distinctive roots. The language has evolved into several dialects,[9] as has Chinese itself. In the dialect of the Kwangtung Yao it possesses only one sound, a retroflex "d," not used in Chinese. No divergence in grammatical usage appears between Yao and Chinese.

In religion the Yao maintain ancestor worship, and also a cult of the exorcism of ghosts with the express intention of curing illness,

[8] Lieutenant-Colonel Bonifacy in his work, *Conférence sur les Groupes Ethniques du Haut-Tonkin* (*Cahiers de la Société de Géographie de Hanoi*, 1924, *septième cahier*), presents three photographs of Miao, Tai and Annamites respectively in tirailleur uniform, and urges that no differences in norm of physical type exist between these three peoples. He then presents photographs of these people and of the Yao (Man) in folk costumes in order to stress the existence of striking cultural differences.

Le Père F. M. Savina in his work *Histoire des Miao* defines different physical types of different peoples of the Far East in terms of extreme of variation, without much weighting one extreme variation against others, or against the weight of a more or less common norm. His inferences are diametrically opposed to those of Bonifacy, in consequence.

Our own method is an avoidance of special pleading in either of the above two directions. We agree with Savina in one of his defined variations for the Yao (Man), that of the longer trunk and shorter legs, and also in another, but not in his weighting of this second feature as uncommon. Chestnut hair is not uncommon amongst the Kwangtung Yao, though it is not as common as it is in another non-Chinese mountaineer people, the Miao of Tonkin. Other points of variation for the Yao noted by Savina we disregard as not observed in any considerable frequency. The dispersion of these peoples over all south China and High Tonkin in mountains demands considerable travel for complete investigation, when the work of exact physical measurement comes to be done.

[9] The reader who wishes to investigate these dialects in detail is referred to the "Dictionnaire Français-Mân," by F. M. Savina, *Bulletin de l'Ecole Française d'Extrême Orient*, T. XXVI, 1926, where the dialect of a Yao group of the extreme east of Tonkin is recorded, and where five hundred words of this dialect are also compared with their correspondents in the dialect of the Yao with horns (*Mân tài-pan* or *Mân Côc*), a Yao group of the extreme west of Tonkin. Further comparison is available with the dialect of the Yao group of northwest Kwangtung herein. There are also some short vocabularies from yet other dialects contained in the work *Ethnographie des Territoires Militaires*, by Lunet de Lajonquière. Not more than a half of what is said in one dialect is understood by a people who use a different dialect.

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and preventing death when illness occurs. The procedures correspond to Chinese ancestor worship and to popular Taoism, respectively. The Yao are more afraid of ghosts, and more addicted to the exorcism of ghosts for its believed curative powers than the Chinese, since they have not developed a practical medicine in addition to a religion for dealing with illness. Less of their money (practically none) is expended for medicine, and more for priests' exorcism of ghosts than in the case of the Chinese. Some special features distinguish Yao priests. The Yao of Kwangtung and of Tonkin alike have a hierarchy of priests of three degrees[10] (in one group of the Tonkin groups, of two degrees only), and alike they preserve distinctive accoutrements.[11]

In social organization the Yao possess a formal kinship system, essentially similar to the Chinese, existing in non-Chinese terms. There is the same differentiation of terms for elder and younger relatives, with respect for elder relatives. There is the same distinction between relatives of common ancestry on the male side, according to which brothers, paternal first cousins, paternal second cousins, paternal third cousins, etc., are all called by the terms meaning elder or younger brother, but with supplementary (not numeral) terms indicating the distance back of their common ancestor. These distinctions, between brethren of the same common ancestry, surname and clan, mark out parallel descent lines, on the male side within a clan, which, if they come from a colonising founder of a village, and multiply, become different *fongs* (房).[12] These *fongs* are the practical units of social organization within a surname or clan, both in Chinese and in Yao custom.

In other aspects of social organization Yao custom varies widely from Chinese. The Yao surname, or extended patrilineal clan, is not exogamous, either for the entire people (as in the Chinese case), or even for a local resident unit of the surname and clan. The Yao rule against incest forbids marriage between first cousins or second cousins, on either side, but marriage is allowed between third cousins. This rule is in strong contrast to the unilateral patrilineal exogamy for all China, coupled with prohibition of patrilateral cross-cousin marriage, which the Chinese observe, without disapproval of marriage with first cousins on the maternal side.

The Yao family is not extended in size by the addition of daughters-in-law and of their children to the paternal household. On the contrary, each married couple forms a separate family, builds its own house, takes its own allotted subdivision of land, and works the

[10] See : Abadie, above cited, p. 123, 133, 141, for the Tonkin facts.

[11] Distinctive are the sacred knife and wooden staff painted red, mentioned by Abadie, and the crown in paper with seven points.

[12] The term *t'ing* is also used. Both terms are closely related to the term for a room, but in social organization refer to a group of brethren of one descent line, a subdivision of a clan.

land for itself. Old people, in their turn, work for themselves, and do not expect to be supported by their children.

The position of Yao women in the family is very high, and very independent. Marriage depends upon the consent of the woman to her wooer in person, and is not arranged for her. At her marriage a woman is always allotted her own subdivision of the land of her family, for her use, and for the use of her children after her, after which time it reverts to the paternal line from which its usufruct was temporarily alienated. Widows remarry at their free will. The women are good workers in embroidery, and pay much attention to their elaborate costumes. They do not take part in rites between men and men's ancestors, or between men and ghosts, except momentarily, a bride at her marriage ceremony.

In their morals the Yao people are strict. They have their own courts and arbitrators. They inflict capital punishment upon incorrigible thieves. They impose heavy fines upon adulterers. They do not permit beggars or bandits residence. In a case of accidental manslaughter, due to negligence, the offender has his land and property confiscated and awarded to the kin of the dead. The Yao do not interfere with the moral and economic independence of women or men in the family by any legal impediment upon divorce, or by any sanction against it. They do not interfere with the independence of growing children, who are allowed to contract their own liaisons, but who are expected to marry before they produce illegitimate children, which fall under a social stigma.

In their manners the Yao are by no means prudish. Abadie says that at marriages the men drink, and sing very bawdy songs. They also dance bawdy dances, some of which represent the gestures and the attitudes of lovers. The guests invited to the marriage reception in the evening make a joke of staying very late, and keeping the bridegroom from retiring with the bride, until the last moment.[13] The women do not take part in the heavy drinking, or in the bawdy songs and dances, but they enjoy the jokes very well. Our own observations confirm the fact that the Yao have at all times a free and a lusty humor of a little repressed nature.[14] Twice a year, in the case of the Kwangtung Yao, there are festival occasions of free sexual encounters for all men and women, without jealousies or any other emotion than merriment dominant. The men drink heavily at marriages and at funerals. Their custom in making friends, at any time, is for men to exchange bowls of rice whisky, and for each man to drain the other's bowl.

Exposure in plain view for the purpose of the natural functions is allowed, and there is no special prudery over women, or in women, in distinction from men in this. Exposure in plain view for washing

[13] Abadie, above cited, p. 120-1, 125, 140.

[14] Abadie (p. 119) notes of childbirth custom that in case of a difficult delivery it is sometimes customary to hang the husband's pants above the head of the woman.

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is not allowed, as it is Yao custom to wash in hot water, outside the front of the house, upon return from work after dark.

In reviewing in summary form the main facts of Yao physical type, language, religion, social organization, morals and manners, we note that, from all these points of view, there is some difference between the Yao norm and the Chinese norm. The difference in physical type, language, religion, formal scheme of kinship terminology, and formal basis for clan segmentation into *fongs* (房) is one of fine degree. The difference in practical social organization in regard to the family, sexual relationships, the relationships of men and women generally, and in manners, is one of gross degree, which impresses itself most forcibly. This conclusion is not one that will appear novel or extraordinary in anthropology. The concept of a *culture area* is founded upon the fact that the different cultures of the natives indigenous to a wide region reveal, very normally, fine differences in physical type, language type, in religion or magic, and in the formal basis of kinship organization upon a plan common to the area, but not shared by other distantly related areas. It is well known, on the other hand, that within one and the same culture area the widest differences may prevail between its native cultures in practical social organization and in manners. From the evidence it is indicated that the Yao are a less civilized branch of the same stock from which the Chinese also sprang. The gross dissimilarities between these peoples are not of a type to justify an inference that the Yao stem from any different stock. The Yao are one of the few small peoples left in the Far East from the primitive period, when there was no great civilization in China, but when a congregation of different small peoples of their culture area type, the Chinese included,[15] divided the country.

II

The Yao people have borrowed certain elements in their culture from other peoples. At least one of these borrowings dates from before their defeat and their dispersion in the thirteenth century of our era, if the evidence of its present universal distribution amongst all the scattered groups of Yao is conclusive. This adopted element is a system of sacerdotal education in a series of basic Taoist classics, written in Chinese characters. The Yao priests educate a considerable minority of the male children in these classics for small fees, and recruit their priests' membership from the very few successful pupils who can remember and repeat the entire series of texts by heart. The oral examinations for priestly ordination are severe, and, in consequence, the number of priests in the male population is confined to about ten in a thousand.

[15] The Miao people should certainly be included in this culture area type. The Père F. M. Savina in his *Histoire des Miao* argues strongly against any basic association of the Miao with the Chinese, but the argument is in some measure improbable. Its refutal, at many points, is found in the more thorough study of Miao culture by Dr. David C. Graham, published in the Journal of the West China Border Research Society, Vol. IX (1937) and in the following volumes of the same Journal.

The sacerdotal system of education, which the Yao have adopted, imitates the secular state system of education in China in a use of written characters, and in the custom of selection of the best pupils by examination. The Chinese priests have some status in the villages, second only to the representatives of the state, the products of the state system of education. There is no doubt, nevertheless, that the sacerdotal system of education is a thoroughly reactionary force in modern China. The Taoist classics are hand-written books of incantations, lists of gods' names, and exorcisms of ghosts, which are believed to be efficacious in curing the sick, when repeated on occasions of sacrifices made to the ghosts. The priests secure a relatively easy income by the placating and the exorcism of ghosts, which are believed to cause illness and death.

The Yao priests represent their own society in many rites, which are not borrowed from Chinese custom. We may instance the rite of the priest driving the first plough and making the first furrow on New Year's Day (Chinese calendar) before an occasion of sexual license. We may instance the rite of sacrifice of dog flesh to ghosts, dog flesh being especially sacred amongst the Yao. In their specific accoutrements and in their specific age grade organization, Yao priests are also unique. But they do not represent their own society in its historical illiteracy. Nevertheless the historical illiteracy of the Yao people is a reasonably certain surmise. The Yao cannot have been characterized as barbarians by the Chinese for no reason. They have no system of writing of their own. At the present day the Taoist classics of the Yao priests are so badly copied and recopied by the Yao scribes that the writing is, for the most part, incomprehensible to the best Chinese students. The incantations, recitations and exorcisms contained in the books, recognizable in part, are handed down orally, and attributed to the written characters in the books. The Yao have not any writing or any ability in writing beyond their copies of the priests' books and the Chinese calendar (useful to priests in forecasting lucky and unlucky days, and in keeping count of holy days).

The Miao mountaineers, unlike the Yao in this, have declined to borrow Taoist exorcisms of ghosts in hand-copied books from Chinese sources. Neither do they use the Chinese calendar. The Miao have no literary pretension whatever. According to Abadie, the Miao priests transmit their incantations and exorcisms orally, and their position is generally hereditary.[16] It must be admitted that the Miao method of priestly education and selection is more economical of time and energy than the Yao method. At the same time it has the additional advantage of not broadcasting the excessive fear of ghosts amongst the entire population since no sacerdotal educational system

[16] Abadie, above cited, p. 168-9.

is widespread amongst the people.[17]

If now we note the borrowed elements of Yao culture which are not common to all the dispersed groups of Yao, but which different dispersed groups have adopted independently, we open a wide field that we cannot expect to deal with exhaustively. We have already noted the borrowings the Kwangtung Yao make of Chinese manufactures, the cloth, guns, tools, paper, alcohol and bean curd which they buy from Chinese sources. The Man-Lan-Tien group of Yao in Tonkin have borrowed funerary trappings from the Tho (that is, the Tai who are under the greatest Sino-Annamite influence), which are entirely alien to other Yao groups. They bear the corpse to the grave in a coffin, surmounted by a great paper and cardboard representation of a house of many stories, as the Tho do.[18] The Man-Ta-Pan group of Yao in Tonkin have borrowed the swastika in their embroidery patterns from some unknown source.[19] The Man-Tien group of Yao have adopted the usage of dyeing cloth by the *cire perdue* process.[20] The Man-Ta-Pan and the Man-Tien both preserve a religious belief deriving from Buddhism, according to which men have three souls and seven vital spirits, and women three souls and nine vital spirits. After death the vital spirits return to earth. The souls, on the other hand, go to hell, and can only be redeemed by dery patterns from some unknown source.[19] The Man-Tien group of Yao wear copper cash suspended down the back, seven for a man, nine for a woman, representing the seven vital spirits of a man, and the nine vital spirits of a woman, according to this belief.[21]

Finally in the field of practical social organization, the Man-Quan-Trang group of Yao in Tonkin appear to have borrowed an influence not compatible with Yao custom, as it is generally found. Amongst the Man-Quan-Trang the fiancé lives three years in the house of his future parents-in-law, unless he can purchase his indemnity from this custom. (In other groups of Yao, only the very poor, who cannot afford the marriage expenses, serve in the house of the wife's parents, and that after marriage, not before marriage, as in the Man-Quan-Trang case.) Over this time the Man-Quan-Trang fiancé is supposed to avoid his fiancée, but as Abadie says, the reverse usually occurs before the three-year period is expired. At the end of

[17] Abadie notes that the Miao have very little fear of ghosts, and are conspicuous for the absence of such fear (p. 168). He also notes extremes of superstitious fear of ghosts amongst the Yao (the Man), and amongst those Tai who came most under Sino-Annamite influence, in distinction from Tai who remained most free from Sino-Annamite influence. The explanation offered in the text is probably correct. The channel of fearful influence is the sacerdotal educational system.

[18] Abadie, p. 121, and photograph 372, plate 34.

[19] Abadie, p. 131.

[20] Abadie, p. 135.

[21] Abadie, p. 132 and 135. See also p. 54, and Savina, *Dictionnaire Etymologique Français-Nung-Chinois*, p. 527, for evidence of Buddhist derivation of this belief.

the period follows marriage. After mariage, the young couple must spend seven years in the house of the parents of the young man before they found their own, independent household.[22]

In all other groups of Yao, the young who are newly married are given their independent and separate household after one year. The Man-Quan-Trang Yao are the most lowland group of the Tonkin Yao, and the group in closest contact with the Annamite and the Tai peoples of the delta region. The Annamites and the Tai have the enlarged family, where the daughters-in-law and their children join the one roof tree, dominated by the old people. It appears as if the Man-Quan-Trang have been influenced by their neighbors, rather than that they have departed from the more general Yao custom independently of external influence. In effect, they have a compromise between the two systems. If we allow the last case to be a borrowing, or at least a change under influence, rather than an independent evolution, it is clear that there is little in Yao culture, in its dispersed state, which is sacred from the range of possible borrowing, neither manufactures, last rites over the corpse, religious beliefs concerning the soul, or practical social organization. Nevertheless, the Yao still have a culture of their own, one that is unique, and one that can be rendered in account.

III

The practical proposals for effective work towards the assimilation and the civilizing of the Yao which follow from this study mainly concern education. The Yao are held fast in the grip of their sacerdotal system of education borrowed by them from Chinese sources at a date probably prior to their dispersion in the thirteenth century of our era. The Yao priests exercize a preponderant influence in holding their people to this reactionary system of education, in antagonism to the efforts of the Chinese Bureau for Civilizing the Yao towards establishing the modern, state, secular system of education in the Yao villages. These priests exercize their extraordinary influence profiting from Yao nationalism in antagonism to the State, and the Yao people are superstition-ridden to an excessive degree. They spend as much wealth in education into ghostly mysteries, and in exorcism of ghosts in attempted cure of illness as would run a good educational and a good medical service, were they willing to receive it, and pay for it, instead of receiving and paying for the out-of-date system which they now possess. The best results are not likely to follow compulsion. Compulsory taxation might provide the payment. Compulsory state education and medical treatment might furnish them with the apparatus of civilization. But where nationalism and religion are strongly bent against improvement, the heart can easily be taken out of the best intended compulsory measures, and the real improvement effected be superficial only. As a practical advice resulting from this study it may be suggested that:

[22] Abadie, p. 140-1.

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(1) The Yao priests of the third grade (the youngest) should be given some short courses in secular studies, and particularly in the elementary uses of medicine, and instructed to hand on this teaching to their Yao students in their villages.[23]

(2) The officials of the Bureau for Civilizing the Yao and officials similarly placed in relation to the Miao, the Lolo and other non-assimilated races of China should be encouraged to attend university courses offered in anthropology, where the problems arising from the contact of civilized peoples with primitive peoples are especially studied.

(3) Students in anthropology and in government from the universities should be encouraged to enter into the branches of the State service that are concerned with the assimilation of the non-assimilated races of China.

The worth of these proposals can be fully weighed by a examination of the present work. The work is not without its defects. It was done by a small party of students who had not had any thorough training in anthropology, but who picked up the method by being thrown directly into the field under the care of the present writer, who is not a sinologue. Despite defects, however, the work breaks ground, and shows evidence for the practical advices that come from it. The following chapters include one by Lee Chee Boon on social organization, one by Miss Lee Kwei King on the family in birth, marriage and death, one by Wang Wing Chou on religion and education, and one on economics by Lin King Yü, all chapters being edited by the present writer. Ng Wing Chiu, a fifth student of the party, was unfortunately taken ill with appendicitis in the field early in the expedition, and retired from it to the American Hospital at Linchow. Mr. Wong Sik-Ling, of the Department of Chinese of Lingnan, adds some linguistic notes on the Yao dialect of northwest Kwangtung.

The field party owe their thanks for assistance on their way to the mountains of northwest Kwangtung particularly to Dr. and Mrs. H. V. Bradshaw of the American Hospital of the Church of Christ in China at Linchow, to Mr. Montgomery, evangelist, and his wife, Dr. Montgomery, also at Linchow, to Mr. Montgomery's helpers at Sam Gong, to the magistrate of Linchow, Mr. Hoh, and to the officials of the Bureau for Civilizing the Yao, all of whom did everything in their power to forward the work of the expedition. The work was done on a field trip in the summer vacation of 1938, June 16th to August 16th, by students of Lingnan University, accompanied by Mr. Wong Sik-Ling of the Department of Chinese, and in charge of the present editor of the Department of Sociology. The work was made possible by a grant from the Committee for Research in the Social Sciences of Columbia University, administered through Dr. J. M. Henry, Provost of Lingnan University, and the editor.

[23] The French Government in Cambodia has found it good to extend in this way the village education traditionally given by Buddist bonzes. The advantages of the system are low costs to the Government, and compromise with a nationalism and a religion quite capable, if antagonised, of successfully maintaining ignorance against civilizing effort.

猺族文化概觀

霍眞

(摘要)

本篇以研究廣東連州猺山之油嶺排爲主。其成立年代約當第十二世紀之後。其他猺民散處於中國西南各省及法屬東京一帶窮山中。因常與他族接觸及處境之不同，各地猺人所用方言以異，而同爲猺語則一。猺人並有特殊之體型。然則謂猺人有猺人之文化亦無不可也。如油嶺排猺人有自耕之地，但製造品仍仰給於漢人。東京之猺擇有可耕之地居之遷徙無定，亦能自製用品。惟猺人尙多未肯爲他族所同化者誠堪注意耳。

LOCAL HISTORY, SOCIAL ORGANIZATION AND WARFARE

By C. B. Lee (Lee Chee-Boon, 李智文)

History of the Eight Pais

There is no written record available from the Yao people themselves on the history of the eight *pais*, or mountain-top villages, but from their legends and myths they all agreed to the fact that the Liu (廖) family in Hoh Chuen (連州), in the neighborhood of Linchow (河村), had played an important role in their lives. Their version was that a Chinese woman had sexual relations with a dog, and that she gave birth to eight baby dogs. To avoid society's damnation, the mother married each of the dogs to a wife and then sent them to each of the eight *pais* now existing. The mother also tied a piece of red cloth round the neck of each of the sons. That explains why every male Yao adult possesses a red turban. The dogs eventually turned into men, but by then the mother was old. A kind man, a certain Mr. Liu (廖先生), took pity on her, and undertook to travel to each of the eight *pais* to collect money from the sons for the mother. The sons readily agreed. Ever since, the Yao people have made regular payment. Once a drunkard haggled with Mr. Liu and paid two coppers less than he ought to have paid. The following year Yau Ling village experienced a drought. The superstitious Yao thought that the god was angry because somebody paid less than the usual amount. So today they never think of haggling with Mr. Liu. Moreover they asked the people of Hoh Chuen (the village from which Mr. Liu comes) to send somebody each year to make collection, so that there will always be a good year and a good harvest.[1]

The collection is made soon after harvest, when two representatives of Hoh Chuen make a trip to all the Yao settlements. The day when collection is to be made is a holiday for all the Yao people. Each family waits patiently for its turn, and when the turn comes, readily gives its contribution.

We paid a visit to the collector in Hoh Chuen, and he somewhat confirmed the truth of what the Yao people had told us. But the version of the history of the eight *pais* as recorded in the history of the family of the Liu surname is somewhat different, and is to all

[1] See the account given by Lin King-Yü following. The contribution of money to Hoh Chuen village by the Yao is partly in gratitude, partly in superstition, and partly in taxation as the sequel of a former rebellion repressed. A part of the money goes to the Government, but only by indirect receipt from Hoh Chuen village. (Ed.)

of us more intelligible than that relating to dogs.[2] The ancestor of the tax collector we interviewed was Liu Yung (廖順), who lived in the twelfth century. He resigned from governmental service in Hunan Province, and brought back eight Yao males to carry his sedan chair. He came to settle in Hoh Chuen. To each of the eight Yao servants, he gave a piece of land so that they might not idle. The Yao servants found that the land was very fertile, and from time to time, some of them went back to Hunan and brought more Yaos to settle in the vicinity of Linchow and areas around the lower course of the river leading to Linchow. The Yao people were savage in nature, and some of them turned highway robbers. At any rate they were a nuisance to the peace of the country, and on several occasions they had clashes with the government. The Yao people were defeated, and they retreated to the more hilly parts of the country. During the later part of the Ching Dynasty (清朝), the Yao people experienced a famine. They made an attack on Sam Kong (Three Rivers) in a desperate effort to get food. From that time it was found necessary to station Chinese troops in the vicinity of Sam Kong, and for a time the Yao people were forbidden to enter the village wall.

After the formation of an organization for civilizing the Yao people (化瑤局) under government or district government supervision, things began to take a better turn. The years of the Republic witnessed a revival of the organization after a lapse of a few years, and to the present day, the organization carries on with its work.

History of Yau Ling Village (油嶺)

Coming of the Various Surnames (姓).—There is no history written and preserved as to the history of the various surnames existing in Yau Ling, and the facts are recorded from what has been told by the Yao people themselves within their memory. According to the version of the Yao people themselves, Poon (盤) was the first to come to Yau Ling. It dated from time immemorial. The Poon was followed by Fong (房), Lung (龍), Lee (李), Sham (沈), and Tong (唐) in their respective order. Fifteen generations ago Lee fought with Fong, surrounded them in a house, and killed them.

[2] The origin legend amongst all Yao groups tells how the Yao are descended from the progency of a dog called P'an-Hou and a daughter of an emperor of China, named by some as Ti-Kou (2436-2336 B.C.) and by others as P'an-Hoang. For accounts of the legend see *Histoire des Miao,* p. 108-9 (le P.F.M.Savina), and *Les Races du Haut-Tonkin,* p.105-6, 137, 142 (Abadie). Abadie states that, in keeping with their origin legend, no Yao group eats dog flesh. It is a sacred taboo. Amongst the Kwangtung Yao, dog flesh is sacred, but it is commonly sacrificed in the measures intended to cure illness, and then eaten by the priests and their clients. We have eaten it several times on the invitation of the priests, when observing the mode of sacrifice. On the paper on which the priests write the names of the gods on these occasions, they write also words asking the gods to allow them to kill and eat dog without harm. (Ed.)

Only one escaped, and she was a woman in confinement. She escaped to Ngau Lo Shui (牛路水), and there she gave birth to a son.

After the war a dry year followed, and to make matters worse, pestilence and disease swept the village. Sham migrated elsewhere. The superstitious Yao believed that it was bad to have driven away the Fong and left the temple entirely in the charge of Poon, for prior to the war, Fong and Poon shared in the charge of the temple. So Tong went to Ngau Lo Shui and persuaded the escaped woman to come back with her son. The son was then three years old. In revenge for the work Lee had done, the rest of the village joined forces and expelled Lee. That was twelve generations ago.

The Tong flourished quickly, while Fong, Lung, and Poon did not. Lung later got into Tong's disfavor and many migrated elsewhere.

In cultivating their land, the Yao people pushed further and further, and finding that the distance from their homes to their fields became too great, they erected temporary homes where Sam Pai (三排) is situated today. Thus the existence of Sam Pai was brought about. Not long ago, about thirty years, Tong and Poon had a dispute over the land question. Poon, being the minority, was beaten and sought refuge elsewhere. In the rebuilding of the temple, Poon refused to take part, and the surname was deprived of its share.

Most of the 400 families in Yau Ling today bear the surname Tong. Only ten families bear different surnames (five are Poon, three are Fong, and two Lung). Under such conditions, it may be worthwhile to trace the history of the Tong.

Though no written record is available, the Yao people all agreed that the first Tong who came to Yau Ling was a man from To Chow (道州) in Hunan Province; he was Tong Sei Kung (唐四公), now made one of the chief gods in the temple. In To Chow there had been a dry year, and a Tong killed somebody. The relatives of the victim came and deprived the Tong of his property and drove him out. He trekked to the region somewhere near the lower course of the river running from Linchow (連州), in Yeung Shan (陽山) and thereabouts. He managed to live from hand to mouth, and married, and got three sons. The eldest and the youngest went back to Hunan. The second son was Tong Sei Kung, and he came to Linchow and earned his living by selling vegetables. Then he resorted to keeping fish. Business did not flourish, and he decided to come to Sam Kong (三江) to grow vegetables. It was a failure again. But while he was there, he noticed the fertile mountains of Yau Ling, and thereupon he decided to go there to try his luck. Prior to his arrival, several surnames had already settled here.

One day when he was out obtaining lime from the mountain, three members of the Fong surname were chased and accused of

stealing a buffalo. They came to Tong Sei Kung for help. Tong Sei Kung offered them shelter, and then sprayed lime over the road from where they came. When the pursuers came to where Tong Sei Kung was and asked if he had seen three men running this direction, Tong Sei Kung pointed to the lime on the road and asked, "Do you notice any footprint?" Thereupon the pursuers departed. In gratitude, one of the three Fong's offered Tong Sei Kung his daughter.

Tong Sei Kung was an honest man. Having travelled to so many places in an attempt to earn his living, his knowledge of life was considered profound. Thus, when the war broke out between the Lee and the Fong, and when pestilence swept over the village, Tong Sei Kung attributed the cause to the expulsion of the Fong by the Lee. It was he who suggested the recall of the only Fong fugitive and her baby son to take charge of the temple, so that the god might not be so angry. After the recall of the Fong, peace was restored in Yau Ling.

Coming of the Chinese.—All available records indicate the fact that growth of population led to the seeking of extensive land, and that in the settlement of Yau Ling (油嶺), the inhabitants first passed through Sam Kong or some other Chinese village; and presumably the people noticed that many articles of daily use were obtainable in the village. Thus a development of trade sprang up between the inhabitants of Sam Kong and those of Yau Ling. In a competitive society, traders found it worthwhile to make a special trip from Sam Kong to Yau Ling for the convenience of the inhabitants of the latter. Thus from time immemorial Chinese traders had made frequent trips from Sam Kong to Yau Ling. There is no written record of the first man who made such a trip.

As time went on the traders prospered. Some evidently found it worthwhile to stay in Yau Ling and obtain permanent economic relations with the Yao people. Cheung Wah Tak (張華德), the oldest Chinese residing in Yau Ling now, is a native of Hunan Province. He came here thirty-one years ago. Wong Sek Yeung (黃石羊), a native of Kwangtung, came here about twenty years ago. Both of them were at first travelling dealers in miscellaneous articles of daily need, and having prospered, have now permanent residence in Yau Ling and are still carrying on trade with the Yao people.

There are now about thirty Chinese families or about 130 Chinese population. Of these the majority are natives of Kwangtung and they are chiefly dealers in bean curd and wine. The Hunanese constitute the minority, and they are chiefly barrel makers and blacksmiths. There are three or four Hunanese families trading in wine and bean curd also.

The capital required to launch a business enterprise of these types ranges up to three or four hundred dollars. Very few cash sales are made. All debts are accumulated and payable at harvest time, when the Yao people either bring their agricultural products

in settlement of the debts, or pay in cash. Thus the amount of capital needed varies directly with the volume of sales. Bad debts normally amount to 10 to 15 per cent of net sales.

Where the blood relationship of the Yao people is strong, the people find considerable difficulty in doing business among themselves; for under such conditions, debts are bound to be extensive, and accounts uncollectable run high. A blood relative would have extreme difficulty in collecting debts from his relatives. Thus the Yao people seldom slaughter pigs and make sales to the village, but instead they sell the pig to the Chinese trader, who slaughters the pig and then sells it to those who need pork. In so doing, the seller gets ready cash in a lump sum for the sale of the pig. The fact that the Chinese traders make enormous profits through such retail sale does not ever disturb the Yao. Thus the Chinese traders serve as the medium through whose hands an exchange of products is made possible among the Yao people themselves. They are the middlemen, and their profit is their commission. Their business is not so much an economic invasion or aggression as a social solution to the economic problem brought about by strong blood relationship. This strange problem exists in the Chinese villages as well as here.

Organization

Organization of the "Fong" (房).—The organization of the Yao people is on the *fong* (房) basis, corresponding to that which we find among the Han people (漢人). This system has broken down among the Chinese who have come in contact with the Occident, but it exists, nevertheless, among those residing in villages and places where western influence is comparatively unknown.

As has been mentioned above, Tong Sei Kung (唐四公) was the first person to bear that surname to come to Yau Ling (油嶺). The male descendants of Tong Sei Kung are as follows:

Tong Sei Kung (唐四公)

Tong Yat Kung (唐一公)

Yung Po	Cheung Po	Chau Po	Faat Po	Tin Po (adopted son from the Hans)
用保一郎	長保二郎	州保三郎	發保九郎	天保七郎

Yung Po died at Yau Ling, but his descendants migrated to Lin Shui (連水). Cheung Po and Chau Po also died at Yau Ling, but their descendants migrated to Bu Chai or Sam Pai (三排). The relation of the Yao people in the various villages can be clearly seen

in the blood relationship inherited from a common ancestor and in their ancestral worship which takes place annually soon after the New Year.

The present population of Yau Ling, about 400 families, consists of the descendants of Faat Po, better known as Tong Kau Kung (唐九公), and those of Tin Po, better known as Tong Tsat Kung (唐七公), with the exception of ten families of different surnames. Descendants of the former are members of the Big Tong (大唐), and those of the latter are members of the Small Tong (小唐). Tong Kau Kung had only two sons, Tong Faat Wooi (唐法會四郎) and Tong Faat Wan (唐法溫廿四郎). The descendants of the elder son were split into Pang Koh Fong (崩哥房) and Mai Hau Fong (賣口房) as they exist today. The descendants of the younger son were more numerous, and later they split into several *fongs* viz., Hei Foh, Faat Loh, and Lung Pang (喜火, 法羅, 隆彭).

The descendants of Tong Tsat Kung, the adopted son, or the Small Tong, were split into three *fongs*, viz., Kau Luk (九六), Yin Noh (烟糯), and Tai Ka (大家).

Today in Yau Ling there are nine *fongs* each possessing a Big Hall (大廳) for the purpose of ancestral worship. Each of these *fongs* is split into smaller camps and each of these small *fongs* (小房) possesses, or several of them combine to possess, a Small Hall (小廳), union in a hall being indicated by grouping in the list below:[3]

TONG FAMILY:

A. Big Tong

1. Hei Foh (喜火)
   - Tai Ta (大打)
   - Haau Chuen (孝傳)
   - Mai Sheh (賣社)
   - Ting Kiu (丁橋)
   - Kan Pai (間拜)
   - Kai Pin (界變)
   - Cham Tau (斬頭)
   - Yiu Koo (猺古)
   - Peh Toot (四?)
   - Man Err(?) (民侇)
   - Lo Ma (老馬), newly joined
   - Lung Woh (龍和), newly joined. Surnamed Lung (姓龍)
   - Tau Tang (斗燈)
   - Koo Man (古民)
   - Sei Shang (四生)
2. Lung Pang (隆彭)
3. Faat Loh (法羅)
   - Kung Nang
   - Hau Kwong Keuk (口廣脚)
   - Hei Tsoi (起才)
   - Fong Kung (方工)
   - Tai Kei (大基)
   - Loh Tsoh (羅左)
   - Peh Pooi (四?)
   - Chut Tung (出東)
   - Loh Koo (羅古)
4. Mai Hau (賣口)
   - Bang Koh (崩哥)

B. Small Tong

5. Yin Noh (烟糯)
   - Pak Tau (白頭)
6. Tai Ka (大家)
7. Kau Luk (九六)
   - Kiu San (橋辛)
   - Tai Wa (大話)

OTHER "FONGS":

8. Faat Tseung (法將). This "fong" has only five families and its surname is Poon (姓盤).
9. Tso Sz (祖師). This has only three families and its surname is Fong (姓房). It is closely connected to Bu Chai (三排)

[3] For consistency of Romanization the Cantonese pronunciation of these names is given. The Yao people themselves, however, have a different system of sounds for all these proper names as transcribed below in their respective order:

A. Big Tong: 1. hi foh; tam ta, hau tson; mai sia, ting kiu; kam pai, kai ben, tsam tu, yau ku, peh tut; men?; loh ma; lung voh; tu teng, ku men, heh sang; 2. long pang; 3. fa loh; kung nang, vu kong dau, hi soi, fong kong; tai ki, loh toh, peh pui; sot tung, loh ku; 4. mai vu; pang koh; B. Small Tong. 5. en noh; pa tu; 6. tam ka; 7. ku lia; kiu hen, tai va; Other Fongs. 8. fa tiang; 9. tu si.

Notice that many small *fongs* have joined Hei Foh, particularly Lung Woh which has a different surname altogether. Hei Foh is the strongest of the *fongs*, and in entering into alliance with Hei Foh, the weaker *fongs* are better off in their standing. The procedure for entering into such alliance is very simple, and consists only of feasting and drinking, and the burning of joss sticks and joss papers in the Hall of the stronger *fong*. The members of the male sex of the weaker *fong*, one from each family, must pay for the expenses for bean curd, a pig, wine, joss sticks and joss papers, and treat all the old members of the stronger *fong*, or anybody from this latter *fong* who cares to come.

The study of the system of *fong* organization is the keystone to both the political and social systems of the Yao people. Thus, in the selection of Yao Chang[4] (猺長) and Yao Lien[5] (猺練), and of Tau Muk Kung[6] (頭目公), in tracing the causes of fights and wars, a knowledge of this *fong* organization is indispensable. In housing, too, the members of the same *fong* tend to group together. But recently, owing to frequent buying and selling of houses, this system of grouping has died out. In marriage, each of the *fongs* is an exogamous group, but where a woman of one *fong* marries into another, the descendants of this woman can remarry members of her previous *fong* only after a lapse of three generations.

Election of Yao Chang (猺長) *and Yao Lien* (猺練).—For the administration of the affairs of the Yao people, there are two Yao Chang (猺長), corresponding to prime ministers, and eight Yao Lien (猺練), corresponding to a cabinet. The Yao Changs are elected by popular consent, and they are directly responsible to the people. Each of the Yao Liens is chosen from the first eight *fongs*

[4] The Yao Chang are the leaders of the village council.

[5] The Yao Lien are the members of the council.

[6] The Tau Muk Kung are the executives who keep public order, judge disputed cases, and deal with offenders.

whose members must necessarily be strong, which means that the *fongs* must have a great number of members or hold traditional importance in the settling of the affairs of the people. Both the Yao Chang and Yao Lien alike must necessarily be clear-minded and fair, and must possess the ability to express their thoughts to the understanding of the people. The seat may not be hereditary, though the seat, once held, may be retained for a life time. Deposition may take place as a result of unfair play, but generally the Yao Changs and the Yao Liens are persons who have the respect of the people, because they possess wealth, or because of the fact that their ancestors had held prominent positions in the community. In Yau Ling (油嶺) the two Yao Changs are Ting Kiu Tai Kei (丁橋大基) and Tai Ta Sha Yi (大打沙二). The eight Yao Liens are Tong In Noh Yat (唐烟糯一), Tong Faat Loh Yat (唐法羅一), Tong Lung Pang Sam (唐隆彭三), Tong Tai Wa Yat (唐大話一), Tong Hei Foh Ng (唐喜火五), Poon Faat Tseung Yat (盤法一將), Tong Lo Ma Ng (唐老馬五), and Tong Mai Hau Yi (唐買口二). Notice that the above names bear the *fongs* to which they belong. Upon the death of any of the above, the seat is transferred to another member of the same *fong* as the deceased, except that when one *fong* is supplanted by another a different name is used.

Tau Muk Kung (頭目公).—There is a saying among the Yao people, "Yao si noi Tu Mu (i.e. Tau Muk Kung) (猺事問目頭). Kien si noi Tam Kien (i.e. the Yao Chang) (漢事問大漢)." This means that all affairs concerning the Yao people themselves are to be settled by the Tau Muk Kung (頭目公), and that all affairs concerning the relation of the Yao people and the Hans are to be settled by the Yao Changs and the Yao Liens. This seems to be the fundamental difference between the Tau Muk Kung on the one hand and the Yao Changs and the Yao Liens on the other. But, in actual fact, the work of the Tau Muk Kung and that of the Yao Chang and the Yao Lien is closely blended. The distinction lies, however, in that all affairs and disputes are first brought to the Tau Muk Kung, but when they cannot bring any settlement, then the Yao Chang and the Yao Lien are called upon.

There are fourteen Tau Muk Kungs, one from each of the following *fongs*:

1. Man Err	(民俍)	8. Lo Ma	(老馬)
2. Mai Sheh	(賣社)	9. Lung Pang	(隆彭)
3. Tau Tang	(斗燈)	10. Yin Noh	(烟糯)
4. Yiu Koo	(猺古)	11. Kiu San	(橋辛)
5. Haau Chuen	(考傳)	12. Pang Koh	(崩哥)
6. Faat Loh	(法羅)	13. Tai Ka	(大家)
7. Tso Sz	(祖師)	14. Faat Tseung	(法將)

The seat lasts two years, but is effective mainly in the first year, and during the second year, the candidate helps only in less important matters or in matters in which the rest of the Tau Muk Kungs

cannot find any settlement. The seat is given to all the adult male members of the same *fong* in turn. Some of the work done by the Tau Muk Kungs consists of the work of heralding, warning the people to be careful with fire, telling them not to steal, settling fights and disputes and looking after prisoners of war, and repairing roads. The work goes in service for the community, for which four taels of rice is given to each Tau Muk Kung annually by every family.

Sin Shang Kung (先生公).—The Sin Shang Kung (先生公) is a professional group of scholar-priests. They are the educated and intelligent members of the community, for they are the scholars and teachers and priests who play the part of medicine men. The name of Sin Shang Kung is acquired by years of study and the ability to recite the classics from memory, an art which the person must demonstrate during Liu Koh Tong (丫歌堂) in order to win the recognition of the people. There are three grades of Sin Shang Kung: (1) The first group has now six members, and they are only permitted to teach and to perform minor religious ceremonies as driving away the devils (a superstitious belief) to cure the sick. (2) In the second group there are now ten members. They must be more than thirty years of age and each must have at least one son. They are permitted to perform major ceremonies such as "building the bridge" (架橋) (curing serious illnesses), helping in births and performing more elaborate ceremonies in cases of death. (3) The third group has only two members. They are the greatest of the Sin Shang Kungs because they are the oldest. They perform religious ceremonies for the community besides the work which the first and the second group are permitted to do.

There are no restrictions as to who are the exclusive persons allowed to become Sin Shang Kungs. In return for the laborious study and the recitation of the classics from memory, the work which they perform for individuals of the community is paid for by the person engaging them. The Sin Shang Kungs form the leisure class of the community, for, being able to get an income through their pious care for the sick, they can afford to work less in the fields.

Koon Shui Kung (管水公).—The Koon Shui Kungs are selected by the people to take care of the water system of the community. In Yau Ling there are eight *kaans* (姓), Chinese name for the wooden trunk which conveys water from the source. For each *kaan* two Koon Shui Kungs are appointed, except in cases where the number of people using the water from a *kaan* is small, when one Koon Shui Kung is appointed. The work of the Koon Shui Kungs consists of picking up leaves or removing any obstacle that checks the flow of water, and cutting grass for the road leading to the source. If there is anything wrong with the water system and repair is needed, he calls on the community for help, and after the repairing is done, the participants get a good treat from those people using the water of that particular *kaan*.

Thus the work of the Koon Shui Kungs is done in service for the community. To each of the Koon Shui Kungs fifty-two catties of cotton are paid. The cotton is collected from the people. When the number of people using the water of *kaan* is small, only thirty-two catties are paid.

Masters of Ceremony.—For the festivals that are held on the third day of the third moon, the sixth day of the sixth moon, the seventh day of the seventh moon, the sixteenth day of the tenth moon, and New Year's Eve, two persons are chosen to take charge of the ceremony to be held in the temple (大廟). The two so-called Masters of Ceremony represent the Big Tong (大唐) and the Small Tong (小唐), one from each, and the representation is decided by dropping two pieces of wood before the altar of the god, the first to get a "head and a tail" three times in succession being the chosen candidate.

The work of the Masters of Ceremony is extremely simple, and consists only in the purchase of a small pig, two chickens, joss sticks and joss papers, and candles, and a few catties of rice for the making of rice cakes; and the preparation of the food so purchased during the process of worship. The expenses incurred are borne by them, but after harvest, the Masters of Ceremony get as a refund half a catty of rice collected from each family.

Warfare

Within the Pai (排) (*mountain village*).—In dealing with the question of warfare, the *fong* system must always be borne in mind. In 1938, during the second moon, Faat Loh (法羅) went to war with Hei Foh (喜火). A member of Kau Luk (九六) burnt the timber belonging to a member of Mai Viang (寶). Not admitting the fault, members of Kau Luk captured a member of Mai Viang and beat him, depending, of course, on the aid of the rest of the small Tongs if war should result. Mai Viang was a member of the Big Tong, and urged all the rest of the members to its aid. Thus the dispute soon developed into a general war between the Big Tong and the Small Tong.

Barricades were set up in all the roads, and no male was allowed passage unless he were willing to risk the danger of being shot or captured. In the latter case, he might be ransomed upon payment of money. All males had to take part in the fighting, being otherwise subjected to fine. Women were not molested or captured, and while barricades were set up, women continued to go to the fields to work. After a period of several days, the population succeeded in their peace negotiation. Faat Loh finally admitted the fault, and a fine of wine was imposed. Kau Luk fired off their rifles, followed by all the other members of Faat Loh; then all the members of Hei Foh fired theirs. Peace was restored.

Fights may not necessarily arise through the *fong* organization.

Six or seven years ago, two Koon Shui Kung (管水公) stole the water belonging to another section of the village. The Koon Shui Kung of this latter section declared war on the former, and all the members of the respective sections took up arms. There was one casualty. But peace was restored again after feasting and drinking and the usual letting off of their rifles.

Quarrels are frequent among the Yao people, and causes may range from simple cases of drunkenness to theft. But usually the differences are settled before they ever develop into a war or mass fighting between the *fongs*.

With other Pais.—In inter-*pai* warfare, all the inhabitants of a *pai* involved have to take part, with the exception of women, the old, and the very young. Where a *pai* is weak, it tends to draw in aid from outside sources using the pretext of blood relationship. In such warfare, there is no scout, no messenger, no leader. In short, everybody plays an equal part. A so-called commander stands on the top of a hill, and shouts to his men the things he sees during the process of fighting. There is actual killing. Usually the time for fighting is appointed. The general tactics are to avoid face to face combat, but to carry out surprise attacks and sieges. Prisoners are beaten and bound up to be ransomed by the opposition. Women and children are also captured, but they are not molested or beaten. The ransoming is done by the relatives of the prisoner. In making peace, Chinese traders of both *pai* are called upon to guarantee the safety of the Yao Chang (猺長) and the Yao Lien (猺練) when they meet together to negotiate peace.

The work of the Yao Chang is extremely simple, unlike the complications with which a modern general is confronted. He calls the people together, and inquires into the causes, and settles the trouble if possible. But if the majority of the people is against his decision, the Yao Chang must yield to the demand of the people. He awards prizes to those who capture or kill any of the enemy. He calls the people together and tells them what to do, but generally the people act on their own initiative. He conducts the peace negotiation.

Though no history was written about the war Yau Ling (油嶺) had with other *pai*—a thing which they wisely forbid any writing about for fear that the younger generation may seek revenge—stories and legends reveal that the Yao people were very warlike. Yau Ling had a war with Sam Pai (三排) for nine years, and with Nam Kong (南江) for more than twenty years over the question of land.

With the Chinese.—Although no written record is obtainable from the Yao people themselves regarding the various conflicts they had with the Hans, legends have not failed to mention in the history of the Yao people that long ago warfare with the Hans was frequent. Furthermore, written Chinese history serves to confirm the truth of

the report. As to the early fights the Yao people had with the Chinese, I have already mentioned these in brief during the early part of my writing. I shall confine my attention here to the fight which took place in Yau Ling (油嶺) twenty-four years ago, a fight which resulted in the burning of almost the entire village.

Prior to the fight, the condition in Yau Ling was briefly thus: the village was most thickly populated, containing about 2,000 souls, or 700 families. Hitherto the people were not friendly to the Hans, and Han visitors or traders were often subjected to insult and discrimination. Every Han, with the exception of those who castrated pigs (a skill for which the Yao people had to depend upon the Hans), visiting Yau Ling, whether on business or otherwise, had to pay 60 cash, 36 for passing the *pai* (過排錢) and 24 for using the road (過路錢). This money went to the Tau Muk Kung (頭目公) for public purposes.

According to the story told by Tong Woh Shang (唐禾生), a Yao, "It was twenty-four years ago, and I was eight years old then. Some Yao thieves robbed a Chinese trader and killed him. The brother of the victim reported the matter to Mok Lo Ng (莫老五), then head of the organization for civilizing the Yao (化猺局長). An understanding or a compromise could not be reached, and on the twenty-first day of the fourth moon, the Hans came up to Yau Ling and made an attack from the northwest, that is, the present road to Sam Kong (三江). The Yao people, knowing this beforehand, rushed to meet the enemies. Fighting started at about four in the morning. At about six, suddenly a company of Hans attacked unexpectedly from the northeast, the present road to Sam Pai (三排). On this side of the hill the Yao women and children had taken refuge. There was nobody to meet the on-coming foes except one old Yao, who was making bean curd. He fled. The Hans took possession of his house, stole all there was to take, and then set fire to the hut. With the wind in its favor, the fire spread, burning down all the huts with the exception of a few on the southern border. All the Yao men, women and children took refuge in the valley on the southern side."

As to the horror of this war and of the fire that resulted therefrom, Tong Woh Shang continued, "The Hans bayonetted an old woman about seventy years old, and robbed her of all the silver she had on her person .... I was eight years old, and I was carrying a younger brother on my back. I was terribly frightened. My father had gone to fight, and my mother was lost and nowhere to be found. For two days we went without food or shelter. We cried. Fortunately we found our mother on the third day..... After the fire, Yau Ling was swept by smallpox and dysentery infection. Many people migrated..... When peace was restored, the population was reduced to about 1000, or 330 families."

八排猺之來歷及其社會之組織與爭端

李智文

(摘要)

八排猺山之油嶺猺排現約有四百戶，除十戶外，餘皆姓唐。每姓又分爲若干房，以定婚姻血統之別，其政治之設施與居留之區域每以此爲準則。蓋各房爲一排之基本組織也。房與房發生爭執每引起兩房之敵對行爲。一房之內因爭端而致分裂者間亦有之。現居於該排之漢人約有三十戶皆經營生意。但排內各猺因親屬關係，營生反爲不便。漢人居間圖利所獲不菲。

THE YAO FAMILY IN BIRTH, MARRIAGE AND DEATH

By K. K. Lee (Lee Kwei-King, 李季璟)

The Yau Ling *pai* (mountain village), is situated near the summit of a hill, with a northeast aspect. This hill is overlooked by many higher ones, while it surmounts a number of the surrounding small hills, and overlooks them. On its own slopes, as well as those of the hills in the vicinity, are countless tall pine trees which form an attractive landscape. Beneath these trees, grow agricultural plants, such as tobacco, millet, potatoes, maize and rice, arranged in orderly terraces. The irrigation system is also very well arranged.

In the village there are about four hundred and twenty families, but of these about two dozen are Chinese families, who run such business as manufacturing wine and bean curd, and keeping groceries. The population is approximately 1200 people. It is very hard to find out the exact numbers, because the Yao people are very suspicious and strangers cannot take a census openly.

These aborigines are a farming and sedentary people. Their living depends entirely upon agriculture. Since servants are unknown here, all people, even the larger landowners, have to work very hard, although these latter hire poorer men to help in reaping crops. The Yao people are indeed a hardworking, persevering and frugal people. For the adults, the working hours are from eight a.m. till long after sunset. At nine p.m. most villagers will be back home again to have a bath, and prepare their supper. Starvation will result to those who neglect their farms. Old people of sixty or seventy, and small children under ten are often seen toiling hard in the fields under the hot sun.

We cannot deny that the Yao people are simple-hearted and contented people. They sing all their way to the fields, and their hearts grow still lighter on their way home. They are not well situated to be a good commercial people, neither are they inventors, but they are tough people who are always on the better side of the struggle fought between themselves and nature. They do all their labor with their hands, with the help of some crude agricultural implements. Irrigation on the hillside depends on the rainfall. If there should be a long drought, a famine would be the result.

Birth

Women who are pregnant go to work as usual, if they are poor, and stop work only near to the time of childbirth. Those in better circumstances cease work in the fields when they are pregnant, and occupy themselves about the house only. They do not have much extra nourishing food during the period of pregnancy or confinement.[1]

[1] According to Abadie, p. 119, an interdict is put upon eating green vegetables and fat during pregnancy, so that even ordinary diet is curtailed. (Ed.)

Ordinarily the pregnant woman's mother or the husband's mother or elder female relative assists at confinement. The infant is received in a basket containing some leaves and pieces of paper. This basket is kept under the bed afterwards. If the first child is successfully brought up, the same basket will be used for another, later child. Otherwise the basket will be thrown away, and a new one made. The after-birth is wrapped in straw and covered with ashes. Afterwards it is buried in a hole dug in the floor of the bedroom.

In order to warn people not to enter, without permission, the house where a new baby has been born, a bunch of straw is hung on the door. If the bundle is on the left it indicates a girl, if on the right, a boy. It is taboo to enter the house in straw sandals or in white clothes. The sandals are thought to bring in evil spirits with them. White clothes are those used in mourning the dead.

Immediately after giving birth, the mother eats a male fowl,[2] and, if circumstances allow, she eats two or three more in the following days. But afterwards, she eats ordinary food, such as bitter vegetables, yellow peas, boiled bean curd, rice. Two special meals of pork and fowls are had if the family is well off. The mother has to abstain from eating pears, snails, peaches, garlic and fried bean curd for a hundred days.

A few priests are called in to bless a new-born baby. They chant to drive away the evil spirits that may do it harm. When this is done, the parents of the infant entertain the priests and the male neighbors with bean curd and wine and cows' hooves. The priests fix a date on which a name is to be given to the child. This date may be on the twelfth day, if the mother is young, but the thirtieth day, if the mother is over thirty years of age.

The names given to the babies are always numerals, but it is not necessary that the first child in the family be named number one. It may be named number three, for the priests have to consult the gods. They use two pieces of bamboo known as *ka pui* (架杯) to find out what numeral is favorable. They drop the bamboos and see whether the concave or convex sides turn upward.

On the day that marks the full moon of a child's birthday, a celebration is held. The priests that have done something for the child and the nearest adult relatives are invited to the feast. On the same day, the mother brings the baby to see its mother's mother, and the grand-mother gives the baby a bundle of six sticks. This means that the child will grow up to be useful, and rapid in development like a fire.

Over the time of these thirty days passed since the birth and for ten days more to come, the mother stays in and rests. She washes

[2] Abadie (p. 120) cites for a group of Tonkin Yao a custom of the mother eating flesh of female animals or of castrated male animals only. It appears that custom varies by opposites here between different groups of Yao. (Ed.)

her own clothes and the baby's clothes. She washes the baby with hot water three times daily, morning, noon and evening. The mother takes a bath every day, but she does not necessarily change her clothes daily. The husband, for these first forty days, does the household work, such as cooking, feeding the fowls and pigs, and bathing the other children. After the forty days of rest for the mother are expired, she takes over her normal work from her husband.

There remains the release of the mother from her abstention from eating proscribed foods after a hundred days are elapsed. On the hundredth day, a great many puddings are made and distributed among the relatives, friends and neighbors.

The babies of the aborigines are breast-fed, but the period for suckling differs with different children.[3]

Marriage

Courtship is always initiated by the man, who goes to the girl's door at night, and sings to her, after having had his supper and bath. Since the boys and girls are well acquainted, they can recognize one another's voice without the slightest doubt, even though they do not see each other's face.

As the boy sings, he raps the door twice every now and then, and insists upon telling the girl why he is worthy of her; he also tells the girl how useful and rich he is and begs her to offer him her heart. After an hour's time, he may or may not have any reply from her, because she may not admire him. If she does not show any fondness for him, he will request her to give him a bundle of firesticks, so that he may have a light to guide him home. A suitor must always have patience. Although he may fail on the first night, he will try again the next, because, after all, the girl needs time to think over this question before making her decision. On the second night or third (which is rather unusual) the girl must give a definite reply, whether she will accept him or no. If at last it turns out to be a failure, the boy has to quit with a bundle of firesticks the girl gives him, and he will never come back to sing to her again. But if the girl yields to his request, they will sing to each other for hours, until almost day-break. The girl will talk to him in bed; she only gets up when she is obliged to give away the bundle of firesticks. From this time on the boy will come to serenade her every night until they are married.

A man may begin to court from the beginning of the year, but after the festival which takes place on the sixth day of the sixth moon, every man who has the intention of getting a wife during the year will use a great deal of effort in courting. He may try several girls without favorable results, if he is a bad worker and poor.

[3] Abadie (p. 120) gives the period as three years, sometimes more, but terminating earlier if a new pregnancy occurs. (Ed.)

Girls like to go to sleep in other girls' houses, so that the older ones may teach the small ones how to sing love songs. When a man sings to one of these, the rest will be disturbed in their sleep.

A beautiful, popular and rich girl usually attracts a number of suitors. She sometimes gives away several bundles of firesticks in one night. In such a case it is very hard for her to make a decision. Then she may consult her parents who will give her advice in the matter. Otherwise parents do not intervene in their children's marriage choices.

Some people get married as young as fifteen years of age, and few people marry for the first time at an age of over twenty. Girls never marry at the ages of seventeen or nineteen, because according to their superstition this will make their future unhappy.

The engagement will soon be announced after a successful courting. An old woman is sent over by the man's parents bearing two catties of wine, two catties of meat and some vegetables as presents for the girl's parents. If subsequently a girl wants to break her engagement, a rare occurrence, she can do so by returning the same amount of presents to her fiancé. The duration of betrothal is generally a few month's time, for marriage always takes places towards the end of the year in the tenth or eleventh moon.

At the time a couple is to be married, the man will make a sort of bride-price, in gifts of food, to the girl's parents. This includes twelve catties of wine and twelve catties of beef or sometimes pork. Rich and poor must pay the same amount. Half of this gift is sent the night before the bride comes to her husband's home. The rest will be brought to the parents-in-law the following day.

The date of the marriage is fixed by the priests in the *pai*, and all those who are to be married will welcome their brides on the same day. On the marriage evening the bride will be dressed and ready to go with the go-between to her husband's home. This go-between may be an old or even a middle-aged woman chosen for that office, and she must be one who has had children of both sexes and not married more than once.

The bride puts on her best embroidered clothes, which have been made by herself or with the help of her mother. She wears three or four skirts, a pair of leather shoes, and wraps up her hair and becomes a woman. The head-dress is a piece of blue cloth with white designs. Besides these, she also wears puttees which have a beautiful embroidered hem. The villagers who are related to the bridegroom have a right to one meal at the evening reception of the bride. The fare consists of bean curd, yellow beans and beef, and all these are cooked together. These and wine are offered to entertain the males, while rice instead of wine, and the same kinds of food are offered to women and children. Married people who are not yet fathers or mothers never participate in such receptions, because they think that

being without children, they are not honorable guests.[4] On the next morning the bride brings her husband to see her parents. But before doing this, she must first perform some ceremonial behavior to her mother-in-law, presenting her a basin of water for washing her face. In return, the mother-in-law makes the bride a money gift that varies from several tens of cents to a dollar. The bride's family holds feasts for two successive days, and these are attended by the nearest relatives of the bride. When a couple marries, the relatives and friends bring them gifts. To the bridegroom they give forty cents wrapped in red paper and a pair of long colored placards (牌) on which are written words of blessing and congratulation. In addition to these, friends from the outside *pais* present fire crackers. To the bride, relatives and friends give some colored silk threads (紅綠頭繩) for decorating her hair. Presents are brought to the bridegroom within a fortnight after the wedding. There are feasts throughout this whole period, and firecrackers are burned. In return, the bridegroom's parents give one catty (fourteen ounces) of pork to those people from whom gifts are received. Though feastings are carried on for such a long time, the bride and the bridegroom rest for only two or three days at most.

On weddings and other great occasions, the Yao people consume a great deal of wine and bean curd, which they make for themselves, in order to save money. They borrow the equipment of the Chinese traders from whom they ordinarily buy those goods.[5] Occasionally there is mutual economic help between two families. That is, one family may offer a pan of bean curd or forty or fifty catties of wine to the other, when the son of the latter is married. Then when it comes to the turn of the son of the former to get married, the latter will do them the same favor. The expenditure for the wedding purposes is never very great, yet it is a burden to some of the people. The sum varies from thirty to sixty or seventy dollars.[6]

The father always gives the daughter a dowry no matter how poor he may be. The amount of the dowry, of course, varies according to the particular circumstances of the family concerned. The minimum amount is a rice field which yields a crop of fifty-six catties of rice, a piece of land that yields four hundred to six hundred catties of maize, a quilt, two or three suits, and a bath-tub.

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[4] These receptions are those noted by Abadie as occasions of bawdy dances and songs, when the guests stay very late and make a joke of delaying the bridegroom's entrance to the bride, as we have already mentioned in our review of Yao manners. (Ed.)

[5] They ferment the wine, but do not distil it, as the Chinese traders do. It is sweeter and healthier when undistilled. (Ed.)

[6] The burden of this sum falls upon the bridegroom and his family. It includes the "bride-price," and the expenses of the wedding reception, and the subsequent feasts. Abadie (p. 121) notes that cases occur where a young man is unable to meet these costs. He must then enter the family of his wife, take the name of that family and serve that family for a number of years, before being free to set up his own independent household. (Ed.)

It would be considered a disgrace if the family did not give its daughter dowry land. A poor father, who has not much land left, after ceding dowry land to his daughters, will have to break new hillside land for cultivation. The daughter is entitled to keep the dowry land as long as she lives, and when she dies, her son (if she has more than one son, the eldest) can use it until his death, after which the land must be restored to the maternal grandfather or the maternal uncle or his heir. As long as the woman lives in harmony with her spouse, he will share the use of it, but if there is a divorce, the woman will share it with the new husband.

For the first year after marriage the newly married pair live in the house of the young husband's parents. During the course of this year the bride never eats at her husband's father's house. She returns to her own parents' home for meals. (This is possible, because women rarely want to marry men who live outside their own village.[7]) The woman works for her husband's family, returning to them after taking her meals apart from them. The husband comes to escort her to his father's house every evening after her supper, to sleep in the house of her husband's parents.

Next year, when the crops are nearly ready for harvest, the parents consult the priests, and ask them to fix a date for the separation of their son and his wife. Separation of the new family takes place on the chosen date. The harvests of the son's alloted subdivision of land and of the daughter's dowry of land are given entirely to the couple, so that they will have something to live on, while they work this land, now their own exclusively, in the following year. From this time on, there is little chance for the son and daughter-in-law to cooperate with the old couple. Allotments of land are given to the young couple at the discretion of the parents, but this is always done on the principle of equal distribution among the sons, if there is more than one son in the family. The parents as a rule keep a share of land that will produce enough for their own consumption. As soon as separation is declared, the couple moves into a separate house and starts a new life of cooperation, with complete independence from the parents. Upon separation, the mother gives her daughter such agricultural implements as a hoe, a spade and a pole. The son does not have to look after his parents in their old age, but he and his wife may bring them food at times. The Yao people are indeed a die-hard people. Men and women, old and young alike have to work as hard as cattle until all their energy and vigor is gone.[8]

[7] The Yao rear their children in a very marked fear and distrust of everyone who is not an intimate neighbor of long standing. This training was noted very many times. (Ed.)

[8] The writer has in mind the contrasting Chinese custom, according to which the young family is not separated off from the old family, and according to which the work of the young family gradually comes to support the old family, and make work by the old unnecessary. (Ed.)

Five times in the year, a man is obliged to entertain his parents and parents-in-law. These times fall on the following dates: the third day of the third moon, the sixth day of the sixth moon, the seventh day of the seventh moon, the sixteenth day of the tenth moon, and the New Year's Eve. According to their customs, if the father accepts the invitation the mother declines, and if the father-in-law accepts it, the mother-in-law declines. When the two old men, father and father-in-law, or the two old women, mother and mother-in-law, leave the house, the young husband gives them each a catty of pork.

Death

Children have to perform the duty of night watching, if a parent is sick and there appears to be no hope of recovery. The death of a person, especially an old one, will bring a number of priests together. These perform the duty of chanting, and they direct the general steps according to which a funeral is properly carried out. The attending of a funeral is in fact a chance for sociability. Relatives, neighbors and friends of the deceased attend the funeral. The relatives will be distinguishable from other people by their holding bamboo twigs each run through a piece of paper on which are written some incomprehensible words.

The following is an account of a funeral which the writer witnessed during her stay in Yau Ling Pai. A short time before death the sick woman was made to sit up on a bench against the wall on the left behind the door. The costumes that she wore were scarlet cotton underwear, then an ordinary dark blue cotton dress, then a dress of yellow silk embroidered, and, on top of these, an orange embroidered dress. She also wore dark blue cotton puttees with colored hems. On her head was put a beautifully designed headdress, and in addition, on both sides of her head, some nickel ornaments, while rolls of parchment, decorated with paintings of figures of men, animals and gods, were used to wrap across her shoulders.

As soon as her heart failed, her daughter wailed and stood in front of the corpse, fanning it; the sister of the dead sat on her right and tried to smooth the wrinkles of her clothes. Meanwhile, two plugs of gunpowder were exploded outside the house telling the neighborhood that someone has just died in their own *pai*. On the morning[9] of the funeral, three plugs of gunpowder were exploded. Then the priests burned joss papers and did some chanting. After this, the corpse was placed in a chair, and its neck and waist were tied to the back of the chair with pieces of red and blue cloth. The chair used for this purpose is always a new one. At first three men moved the corpse out from the house to that end of the village which was nearest the dead person's land. Here a ceremony of short

[9] Sometimes the corpse is kept overnight in the house, but usually it is buried on the same day if there is enough time for preparing the funeral.

duration was held. The principal mourner, who in this case was the nephew and heir of the old woman, led the funeral procession. He pulled down his hair and wore white mourning clothes. At the end of the village, the daughter, sister and grand-daughter of the deceased wailed most bitterly and took turns in fanning her dresses and hands. At the same time, three men bringing buckets of home-brewed wine served the men who were there. A bowl was given to each of them, and afterwards they perched on the hill by the road side, and gave three shouts at the departure of the corpse. They did not go any farther, but the priests and the near relatives and those who were to help in grave digging accompanied the corpse. Some women stoped half way, and others who were relatives of the dead went to the grave. At a funeral, one can easily find out which of the women are widows and which of them are not, because the widows wear a red head-dress, while a woman with a husband wears an ordinary blue and white one.

When the corpse arrived at the grave, a woman burned joss sticks and straws while the younger sister and daughter fanned the corpse. While the grave diggers were at work digging, four priests chanted. Chanting continued for more than an hour. As this old women was poor, she had no coffin, and six pieces of board were used instead. The things buried with the dead were a dozen pieces of white cloth (each piece being about ten inches by eleven) which were used for covering the upper part of the body of the dead, a bag of rice (for the soul's sake), the nickel neckrings and earrings. The paper head-dress and the nickel decorations for the head were taken off and brought home to be kept in remembrance of the dead. When the grave had been dug and the boards fixed, the corpse and the burial articles were put in. Before putting the cover on top, the daughter stroked her mother's clothes making them smooth, and arranged her hands and feet in such a way that she seemed to be enjoying a tranquil repose. Then the gravediggers pushed the earth into the grave and made a small mound. Immediately following this, wine and bean curd cooked at the grave side, were offered to those men who had helped in the funeral. This fare was served in bowls which had been brought to the grave by the mourners in a sack carried on their backs.

The above case will suffice to give an idea of the funeral of the adult Yao. Girls and boys who die at the age of seven and nine respectively or at a more advanced age, will have the same arrangements at their funerals as the adults. However, younger children will be carried to the grave quietly. Only the mother weeps, the father usually does not.

The Family

The Yao family is a small, patrilocal, social and economic unit. Economic cooperation is one of the chief characteristics of the home. The father and the mother are the major workers in farming. The children from the age of ten or twelve do much work, such as digging the soil, eradicating the wild grass, gathering food for pigs and carrying firewood. Smaller children help to tend cows, catch fish for food, and look after the youngest brothers and sisters. All these children play a minor role in producing the income of the family.

There is no obvious ceremonial behavior between the family members, and children of both sexes are treated with the same kind of parental attitude. The husband and the wife have the same amount of liberty to do the things that interest them, and they have an equal status. But as a matter of fact, the wife has more authority in some matters. For example, once a native was selling a fowl to our party. He had weighed it and stated a price. His wife did not want to give it up, and she stroked the feathers of the fowl, turning her head at the same time. Seeing this, the husband immediately refused to proceed with the transaction. It is the woman who keeps the money her husband has obtained from selling agricultural products, or earned for having worked for a neighbor. Whenever he wants to buy things for the home or for some special purposes approved by his wife, he is obliged to ask her for money.

After working at a stretch for several days and getting fatigued, the husband and wife will take turns for a rest. They seldom rest on the same day. Whichever stays at home will have to look after the children. Very often a man carries a baby on his back, if his wife is busy.

Children are highly respected by their parents, and no child is ever given any punishment unless he has done something unpardonably wrong. As a rule, a Yao without a son will adopt a child of his relatives. This child inherits his property, and is held responsible for his funeral. The adopted son is always treated as though he were the man's own child.

Correlative with the economic independence of women amongst the Yao, and with the high position of women in the family, goes an allowance of divorce (although different villages may differ in the frequency of divorce). Any one of the following conditions may lead up to divorce:

(a) If the husband beats his wife.

(b) If the husband or wife refuses to cooperate with the other and prefers a quarrel.

(c) If the mother-in-law and father-in-law are querulous or talk evil of the daughter-in-law.

(d) Sterility in the woman (this sometimes results in the adoption of a child).

(e) If the step-mother maltreats the children of the former wife, or if the step-father maltreats the children belonging to the woman's former husband.

In most cases, having had some trouble with her husband, the woman will run back to her parents. This indicates her desire for a divorce, which, unlike courting, is almost always initiated by the woman. If her husband is anxious to become reconciled with her, he goes to see her and to persuade her to come back to him. She may or may not give in. If she thinks she had better not be his wife any more, then she lives with her parents until someone courts her and takes her as his wife. But before doing this, she must make a contract in writing with the divorced husband, stating that there is no possibility of their reunion. It is not good for any woman who has divorced her husband ever to stay with her brother's wife. If she ever does so, her sister-in-law will consider it as a great insult, and in consequence she will demand a divorce from her husband, the brother of the intruding (and divorced) guest.

Since the priests are the only people who can read and write, one of them will be asked to write the contract for the divorced couple. This is writen according to the advice of the witnesses, who are the father, uncle, brothers or cousins of the wife, and some relatives of the husband. In this contract or divorce certificate, it is also stated how the children are going to be distributed. If the number of children is even, each spouse will take an equal number of them, or else the distribution will depend on the general opinion of the witnesses. To express his gratitude for the help from the priests and witnesses, the husband may entertain them with a great quantity of wine.

Widows as a rule bring their children with them if they remarry. The sons will be restored to their father's relatives when they grow up, but the new family, if they so wish, may keep the daughters. When widows remarry, the only goods that they can bring with them are their personal belongings, such as clothes and ornaments, and their dowry land. A widow never remarries during the hundred days after her husband's death. It is believed that as a penalty for the breach of this rule the widow is haunted by her former husband's ghost.

The courting of widows is, like all courting, initiated by the man, but this kind of courting is less formal. A man may court a widow in the daytime, on his way to the fields or back to the village. If she is willing to marry him at once, she can go home with him. Then he consults a priest who will fix a date on which the relatives will be invited to a feast. A second marriage involves little ceremony or expense, and seldom takes place in the formal wedding season. If a man who has never married before marries a widow, he has to give twelve catties of beef and ten catties of wine to her parents or kinsmen. But if it is a widower he has to give her parents or kinsmen only six catties of beef and ten catties of wine.

Little approval is given to a widow who, having had an unsuccessful second marriage, comes back to her adult children by her

former husband. It is generally believed that if the mother should ever do so, her sons would never become prosperous.

Pre-marital chastity or chastity in general on the part of the woman, is not emphasized by the Yao, although there is some restriction upon adultery. The Yao community is a place where there are various kinds of social forces that make chastity impossible.

In the course of every year, there are two festivals in which the young and the middle-aged people make merriment. The first one falls on the New Year's Day and is known as "Letting the Cattle Out of the Shed" (放牛出欄). This day ends up their long winter vacation, and plowing begins on the next. A priest wearing a colored costume leads the villagers to a neighboring hill. First of all, this priest plows a portion of the earth on the hill. Then he puts away the plows and the people in one big crowd throw firecrackers at him. He runs, jumps, kicks like a buffoon trying to avoid the firecrackers. Thus he makes a most amusing spectacle to the onlookers who watch in great excitement.[10] As soon as this amusement is ended, the boys and girls of the age of fifteen or above, and the men and women of middle age, will find their own partners and scatter all over the hills and valleys, and even in the firewood storehouses dancing and singing. Following this, there is free sexual relationship.

The second festival occurs on the twenty-fifth of the eighth moon, and is called "The Birthday of the Ancestor" (大廟亞公生日). The young men, women, boys and girls are again the participants. As in any festival, they are dressed in their best clothes, have their faces washed, and hair beautifully decorated. After dancing and singing there is free sexual union. The husbands and wives must be tolerant. No matter with whom their spouses are having a merry time, there must arise no interference or jealousy. A short time before supper these folks will return to the *pai*. To celebrate the ancestor's birthday, two dozen or even more cattle are killed for food. All the villagers will buy some of the beef, and every family will have at least two meals of beef cooked with noodles. The people consider this a very important day, and they never eat such delicious food at any other time of the year.

There are, as well as the above two annual festivals, greater festivals occurring at longer intervals of time. These greater festivals are the *Tai Koh Tong* (大歌堂), *Siu Koh Tong* (小歌堂) and *Wong Koh Tong* (旺歌堂) which occur once in every five, in every twelve or thirteen, and in every fourteen or fifteen years, respectively.

[10] The priest is paid three hundred catties of rice for this New Year's Day duty and for his duties in subsequent year. It is his duty to look after the village temple for the rest of the year, and to make sacrifices to the idol gods on every first and fifteenth day in the month. The priest selected for the year may come from another village, in memory of an old relationship with it, centuries ago; or he may be a dweller in the village.

The *Tai Koh Tong* is celebrated in the ninth moon. During this festival, all the idols in the village temple on the sumit of the hill are taken out to be carried in a procession. At the head of the procession will be some men beating drums and wearing beautiful embroidered skirts. The men do the carrying. The festival lasts for nine days. Even at night the idols are not brought back to the temple, and the men build little roofs with bark for sheltering them in the different parts of the *pai*. The men sleep in the open air at night. Those who are above middle age and know the legends, history and traditions of their own tribe, will tell these to the others who are ignorant of them. That is the way in which legends, history and tradition are handed down from one generation to another. The young folks will have a merry time; they find partners to dance and sing and do whatever thing they like.

The *Siu Koh Tong* takes place at the end of the year. During this festival, which lasts a few days, all the natives except the old ones, go to the neighboring hill to dance, sing and have a merry time. This is also followed by sexual union.

The *Wong Koh Tong* is religious in nature, and different from the other festivals in some respects. This kind of celebration is managed by the people belonging to different family temples. Each family takes turns in playing important roles in the celebration, and is responsible for paying the priests for helping them in chanting and worshipping. No money is given to the priests but, instead, many puddings are given to them.

Although the social forces of a Yao community make chastity impossible, there are very few cases of illegitimate children. This is not strange as the young are either married or capable of marrying, and widows and widowers generally remarry. Where illegitimate children occur, as they do rarely, they are not reared. Adultery, which is a punishable offense, is always counted against the man, if he is caught in the act. When he is seized, he will have to pay a fine of sixty to ninety catties of wine. The husband of a woman who commits adultery will divorce his wife.

猺族家中之生育婚嫁與喪葬

李季璜

(摘 要)

猺族婦女有擇偶自由，嫁奩以耕地爲主，並有權提出離婚。結婚後在丈夫父母家僅能居留一載。到期與夫另組獨立家庭。狂歡節令男女雜沓調笑縱淫以爲樂，不禁也。但私生兒尚罕見。平日有通姦情事則處罰綦嚴。

BOOKS AND SPECIAL PUBLICATIONS

ORCHIDS. FIRST TWENTY, by G. A. C. Herklots, 62 p., *15 pl., 34 fig.*, Hongkong Nature Series, published by the author, the University, Hongkong, 1938.

This very attractive little book is in the main a re-written account of articles on Orchids that appeared in the Hongkong Naturalist. One interesting chapter is by J. L. Young Saye, on Orchid Hunting on the Ma-On-Shan. Since Mr. Saye is evidently an enthusiastic amateur botanist, this chapter is the key note of the book, that is, a guide to amateurs. Twenty local species are carefully described in simple terms and illustrated by drawings and very good photographs. An introductory chapter describes the parts of an orchid, the principles of classification and the general habitat of the Hongkong species. On page 21, is a complete list of all the species that have been recorded from Hongkong. There is a brief glossary of scientific terms used in the book. The species described include one *Coelogyne*, a *Philodota*, a *Bulbophyllum*, a *Diploprora*, an *Acampe*, a *Phaius* and a *Spathoglottis*. There are six species of *Habenaria* described, one *Arundina*, one *Paphiopedelium*, one *Nephelaphyllum* and four *Calanthes*. On page 36, under *Phaius grandifolius*, the statement is made that this is the only species found in China. At least one other species has been found in Kwangtung Province by collectors for the Lingnan Herbarium, *Phaius maculatus* Ldl. The book is attractively gotten up. The descriptions are clear and simple and there are very few errors in the printing. Every orchid lover, especially in the Far East, will find this book indispensible.

Wm. W. Cadbury.

THE WORLD WAS MY GARDEN, by David Fairchild, 8vo., cloth, 510 p., *206 illus.*, Charles Scribner's Sons, N.Y., 1938. $3.75 U.S.

This is the autobiography of an internationally known plant specialist who from his young manhood was officially connected with the United States Department of Agriculture, and who tells an absorbing story of his wanderings over the globe seeking out new plants for the American farmers. David Grandison Fairchild was born in Michigan in 1869, spent his youth and received his early education there and in Kansas, obtaining his B. S. degree in 1888 and his M. S. degree in 1889 from the Kansas State Agricultural College at Manhattan. In later years he did graduate work in various European educational institutions, notably in Italy and Germany. He also received D. Sc. degree from Oberlin College in 1915. He was married to Marion Hubbard, daughter of Alexander Graham Bell, in 1905. He entered upon governmental service as a botanist in 1889, and not very long thereafter he became an agricultural explorer. In the years which followed he visited many parts of the world, making special researches in botany, and continued this type of activity until his retirement from active service in 1935. Among his more outstanding achievements were his extensive expeditions in search of economic plants for introduction into the United States, in the Dutch East Indies in 1895, in the South Seas, Siam, Australia and New Zealand in 1896-97, in West Indies, South America, Egypt, Ceylon, Dutch East Indies and New Guinea in 1898-1900, in Japan, China, Ceylon and Persian Gulf region in 1901-02, and in Africa in 1903. He was also in charge of the scientific work of the Armour expeditions to Morocco, Dutch East Indies, West Africa and the Carribean. He is past president of the American Genetic Association, a member of the board of directors of the National Geographic Society, and fellow or member of a large number of scientific organizations in various parts of the world. In addition to numerous official publications issued through the United States Department of Agriculture, he is also author of "The Book of Monsters" (1914) and "Exploring for Plants" (1930). Since his retirement, the greater part of his time has been spent either at his summer home at Baddeck, Nova Scotia, or at his winter home, Coconut Grove, Florida. The

list is a very long one indeed of the various plants of one kind or another which he introduced into the United States or in the introduction of which he had a part. These include numerous fruits, vegetables, and other plants of industrial interest, such as long-staple cotton, tung oil trees, and the bamboo. His account of the introduction of the famous Japanese cherry trees is one of particularly absorbing interest. J. S. W.

THE SILK ROAD, by SVEN HEDIN, translated from the Swedish by F. H. LYON, 8vo., cloth, 322 p., *31 pl., map*, E. P. Dutton & Co., N.Y. 1938. $5.00 U.S.

This book is a narration of the rediscovery and exploration of China's ancient Silk Road, that amazing highway some six thousand miles long, which was used nearly two thousand years ago to transport the silks and other merchandise of the East to the Western world. In 1933, Dr. Hedin, in discussing Chinese affairs with the Chinese Vice-Secretary of Foreign Affairs, suggested that a good way to prevent further losses of interior provinces would be the construction of a motor highway between China proper and Sinkiang, and shortly thereafter he was commissioned to conduct a survey for such a road. It proved to be an exceedingly difficult and dangerous undertaking, for much of the area to be traversed was the scene of a dozen wars. However, his expedition, in four lorries and a sedan, was pushed by him across desolate deserts and over wild mountains into the heart of Asia. The entire journey which they hoped to complete in eight months eventually took twice that time. But they did actually map out a roadway, which is now being used by the Chinese government and is today the longest motor road in all the world. J. S. W.

ABSTRACTS AND REVIEWS

Asahina, Syoziro. Odonata of Hokkaido. *Tenthredo* 2(2) :149-172, *1 map*, 1938.—About 200 species of Odonata are known to occur in the Japanese Archipelago. Of these 57 (3 doubtful) are reported from Hokkaido. Of the latter, *Sieboldius albardae* Selys is also known to occur in N. China, *Copera annulata* Selys is also from Formosa, and *Libellula sabina* is doubtfully reported from China.

Bailey, L. H. Species of *Rhapis* in cultivation. The lady palms. *Gentes Herbarum* 4(6) :199-208, *9 fig.*, 1939.—The Rhapises are rattan-like small palms that have long been favored as ornamentals. They are of Chinese origin. The genus is revised and 9 species are recognized. They are: *R. excelsa* Henry ex Rehder, probably "eastern China," with the variety *variegata; R. humilis* Blume "probably Chinese"; *R. filiformis* Burret from Kwangsi; *R. gracilis* Burret from Kwangtung; *R. laosensis* Becc. from Laos; *R. micrantha* Becc. from Tonkin; *R. multifida* Burret and *R. robusta* Burret from Kwangsi; and *R. subtilis* Becc. from Laos.

Bartram, Edwin B. Mosses of the Philippines. *Phil. Jour. Sci.* 68(1-4) :1-437, *29 pl.* (*510 fig.*), 1939.—This is a comprehensive survey of the moss flora of the Philippines. A total of 512 species, representing 180 genera, in 45 families, is described and figured. The affinities are primarily Malayan, but there is a marked Himalayan element in the mountains of northern Luzon and there is a high percentage of endemic species. Keys and descriptions are given to each species. Many of the species of the Philippines are also recorded from China and neighboring regions: "Asia" 3 species, China 29 species, Formosa 23 species, Korea 4 species, Hong Kong 5 species, Yunnan 8 species, and Manchuria 1 species.

Becker, Hans. Pre-Loessic faulting in the Nanking hills. *Bull. Geol. Soc. China* 17(3-4) :331-341, *2 fig.*, 1937.—There are still many phases of the younger geological history of the Nanking region that are not understood. The present paper discusses the possible role of recent, pre-Loessic faulting.

Bernhauer, Max. Übersicht der *tetracarinatus*-Gruppe der Gattung *Oxytelus* Grav., Untergattung *Anotylus* Thoms., mit den Beschreibungen zweier neuer Arten. *Koleopt. Runds.* 25(1-2) :70-75, *1 fig.*, 1939.—A key to the species, which include 5 from China, 2 from Manchuria and 1 from Formosa. Two new species are described: *Oxytelus* (*Anotylus*) *Christianae* from Austria and *O.* (*A.*) *manchuricus* from S. Manchuria.

Bigot, A. Le petit pied de la Chinoise. *Rev. Méd. Fran. Extrême-Orient* 17(4) :321-372, *4 pl.*, 1939.—The discussion of the bound feet of Chinese women is divided into three parts: (1) Anatomy and physiopathology. Modifications in the bone and muscle structure and consequent changes in physiology of the foot are described. Binding was accompanied by great pain, frequently by skin diseases, gangrene and bone lesions. (2) History of the mutilation of the feet of Chinese women. The custom may have begun as early as the Fifth Century. According to some authors it began during the Sung Dynasty in the Tenth Century. In spite of edicts against it by the Manchu emporers, foot-binding was practiced extensively till the early days of the Republic of China when it was finally abandoned as a result of the efforts of progressive Chinese organizations and of foreign missionaries. (3) Ethnology. The custom was practiced all over China but never extended over the frontiers. It was first practiced and first discontinued by the upper classes. Original reason for beginning of the custom is unknown.

Chang, Hsu. Recent progress of physics research in China. *China Inst. Bull.* 3(5) :146-152, 1939.—A five page bibliography of Chinese contributions to physics is included.

Chang, K. S. Francis. Some new species of Chinese Acrididae (Orthoptera: Acrididae). *Not. Ent. China., Mus. Heude,* 6(1):1-59, *3 pl.*, 1939.—Ten new species and one new subspecies are described. Acridinae: *Chorthippus shantungensis,* related to *C. bicolor* (Charp.) and *C. vagans* (Eversm.), is from Shantung and Kiangsu; *C. chapini,* near *C. grahami* Chang, is from Szechwan; *C. hammarstroemi* ssp. *peipingensis* is from Shansi and central Mongolia; *Dasyhippus peipingensis* from Peiping and Shantung; *Aeropus licenti,* closest to *A. armeniacus* Uv., is from Shansi and Mongolia. Oediponidae: *Oedaleus manjius,* related to *O. infernalis* Sauss., is reported from Chekiang, Szechwan, Kweichow and Yunnan. Pyrgomorphinae: *Phymateus asiaticus,* compared to various African species, is from Szechwan. Catantopinae: *Caryanda methiola, C. sinensis,* and *C. omeiensis* are from Szechwan; *C. pieli,* related to *C. omeiensis,* is from Chekiang. For each genus species previously known from China are listed. *Dasyhippus przewalskii* (Zub.), *Oedaleus infernalis* Sauss., *O. decorus* (Germ.), *O. abruptus* (Thunb.), and *Caryanda elegans* Bol. are redescribed.

Chedecal, M. Contribution à l'etude du comportement trophique des anophélines a Hanoi. *Rev. Méd. Fran. Extrême-Orient* 21(8):1007-1011, *1 tab.*, 1938.—From serum tests it was found that *A. hyrcanus* var. *sinensis* and *A. vagus* are the most important species of mosquitoes attacking man in Hanoi.

Clay, Theresa, and **Rothschild, Miriam.** Ectoparasites from captive birds. I. 1936-1937. *Novitat. Zool.* 41(1):61-73, 1938.—Birds dying at the London Zoo (128 birds of 91 species in 34 families) were examined for parasites. A total of 48 species of Mallophaga, 58 of Acarina and one of Siphonaptera were found. A Kirghiz Pheasant (*Phasianus colchicus mongolicus* (Brandt)) from Mongolia was infested with *Lipeurus caponis* and *Goniodes meleagridis.*

Cressey, George B. The land forms of Chekiang, China. *Ann. Assoc. Amer. Geogr.* 27(4):259-276, *2 pl., 14 fig., 1 tab.*, 1938.—The most conspicious geological features of Chekiang are the widespread rhyolite flows. "Beneath these Upper Cretaceous extrusions the sedimentary record goes back to the early Paleozoic, while above the rhyolite are Tertiary red beds and recent alluvium." There are five principal land forms: coastal flatlands comprising 18% of the area; interior lowlands, 8%; rolling hills, 6%; mountainlands, 65%; steeplands, 3%.

Daniel, Franz. Beiträge zur Kenntnis der Gattung *Lithosia* F. (Lep. Arct.) I. *Mitteil. Münchner Ent. Ges.* 29(1): 44-54, *5 fig.*, 1939.—Notes are given on 11 species and subspecies of *Lithosia* F. *L. innshanica* n. sp. is described from Mongolia.

Draudt, M. Die Gattung *Orthogonica* Fldr. (Lep. Noct.) in den Höne-Ausbeuten. *Ent. Runds.* 56(15):145-150, *2 fig.*, 1939.—There is a key to 8 species. The new species *O. tapaishana, O. basimacula* and *O. denormata* are all from China.

Eggers, Hans. Japanische Borkenkafer II. *Arb. morph. tax. Ent. Berlin-Dahlem* 6(2): 114-123, 1939.—Of the ten new species of bark-beetles described, 8 are from Formosa.

Fowler, Henry W. A synopsis of the fishes of China. Part VII, cont. The perch-like fishes. *Hong Kong Nat.* 9(3):141-164, *9 fig.*, 1939. This instalment is devoted to the family Pomadasyidae. Keys are given to the genera (8) and the species (23). Each species is described, nine are figured and geographical distribution is given for each.

Furtado, C. X. The typification of *Bombax, Gossampinus* and *Salmalia. Gard. Bull., Straits Settlements,* 10(1):173-181, 1939.—The author's conclusions, based upon his painstaking investigation of the bearing on the subject

of this paper, are summarized by him in the following points: "(1) that the typification of *Bombax* made by Schott and Endlicher (Metel. 1832), and later by Dr. Bakhuizen (Bull. Jard. Bot. Buitenz. VI, 1924, pp. 161-240), is the correct one; (2) that the typification recommended in the Rules cannot be accepted; (3) that, unless the evidence produced below is wrong, the name *Gossampinus* cannot be maintained except as a synonum of *Ceiba;* and (4) that *Salmalia* Schott et Endl. (1832) is the legitimate name for *Gossampinus* Ham. sensu Bakhuizen (1924)." After a very interesting presentation of the evidence in detail, the results are further clarified and simplified by the author's conclusions, which are as follows: "(i) The lectotype species (*Bombax malabaricum* DC) recommended in the Rules for the genus *Bombax* L. (1753) is unacceptable; it violates the very fundamentals of the type-concept embodied in the Rules. (ii) The genus must be typified on the American *Bombax Ceiba* L. (1753) sensu stricto, the only species left in the genus out of the original three. (iii) If *Bombax* L. is typified on the Asiatic *B. malabaricum* DC (1824) great nomenclatural changes will follow: the American plants now referred to *Bombax* L. sensu strictissimo (with *B. Ceiba* L. sensu stricto as the lectotype) will be without a generic name. (iv) *Gossampinus* Ham. as restricted by Schott and Endlicher (1832) is merely *Ceiba* Gaertn. This sense must be accepted. (v) *Gossampinus* Ham. quoad alteram partem is *Salmalia* Schott et Endl. (1832) which is the legitimate generic name having as its type *Salamlia malabarica* (DC) Schott et Endl. = *B. malabaricum* DC (1824)." The one species of Silk Cotton common in cultivation is southern China (an exotic, from the Malay Archipelago) known locally as Muk Min (木棉), after having been identified by botanists for many years as *Bombax Ceiba* L., and more recently as *Gossampinus malabaricus* (DC) Merr., will now have to be called *Salmalia malabarica* (DC) Schott and Endl., if the conclusions of the author of this paper are accepted.

F. A. McClure

Gahan, A. B. Notes on some genera and species of Chalcidoidea (Hymenoptera). *Proc. Ent. Soc. Wash.* 40(8):209-227, 1938.—Among the species treated are *Brachymeria femorata* (Panzer), which is recorded from Hong Kong, and *Eurytoma monemae* Ruschka from Tientsin.

Galliard, H. Contribution à l'étude de la filariose humaine à *Filaria malayi* et *Filaria bancrofti* au Tonkin. *Ann. Ecole Sup. Med. Phar. Indochine* 1:53-62, 1937.—Galliard records *F. malayi* in Tonkin. From a comparison of the present-day incidence of filariasis (*F. malayi* and *F. bancrofti*) with the records of Mathis and Leger (1911) it appears that filariasis has not increased in Tonkin during the past 26 years. The incidence of the 2 species in different areas is as follows: in the delta, of 1,121 examined, 5.1% had *F. malayi* and 2.2% had *F. bancrofti;* in the middle region, of 251 examined, 1.2% *F. malayi* and 1.6% *F. bancrofti;* in the upper region, 0.4% *F. malayi* and 3.3% *F. bancrofti.* Taken as a whole, the number of cases of *F. malayi* is about twice those of *F. bancrofti.*

J. J. C. B. *in* Helminth. Abst.

Goltz, D. H. Frhr. v. d. Die Callerebien der Ausbeute Höne. *Ent. Runds.* 56(11):102-107, 1939.—The *Callerebia* and *Loxerebia* are treated in this section. *C. orixa suroia* Tytl. is from Likiang, *C. orixa atuntseana* n. subsp. from Yunnan; *L. pratorum* Obth. is described from Likiang, *L. saxicola* Obth. from Peking, *L. phyllis distincta* n. subsp. from Szechwan.

Hennig, Willi. Beiträge zur Kenntnis des Kopulationsapparates und der Systematik der Acalyptraten. II. Tethinidae, Milichiidae, Anthomyzidae und Opomyzidae. *Arb. morph. tax. Ent. Berlin-Dahlem* 6(2):81-94, *1 pl., 12 fig.*, 1939.—The genitalia of various species of the different families are described and figured. Among the examples chosen for study are the following from Formosa: *Milichiella Bakeri* Aldrich, *Desmometopa tarsalis* Loew, and *Amygdalops geniculata* de Meij.

Herklots, G. A. C. The birds of Hong Kong. Part XXXI. *Hong Kong Nat.* 9(3) :99-101, *2 pl.*, 1939.—Biological notes on *Caprimulgus indicus jotaka* T. and S. and *C. monticola amoyensis* Baker.

Heywood, G. S. P. Clouds and the weather. *Hong Kong Nat.* 9(3) :119-128, *2 pl., 5 fig.*, 1939.—This article tells something of the clouds and sky from the point of view of the amateur meteorologist of Hong Kong. The types of clouds and the methods of cloud formation are described. The weather of Hong Kong is largely governed by the monsoons. The comparatively dry NE. monsoon of early winter brings cool sunny weather. After New Year the air passes over the seas east of China bringing cloudy weather. In early spring and summer the weather is governed by warm, damp southerly or south-westerly winds, in September by easterly winds from the Pacific, which often bring typhoons. Typhoon clouds, thunderstorms, and the optical phenomena often seen in Hong Kong are described.

Hone, Hermann. Mein Sammeljahr 1938. *Ent. Runds.* 56(24) : 257-261, 1939.—The author describes his collecting during 1938 in China.

Horn, Walther. Über Insekten-Götter und Heuschreckenkäfige in China und Mandschukuo. *Arb. phys. angew. Ent. Berlin-Dahlem* 6(1) :62-65, *1 pl., 1 fig.*, 1939.—The author has previously reported on the "insect-gods" of China [see *Ling. Sci. Jour.* 15 :520]. There are notes on the "insect-gods" of Manchukuo. In addition, cricket cages are described and a number of ingenious one are figured.

Hsu, Te-You. Notes on the Triassic formations and faunas of the Yuan-an District, western Hupeh. *Bull. Geol. Soc. China* 17(3-4) : 363-391, *2 pl., 2 fig.*, 1937.—Tayeh limestone is identified as a Lower Triassic formation. Fossils obtained from it were 3 species of *Ophiceras* (Cephalopoda), *Schafhautlia* sp. (Pelecypoda), and *Worthenia* sp. (Gastropoda). The name Patung series is restricted to the lower purple shale and the middle limestone of the Middle Triassic of the Yangtze Gorge. The upper purple shale is considered to be Upper Triassic and the name Yuan-an series is here proposed. The shale contained several species of Pelecypoda : *Avicula arcuata* Munster, *Pseudomonotis* n. sp. ind. aff. *P. pygmaea*, *P. subillyrica* n. sp., *P. illyrica* Bittner, *P. i.* var. *crassistriata* n. var., *Myophoria goldfussi* (v. Ziethen), *Lima convexa* n. sp., and *Anodontophora gregarea* (Quenstdt). All the species are described. All the specimens are generally of small dimensions.

Hsu, Yin-chi. The mayflies of China. (Order Ephemeroptera). *Peking Nat. Hist. Bull.* 12(3) :221-224, *3 fig.*, 1938.—In this section the new genus *Neopotamanthodes*, with *N. lanchi* n. sp. and *N. nanchangi* Hsu, is described.

Isshiki, O. On a nematode *Trichostrongylus axei* (Cobbold, 1879) from cattle and Noroshika in Chosen (Korea). (In Japanese with English summary.). *Jour. Japanese Soc. Vet. Sci.* 16(1) :61-89, 1937.

Isshiki, O. and **Ogata, S.** On a nematode, *Capillaria bovis* (Schnyder, 1906), from a Chosen calf. (In Japanese with English summary.) *Jour. Japanese Soc. Vet. Sci.* 16(2) :240-249, 1937.

Jordan, Karl. In memory of Lord Rothschild. *Novitat. Zool.* 41(1) :1-41, *13 fig.*, 1938.—A bibliography with list of scientific publications of Lord Rothschild, 1868-1937.

Jordan, Karl. On the remarkable variation of an oriental hawk-moth (Lepidoptera). *Novitat. Zool.* 41(2) :126-129, *1 pl., 4 fig.*, 1938.—The new subspecies *Polyptychus trilineatus kalisi* is described from central west Celebes. The variations of the species (9 subspecies) are discussed. *P. t. chinensis* R. and J., described from China, is now considered to be a distinct species.

Joyeux, C., and **Baer, J.** Sur quelques cestodes de Cochinchine. *Bull. Soc. Path. Exot.* 30(10) :872-874, 1937.—Joyeux and Baer record the presence in Cochin-China of *Taenia taeniaeformis* in *Viverra zibetha* and *Felis viverrina*, and *Sparganum mansoni* in *F. viverrina*. They also describe *Raillietina* (*Paroniella*) *ngoci* n. sp., from *Ducula badia griseicapilla*, a columbiform bird. It is distinguished from all other species of *Raillietina* in Columbiformes by the presence of a single egg in each uterine capsule.

P. A. C. *in* HELMINTH. ABST.

Juan, V. C. The last phase of the Hercynian movement in southern Anhui. *Bull. Geol. Soc. China* 17(3-4) :323-330, *4 fig.*, 1937.—From a description of 3 cases it is established that an important orogenic movement occurred in post-Lungtan and pre-Chinglung time. "According to the recent statement made by S. Chu, C. Li and Y. Y. Lee the Lungtan coal series is supposed to belong to Upper Permian. So that the date of the movement is approximately at the end of Palaeozoic. The movement would therefore exactly correspond to the Suwanian of J. S. Lee."

Kanervo, Erkki. Zur Systematik und Phylogenie der westpaläarktischen *Eristalis*-Arten mit einer revision derjenigen Finnlands. *Ann. Univ. Turku., ser. a*, 6(4) :1-54, *7 fig.*, 1938.—A taxonomic and phylogenetic revision of the genus *Eristalis*, especially of the species of Finland. *E. arbustorum* L. is also from Formosa, *E. ventralis* Thoms. from China, *E. horticola* Degeer. from S. Asia, *E. cerealis* from China, *E. arvorum* Fabr. from Formosa, *E. ocularis* Coquill. from Korea and Formosa.

Kariya, S. On the relation of the food plants of *Dendrolimus spectabilis* Butl. to the percentage of adult emergence. (Preliminary report.) (In Japanese.) *Oyo-Dobuts. Zasshi* 10(3-4) : 166-167, 1938.—Larvae are exceedingly injurious to pines in S. Manchuria and prefer *Pinus tabulaeformis*. In experiments, 30% of the larvae gave rise to adults when fed on *P. tabulaeformis*, *P. bungeana*, *P. densiflora*, *P. sylvestris* and *P. nigra*, and less than 30% did so when fed upon *P. koraiensis*, *P. ponderosa*, *P. strobus*, *P. banksiana* and *Larix kaempferi*. Although the larvae fed slightly on *P. rigida*, *P. excelsa*, *Abies* spp. and *Picea* spp., none gave rise to an adult.

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Kellogg, Claude R. Bee-keeping in Fukien Province. *Frontier, Bees and Honey* 19(12) :450-451, 465, *3 fig.*, 1938.—Traditional methods of bee-keeping are described. The principal honey plants are the litchi (*Litchi chinensis*), and the lungan (*Nephelium longan*). Foulbrood diseases are unknown but some of the large wasps are troublesome, as are the wax moths. The native bee is the *Apis indica* var. *peroni*. Introduction of Italian bees has been unsuccessful.

Kishima, Toyochi, and **Okamura, Masahisa.** New varieties of the pineapple. (In Japanese with English title.) *Formosan Agri. Rev.* 35 (2) :137-144, *2 fig., 5 tab.*, 1939.

Kôno, Hiromichi. Neue und wenig bekannte Käfer Japans V. Gattung *Demimaea;* VI. Gattung *Anthonomus. Ins. Matsumurana* 13(2-3) : 71-80, *6 fig.*, 1939.—V. *Demimaea fascicularis* (Roelofs), *D. minuta* Voss, and *D. basalis* n. sp. are from Formosa. VI. *Anthonomus pomorum* (L.) is from Korea, *A. albomaculatus* n. sp. from Formosa.

Kôno, Hiromichi, and **Tamanuki, Kôichi.** Die Ipiden, schädlich an Sachalintannen und Ezofichten in Sachalin. (In German with Japanese summary.). *Ins. Matsumurana* 13(2-3) :88-96, *1 pl.*, 1939.—Among the 20 species treated, *Hylurgops glabratus* Zett. is from Korea and China; *Crypturgus pusillus* (Gyllen.), *Dryocoetes autographus* (Ratz.), *Trypodendron lineatum* (Oliv.), *Pityogenes chalcographus* L., and *Ips typographus* (L.) f. *japonicus* Niijima from Korea.

Latham, Ada M. *Tanichthys albonubes* (Lin) (White Cloud Mountain fish). *Aquarium* 7(8) :131, 1938.—The author describes the color variation between the two importations of this fish from Canton to Vermont and California. Notes are given on the breeding of both varieties.

Li, Chingyuan Y. A quarter century of Chinese physical geography, 1911-1938. *China Inst. Bull.* 3(5) :137-143, 1939.

Lin, S. Y. Fish air-bladders of commercial value in China. *Hong Kong Nat.* 9(3) :108-118, *1 pl., 7 fig., 4 tab.*, 1939.—Fish air-bladders are regarded as a luxury food and also as having some medicinal value. The bladder is an elastic, hollow sac and serves the fish as an organ of equilibrium. It is composed of protein and water with traces of fat, calcium, phosphorus, iron and potassium. Bladders of commercial importance are those of the yellow-lipped croaker (*Bahaba flavolabiata* (Lin)), the slate-cod croaker (*Nibea diacanthus* (Lacépède)), the white croaker (*Wak coibor* (Ham. Buch.)), the yellow croaker (*Pseudosciaena crocea* (Rich.)), the conger-pike (*Muroenesox arabicus* (B. and S.)), the puffer (*Lagocephalus lunaris* (B. and S.)), the sea catfish (*Arius falcarius* (Rich.)). The weight of the air-bladder is fairly proportional to that of the fish. Methods of preparation of the bladders for market, price range, food value and methods of cooking are described. Isinglass is also prepared from fish air-bladders and used in high-class glues for furniture making.

Masera, E. Artropodi dannosi al *Bombyx mori* L. ed alla seta. *Atti Acc. Padova N. S.* 53 :139-157, *8 fig.*, 1937.—A review from the literature of the Arthropods harmful to *B. mori* or to silk in Europe and Asia, with 38 references. REV. APPL. ENT.

Matsumura, Shonen. A new *Zephyrus*-species from Formosa. *Ins. Matsumurana* 13(2-3) :110, *2 fig.*, 1939.—*Z. rarasanus* n. sp. is related to *Z. hisamatsusanus* from Japan.

Matsushita, Masaki. Zur Kenntnis der Japanischen Cerambyciden (IV). *Ins. Matsumurana* 13(2-3) :56-60, 1939.—*Demonax arcuata* and *Monochamus sintikensis*, both new species, are from Formosa.

Mimura, H. The seasonal changes in starch and fat reserves of the hardy and not hardy Manchurian pine trees (*Pinus tabulaeformis* Car. var. *Mukudensis* Uyeki) (In Japanese with English résumé.) *Ecol. Rev.* 4(1) :1-16, 1938.

Mira, Yushiro. On a longicorn-beetle injurious to natalbark (*Acacia morissima*) in Taiwan. (In Japanese with English title.) *Formosan Agri. Rev.* 35(6) :450-454, *3 fig.*, 1939.

Mu, J. W., and **Kurotchkin, T. J.** Statistical and mycological studies of dermatomycoses observed in Peiping. *Chinese Med. Jour.* 55 (3) :201-219, *7 tab.*, 1939.—A study was made of 92 cases of favus of the scalp, 1,104 cases of tinea of the scalp, 760 cases of tinea of the body, 526 cases of tinea of hands and feet, and 49 cases of tinea of the nails. Mycologically, the fungus responsible for the favus of the scalp was found to be *Achorion schoenleinii*; for tinea of the scalp, *Trichophyton violaceum, T. endoectothrix, Microsporon ferrugineum* and *T. glabrum*. The most important etiological agent of tinea of the body was *Epidermophyton rubrum*, which was also common in tinea of the hands, feet and nails.

Neuville, Henri. Quelques remarques sur le crabe dit "a face humaine" ou "des Samouraïs" (*Dorippe japonica* von Siebold) et son rôle dans le folklore de l'Extrême-Orient. *Bull. Mus. Nat. Hist. Nat.*, ser. 2, 10(1) :48-56, *5 fig.*, 1938.—Notes on the biology of and folk lore associated with *D. japonica* in China and Japan.

Ogata, Yasumi, and **Ishimaru, Hakaru.** Influence of fertilizer ingredients on yield of castor seeds and on quality of the castor oil. (In Japanese with English title.) *Formosan Agri. Rev.* 35(3) :190-197, 1939.

Ogura, Tsutomu. Morphology of north Manchurian volcanoes. *Goegr. Rev. Japan* 14(11) :893-907, 1938.—The N. Manchurian volcanoes, especially those near Mergen, have truncated cinder cones, standing on the valcanic shields, with craters on the summit and consist of basic alkaline rock with occasional leucite. The groups gather in the district of intersection of Great Khingan and Small Khingan Mts., and the cones are arranged in the directions of NE-SW, NW-SE, or N-S. Three kinds of lava flows are distinguished : (1) block lava, (2) spiny or aa lava, (3) ropy or pahoehoe lava. The birth of most of these volcanoes is believed to have occurred after the accumulation of the Diluvial sand and gravel and the newest is recorded to have dated from 218 years ago in the eruption of Laoheishan and Huoshaoshan of the Wutalienchih volcano.

From review in MEM. RYOJUN COLL. ENG., MANCHURIA

Pei, W. C. On the Upper Cave industry. *Peking Nat. Hist. Bull.* 13(3) :175-180, *3 pl.*, 1939.—The stone implements of the Upper Cave industry (Choukoutien) include large stone choppers and flake tools of flint and quartz. Among the latter are "bipolar" types similar to those of the Sinanthropus industry. The bone objects include a needle and a polished fragment of antler suggestive of the European *bâtons de commandement*. Ornaments were the characteristic element of the industry as represented at this station. Notable among them are stone beads, drilled from one or both sides, and sometimes colored. The raw materials indicate that the people had communications ranging as far as 350 kilometers. Burial seems to have been practiced, with hematite powder sprinkled over the dead. Clothing may be inferred from the needle. Evidences of fire are abundant. The industry does not correspond typologically with the European cultures of similar geological age. CHARLOTTE GOWER

Pellegrin, Jacques. The "Scats." *Aquarium* 8(2) :24-26, *2 fig.*, 1939. —Popular notes on the *Scatophagus* species as aquarium fishes. The taxonomy of some of these species is also straightened out. Among others treated is *S. argus* from British India, the East Indies and China.

Rajagopalachari, S. P., et al. Symposium on "Rice." **S. P. Rajagopalachari.**—Opening Address; **B. Sanjiva Rao**—Some aspects of the chemistry of rice; **B. K. Narayana Rao**—Rice as food, in its relation to health; **V. K. Badami**—Paddy work in the Mysore Province; **A. Srinivasan**—Parboiling of rice; **V. Sadasivan and A. Srinivasan**—Nutritive value of rice varieties; **A. Srinivasan**—Some aspects of the nutrient requirements of the rice plant. *Proc. Soc. Biol. Chem., India*, 3(3) :73-85, 1938.

Rivoalen, A. La filariose en Extrême-Orient. *Rev. Méd. Fran. Extrême-Orient* 17(3) :260-264, *2 fig.*, 1939.—Two species of filaria are common in the Far East : *Wuchereria Bancrofti*, carried by *Culex fatigans* and *Culex Pipiens;* and *Microfilaria Malayi*, borne by *Mansonia* spp. and by *Anopheles Hyrcanus* and *Taeniorhyncus*. The two species are distinguished and notes are given on their incidence in various countries.

Saeki, Hideaki. The agricultural status of Hainan Island, China. (In Japanese with English title.) *Formosan Agri. Rev.* 35(3) :219-228, 1939.

Sakurai, Kyuichi. Beobachtungen über Japanische Moosflora. XIX. *Bot. Mag.* 53(630) :246-251, *6 fig.*, 1939.—Geographical records are given for Japanese species of *Ptychomitrium*, including *P. formosicum* from Taityu, Formosa.

Sawada, Kaneyoshi. The blast disease of rice plants. II. Relation among fertilizer amount, frequency of the disease and yield of rice. III. Relation among fertilizer amount, frequency of the disease and seeds of rice. IV-V. Relation between the disease on leaves and quantity of fertilizers. VI. Relation among the leaf tissue, the disease on leaves and quantity of fertilizers. VII. Relation among the tissue of panicle stalks, the disease on the stalks and quantity of fertilizers. VIII. Relation among the tissue of stem nodes, the disease on the nodes and quantity of fertilizers. (In Japanese with English titles.) *Formosan Agri. Rev.* 35(1) :22-31, *6 tab.*; 35(2) :111-118, *8 tab.*, 35(3) :182-189; 35(4) :251-259, *8 tab.*; 35(5) :383-387, *2 tab.*; 35(6) :444-449, *3 tab.*, 1939.

Schretzenmayr, A. Extension du domaine géographique du kala-azar, apparition d'une épidemie à Canton. *Rev. Méd. Fran. Extrême-Orient* 20(7) :868-877, *6 tab.*, 1938.—The presence of *Leishmania Donovani* was first demonstrated in Canton Jan.-Mar., 1938, when 84 cases of kala-azar were found. Three cases were fatal. The disease was probably brought from the North by soldiers. Clinical aspects of the disease are discussed.

Shibata, Kikuo. Silk worm gut industry in China. I. Economical outline. (In Japanese with title also in English.) *Formosan Agri. Rev.* 35(6) :455-466, *3 tab.*, 1939.

Shibuya, Kisaburo. Some important agricultural crops of Kwangtung Province, China. I. Tobacco. II. Tea. III. Paddy rice, upland rice and sugar cane. (In Japanese with titles also in English.) *Formosan Agri. Rev.* 35(3) :229-237; 35(4) :300-305; 35(6) :476-484, 1939.

Soika, A. Giordani. Nuovi *Eumenes* (Hym. Vespidae). *Boll. Soc. Ent. Ital.* 71(3) :54-57, *4 fig.*, 1939.—*E.* (*Delta*) *kashmirensis* n. sp. is compared to *E. Waltoni* M. W. from Tibet.

Sonan, Jinhaku. Insects injurious to seeds of tea-plants. (In Japanese with English title.). *Formosan Agri. Rev.* 35(1) :38-45, *2 fig.*, 1939.

Sonan, Jinhaku. On the white grub (*Holotrichia sinensis*) injurious to the tea seedlings. (In Japanese with English title.) *Formosan Agri. Rev.* 35(3) :198-202, *5 fig.*, 1939.

Sonan, Jinhaku, and **Tadasa, Yutaka.** Influences of the white-wash to growth of teabushes. (In Japanese with English title.) *Formosan Agri. Rev.* 35(2) :83-110, *31 tab.*, 1939.

Sugimoto, M. and **Nishiyama, S.** On the nematode, *Tropisurus fissispinus* (Diesing, 1861), and its transmission to chicken in Formosa. (In Japanese with English summary.) *Jour. Japanese Soc. Vet. Sci.* 16(3) :305-313, 1937.—The authors have completed experimentally the life cycle of *Tropisurus fissispinus*. Insects, mainly Orthoptera, and annelids may serve as intermediate hosts. After ingestion the larvae develop to the infective stage in a period varying from 9 to 28 days. After ingestion by the definitive host, the larvae are freed and enter the glands of Leiberkühn where they reach maturity in about 90 days. P. A. C. *in* HELMINTH. ABST.

Svenson, H. K. Monographic studies in the genus *Eleocharis*—V. *Rhodora* 41(483) :90-110, *2 pl., 21 maps*, 1939.—This paper concludes the monograph on *Eleocharis* (see *Lingnan Science Journal* 17 :129, 18 :254 for abstracts of earlier parts). *E. tetraquetra* Nees. is described from China, *E. laeviseta* Nakai from Korea, *E. pellucida* Presl. from Formosa, Korea, and Indo-China.

Takahashi, H. Soil characters of sugar-cane fields and distribution of soil insects. *Jour. Formosan Sug. Plant. Assn.* 16(12) :336-344, 1938.—In investigations in Formosa, 29 species of insects were found in sandy soil and 22 in humus soil in sugar-cane fields. Of these, *Brachytrypes portentosus* Licht., *Gryllotalpa formosana* Shir., *Lacon musculus* Cand., *L. setiger* Bates, *Cardiophorus* (*Platynychus*) *formosanus* Mats. and *Aserica* (*Autoserica*) *formosae* Brenske, were much more numerous in the sandy soil, while some Scarabaeids were more numerous in the humus soil.
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Takahashi, R. On the galls of *Melaphis chinensis* Bell in Formosa. (In Japanese.) *Bull. Govt. Res. Inst. Formosa*, no. 148, 12 p., *4 fig.*, 1938.—*M. chinensis*, the migrant and nymphs of which are described, causes galls on the lower surface of the leaves of *Rhus javanica* var. *roxburghi* in Formosa. The dried galls contain 70.04% tannin, and investigations on the possibility of using them commercially were made in 1938. This aphid occurs in the mountainous region of northern Formosa, and the alate forms emerge from the galls, from mid-September, and migrate to mosses of the genus *Mnium*, on which they reproduce. In the laboratory, the migrants also produced young on another moss, but the nymphs died within 2 days. The galls are formed mostly on trees of moderate size, are less common on old trees, and do not occur on young ones. *Nurudea shiraii* Mats. also causes galls on the same tree, and these, when dried, contained 58.64% tannin. This aphid is very common throughout the Island up to about 5,000 ft. above sea level.
REV. APPL. ENT.

Takahashi, R. On mites injuring agricultural plants in Formosa. (In Japanese.) *Bull. Govt. Res. Inst. Formosa*, no. 144, 10 p., *3 fig.*, 1938.—*Tetranychus telarius* L. is very common in Formosa, all stages being found throughout the year. Its numerous food-plants include castor, sweet potato, cassava, mulberry and radish, but it is rare on cotton, though very injurious to it in Korea. The Coccinellids, *Stethorus rotundatus* Motsch. and *Scymnus* sp., and an unidentified Staphylinid are predacious on it, *Stethorus* sometimes reducing its numbers considerably. Another species of *Tetranychus* produces galls on the lower sides of the leaves of *Cephaëlis* (*Uragoga*) *ipecacuanha*, and *Stigmaeus floridanus* Banks, injuring seedlings of pineapple, on which it is common. *Tetranychina* sp. kills the leaves of the noxious weed, *Oxalis violacea*, from mid-April to July; it has not been found on other plants and is scarce from August to February. Eriophyids occur on some 16 species of plants in Formosa; they include *Phyllocoptruta* (*Eriophues*) *oleivorus* Ashm., which is very injurious to *Citrus*, but is well controlled by sprays of lime-sulphur, and an unidentified species of *Eriophyes* that attacks *Nephelium litchi*, and *N.* (*Euphoria*) *longana*, causing galls on the leaves. The latter mite also occurs in Foochow, China. *Rhizoglyphus echinopus* F. and R. is common on rocamboles [*Allium*] imported from Japan and China, but serious damage to them has not been observed in Formosa. REV. APPL. ENT.

Takahashi, S. Damage by the larvae of *Eucosma schistaceana* Snellen in the sugar-cane stalks for planting and the percentage of their emergence as adults. (In Japanese.) *Jour. Formosan Sug. Plant. Assn.* 16(4) :71-96, 1938.—In experiments in Formosa in which sugar-cane setts infested by larvae of *E. schistacaeana* were planted, 71% of the larvae abandoned them and about 17.6% gave rise to adults. About 12.5% of the larvae attacked the buds and shoots. Seed-cane may, therefore, be a source of infestation in the field.
REV. APPL. ENT.

Takahashi, S. On the relation of the degrees of growth of sugar-cane to the oviposition of the borers and the appearance of the withered hearts. 1. Observations on *Eucosma schistaceana* Snellen. (In Japanese.) *Jour. Formosan Sug. Plant. Assn.* 16(7) :135-153, 1938.—Observations in Formosa showed that half-grown sugar-cane, which is thickly leaved, is preferred by *E. schistaceana* Sn. for oviposition, and most dead-hearts appear in this stage of growth. Full-grown canes, 24-32 ins. in length, are preferred to young ones less than 8 ins. long, but fewer dead-hearts appear in them, since in this stage the borers do not attack the growing point of the stalk.
REV. APPL. ENT.

Takeuchi, Kichizo. Chinese sawflies and woodwasps in the collection of the Musée Heude in Shanghai. ***Not. Ent. Chin., Mus. Heude,*** 5(7) :59-85, *1 pl., 5 fig.,* 1938.—This is the first of a series of papers on the Symphyta of China. In the present paper 46 species are discussed, of which 6 are new to science and 22 are new to China. Types are in the Musée Heude. The new species are: *Tenthredella pieli* from Kiangsi, related to *T. sauteri* Rhwr. of Formosa; *Laurentia pieli* from Chekiang, allied to *L. ruficornis* Mâl.; *Macrophya abbreviata* from Chekiang, allied to *M. potanini* Jakow. from China; *Emphytus flavus* from Kiangsi and Kwangtung, near *E. nakabusensis* Tak. of Japan; *Allomorpha fulva* from Kiangsu, near *A. varicornis* Cam. of India; *Nematus* (*Holcocneme*) *pieli* of Kiangsu.

Tien, C. C. Devonian Brachiopoda of Hunan. (In English with Chinese summary.) *Palaeontologia Sinica,* new ser. B, No. 4, iv and 192 p., *22 pl., 41 fig., 63 tab.,* 1938.—A systematic study has been made of Devonian brachiopods collected since the publication of Grabau's monograph "Devonian Brachiopoda of China" in 1931. The Devonian of Hunan is re-classified as follows:

Super-formation: Lower Carboniferous, Hsuehfengshan sandstone with *Calamites* flora; Hiatus and disconformity
Devonian
Upper Devonian
IV. Hsikuangshan series characterized by *Yunnanella* and *Yunnanellina* fauna
I. Makuano limestone with *Yunnanella* fauna
H. Tutzutang limestone with *Yunnanellina* fauna
G. Changlungchieh shale
III. Shetienchiao series characterized by *Sinospirifer* fauna
F. Shetienchiao beds
E. Lungkouchung beds
Middle Devonian
II. Chitzechiao series characterized by *Stringocephalus* fauna
D. Chitzechiao limestone
C. Ichiawan shale
I. Tiaomachien series
B. Upper part, yellow weathered argillutytes or intercalated with limestone bands or inclusions characterized by *Stropheodonta* fauna
A. Lower part, in Changsha and Hsiangtan districts consisting of the following beds: 5, whitish gray sandstone and purplish shale with *Protolepidodendron* and Trematraspids; 4, yellow and purple shales with bivalves; 3, conglomeratic sandstone; 2, purplish shale and yellowish sandy shale carrying pelecypods and gastropods; 1, sandstone and conglomerate.
Unconformity (Kwangsian Movement)
Sub-formation: Silurian: Tanchiapa series or Tienmashan series.

Faunal assemblages are given for the following series: Upper part of the Tiaomachien (13 spp.), Ichiawan Shale (3 spp.), Chitzechiao Limestone (10 spp.), Shetienchiao (14 spp.), Hsikuangshan (49 spp.). There is a total of 87 different species and varieties. The horizon and locality and description are given for each. Thirty of the species, 25 of the varieties and one mutation are described as new to science.

Tokunaga, Masaaki. Japanese biting midges of *Bezzia* and *Palpomyia* (Ceratopogonidae, Diptera). *Tenthredo* 2(3) :273-328, *3 pl., 45 fig.,* 1939.—The species described were collected in Formosa, Sakhalin, Honsyu and Kyusyu.

Toumanoff, C., and **Try, H. T.** Recherche des parasites sanguicoles chez le buffle domestique au Tonkin. *Rev. Méd. Fran. Extrême-Orient* 17(4) :435-438, 1939.—In 1938, the following blood parasites were found in domestic buffalo: *Plasmodium bubalis, Piroplasma* spp., *Trypanosoma* spp. and microfilarias.

Villegas, Valente. Live stock industries of Cochin China, Cambodia, Siam, and Malaya. *Phil. Agri.* 27(9) :693-725, *18 fig.,* 1939.

Weidenreich, Franz. On the earliest representatives of modern mankind recovered on the soil of east Asia. *Peking Nat. Hist. Bull.* 13(3) :161-174, *6 pl., 4 tab.,* 1939.—The investigation of the Upper Cave at Choukoutien has produced remains of seven individuals, all showing indications of death by violence. There are evidences of funeral rites in connection with these bodies, but the skeletal parts are widely scattered. Dr. Weidenreich holds the opinion that the individuals constituted a single family group. It is thus surprising to find that the three skulls which permit detailed study exhibit the characteristics of three diverse racial types, being Mongoloid, Melanesoid, and Eskimoid respectively. At the same time all have relatively low orbits, and in this respect resemble their contemporaries in Western Europe. (The fauna of the Upper Cave indicates a Late Pleistocene date, and the artefacts are comparable to those of the European Upper Paleolithic.) The mixture of racial types in the Upper Cave is especially interesting in that it includes those strains which are recognizable among the American Indians. The Upper Cave population sheds no light on the origin of the Chinese.

CHARLOTTE GOWER

Wheeler, Louis Cutter. Notes on the genus *Aleurites. Bot. Mus. Leaf. Harvard Univ.* 7(7) :119-122, 1939.—The author calls attention to the varieties of *Aleurites* described in the following paper: Langeron, Maurice. 1902. Le genre *Aleurites* Forst. (Euphorbiacees), systematique—anatomie—pharmacologie. 160 pp., *52 figs.* Paris. L. Boyer.

Woodruff, Sybil, Chambers, Evelyn, and **Klass, Helen.** A study of protein extract from soybeans with reference to its use in food. *Jour. Agri. Res.* 57(10) :737-746, *2 pl., 3 tab.,* 1938.

Wu, Chenfu F. The stoneflies of China. (Order Plecoptera). *Peking Nat. Hist. Bull.* 12(3) :225-252, *47 fig.,* 1938.—The subfamilies Acroneuriinae and Chloroperlinae are treated. There are keys to genera and species. New forms are *Acroneuria quadriplagiata, Atoperla chekiangensis* and *A. nigra* from Chekiang; *Alloperla erectospina, A. longistyla* and *A. recurvata* from Kansu.

Yang, Tsun-Yi. Development of geology in China since 1911. *China Inst. Bull.* 3(5) :131-137, 1939.—The National Geological Survey was organized in 1916, the Research Institute of Geology (a part of the Academia Sinica) in 1927. The Geological Society has been active since 1922. Provincial surveys have been made of Hunan, Kwangtung and Kwangsi provinces. There are brief accounts of geological education, of expeditions into China and of the literature on Chinese geology.

Yasumatsu, Keizo. Three new or unrecorded Apoidea from Saghalien (Hymenoptera). *Ins. Matsumurana* 13(2-3) :66-70, 1939.—*Prosopis annulata* (L.) is also from Mongolia and Manchuria; *P. tamanukii* is related to *P. indistinctus* Morawitz from NW. China.

Young, C. C. An early Tertiary vertebrate fauna from Yuanchü. *Bull. Geol. Soc. China* 17(3-4) :413-438, *16 fig.,* 1937.—One unidentified crocodilian and 13 mammals are identified from the vicinity of Yuanchü. Six of the forms were already known from Mongolia. "This fact suggests that up to the Miocene tectonic disturbances, the climatic and topographic conditions were such in China as to permit easy communication all over the continent.

They heavy Mongolian *Eudinoceras kolobochiensis* is recorded as far south as western Hupeh." The fauna seems to include both Upper Eocene and Lower Oligocene fossils.

Young, C. C. New vertebrate horizons in China. *Bull. Geol. Soc. China* 17(3-4) :269-288, *1 pl., 1 fig.*, 1937.—Early work on Chinese fossils was mostly based on "dragon bones," fragments found in Chinese drugstores, and collected NE. Shensi and NW. Shansi. The present paper is a report on work done by the Geological Survey of China since 1930. The following horizons are entirely new : the Triassic Karroo fauna of reptiles related to the Karroo Dicynodont-fauna of S. Africa and found in Sinkiang and SE. Shansi; the Tung Gar deposits of Chahar are recognized as Upper Miocene; Mio-Pliocene Cyprinidae fauna in N. China; a new lowest Pleistocene level, below the *Sinanthropus* beds of the Choukoutien deposits, in which the deer, *Euryceros flabellatus*, is conspicuous; and the new Anyang fauna from the Yin Waste, of north Honan. Extensive new work has also resulted in many discoveries in the lower Cretaceous Dinosaurian faunas of Sinkiang, Szechwan and Ninghsia; in early Tertiary faunas in SW. Honan, at Changsintien, in W. Hupei, in Shantung and Shansi; in Pliocene mammals from the Yüshê Basin of SE. Shansi. Extensive new material of the Middle and Upper Pleistocene has also been found in the excavations at Choukoutien, in the Harbin deposits and in S. China.

[Issued and Mailed August 28th, 1939]

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No. 1. Fifty-one Common Ornamental Trees of the Lingnan University Campus by EGBERT H. WALKER. (Reprinted from the Lingnan Science Journal Volume 6, Numbers 1 and 2. Issued January 24, 1930.) 166 pages, copiously illustrated. Cloth binding. Price $1.00 Hong Kong currency.

No. 2. Plants of Lungt'aushan by G. WEIDMAN GROFF. An enumeration, with field notes and local names, of two collections of plants made under the auspices of Lingnan University. Lungt'aushan is located in Northern Kwangtung, and is a part of the extension of the Himalayan range which marks the transition zone between subtropical and temperate faunistic and floristic regions of China. Issued June 1930. 138 pages. Price $1.00 Hong Kong currency.

No. 3. Plants of Lantau Island I. by F. A. MCCLURE. Similar in plan to Bulletin No. 2. Two hundred and twenty-three species of seed plants and twenty species of ferns and fern allies are here enumerated, with field notes and Chinese names. The brief introduction is devoted to notes on the features of the area which have a bearing on the present state of the flora. Issued May 1, 1931. 44 pages, 1 map. Price $.50 Hong Kong currency.

No. 4. The Chemical and Physical Properties of Soybean Milk by CHIU YAN-TSZ. A comparative study of cow's milk and soybean milk conducted with a view to ascertain how soybean milk might be chemically improved as a food. Issued September 1931. 38 pages, 1 plate, 9 figures. Price $.50 Hong Kong currency.

No. 5. Preliminary Notes on the Fresh-water Fish Industry of South China, Especially Kwangtung Province by WILLIAM E. HOFFMANN. The history of fish culture in China is given briefly. Interviews with present-day fish farmers, conducted with the help of interpreters, have been set down much as given. Visits have been made to various regions where fish are reared, and observations of rearing, harvesting, and marketing are given in detail. The need for experimental study is pointed out and suggestions are made for practical procedure. Issued January 17, 1934. 70 pages, colored frontispiece, 11 plates. Price $.75 Hong Kong currency.

No. 6. The Flora of a Canton Herb Shop by F. A. MCCLURE and HWANG TS'UI-MEI. A brief introduction discusses herbalists in China and the part they play in the lives of the people. Following is a list of 108 plants which are used in dry or fresh form by the Chinese as medicine. The diseases for which the herbs are prescribed, the method of preparation of the medicine, and the effect produced according to Chinese observation are given. The names of the plants and diseases are given in Chinese and in romanization. Issued May 22, 1934. 32 pages, frontispiece. Price $.50 Hong Kong currency.

No. 7. An Abridged Catalogue of Certain Scutelleroidea (Plataspidae, Scutelleridae, and Pentatomidae) of China, Chosen, Indo-China, and Taiwan by WILLIAM E. HOFFMANN. This volume catalogues 480 species and varieties of three families of insects (commonly known as stink-bugs or shield-bugs) of the order Hemiptera; over 340 species and varieties have been recorded from China alone. For each species the original reference and all available taxonomic and also bionomic references (since 1909, the date of the latest world catalogue for these families) are given. Distribution for each species is arranged under faunal subregions; these subregions, and the general topic of the zoogeography of southeastern Asia, are extensively treated in an appendix. An annotated bibliography of 70 pages, covering over 500 titles, is included. Issued August 21, 1935. iv and 294 pages, 2 figures. Price $1.50 Hong Kong currency.

No. 8. A Study on the Loss of Nitrogen in Connection with the Use of Chemicals for the Killing of Hookworm Eggs in Nightsoil by FRANK LAI-NGI CHAN. A brief discussion is given of two problems connected with the use of nightsoil as a fertilizer, the spread of hookworm disease by this agency, and the loss of nitrogen during storage of nightsoil; Oldt's proposal that the first problem be attacked by the addition of chemicals is also discussed. The effect of this procedure on nitrogen loss in storage occupies the rest of the volume. Two analytical procedures which were worked out are described in detail, and the results obtained on nitrogen loss from nightsoil alone and from mixtures of nightsoil and ammonium sulfate are presented in the form of tables and curves. Conclusions applicable to the practical problem are discussed. A bibliography on nitrogen loss from nightsoil and liquid manures is appended. Issued September 1, 1936. v and 42 pages, 23 figures, 24 tables. Price $.50 Hong Kong currency.

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LINGNAN SCIENCE JOURNAL
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YAO RELIGION AND EDUCATION

By W. C. WANG (WANG WING CHOU, 宏永就)

(Continued from *Lingnan Science Journal* Volume 18, p. 382.)

Yao Religion

Yau Ling community possesses one great temple for communal religious purposes. The present temple, built of wood, is situated above the village. It is the largest building in the village, and measures thirty feet in length, twenty in width, and eighteen feet in height.

In the great temple of Yau Ling there are several carved wooden figures upon the altar. These carved figures represent certain ancestors. The largest figure, placed in the center, represents a man riding upon an ox, and is called Loh Gon. The oral tradition relating to Loh Gon runs as follows: When the Yao first came to Yau Ling they were very comfortable. But, after some years, there arose a man whose temper was not very good. He went out to many villages and made trouble wherever he went. One day when riding an ox out from Yau Ling, he fell down a steep place and was killed. After this incident the people at Yau Ling had trouble. Many people died, and others had misfortunes. They thought that all these troubles must be due to that bad fellow named Loh Gon. So they built a temple for him so that they might make sacrifices to him at every festival. Since all the members of the community were involved in this matter, they made, and still maintain, a great temple for the entire community, without distinction of separate clan, separate ancestry and separate surname.

Besides the figure representing Loh Gon, there are figures representing founders, or early ancestors of each separate surname in Yau Ling. The founder of the Tong surname, and the founder of the Fong surname are represented. These men are reported to have died peaceful deaths. There are two figures representing ancestors of the Poon surname, and one representing an ancestor of the Lung surname, who, all three, died violent deaths, and whose deaths, like that of Loh Gon, were followed by epidemics or a sequence of deaths by sickness. There are also some figures representing other village heroes who died violent deaths and whose ghosts needed special placating. The appeasement of these ancestors by periodic sacrifices in the temple which bears their wooden images is believed to be necessary for public health.

The festival days of the year, upon which there is ceremony in the temple, derive from the Chinese calendar, and are:

(1) New Year's day.
(2) Third day of the third moon.
(3) Sixth day of the sixth moon.
(4) Seventh day of the seventh moon.
(5) Twenty-fifth day of the eighth moon.
(6) Sixteenth day of the tenth moon.

On festival days the people do not go out to the fields to work. They take a holiday and eat better food, such as bean curd and meat. Many of the men attend the ceremony in the temple in the morning (no women enter the temple). Some of the men use the day to invite their ancestors to have a drink in the home afterwards. They may ask a priest to join them in calling their ancestors, offering wine to the ancestors, and in drinking themselves. They sing songs at night, and men who are courting may sing courting songs all night.

In the private family house there are at least two carved wooden figures of family ancestors. Incense is offered to these figures twice a day, early in the morning and late at night. Special worship is made to these ancestors twice a lunar month, on the first and the fifteenth days, as well as on festival days.

The Yao place under the wooden figures of ancestors, a wooden figure of the god Sai Mon Gon,[1] the same as the Chinese 地主 (in Cantonese, *tei chue*). On the outside of the house door they paste papers with drawings of the god of the door (in Cantonese, *moon shan*), bought from Chinese shops, and the same as the Chinese use on their doors.

The Yao also pay special respect to certain stones and rocks as gods, the same as the Chinese 石敢當. Red and white paper offerings are sometimes plastered on these rocks. Besides the gods of the temple images, the family ancestors, the god Sai Mon Gon, the god of the door, and the gods in rocks of local places, there are more than thirty names of gods known to the priests from books. The names of these thirty gods are written on paper burned on occasions of sacrifice offered with intent to cure illness.

The Yao have priests who function: (a) on festival days in the community temple in community worship and in communal rites outside the temple also; (b) in attending births and deaths, and in fixing days for marriages; (c) in exorcising ghosts with an aim of curing illness; (d) in educating children in priestly literature and in knowledge of recitals and exorcisms.

The popular classics which these priests use are written in Chinese characters, and derive from Chinese sources. They contain references to Taoist gods for the most part. Although a few Buddhist

[1] So called in the Yao dialect.

terms also occur in these classics, Yao religion is not otherwise influenced by Buddhism. Yao priests do not shave the head, remain celibate, or practise meditation. They do not believe in a reincarnation of souls, nor are they vegetarian in their diet. They practise frequent blood sacrifice (of animals) to more than thirty gods of Taoism.

There are eighteen priests in Yau Ling village. Two of them, the oldest, belong to the first or highest grade. Ten, of middle age, belong to the second grade. Six belong to the third grade. Priests belonging to the third grade must have a child and be over thirty-six years of age to pass into the second grade. Priests of the third grade are only permitted to teach pupils and perform the most simple form of exorcism of ghosts. They are not allowed to own the sacred staff, carved in wood and painted red. Priests of the second grade can perform all rites, and take part in all social activities (births, deaths, temple ceremonies, higher forms of exorcism of ghosts, etc.). The oldest priests, of the first rank, are always required to attend in every religious ceremony in which the whole village is engaged.

Education

The priest attains his position as the successful pupil of older priests. Priestly education, for a very small fee, is open to all pupils who offer themselves for it. The successful pupil is one who can recite the priestly classics by heart, and who demonstrates his capacity to do so before all the people at the Liu Koh Tong ceremony.

The priestly classics are, for the most part, incomprehensible. Semiliterate scribes have filled them with errors in writing, and copied one another's errors, until the original meaning is lost. Some passages, however, are clear. We quote examples of such:

I

We can only see the male dragon mating with the female dragon.
We can never see the female dragon mate with the male dragon.
Man and woman in the family are dragons.
Son and grandson are dragons and sleep in the dragon's bed.
When two dragons meet they fight for leadership,
The heads butting, the tails striking.
They open the mouth to eat the bad air of epidemics.
The green dragon lies on the left side helping the waves.
The white tiger lies on the right side, making disturbance and jumping around. From the *Book of Killing the Ghost*.

II

There is an origin for the bad ghost,
King of Hong is the origin of the bad ghost.
King Hong's family begins the bad ghost.
There are more than eighty people in King Hong's family;
They lived together for three generations.

King Hong had buying and selling relations with the people
.....[2]
.....begins the bad ghost[3]
Because King Hong becomes the third princess of another King.
From the *Book of Exorcising the Ghost.*

III

Call on the bad ghosts back to a thousand years ago,
Call on all the bad gods back to a thousand years ago.
The illness has gone. Now it comes to the bed.
This Bed is not an ordinary Bed—
It is the mysterious Bed of Highest Big Old Kwun.
From the *Book of Making the Bridge of Ghosts.*

This same Big Highest Old Kwan, 太上老君, is the greatest god of Taoism.

The Yao priests qualify as priests by learning and repeating by heart several consecutive books of recitations of the above type, associating the recitations, line by line, with the written lines of Chinese characters. In some cases the written lines of characters truly correspond to the spoken lines of the recitation. In other cases where the written lines of Chinese characters have no intelligible meaning, the spoken lines of recitation continue anyway, because (1) the learning is rote learning of an oral tradition, and (2) the learning does not have to make sense necessarily, being, as it is, largely mystery, and mysterious commerce between ghosts and priests and sick men. Where the sacred books are well transcribed, the priests learn the correct meaning of some Chinese characters, but without gaining much power of recombining these characters in any other context.

Priests' positions are not inherited. A priest seldom instructs his own son in the priests' classics. If he wants his son to try to learn, he sends him as pupil to another priest. There are seven basic texts used in the education of priests (samples from three of these have been quoted above), which is the only type of education the Yao admit.[4] Pupils are boys between the ages of nine and fifteen

[2] An incomprehensible line.

[3] A line half incomprehensible.

[4] The Yao children in being submitted to the above type of "learning" do much work that is of very little use. They learn to decipher dates and elementary legal documents such as last wills of property or divorce contracts. The best pupils learn to write such documents. But most of the effort is put into learning incantations, many of which are incomprehensibly written. This general fact is not confined to the Yao people only. For example, all that is now left of the writing of the Lolo people in a Burmo-Thibetan type of script is priests' books. A study of these books leaves the correct interpretation of Lolo characters entirely disputable. See *L'Ecriture et les Manuscrits Lolos* by Ching-Chi Young, Imprimerie et Editions Union, Genève, 1935. The peculiar character of priests' learning led to much European research wasted in a vain effort to decipher Lolo characters. (Ed.)

years. No girls are pupils, as no women are admitted as priests. It takes the best pupils at least five years, with constant individual instruction, to learn to recite the required seven basic texts with success. A very small minority of the pupils succeed. Nevertheless, the priestly education has prestige among the Yao, and the priests secure many pupils. Most of Yao families cannot afford to release their sons from work in the fields during the day, and they cannot afford the higher cost of individual instruction for their sons. So only a few pupils secure individual teaching from the priest teachers by day. The majority go to a night school, after working hours, where they secure collective instruction at a low cost.

There are no special school houses. The young priests of the third age grade, who act as teachers, receive pupils in their own homes. At one lesson witnessed, of individual instruction by daytime, the priest opened the book and put it on a stool. He sat on the ground on one side of the stool, and the pupil sat down on the other. The priest recited a page or two of the book, hardly glancing at it. The pupil repeated the recitation after him without looking at the book at all. The process was repeated until the pupil could recite the passage. The priest then wrote the date from the Chinese calendar on a slip of paper, and gave it to the pupil to take home to imitate. (Sometimes the Chinese calendar is used as an extra text, as there is much superstitious practice for the priests in advising people of lucky and unlucky days.) The father of the pupil who receives constant or frequent individual lessons in the daytime must pay the priest instructor three catties of rice and ten catties of firewood a month, a catty of salt a year, and gifts of food on festival days.

Most Yao families cannot afford to give their sons individual tuition. Instead they send their sons to night school. Night pupils, who go to school about nine o'clock in the evening, or even a little later, sit near the nook of the teacher's house. A small, low table and a simple kerosene lamp are used. Nine in the evening is the usual hour for cooking and eating. As the priest teaches, his wife or daughter cooks in the same house. It is hot, stuffy and smoky, and the pupils may take off their upper clothes. The teacher teaches his pupils several pages every night, but he cannot give them individual attention. The teacher charges only sixty cents silver a year for each pupil in the night school.

Activities of Priests

Among the special accoutrements of a Yao priest are:

(1) A sacred staff about five feet long carved in wood, painted red, and with the point shod in steel; carved at the head of the staff is a representation of a god riding a tiger, called the god of killing ghosts.

(2) A sacred knife, made of brass (leaf-shaped or diamond-shaped blade).

(3) A back-scratching stick (resembling the American Indian back-scratching stick), usually carved in wood (sometimes in horn) in the shape of a serpent; the stick is worn down the back and balanced on the shoulder by a chain pendant from it falling down the front of the chest and the body of the priest; attached to this chain are plaques in copper with illegible inscriptions.

(4) A seven-pointed crown made of stiff paper.[5]

The Yao priests also use a wooden rod, a bell (bought from Chinese traders), and a pair of omen sticks. These omen sticks may be carved in bamboo, in wood or in horn. They have one surface concave, and one convex, and omens are cast by tossing them to see if they fall, the pair convex, or the pair concave, or one each way.

The ceremony of exorcism of ghosts, in believed healing of the sick, takes place whenever the relatives of the sick summon and pay a priest. The varieties of exorcism rites are:

(1) Simple exorcism.

(2) Exorcism of ghosts over the bridge of ghosts,

(a) over the flower bridge,

(b) over the sky bridge,

(c) over the big bridge.

(3) Killing the ghost.

Simple exorcism is done in any place in the open air at any time. The client accompanies the priest, bearing paper, wine, rice and a fowl for sacrifice. The priest need not wear any of his special accoutrements. He simply chants long recitations, tears god-money[6] into strips and burns it. He cuts the fowl's tongue and mouth, and drips blood on to the burning god-money and on to the earth. If he wants to kill the fowl he cuts its throat. He scatters sacrificed rice in the different directions. If the priest has with him his scratching stick, with its carved serpent or dragon body, he points the dragon head of it in the different directions with one hand, as he scatters the grains of rice with the other hand. He pours out sacrificed wine upon the ground. He keeps on chanting throughout these manoeuvers. His client then opens to him a turban or a belt coming from the sick person (who remains at home), disclosing a small packet of glutinous rice therein. The priest takes the packet of glutinous rice and chants over it, then returns it to the client to wrap up in the turban or belt. Finally the priest casts god-money

[5] The above four accoutrements are special and specific to the Yao. Abadie describes the former two and the fourth as such, but appears to have overlooked the third. (Ed.)

[6] Pieces of a rough paper, unmarked, symbolising paper money in the ghost world. The client also often carries a smouldering fire brand to light the fire. The fire brand is a vegetable substance dried, which breaks into flame only when the white ash is blown upon. In one case witnessed an offer of matches was refused. (Ed.)

to the wind and closes his chanting. The sacrificed god-money, wine, rice and fowl's blood have been consigned to the ghosts by medium of fire, earth and air, and the ceremony is over. The client pays the priest the fowl of the sacrifice, alive or dead, as the case may be, and a small piece of silver, and carries home the charmed rice in the turban or belt of the sick person. The sick person wears this rice enclosed in its paper package in his or her clothes.

The rite of exorcism of ghosts over the bridge of ghosts is a little more complex, and it is more expensive. It is common for several clients to club together to summon two or three priests at once, in order to share the expense amongst themselves. The exorcism of ghosts over the bridge usually takes place on the roadside just below the village, towards dusk. In this rite the priest erects a small structure in sticks and in bamboo symbolising a bridge by which ghosts are supposed to cross to the other world. The purpose is to show troublesome ghosts that cause illness the way back to the ghost world. The rite has three variations in which (a) the flower bridge is built, (b) the sky bridge is built, or (c) the big bridge is built.

The flower bridge is built for exorcism of ghosts that are causing illness in children, not in adults. The priests prepare, for this rite, a long piece of thin paper, on which they write the names of the gods. They bring with them their scratching sticks and bells. The clients bring sticks and bamboo for the bridge, fowls, wine, rice and god-money paper, and a dog for sacrifice. In a rite witnessed there were six clients who shared the expense of three priests. While one priest chanted, and another rang a bell, a third built an arch in bamboo representing the bridge of ghosts, chanting as he built it. On the arch was then spread the long piece of paper bearing the names of the gods. The action was very much the same as the action for the rite of simple exorcism. That is to say, the priests chanted, burned god-money, dripped fowl's blood onto the fire and the earth, scattered sacrificed rice to the east, west, north, south, and to the center, poured out wine in sacrifice, and charmed small packets of rice which their clients disclosed to them from their wrappings in the turbans or belts of the sick persons. In addition, however, the priests kept a bell ringing. When the clients gave the priests god-money to burn near the opening of the ceremony, they also gave them silver money for themselves, each priest taking two clients, and receiving twenty cents in silver from each client. The client bowed at the knees in giving the god-money and the real money to the priest, and the priest bowed at the knees in receiving it. During the process of the rite, some small boys and one or two of the clients cooked the meat of a dog (which had been killed before the rite began) by the side of the road, beyond the ghost bridge construction. The paper on which the priests had written the names of the gods that morning was displayed on the bridge, but it was taken down after a time and burned with god-money after a priest had read it aloud. At the close of the ceremony the three priests ate a half of the dog, and

the six clients and some of their children ate the other half of the dog.[7] Each priest took home a fowl and his forty cents. The clients took home the turbans and belts of their sick children, containing the packets of charmed rice, and an optimism for their childrens' recovery.

The rite of building the sky bridge is similar to the rite of building the flower bridge, but it is done for sick adults instead of for children. The sky bridge is represented by a horizontal cross stick supported on two upright forked sticks, whereas the flower bridge is represented by an arch in bamboo. As before, the paper on which the names of the gods are written is displayed on the bridge with god-money placed upon it, before it is read and burned with the god-money.

The rite of building the big bridge is performed when illness becomes more serious, and the kinsmen of the sick more desperate. A greater number of priests are summoned. A pig is killed as well as a dog to feast the priests, and more money is paid to each priest in fee. The big bridge has the same form as the sky bridge (a horizontal bar on forked uprights), but it is decorated. Small branches of decorative shrubs are planted in the ground beside the forked uprights of the bridge. Red cloth is draped about the cross bar, and white cloth and black cloth are suspended over the cross bar, on which the paper of written gods' names[8] and god-money are displayed. The action of the rite is not different.

When all else fails to recover a sick person, resource is had to the rite of killing the ghost. This rite is the most expensive of all. More priests are invited than in lesser rites, more money is paid

[7] The division of the dog in eating is the editor's observation. The observers were invited by the priests to share the meat, but the editor alone accepted and stayed. The paper on which the priests write the names of the gods usually contains a reference to the killing of the dog, which is of some importance, as it shows native Yao beliefs occurring in the midst of literary or semi-literate Taoism. See further note below. (Ed.)

[8] One of the priests, forewarned of services needed, spends some hours of the morning in writing down on a long thin piece of paper the names of the gods. A typical paper, done with care, contains: (1) the current date; (2) the date of the foundation of the village early in the Ming dynasty; (3) a petition that the sick recover; (4) a petition that the crops grow well and that the domestic animals breed well; (5) a petition that Tai Sheung Lo Kwan (Big Highest Old Kwan, also known as Lao-tsŭ, the founder of Taoism) direct the attention of all the gods to the present paper; (6) a petition to the gods of the east, west, north, south and center, to the seasons of summer, autumn, winter and spring, to the hundred and twenty-six gods and to the twelve kinds of compositions of medicines to permit a dog to be killed to cure the sick; (7) an injunction to the ghost of the dog which is killed to go away, and not trouble the sick; (8) names of a number of gods.

The emphasis on dog killing should be noted. Abadie writes that the Yao not only claim a dog as their first ancestor, according to the legend, but hold the dog sacred, and never eat its flesh, as the other peoples of the area do. The truth appears to be that the Yao hold the dog sacred, and never eat its flesh casually. (Ed.)

them, and a pig or a cow is slaughtered for feasting them. The rite takes place in the house of the sick person. In one case witnessed four priests officiated, helped by two young priests in a subordinate capacity. The main priests took up their sacred staves and sacred knives for this occasion (as they do otherwise only at funerals, and on days of greater festivals). When the first priest arrived at the house, he raised his staff and jumped, as if he were fighting with the ghost. He then burned incense in the doorway, and under the shelf of the wooden figures of the ancestors of the house. He chanted for about ten minutes, striking his brass knife against a specially prepared sounding board or rod. Then he cast the omen sticks several times. Later he took some rice in his hands and chanted again. He then took his scratching stick and drew a sign " 米 " on the ground with it, chanting meanwhile. The sign " 米 " is supposed to represent a dragon. He then drank wine. The second priest arrived shortly afterward, and did exactly as the first priest had done. The third and the fourth came in their turn, each one making an entrance alone in his turn and repeating the same procedure as his predecessor. While the priests acted, the owner of the house distributed wine to all the guests attending. He then had a pig killed. The priests went away from the house and village to the graves of their ancestors, where they chanted for a while, and then returned to the house, where they were given food. After food and a rest, the priests recommenced chanting. They walked in a line, each one striking his brass knife across his sounding board, chanting as they walked. The priests then drank wine, praying first and tipping a little of the wine onto the ground. They chanted, drank wine again, read some passages from the "classics," drank more wine, burned god-money and chanted until the pig meat was cooked, when they ate pig meat and drank wine.

We have discussed the functions of Yao priests in educating male children in the priestly "classics," and in their lucrative private practice in exorcising ghosts. They have also special functions in performing communal rites on festival days,[9] in performing rites praying for rain when drought threatens, in naming new-born infants, in determining a lucky day for marriage ceremonies, and in attending funerals.

The rites of a festival day of the Chinese calendar, held in the temple, involve: (1) bowing to Loh Gon, the chief of the ancestor images, (2) burning joss sticks before the ancestor images, (3) offering and burning god-money to the ancestor images, (4) cutting fowls' throats and dripping blood offering to the images, (5) long chants

[9] Those of the Chinese calendar, after the Chinese custom, and those of the Liu Koh Tong, after their own Yao custom. These latter the Kwangtung Yao said were done one, once every five years, another, once every twelve or thirteen years, a third, once every fourteen or fifteen years. Abadie (p.133) mentions that one group of Yao in Tonkin preserve a grand ceremony once every ninety years. (Ed.)

by alternating groups of priests, accompanied by drummers beating the tympanums of long, hourglass-shaped drums, (6) wine drinking, and cooking a pig in the temple fireplace, and eating the pig, (7) casting of the omen sticks to determine future luck.

In a typical temple ceremony witnessed, there were seven officiating priests, of whom a group of three first alternated in chanting with a group of four; and then later a group of four alternated in chanting with one priest, who came forward in the temple. In between chanting, the priests often helped themselves to wine. A congregation of about one hundred men and thirty boys sat through the long chants, occasionally drinking wine, and waiting for the pig meat to be cooked, when everyone ate some of it.

The two oldest priests in the village, those of the first grade in the hierarchy, were present. The leading priest in the rites, conspicuous by a red coat and a seven-pointed crown on his head, was, however, a man from a different village, Sam Pai village.[10] The priest who came forward in the temple and chanted alone, against a responsive chant of four priests, was also a special functionary elected by the people for his role for a five year period.

The rites of praying for rain in the temple involve actions similar to the rites of a festival day. There is bowing to the ancestor images, burning incense, burning god-money, dripping fowl's blood, chanting, casting of omen sticks, drinking wine and cooking and eating a pig in the temple. The words of the chants are different, and other villages are not represented.

At funerals the priests carry their staves and brass knives. In the house of the dead they burn god-money in a basketry tray, and collect the ashes from it in a small cloth bag which is later put in the coffin. One priest kills a cock and drips its blood upon the fireplace of the house, and upon the threshold. At the grave side the priests erect a staff in the ground, and move around it chanting.[11] The priests may or may not help the grave diggers and the relatives to put the grave clothes over the corpse, and to place a bag of rice in the hand of the corpse (left hand for a man, right hand for a

[10] Sam Pai and Lin Shui were villages settled by the descendants of Tong Sei Kung, the foundation ancestor of most of the population of Yau Ling Pai in early Ming times. So Sam Pai and Lin Shui villages send representative priests to festival ceremonies in Yau Ling Pai temple in memory of their common ancestry. The representative priest of Sam Pai is paid 360 catties of rice a year by the people of Sam Pai to represent them in the temple at Yau Ling Pai. All he does is to chant during the ceremony. His surname is Fong (房), and his presence recognises also the work done by the Fongs after their war with the Lees (李). (See p. 359.) His term of office lasts four years. After him, the representative from Lin Shui village comes, and represents Lin Shui just as the former represents Sam Pai. His surname is Tong and his term of office is five years. After him the representation goes back to Sam Pai again. (Note by Lee Chee-Boon.)

[11] Priests witnessed at this chanting moved very grotesquely, being in a rough humor and very drunk indeed. (Ed.)

woman).[12] After the corpse is covered in the coffin, a priest walks back and forth on the coffin lid, hopping sometimes as he walks, chanting.

The part played by priests in the ceremony of naming new-born infants, and in determining a lucky day for marriages[13] was not witnessed.

A Yao song about priests runs as follows:

If you have a daughter do not encourage her to marry a priest.
If you let your daughter marry a priest you will meet many ghosts.
If you have a daughter you may let her marry a priest.
She will get a wider life if she marries a priest.
The priest is the waiter of the goddess.
If you become ill the priest can cure you.[14]

[12] As in Chinese custom also. The groom, in Chinese custom, stands on the left hand of the bride, and a man is buried with rice in the left hand. (Note by Lee Kwei-King.)

[13] Abadie, who gives a good account of marriage (p. 121), says, "les prêtres 'man' n'interviennent pas dans les mariages." (Ed.)

[14] The above behavioristic account of Yao religion might be improved by some interpretative material. The Yao theory of sickness is not only that sickness is caused by ghosts, which priests exorcise, but more exactly that sickness is caused by ghosts abstracting the soul from the person who becomes ill with such loss of soul. The priests placate the ghosts and recover the abstracted souls of their patients, as well as exorcising the ghosts, or, in extremity, "killing" the ghosts responsible. This theory is probably symbolised by the priest in his opening of a small packet of rice from the turban or belt of the sick person, placing it below the "bridge of ghosts" for a while, chanting into it, wrapping it up in the turban or belt again, and restoring it to the kindred of the sick to carry to the patient for his wearing. The soul of the sick is recovered from the ghosts and restored in the rice which is wrapped in the clothing of the sick. This, it appears, is the symbolic meaning of the rite. The oral chants of the priests, which are possibly interpretative of such rites, or possibly not interpretative of them, were not collected and translated, but were only studied in the books purporting to hold them. As these books were, for the most part, unintelligibly written in Chinese characters unintelligibly collated, there remains a possibility that the oral tradition preserved better sense than the books. The oral tradition is said by the Yao priests to be derived from the books. The use of the books with their Chinese characters as mnemonic signs for the chants, the systematic sacerdotal education observed, and the custom of admittance to the priesthood by examination (and not by inheritance of privilege) all point to the truth of the Yao priests' assertion that their chants derive from a Chinese source. A possibility that the Yao priests may have preserved some of their own original religion in their chants, dating from the time of their tribal illiteracy, is not excluded perhaps by the Yao priests' word against it. It is not rendered probable, however, by the facts observed. The Chinese source, the popular Taoism of village priests, is not well recorded for the use of Chinese or European investigators; for it is a backward cultural feature of agricultural and country China. For this reason we cannot remedy the deficiencies of the above account of Yao religion by referring the reader to a full interpretative account of its source in Chinese popular culture.

For the Miao mountaineer people, who have in contrast kept much of their original religion, as well as all of their original illiteracy, we have a

full interpretative account of the religion, rendered by Dr. David C. Graham. That does not help us directly in a study of the Yao. It does, however, add to knowledge a very interesting and an independent religion parallel to that popular religion which is apparently shared by the Yao and by the Chinese in their country practice. (Ed.)

猺人之宗教與教育

宏永就

(摘要)

猺人宗教起源於羅公之死於非命。羅公生時性兇暴，死後爲鬼作祟，猺人疾病死亡相繼，乃立祠奉祀焉，即今油嶺之大廟是也。各房開基祖先亦立牌位於廟內歲時致祭甚謹。祭司曰先生公或曰調鬼公以祈禱禳祓爲事。職位分三等資格一定，所用祭器服色各異。猺民所謂教育祇教猺童熟誦殺鬼，調鬼，架橋等咒，其經文署如漢人之南和書，義多不可曉。禳事以架橋爲常，蓋橋所以度鬼回陰間不使作祟於人間耳。如禳病無效則有殺鬼一幕，祭司手舞足踏作捉鬼狀至滑稽可笑。他如求雨，命名，擇吉日，送葬等皆調鬼公之事也。

THE ECONOMICS OF YAO LIFE

By K. Y. Lin (Lin King-Yü, 林敬隅)

Economic Conditions

Farming.—The economic community of the Yao people is in the agricultural stage. Nature affords them a vast area of fertile land and immeasurable arable slopes. Their principal mode of obtaining subsistence is by farming which is the only source of food supply. Almost all of their time and energy is devoted to agricultural production which gives them raw materials and food products for direct consumption.

Farming may be divided into two main classes: lowland farming and upland farming. Lowland farming is chiefly for rice production. The climatic conditions of Yau-ling Pai limit the rice production. There is only one growing season for rice. Rain is usually late, and the lands cannot be plowed until there is sufficient moisture. Seeds (paddy rice) are sown some time before or after the Ching Ming Festival and transplanting takes place in the fourth moon. The eighth moon and the ninth moon are the first and second times of ripening respectively. The rice of the second period is especially good for making wine.

Fertilizers are cow dung, hog manure, ashes of weeds, sod, lime, etc. Limestone can be found everywhere in the mountains, but it is privately owned. There are many pits for making lime. Generally ten or more persons form a partnership to make one of their own. The pits may be borrowed by paying rent (mostly wine).

For power the cow is employed in lowland farming, but not in upland farming. A cow is rented at the rate of sixty cents a day.

Lime is sometimes painted along the edges of rice-fields and lands as a scarecrow to frighten away birds or animals. An artificial man made of straw is also used. Fences are made of bamboo or cedar wood to bar away the pigs and dogs.

Upland farming is chiefly terrace-cultivation and cultivation of the slopes. The climate is suited to the growth of many crops. The principal ones are maize, taro, yellow bean, and cotton. Next in importance are sesame, wheat, and potato. Only enough vegetables are grown for private consumption. They are Chinese spinach, lettuce, mustard, cabbage, pumpkin, winter squash, etc.

Storage of Produce.—Most of the crops are dried and sold to the San-kiang[1] market. However, every family in Yau-ling Pai has a barn for storing paddy rice and an attic for storing miscellaneous crops.

[1] San-Kiang is the name in Mandarin dialect for Sam Kong, Three Rivers, the Chinese market town at the foot of Yao mountain to which previous reference has been made. (Ed.)

CALENDAR OF AGRICULTURAL PRODUCTS

PRODUCTS	SOWING OR PLANTING TIME (MOON)	HARVESTING TIME (MOON)
Rice	3rd or 4th	8th to 10th
Maize	2nd to 4th	6th to 8th
Yellow bean	5th or 6th	8th
Taro	2nd or 3rd	6th to 8th
Cotton	3rd	8th to 9th
Potato	4th to 6th	9th to 11th
Sesame	2nd	8th
Millet	3rd or 4th	8th to 9th
Wheat	11th	3rd to 4th
Chilli	2nd	7th
Tobacco	2nd or 3rd	6th
Peanut	3rd	6th to 8th

Note: In Yau-ling Pai, the old Chinese calendar is used to indicate or ascertain times and seasons.

PRICES OF AGRICULTURAL PRODUCTS (100 CATTIES)

Rice	$6	Maize	$5 to $8
Yellow bean	$12	Taro	$4
Cotton	$18	Potato	$2
Wheat	$6	Sesame	$8
Millet	$6	Tobacco	10 cents for 3 *liang*
Peanut	$8	Wood-oil seeds	$1 for 16 catties

Note: All are normal prices, not fluctuating prices. One *liang* equals 37.8 grams.

Forestry.—Forestry occupies an important part in the agricultural life of the Yao people, and it is also a main source of income. Nature provides them with vast areas of forest lands upon which various kinds of trees are grown. In Yau-ling Pai cedar trees are grown in great abundance. Next in importance are wood-oil trees, tea-oil trees, pine trees and bamboo trees. Young cedars are planted in the second moon and bamboo trees in the first moon. The Yao people are ignorant of the science of arboriculture, but the cultivation of these trees requires no nursing on account of natural fitness.

It takes about twenty years before the cedar trees can be cut down for use or sale. Cedar trees can be cut down only after the spring equinox or before the autumn equinox, because during the rest of the year the bark sticks to the wood and cannot be cut off.

The usefulness of cedar timber lies chiefly in building construction. It can be sawn into boards or planks. The yearly output of

cedar logs in Yau-ling Pai is about 5,000 to 6,000 pieces.[2] They are sold to the wood merchants in San-kiang. The demand for cedar timber has fallen rapidly during the Sino-Japanese conflict and the indiscriminate bombing of Canton. A piece of cedar timber formerly sold for $1.20 costs only 60 cents today. The bark of cedar trees is cut off lengthwise and pressed flat with rods. It is sold at the price of three or four pieces for ten cents. Both the cedar logs and the bark are necessary building materials of the Yao people.

Bamboo planting requires only three years. The price is thirty or twenty cents for a big piece or ten cents for two or three small ones. Pine wood is usually used as fuel and many miscellaneous trees and shrubs are cut down as firewood.

Wood-oil trees are of great importance. The seeds are sold at the price of $1 for 16 catties. Tea-oil tree is a kind of shrub about 8 to 10 feet high. The seeds are harvested in the eighth moon, and dried for making tea-oil. The production in Yau-ling Pai is not great, but it is great in San-Pai. The seeds are sold at the price of $1 for 30 catties. Eighty catties of seeds will give 17 to 20 catties of oil which is sold at $1 for 3½ catties. The residue in the form of cakes is sold at 80 cents for one picul.

Forest lands in Yau-ling Pai are privately owned. But there are a few which are owned by the public; for example, Hê-tun (荷墩) at the entrance of the village from San-kiang is owned by T'ang Fa-lo-er T'ing (唐法羅二廳).[3] Some lands owned by the rich but lying idle are open to cultivation of cedar trees by the poor. The trees then belong to the planter while the land belongs to the owner.

Fruit trees are scarcely grown. There are only a few pear, peach and banana trees. They are of no economic significance.

Domestication of Animals.—Meat is not the principal food supply of the Yao people. Animal husbandry is only a side line in their agriculture. Domestic animals kept by the Yao in Yau-ling Pai are cattle, pigs and dogs.

Cattle are of two kinds, yellow oxen and buffalo. Most of the cattle are kept in the stony caves in the valleys. Cattle are employed in lowland farming but not in upland farming. They form so important a part in the agricultural life that they are kept for service but not for food. Neither are they bought or sold frequently as an article of trade. They are sold or butchered only when they are too old to be serviceable. On the twenty-fifth day of the eighth moon (birthday of T'ang Szu-kung, 唐四公), a cow is killed for sacrifice. On festival days or ordinary days, the Chinese traders sometimes kill a cow for sale. The cow is usually bought from

[2] The output of cedar timber is greatest in Chün-liao Pai.

[3] The *t'ing* here mentioned is an alternative term for the *fong*, the unit of social organization mentioned in the introduction and in the account of social organization. It is a division of a clan. (Ed.)

Li-fu (獐单) at the price of 30 cents for one catty of meat net (excluding the weight of bones which is about 30 catties in a cow). The meat is sold at the price of $1 for 3¾ catties.

While cattle are important for farming, it does not follow that each family owns a cow. Some of the poor families own none, while some of the rich own as many as four or five head. But cattle may be leased at the rate of 60 cents a day. The number of cattle in Yau-ling Pai is about 200.

Pigs and chickens are kept in the hog-barns and roosts in the extension outside the house. Baby pigs are bought from San-kiang, and raised to the weight of about 100 catties for sale. Pigs are sold or bought at the price of $1 for 4 or 4½ catties. Male pigs are gelded. Very few people keep a boar. The boar is hired for propagation at 60 cents and 3 catties of rice.

In settlement of debts, delinquent debtors may be given a baby pig to raise. The service rendered by the debtor is regarded as a compensation for the debt. Profit-sharing is on the basis of equal-sharing. When the pig is sold, half of the proceeds go to the owner and half to the debtor.

On religious occasions, such as a festival, a baby pig is killed for ceremonial or sacrificial purposes. On ordinary days, the Chinese (Han) traders sometimes kill a pig for sale. The pork is sold at the price of $1 for 2¾ catties.

Pigs are fed on green feed, maize, and rice bran. The number of pigs in Yau-ling Pai is about 400.

With regard to poultry, only fowls are kept. They are fed on paddy rice, rice, rice bran and maize. Almost every family keeps a few, but some families keep as many as twenty head. They are raised mostly for private use—usually for casting out devils. The selling price of chickens is very low, about 40 cents a catty. Eggs are hatched in winter. In summer they are sold at the price of 10 cents for 5.

Gelding of animals and poultry is practised. There are professional men (Han people) walking from *pai* to *pai* to do this business. The service costs $1.20 for a bull, twenty cents for a pig, five coppers for a chicken.

Dogs are kept for the purpose of house-watching.

Fishing and Hunting.—The Yao people make their livelihood by farming. Neither fishing nor hunting is the principal mode of obtaining food. Although most of the Yao mountains are far distant from the rivers, occasionally the Yao go fishing. Fishing is carried on either with (1) lime as poison, or (2) hand-nets with a frame of cane or of wood. Lime is more commonly used; it is placed in the water of rivers so as to kill or stupefy the fish. Fish are usually dried for food. In Yau-ling Pai, there are three ponds—one in the mound known as Hê-tun (荷垗), the other two at the top of the residential quarter, but the Yao pay very little attention to fish-culture.

Although there are many wild animals (such as tigers, chamois, wild boars, squirrels, snakes) and birds (such as partridges, pheasants, eagles) in the Yao mountains, hunting is only a hobby of the Yao. It is more popular in winter when agricultural working time is over. In Yau-ling Pai, almost every young man keeps a firearm which is generally bought from Chai-kang (寨岡). The firearm costs $15 approximately. Gun-powder is put into cows' horns or hollow bamboo stems. It is bought from San-kiang, Lienshan or Chai-kang at the price of ten cents for three *liang* (37.8 gm.).

It is a custom of the Yao that women never go fishing or hunting.

The Status of the Agricultural Class.—In Yau-ling Pai, the cultivators are the whole body of the people. Both sexes are employed in agriculture. Agricultural work occupies by far the greater part of the peoples' time and energy, leaving little opportunity for the satisfaction of any other needs.

Generally speaking, there are small holdings of land. Most of the Yao work on their own lands. But there are several exceptions. The rich men, such as T'ang Szu Shêng Kung (唐四生公), own as much as 60 mows of rice fields. On the other hand, there are some poor men who own nothing. Furthermore, some rich men own two or three cows individually, while some poor families own one cow together. Normally each family can cultivate ten or more mows of rice fields and some area of other land. The family budget of the Yao people can hardly be obtained accurately but the annual expenditure of the average family is estimated to be $350. The following are the annual harvests and in-comings of two typical Yao families:

P'AN FA-TSIANG (盤法将)

Rice	8 piculs	Maize	4 piculs
Yellow bean	3 ,,	Millet	1½ ,,
Cotton	1 ,,	Sesame	40 catties
Potato	2 ,,	Peanut	20 ,,
Tobacco	50 catties	Cedar logs	30 pieces
Pig (owned)	one	Chickens (owned)	6 ,,
Wages earned (20 cents a day)			$15

T'ANG H'UO SHENG ÊR (唐和生二)

Rice	30 piculs	Maize	7 piculs
Yellow bean	2 ,,	Millet	5 ,,
Cotton	3 ,,	Sesame	70 catties
Potato	7 ,,	Taro	60 ,,
Peanut	1 picul	Tobacco	80 ,,
Cedar logs	200 pieces	Pig (owned)	one
Chickens (owned)	10 ,,	Wages earned (70 days)	$14
Wheat	1½ piculs		

Exchange and Medium of Exchange

Exchange.—Intra-communal exchange is rare among the Yao people, since they all produce more or less the same products. However, there are some transactions of exchange of products among themselves when one is in need of a certain kind of product. For example, a certain quantity of yellow bean may be bartered for an equivalent of maize. As a matter of fact, the Yao people are not good business men. They do not know much about the credit system and how to make profits by exchange. They do not kill a pig or a cow for sale, but sell the pig or cow to the Han traders and buy the meat in return. The chief reason is that they do not like credit sales, and do not like to take the trouble or risk of collecting the accounts among themselves. Intra-communal exchange among the Yao and the immigrated Han traders deserves mention. Detailed information may be found below.

Extra-communal exchange occurs between different *pais* and between the *pais* and San-kiang. Exchange is effected by individual transactions and the market. There is no trading class. But there are trade expeditions to the market in San-kiang. The market is held on the fourth, the ninth, the fourteenth, the nineteenth, the twenty-fourth and the twenty-ninth of every moon. The Yao usually sells the products to the market, while some of the poor buy the products from the market.[4]

There is a credit system in operation between the Yao and the traders in San-kiang. Credit sales are guaranteed by a trustworthy Yao who will collect the accounts for the trader and who will be rewarded by the trader. The accounts are settled usually by barter; for example, 12 catties of sesame for 14 catties of rice, or 5 catties of salt for 14 catties of rice. T'ang H'uo-Shêng Êr (唐和生二) of Yau-ling Pai is trusted by two shops in San-kiang (Sheng Chi 生記 and Shing Chi 勝記).

Medium of Exchange.—Money is used as medium of exchange, but the awkwardness of barter still exists. However, the value of goods or property is generally expressed in terms of money. The monetary system of our government is effective in the Yao mountains. Before November 4, 1935 (beginning of managed currency), silver and copper coins were in circulation. Cash (with a hole in the center) are of so small a value that they are not circulated as a medium of exchange. Since November 4, 1935, silver coins have been collected by the government and prohibited for use as a medium of exchange. At the beginning the Yao people had no confidence in the paper money but at the present time, paper money, silver coins and copper coins are in circulation in the Yao mountains. The value of goods is still usually expressed in terms of silver coins. The Yao consider $10 of silver coins as equivalent to $11 of paper

[4] A man who has rice beyond his needs sells and is rich. The poor must buy to eat. (Ed.)

money (Canton currency). This exchange rate is common in almost all Yao *pais*, except San-pai which is the most civilized *pai* and the nearest to San-kiang. Generally the Yao people prefer Canton currency to national currency.

Distribution, Ownership and Accumulation of Wealth

Distribution of Wealth.—There is unequal distribution of wealth among the Yao people. Some of them are rich, some are poor, and some are without property. However, there is no great demarcation between the rich and the poor; both of them belong to the same working class—farmers. Wealth is very precarious. One who lives on his own productive ability and is self-sufficient is said to be rich. The priests belong to the well-to-do class. There are rich men whose total amount of receipts is very much greater than their total amount of expenses. T'ang Ting Kiao Ta Ki (唐丁橋大基), the Head of the Yao people, is one of the rich men, and he is a money lender.[5] The rich men usually lease their excess lands (lands which are beyond their strength of cultivation) to tenants on an equal-sharing contract. Some of them employ cultivators to work for them on the agreement that each employee is provided with three meals a day and paid twenty cents in wages.

Property.—In Yau-ling Pai, there exist both individual ownership and public ownership of property, but the latter is insignificant. The Great Temple at the top of the *pai* is owned by the whole people. Roads and water works are the only public utilities. There is no special fund set aside to defray the expenses incurred in the common interest of the whole people, and no regular tax levied on the people. But occasionally there are compulsory contributions. Contributions of money or in kind are collected from family to family when necessary.

There are very few common lands, timberlands, or houses belonging to the whole *pai* or to a *t'ing* (廳). In Hê-tun (荷墩), the ownership of the pit for making tiles belongs to Lao-Ma T'ing (老馬廳),[6] that of the cedar trees belongs to Ch'i-H'uo T'ing (起廳), and that of the pond belongs to Fa-Lo-Êr T'ing (法羅二廳). The income derived from the public property is held by a man intrusted with the job. It is deposited to meet necessary expenses. Provision is made for lending this fund so that it will

[5] Among the rich are T'ang Fa-lo Êr Kung (唐法羅二公), Szu-shêng Kung (四生公), 請鬼婆, etc.

It is said that T'ang Ting Kiao Ta Ki has a big deposit of silver coins in his vault under the ground. It is true that many of the Yao people still have a large amount of silver coins. The inflow of silver coins before managed currency began was very big, because the Yao people always maintained a favorable balance of trade.

[6] Romanised as Lo Ma Fong in the account of the social organization by Lee Chee-Boon (Ed.).

derive an interest income of at least 30% a year. Property owned by the public cannot be alienated, sold, or disposed of, or quantitatively allotted.

Private ownership of property is dominant in Yau-ling Pai. The unit of ownership is the family. The husband and the wife are responsible for the maintenance of the family, and both take part in agricultural work. They hold the property in common, but the wife is intrusted with the function of cashier. She cannot make use of money independently without first consulting her husband. She holds it only in trust for the upkeep of the family.

Land Tenure.—Most of the land in Yau-ling Pai is privately owned. Stone boundary marks are put between it and other *pais*, and natural objects such as hills and fields also serve as landmarks. Lands within Yau-ling Pai have been fully exploited and intensively cultivated. Some of the lands are leased to the tenants in other *pais* (San-pai, Chün-liao, etc.) on a leasehold contract which may be in terms of money rent or on an equal-sharing basis. The land is very seldom leased on the basis of money rent, and, if it is, the rent paid for the land will correspond to the price of half of the products that are yielded by the land. Leasehold terms are often on a three-year, five-year, or seven-year basis, but those of rice fields are on the basis of one year only.

Common lands held by the whole *pai* or by a *t'ing* (廳) are leased to tenants for cultivation. Some of the private lands are also leased to tenants in case the owner owns a large area of land all of which he cannot cultivate. But the same pieces of leased land do not continue in the occupation of the same cultivators. There are periodic redistributions when the leasehold contract ceases. Ownership of land and tenement houses may be transferred through buying and selling. The price for one mow of rice field is approximately $100 to $150. (This is estimated on the basis that a piece of land which yields 100 catties of rice costs $30 to $50, and one mow of land yields approximately 300 catties of rice.)

The sale of young cedar trees (杉秧) is a common occurrence, when there is an urgent need for money. The ownership of the cedar land will return to the original owner after the cedar trees are cut down.

Inheritance.—All forms of property are inherited. The property is divided one year after the marriage of each son or daughter. Both sons and daughters are heirs to the property, but the sons obtain the major shares and the daughters have no right to houses. Elder son and younger son obtain equal shares. When a son marries the father will divide the property into shares in accordance with the number of sons and daughters and retain one share of his own.

At the time when the father gives land to his married daughter, he also gives her farm implements such as hoe, spade, and scythe.

The married daughter works with her husband but dines with her father in the first year after marriage. This is due to the fact that property is divided one year after marriage, so that the married son cannot afford to support the family during the first year after marriage. It is a custom that the son-in-law should invite the father-in-law or mother-in-law to feast five times a year as an expression of gratitude (usually on the 3rd day of the 3rd moon, the 6th day of the 6th moon, the 7th day of the 7th moon, and on the 30th day of the 12th moon). When the father-in-law or mother-in-law returns home, one catty of pork is given. The property that is inherited by the married daughter from her father can be passed on to her children, but after the death of the children the ownership of the property returns to her father's family. (Only the rich give land to the married daughter.)

In Yau-ling Pai, there is no control exerted by senior lines over junior lines. The younger son may sell his property without the permission of his father or his elder brother if he is compelled to do so by poverty or other reasons. Generally the elder brother buys it.

When a man dies without heirs, an adopted son is chosen from the sons of his brothers to be heir. A woman can hold the property in trust for her children after the death of her husband. The property is divided among her sons at her death. The share which is retained by the parents is generally maintained as a common and permanent property by the sons.

If the parents die when the children are young, the property is held by the father's brothers in trust for the children. The property is divided among them when they are grown up.

At the death of the father, the married daughter should contribute a jar of wine (about 32 catties), a piece of white cloth and 32 cash. Other relatives may contribute 5 catties of wine, 3 catties of rice or millet, a piece of white cloth, etc. Millet or rice is given to the priests who perform the funeral ceremonies. (The distribution of millet to the priests usually takes place on the day following the funeral. Each priest is given two catties of millet.) Relatives or friends who attend the funeral ceremonies or witness the burial are entertained with wine, rice and pork.

Debts and Indebtedness.—Debt transactions occur between members of the same *pai* as well as between members of different *pais*. All debts are incurred through mortgaged lands, houses, or timber lands as security for the redemption of the debt. Notes payable are also given by the borrower to the lender as evidence of debt. In the case of default, the property held for security is liable to foreclosure or forfeiture. Interest rate varies from 40% to 60% a year. The sum of debt is usually very small, but sometimes it amounts to $30 or $50. Money debts can be paid in kind and material debts

can be redeemed in money. Debts of small sums can be remitted in labor. If the borrower has no property of his own, a guarantor must be secured and the guarantor's property pledged for the redemption of the debt.

Consumption and Accumulation of Wealth.—The standard of living of the Yao people is very low, on a subsistence level. They have almost no luxuries, no unnecessary or extravagent expenses. Taking the population as a whole, the Yao people consume less than they produce. Therefore, there must be some saving. The Yao people do not know how to make use of their surplus wealth, but put it into a vault under ground. Generally a person becomes rich only by saving or by money-lending; there are no business profits, no lucky chances or turns of wheels. Wealth is accumulated bit by bit in that way.

The Problem of Taxation

It seems strange that the government of Lien-hsien has nothing to do with the Yao people. There is no regular tax imposed upon them, and the Yao people are autonomous and not interfered with by the government. From enquiries made into the problem of taxation we learned that the village known as Hê T'sun (河村), situated in the west of Lienchow city and separated by the river, is authorized by the government of Lien-hsien to collect the taxes from the Yao people. The writer made a visit to the tax-collector Liao Mei-li (廖美勵), a native of Hê T'sun, and was told that there was a long story. The story and the method of taxation may by briefly stated as follows:

In the reign of Chun Hsi (淳熙年間) of the Sung Dynasty (1131-1162), Liao Yung (廖顒), a native of of Hê T'sun, resigned his government office in Kwangsi and returned home with eight Yao people. They settled down in the vicinity of Lienchow where they remained as farmers. From generation to generation, more Yao came from Kwangsi, and they reproduced so prolifically that they scattered all over the areas in the vicinity of Lienchow. But the Yao people were savage in nature, and from time to time attacked the Han people and turned into highway robbers. For centuries, from the Sung Dynasty to the Ching Dynasty, the Yao people had been a nuisance to the government and to the Han people. Finally a government official, who was a native of Hê T'sun, suppressed the rebellious Yao. As a result, Hê T'sun was, and still is, authorized to collect the taxes from the Yao for the government.

As a result of the defeat of the Yao people, they were driven to the mountainous regions where they are at the present time. From the reign of Hsien Fêng of the Ching Dynasty, the taxes of the Inner Five have been collected by the government of Lienshan-hsien. Nowadays Hê T'sun is authorized to collect the taxes from the Outer Three only.

The taxes paid by the Yao people may be regarded as a kind of land tax. They are not compulsory contributions, and they are not taxes paid by the citizens for the support of the government. The Yao people are willing to pay directly to the natives of Hê T'sun, but not to the government, because the natives of Hê T'sun are the descendants of their patron Liao Yung who brought them from Kwangsi to Kwangtung.

There is no system of taxation and no regulations governing the collection of taxes. At the end of the year (usually the tenth moon), the tax-collector, Liao Mei-li, and several assistants go to the Yao *pais* and collect the taxes from the Yao individuals. The amount of taxes collected is based on the amount as prescribed in the old receipts. The total amount collected from the Outer Three every year is $180 approximately. It is an obligation that Hê T'sun should contribute $40 out of this amount to the Bureau for Collecting Land Taxes in Lienchow. Of the total amount ($180) $20 (approximately) is collected from Yau-ling Pai.

Working Conditions

The Yao are a very industrious and hard-working people. There is no class distinction among them, and the working class includes the whole body of the people. Both sexes are employed in farming and from the oldest to the youngest almost everyone of the whole body of the people is a worker. Woman workers stand on an equal footing with the man workers, regardless of age. Child labor begins at as early as the age of twelve years, regardless of sex. Sons and daughters, from twelve years of age, accompany their parents to the fields as apprentices. They participate in the work of farming and grass-cutting. Their early apprenticeship makes them efficient workers.

The priests are the only exception to the ordinary working class. They are supposed to be the most learned scholars, the only class of the people capable of reading and writing. They are the privileged class who have leisure hours and ease. They do little farming, leaving their lands to be cultivated by their wives, sons and daughters. The priests are authorized to perform religious or sacred functions, to do worshipping and chanting, to perform some kinds of magic and to engage in the practice of medicine. In Yau-ling Pai, people who practise the business of a priest are twenty-odd in number, being only about two per cent of the population.

Working Groups.—Working groups in Yau-ling Pai are chiefly based on a family unit, which consists of a husband, a wife, and several children. The average family ordinarily can cultivate 10 mows of land or more. The husband and wife cooperate with each other in agricultural work with the help of their children. It is a custom that the married daughter works with her husband but dines with her father in the first year after marriage.

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Hours of Work.—The Yao people toil from sunrise to sunset almost without cessation. Usually they get up at dawn, have their breakfast at six, and go out to work at seven. They carry with them their luncheon, and will not return home until dusk. They work nine to ten hours a day. There are no weekly holidays, no lucky and unlucky days for work, and no rest periods, customary or enforced. However, the Yao people usually take a day's rest in every five or six successive working days, and observe the major holidays of the Chinese calendar.

Hired Labor.—In busy seasons, sowing or harvesting, there is mutual help between relatives. Friends and acquaintances also come from other *pais* for temporary help. There are some wage-earners and a hired labor system is common during busy seasons. Each worker is provided with three meals (including wine) a day, and is also rewarded twenty cents or three catties of rice. During harvesting seasons, many Yao people are employed by the Han farmers in San-kiang for more or less the same pay.

In Yau-ling Pai, the cattle are sheltered in the natural caves of the mountains. A hut is built near the cave and a watchman who tends the cattle at night is employed by the owners of the cattle. A cowherd generally can look after twenty to thirty cattle. He is rewarded by a monthly wage of three catties of rice for each one of the cattle, and the owners by turn must send a man to accompany him every night.

In building construction, friends and relatives of the owner go to help in different kinds of work. A building contractor, generally a Hunanese carpenter, is employed. Friends and relatives are treated by the owner as an expression of gratitude.

In Yau-ling Pai, the standard payment for carrying weights is ten cents for ten catties.

Seasonal Work.—There is little regulation made for the performance of necessary tasks, such as preparing the land, sowing, harvesting, etc. The proper time for preparing the land and the proper time for sowing are determined by the priests. Harvesting season is from the sixth moon to the tenth moon.

Roads are repaired once in a year before the harvest season for the convenience of transportation, usually at the end of the sixth moon or the beginning of the seventh moon. Ten or more people take up the work with the approval of the Head of the *pai*. They are authorized to collect rice from every family as the payment of their work, and every Han trader has to contribute wine to entertain them. The roads are not actually repaired, but the grass is cut down and the rocks are made steady. The road to San-kiang usually requires three days of repairing, and 12 *liang* of rice are collected from each family for this road. The road to San-pai requires one day and half a catty is collected.

Every year on the day before *Li-t'siu* (立秋), meaning the beginning day of autumn,[7] one member of each family is required to cooperate in repairing the water pipes of the village. Any family which does not participate in the work will be liable to a fine of ten catties of wine. On the following day, very few of the population go out to work, but the holiday is optional.

Division of Labor.—Specialization is not so marked as in our modern economic society. Only the priests specialize in their own line of business. The Head of the Yao people does what the common people do. He has to work even more laboriously, because he owns a larger area of land. There is a little division of labor between the sexes; the male usually takes the part of preparing the land for seeding and cultivating, while the female takes the part of transplanting the young plants of rice from the nurseries.

Efficiency and Productivity.—Compared with our modern working conditions and our progressive methods of production, Yao labor is far less efficient and productive. The Yao people have some primitive kinds of instruments which they buy from San-kiang or from the Hunanese blacksmith in the *pai*. Machinery and scientific methods of production are unknown to them. However, they are very industrious and persevering.

Influence of Our Modern Society upon the Yao People

The Purchase of Daily Necessaries and Capital Goods.—The Yao people do not devote any time or labor to the production of clothing, articles of luxury, personal ornaments, or to other articles not for immediate consumption, such as agricultural implements, hunting weapons, fishing nets, etc., which are forms of primitive capital. From San-kiang market, they buy articles of clothing, such as trousers, turbans, shoes, sandals, broad-rimmed farmers' hats, personal ornaments such as earrings, bracelets, bangles, and necklets, materials for cult and ritual such as joss-sticks, firecrackers, joss-papers, and many other things such as matches, tobacco pipes, tobacco, salt, peanut-oil. Farm implements such as plow, harrow, hoe, scythe, are also bought from San-kiang or from the Hunanese blacksmith in the *pai*. They do not try to make such things by themselves. As cows and pigs are seldom butchered in the *pai*, the Yao people also buy meat from San-kiang. The amount of commodities bought depends on their yearly income. The more agricultural products they can bring to the markets, the more the commodities they will buy.

The Economic Aggression of the Immigrated Han Tradesmen.—From time immemorial, there have been Hunanese hawkers peddling in the *pais*. They came first as barrel-makers and as grocers dealing

[7] According to the old Chinese calendar, the period of autumn is from *Li-t'siu* (立秋 , usually August 8) to *Li-tung* (立冬 , usually November 8).

in salt, salted cabbage, spices, etc. Chang Hua-tê (張華德), a Hunanese grocer who is still in the *pai*, came thirty-one years ago. Then many Han traders from the neighboring country followed his step. The first who came here is unknown. Huang Shih-yang (黃石羊), a native of Ma-ch'iu-tun (馬仇墩) of Lien-hsien (連縣), came about twenty years ago. He came first as a hawker and later as a dealer of wine and bean curd.

There are more than thirty Han traders in the *pai*, of whom eight are Hunanese grocers, six barrel-makers, one blacksmith, and four wine dealers, and eighteen Kwangtung dealers in wine and bean curd. These traders with their families make up a population of 130 approximately. The Kwangtung traders chiefly come from Lienchow, Yang-shan (陽山縣), Ch'ai-kang (寨岡) and San-kiang. Compared with the Hunanese groceries which may be started with a capital of ten or more dollars, the Kwangtung wine dealers have a rather bigger business which requires a capital of about two hundred dollars. The Hunanese groceries deal in tobacco, salt, salted cabbage, salted bean, while the Kwangtung traders chiefly deal in wine and bean curd. As a side business they may raise cattle, pigs, and fowls. The Yao people seldom make wine and bean curd of their own but at the end of the year, some rich Yao borrow the apparatus from the Han traders to make their own wine. The Han traders get their rice and millet for wine and yellow bean for bean curd from the Yao people.

Very few of the Han traders have their own houses. Most of them lease their houses from the Yao people, paying a rent of $14 to $30 a year for each house, and being also under an obligation that the owner of the house and his relatives should be entertained five times every year (the third day of the third moon, the sixth day of the sixth moon, the seventh day of the seventh moon, the sixteenth day of the tenth moon, and one day at the end of the year). For water supply, each wine dealer has to contribute 42 to 52 catties of wine to the Yao folks for feasting every season (four seasons in a year). In case of road-repairing, praying for rain, water-pipe repairing and the like, the Han traders have to make contributions.

Business is done mainly through open book account, and there are only retail sales. The amount of business transactions depends on the financial standing of the shop. The more credit is extended, the greater will be the amount of sales. Cash sales are very small in amount. Generally the Yao customers bring their agricultural products for barter. For example, 14 *liang* of rice or millet are bartered for one catty of wine, 12 *liang* of yellow beans for one and a half catties of wine, two catties of rice for one catty of salt. Prices are ten cents for one and a half catties of wine, or for two catties of bean curd.

Business is not very prosperous among the Han wine shops. Maximum daily sales amount to only 24 catties of wine (one jar) and 36 pieces of bean curd (one pan) approximately, i.e., $1.60 of wine and $0.90 of bean curd. They make a profit of fifty cents on one jar of wine and forty cents on one pan of bean curd. Casual gains are made when a pig or a cow is killed for sale. But the greater the amount of sales, the more extensive will be the credit, and in consequence the larger will be the amount of bad debts. Therefore, to kill a cow, the Han traders often form a partnership in order to distribute the burden of risk.

The accounts receivable will not be collected until harvest time. After harvest, the Yao people bring their agricultural products in settlement of their debts. The amount of accounts receivable collected is proportional to the amount of crops harvested, i.e., the yearly receipt of the Yao people. The amount of uncollectable accounts fluctuates a great deal depending on whether the year is a good or an adverse one. The percentage of loss is normally 10% on net sales.

猺山經濟一瞥

林敭隅

(摘要)

猺人經濟以農業爲主。禾每年僅得一造。黍豆棉粟麥薯芝蔴煙葉之屬所在多有。林業以杉爲大宗。油嶺一排年值五六千元。但工業用品如衣料農具祭物等概取給於三江墟，猺人不能製也。在油嶺排之木匠鐵匠酒販豆腐販皆爲漢人。因猺人不善營生，舉凡一切交易以三江爲總匯操縱於漢人之手。其生活水準甚低，每年每家約三百五十元足矣。排內亦有貧富之分，但無階級之別。借貸年息百分之四十至六十。財產之承繼子女婚嫁時即行分定，一年後移交使能獨立生活。賦稅外三排由河村廖姓徵收，年約得百八十元，以四十元撥入連縣稅局。內五排歸連山縣府徵收。

PHONETICS AND PHONOLOGY OF THE YAO LANGUAGE
DESCRIPTION OF THE YAU-LING DIALECT

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Introduction

The present article is mainly concerned with the language of the Yao people known as the Pa Pai Yao (八排猺), residing south of and around the market of Sam Kong and the seat of Linshan district, west of Linchow in the northwest corner of Kwangtung Province. The dialect under study is that of one of the most typical of all the Yao Pai (Yao settlements). This variety is most typical because it is one least influenced by the neighboring Chinese dialects (though the fact that it, too, is very much influenced by Chinese dialects is unquestionable), and yet is understood by all the Yao people. The Yao number around 60,000[1] and inhabit the neighboring mountainous regions approximately 100 *li* across east and west and 150 *li* south and north, these regions being collectively known as the Yao Mountains. As will be seen in the map (fig. 1) this typical Yao Pai is situated almost in the center of the whole locality. The inhabitants of this one settlement number around 1,000.

A study of a new dialect, though it may not have any correlation with Chinese phonology still has some intrinsic value in the science of phonetics. Take for instance the domal variety of "d" in the dialect which shall be described presently, the devocalized "m" and "n" both strongly aspirated in another dialect known as the Nam Yiu (South Yao) dialect in the neighborhood of Chai Kong Market, south of Linchow—these uncommon sounds certainly broaden the linguistic experience of the student.

The contribution of the present writer to general philological problems raised by the recording of a hitherto unwritten language must be very modest. The six weeks spent in the field were occupied with getting only a rudimentary working knowledge of the language. He must therefore content himself with an objective presentation of the speech of an isolated group of Yao, as far as his knowledge goes. The results here presented include the materials which have been found useful for practical purposes.

[1] This figure was an estimation of the principal of the school at Yau Ling. Whether or not it includes the Yao in other parts of Kwangtung the author has not been able to tell. The *Chinese Year Book* gives for Kwangtung Yao the figure 60, 936. See : Non-Chinese Speaking Peoples in China, by Tao and Wang, p. 39, tab. 2, 1938-39 Issue.

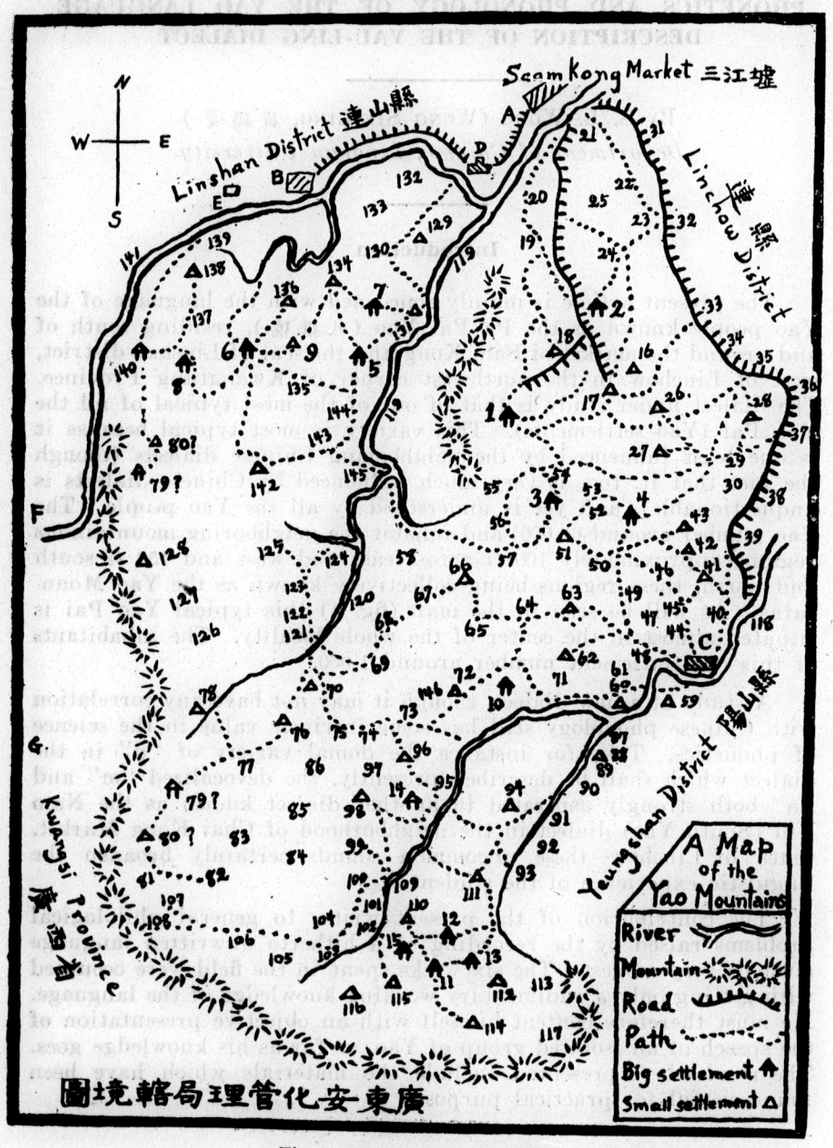

Fig. 1. Map of Yao Mountains

TABLE 1

Place names of the Yao[2]

NO.	NAME OF PLACE	LANGUAGE SPOKEN	CANTON PRONUNCIATION OF NAME	NAME AS PRONOUNCED BY THE YAO	DISTANCE FROM
A	三江墟 (高良墟)	CH	Saam Kong Hui (Ko Leung Hui)	Hom Kong Hi (Koh Liang Hi)	
B	連山縣城	CL	Linshaan City	Lien Len	
C	岡寨墟	CH	Chaai Kong Hui	Tsai Kong	
D	鹿鳴關		Luk Ming Kwaan		
E	太保墟	CL	Taai Po Hui		
F	木樓墟		Muk Keung Hui		
G	永豐墟		Wing Fung Hui		
1	油嶺獞排	*	Yau Ling Yiu Paai	Yiu Liang Yong	A 40
2	三排	*	Saam Paai	Bu Tsai	A 30
3	南江(洋行)獞排	*	Naam Kong Yiu Paai	Hang Hong Yong	A 60
4	橫坑獞排	*‡	Waang Haang Yiu Paai	Va (ng) Heng Yong	A 70
5	軍寮獞排	*	Kwan Liu Yiu Paai	Kon Liu Yong	B 25
6	火燒獞排	*	Foh Shiu Yiu Paai	Dai Tu Yong	B 30
7	馬前獞排	*	Ma Tsin Yiu Paai	Man Teu Yong	B 20
8	大掌嶺獞排	*	Taai Cheung Ling Yiu Paai	Tam Giang Yong	B 30
9	里八洞	*	Lei Paat Tung	Li Dung Yong	B 25
10	九寨	*	Kau Chaai	Ku Yong	C 30
11	上菜坑	†¶	Sheung Tsoi Haang	Ding Toi Heng	C 40
12	中菜坑	†	Chung Tsoi Haang	Ma Dong Toi Heng	C 40
13	下菜坑	†	Ha Tsoi Haang	Di Toi Heng	C 35
14	白芒排	*	Paak Mong Paai	Ba Mong	C 35
15	上洞	*	Sheung Tung	Fu Dung	C 50
16	中洞	*	Chung Tung	Dung Dung	
17	白面峯坳	*	Paak Min Fung	Mien Ba Yong	
18	棠梨坳	*	Tong Lei Aau	Dong (Li) Geng	
19	天鵝墩		Tin Ngoh Tun		
20	圓高陂		Yuen Pei		
21	頭岩		Ko Tau Ngaam		
22	飯甑冲	CH	Faan Tsang Chung		
23	茶山塘	CH	Cha Shaan Tong		
24	小傘峯		Siu Saan		
25	白面峯	CH	Paak Min Fung		
26	連水	*	Lin Shui	Lien Sui Yong	
27	白虎頭		Paak Foo Tau		
28	水井坳	*	Shui Tsing Aau		
29	蜈蚣田		Ng Kung Tin		

[2] This table, to be read with the map, includes the Chinese names of the places as indicated by the numbers in the map, the language spoken in each of these places, Canton pronunciation of the names, equivalent names as pronounced by the Yao people, and their distance from three principal market towns. CH means the Hakka variety of the Chinese language; CL, the Linshan variety; *, the Yao language; †, the Naam Yiu language (South Yao); ‡, a variety of the Yao language called the Tsum Loh; §, the so-called Kwan Shing (軍擎); and ¶, the Chung (獞) dialect, a variety of Thai. Distance from Saam Kong is designated by A, Linshan by B, and Chaai Kong by C, all in terms of Chinese *li* (里).

The geographical material was supplied by the government (安化局), the rest being collected by the author from the informants.

30	丫髻山			A Kai Shaan		
31	桑塘坪	CH		Song Tong Ping		
32	觀音山			Koon Yam Shaan		
33	馬頭山			Ma Tau Shaan		
34	老寨			Lo Chaai		
35	瓦窰塘			Nga Yiu		
36	水竹塘			Shui Chuk Tong		
37	梨壁面			Lei Pik Min		
38	馬屋寨			Ma Uk Chaai		
39	黃淇塘			Wong Kei Tong		
40	老虎涌			Lo Foo Chung		
41	百和冲			Paak Woh Chung		
42	蜆傘山			Fong Saan Shaan		
43	黃花間		§	Wong Fa Kaan		
44	飛來石			Fei Loi Shek		
45	大皮嶺			Taai Pei Ling		
46	大傍山			Taai Pong Shaan		
47	烏石頂			Woo Shek Ting		
48	鉄筆坑			Tit Haang		
49	架龍山			Pat Ka Shaan		
50	九龍寨			Kau Lung Chaai		
51	綿羊排			Min Yeung Paai		
52	天堂坳			Tin Tong Aau		
53	新洞坳			San Tung Aau		
54	大石鼓			Taai Shek Koo		
55	黃地山			Wong Tei Shaan		
56	大鶏頭			Taai Yiu Tau		
57	清楚墩			Tsing Tsoh Tun		
58	猫頭墩			Maau Tau Tun		
59	香車排			Heung Kui Paai		
60	橫嶺			Waang Ling		
61	竹塘寨			Chuk Shaan Tong		
62	新寨			San Chaai		
63	望鶏嶺		*	Mong Kai Ling	Moh Liang	C 15
64	深坳			Sham Aau		
65	老鶏頭			Lo A Tun		
66	馬頭冲		*	Ma Tau Chung	Ma Beh	C 40
67	寨岐			Chaai Kei		
68	羅坪			Loh Ping		
69	猺隆		*	Yiu Lung	Yao Lung	C 50
70	合界			Hop Kaai		C 50
71	白石眉			Paak Shek Mei		
72	新寨仔			San Chaai Tsai		
73	油寨道			Yau To Hom	Yiu Doh Ham	C 35
74	下坪			Ha Ping		
75	深冲			Sham Chung		
76	磨刀坑		*	Moh To Haang	Meu Toh Heng	C 45 ?
77	橫坪		*	Waang Ping		C 40 ?
78	盤古坑			Poon Koo Haang		
79	大坪脚		*	Taai Ping Keuk	Tam Beng Kong	B 58
80	香花根		*	Heung Fa Kan		B 60
81	同龍			Lung Wooi		
82	限定			Haan Ting		
83	同龍頂			Lung Wooi Ting		
84	南洋嶺			Naam Yeung Ling		
85	橫坳嶺			Waang Aau Ling		
86	紫徼頂			Tsz Mei Ting		

87	牛角陂			Ngau Kok Pei		
88	三角塘			Saam Kok Tong		
89	瓦廠排			Nga Chong Paai		
90	仙人寨			Sin Yan Chaai		
91	老虎涌			Lo Foo Chung		
92	坪頭嶺			Ping Tau Ling		
93	岩口			Ngaam Hau		
94	老虎涌背			Lo Foo Chung Pooi		
95	白芒墟			Paak Mong Hui		
96	後洞			Hau Tung		
97	李仔墟			Lei Tsai Hui		
98	火筒冲			Foh Tung Chung		
99	鶏吞頸			Kai Tan Keng		
100	洫田寨			Paan Tin Chaai		
101	生洞寨			Shaang Tung Chaai		
102	樟古寨			Cheung Koo Chaai		
103	龍會			Lung Wooi		
104	馬頭山			Ma Tau Shaan		
105	大坳頭			Taai Aau Tau		
106	橫寨			Waang Chaai		
107	潤坳			Yun Lin Aau		
108	東坪坳頭			Tung Fau Tau		
109	月涼坳			Yuet Leung Aau		
110	橫岡			Waang Kong		
111	三州寨		*	Saam Chau Chaai		C 35
112	桐油冲		*	Tung Yau Chung		C 30
113	堂胆背			Tong Taam Pooi		
114	燈筒頂		†	Tang Tung Ting		C 35
115	深坑			Sham Haang		
116	黃連頂		†	Wong Ling Ting		C 60
117	烏堂頂			Woo Tong Ting		
118	淇潭灣			Kei Taam Waan		
119	纏水			Wok Shui		
120	橫担			Waang Taam		
121	鬚白坑			So Paak Haang		
122	良坑			Leung Haang		C 40
123	担地坪			Taam Tei Ping		
124	黃瓜			Wong Kwa		
125	望鶏冲			Mong Kai Chung		
126	中殿			Chung Tin		
127	栗脉山			Suk Mak Shaan		
128	羊公岐			Yeung Kung Kei		
129	牛路水		*	Ngau Lo Shui	Hng Tsu Yong	B 12
130	鶏公頭			Kai Kung Tau		
131	大竹灣		*	Taai Chuk Waan	Tam Lau Van	B 20
132	保仔嶺			Po Tsai Ling		
133	老鼠頂			Lo Shue Ting		
134	鏡都嶺			Keng To Ling		
135	大嶺			Taai Ling		
136	大塘頂		*	Taai Tong Ting		
137	大山界			Taai Shaan Kaai		
138	鳳凰寨		*	Fung Wong Chaai		
139	錫沙塘			Woo Sha Tong		
140	大古坳		*	Taai Koo Aau		
141	上坪			Sheung Ping		
142	西嶺		*	Sai Ling		
143	興到		*	Hing Toh		

144	磨刀坑	*	Moh To Haang			
145	必坑	*	Pit Haang			
146	茶 坑		Cha Haang	Ha Heng	C	35
	盤血排源		Poon Huet Paai		B	180
	上带源		Sheung Tai Yuen		B	80
	中 爐		Chung Lo		B	80
	百斤洞	*	Paak Kan Tung	Ba Tsan	C	10
	廟坑	*	Miu Haang		C	40
	橫柄	*	Waang Ping		C	40
	担保寨		Taam Po Chaai		C	45
	中 甸		Chung Tin		C	45
	中心岡	*	Chung Sam Kong		C	30
	亞三冲	†	A Saam Chung		C	35
	大王岩	†	Taai Wong Ngaam		C	40
	亞基寨	†	A Kei Chaai		C	40
	參子凹	†	Mak Tsz Aau		C	40
	亞婆岩	†	A Poh Ngaam		C	40
	坑尾	†	Haang Mei		C	40
	鳳岡山	†	Fung Kong Shaan		C	45
	鹿暗	†	Luk Om		C	45
	坑意	†	Haang Yi		C	40
	塘梨	†	Tong Lei		C	35
	坑坪	†	Haang Ping		C	45
	白草坪	†	Paak Tso Ping		C	50
	中雄		Chung Hung		C	45

Description of the Dialect as Spoken in Yau-Ling Pai[3]

The branch of phonetics known as practical phonetics is dealt with here. Practical phonetics studies the distinctive features of speech utterances which recur in recognizable and relatively constant shape in continuous utterances, ignoring some of the gross acoustic features which are non-distinctive. The distinctive or significant features are determined by the principle of phonemes. "A phoneme," to quote D. Jones' words, "is a family of sounds consisting of an important sound of the language together with other related sounds which take its place in particular sound sequences."[4]

In dealing with languages of the Orient in general another feature no less important than the sounds is the tones characterized by musical pitch. The tones are treated in the same manner as the sounds. A distinctive tone is called a toneme.

Phonetic Structure.—The dialect of the Yao language under study distinquishes eighteen consonant phonemes and five vowel phonemes. The principal tonemes are five. A description of each of these will be found in table 2.

[3] The author acknowledges his indebtedness to Bloomfield's *Language*, D. Jones's *Outline of English Phonetics*, G. Noël-Armfield's *General Phonetics*, and the works of several Chinese linguists, without whose hints and suggestions the following description would have been impossible. What is blameworthy in this presentation is the author's.

[4] D. Jones: *Outline of English Phonetics*.

TABLE 2
Yau-Ling dialect phonemes

MANNER OF ARTICULATION	PLACE OF ARTICULATION						
	BILABIAL	LABIO-DENTAL	ALVEOLAR	RETROFLEX	PALATAL	VELAR	GLOTTAL
Stops, unvoiced	p		t			k	?
voiced	b		d			g(gv)	
voiced	(mb)			ɖ (ɳɖ)		(ŋg)	
Affricate, unvoiced					tɕ		
unvoiced	(f)	f			ɕ		h
voiced	(v)	v				(g)	
Nasals	m		n	(ɳ)	ɲ	ŋ	
Laterals			l		(ʎ)		
Nasal Vowels	m̩				ŋ		
Semi-vowel					j		
Vowels, high					i	u (ũ)	
mid					ɛ	ɔ	
low					a		

The tones are as follows:

high falling	ˋX (variable: extra high-even ⁺X)
high even	ˈX
mid even	¯X
mid falling	ˌX
low even	-X (variable: rising ˊX)

It is very difficult to print a large number of phonetic symbols which are not in the possession of the printer. For convenience and for a practical script a system of orthography based entirely on the common Roman letters has been devised as shown below:

Phonetic symbols	Practical script	Phonetic symbols	Practical script
p	p	ɕ	s
b	b	ɲ	gn
m	m	j	y
f	f	k	k
v	v	g	g
t	t	ŋ	ng
d	d	h	h
ɖ	dd	?	–
n (ɳ)	n (nn)	m̩	m
l	l		
tɕ	ts	i	i
ɛ	eh (or e- if followed by a final consonant)		
a	a		
ɔ	oh (or o- if followed by a final consonant)		
u	u		

A few points in connection with the speech habit of the dialect under study must be clarified here.

The three kinds of unvoiced stops [p, t and k], unlike English practice, are invariably of the non-aspirated variety as found in French. They are also found in most Chinese dialects, e.g., *po* 波 *to* 多, *ko* 哥, of Pekinese and Cantonese. The aspirated variety of the stops does not exist in this dialect. One will easily notice these speech habits when he listens to the utterance of Chinese speech sounds by the Yao people, who invariably substitute the non-aspirated variety for the aspirated of the Chinese dialect. They do not distinquish the sounds of *po* 波 and *pho* 坡, *to* 多 and *tho* 拖, *ko* 哥 and *kho* 科 (Mandarin) for example.

The voiced stops [b, d and g] are similar to those of English. The amount of breath pressure is perhaps even less and the vigor of action in the lips or tongue is gentler. Each of these three stops is again modified by the presence of some nasal twang and strikes the ear as [mb, nd and ng] respectively. Where the initials [b, d and g] of words are not distinquished from [mb, nd and ng] respectively, the latter series of ligatures are not employed.

The symbol [dd], represents the domal or retroflex "d" with the tip of the tongue curled up against the hard palate behind the post alveolar position. It is clearly a phoneme distinct from the simple "d." Many pairs of words are distinquished by these two phonemes. It is a true plosive consonant and is not followed by an off-glide in the form of a fricative such as is found in Mandarin ㄉ.

Due to the activity of the tip of the tongue in the domal position, [dd] at times is tinged with a nasal twang in the form of [nn] and at times with a lateral inclination. Where the presence of [nn] before [dd] is not significant only the common [d] is employed in the transcription.

The phoneme [g] is sometimes replaced by the voiced velar fricative "g" in an intervocalic position, e.g., [da gai] (to open).

The unvoiced dental affricative [ts] is made with the tip of the tongue against the ridge back of the upper teeth. It differs from Mandarin "ts" which is made in the interdental position, and from English "ts" in the post-dental position. It is always non-aspirated as the three common plosive stops. The voiced counterpart does not exist in this dialect.

The labial-dental fricatives [f] and [v] are similar to English. [f] and [p] sometimes take the form of a bi-labial fricative and [v] and [b] that of a Spanish "b" in a few examples. But such variable features are not distinctive. Dental fricative [s] like its affricative fellow [ts], is made in the gingival position; [h] is the ordinary English "h".

The nasals [m, n and ng] are the same as found in English, except [ng] which also begins a syllable as well as ends it; [ng] in

a few examples is replaced by a nasalized vowel which precedes it, e.g., [nung>nũ].

Before the back vowels [n] is usually of the retroflex variety, to be designated by [nn], but it has not been found to be distinctive from the ordinary [n] as a phoneme.

The [gn] is a palatalized nasal similar to French "gn" in "compagne." It is made by raising the middle of the tongue against the highest part of the palate. It is used only initially in a syllabic unit and on account of its palatalized nature, usually is accompanied by a "y" glide, to be designated by its homoörganic vowel "i" in the transcription.

The [l] is the ordinary "l". In only one instance it becomes a palatalized lateral [ʎ] before "i" in the word [ʎem dou yiu] (sickle), but [ʎem] is not so common as [yem]; so [ʎ] may be considered an accidental subsidiary member of the phoneme [l].

The semi-vowel [y] is similar to English "y" in "yes", but the contact between the middle of the tongue and the juncture of the soft and hard palate is much tighter and produces audible friction. Sometimes it strikes an untrained ear as a variety of an affricative in the form of English "j" in "jingle."

Vowels.—The distinctive vowels that are found in this dialect are five. The non-distinctive variation of each vowel is determined by its surrounding and therefore will not be indicated. But a description of each of these vowels will perhaps remove some ambiguities that may occur.

The [i] is the ordinary "i" as found in French "si" [si]. When [i] itself constitutes a syllabic unit, it has no friction, but when it precedes any other vowel or a member of a diphthong, it takes on a friction to be designated here by [y] e.g., [yu]. Diphthongs as [iu], where [i] is the principal vowel and long and [u] is just an off-glide, are to be preceded by [y] to distinguish from the syllable [yu] where [u] is the principal vowel. When [i] is found in the middle of a syllable before a vowel and after a consonant, it has only a gliding nature.

When preceded by [i], [eh] is somewhat like the "e" of English "bed," but more open and more towards the back and approaches English "e" in "there." But when it is preceded by a consonant or when it begins the syllable alone, it is similar to English short "a" in such words as "man" or "sang."

The sound of [a] is the ordinary "a" found in most Chinese dialects. The position is not especially towards the back and therefore the symbol [*a*] will not be used to complicate it. But after certain consonants such as retroflex [dd] and [nn] or [ng], it approaches [*a*]. After a gliding [i] it is more towards the front. Generally it is an intrinsically long vowel unless otherwise indicated.

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[oh] is "o" found in French "port" and is also found in Cantonese, e.g., *toh* 多 (many).

[u] is the "u" sound found in the English word "rule." In a few cases [u] becomes nasalized and is indicated by the Spanish tilde over the vowel thus [ũ].

Diphthongs that end in [i] or [u] are falling diphthongs while those that are preceded by a gliding [i] may be called rising diphthongs.

In this dialect the lip-rounded vowels [y] (French u) and [œ] do not exist. Length has not been found to work distinctively in the vowels.

[m, n, ng, p, and t] may end a syllable, but [k] contrary to the linguistic phenomena of most southern Chinese dialects is never used finally. [m] and [ng] alone may each be a syllabic unit and make sense. [p] and [t] used finally are very weak and have no audible release. Indeed they are so weak that when they are in an inter-vocalic position, they are dropped and replaced by a very slight glottal stop. They are surely on the way to deterioration.

Tones.—The Yao dialect has a rather fine tone scale. The principal tonemes are five. The whole extent of the tone scale of this dialect may be indicated by a vertical line arbitrarily divided into five points to be called the extra-high, high-mid, mid, lower-mid and low, thus:

5
4
3
2
1

The high descending tone comes down from 5 to 2 graphically represented thus ..... ˥˩ * (ˋX > ⁺X) (see below)

The next high but even tone is relatively as high as 4 to 4 graphically represented thus..... ˥ (ˈX)

The mid even tone is relatively as high as 3 to 3 graphically represented thus: ..... ˧ (¯X)

The mid falling tone comes down from 3 to 1 graphically represented thus, ... ˧˩ (ˏX)

The low even tone is relatively as high as 1 to 1 graphically represented thus..... ˩ (-X>ˊX)

*changed tones indicated by ..... on the right of the staff.

For practical tone indication, the writer has found it necessary to substitute arbitrary signs as shown above on the right in parentheses.

The highest descending toneme ˥˩ has a subsidiary toneme on the point of 5 to be designated by ˥ or a plus sign thus: ⁺X.

The low even tone ˩ at the last syllable of a two syllable word usually changes to an ascending tone thus ˩ > ˧ or ˊX.

The high even tone sometimes comes down to the mid even tone when it is followed by the low even tone in tone sequence, thus: ˥ > ˧ or ˈX > ¯X.

Most of these changed tones are not indicated in the vocabulary as their variations follow certain definite laws of change.

The simpler set of tone marks are especially practical when the tonemes of a language are even more complicated than that of Cantonese, say. If there are three different falling tones, they may be indicated respectively thus "ˋX, ˎX, ˏX." If there are three different rising tones they may be indicated respectively thus "ˊX, ˋX, ˎX." Other tones and tone combinations may be clearly indicated accordingly.

Exact representation of tones will of course have to be made in a musical staff or better still recorded by mechanical devices.

Phonetic Structure.—In the foregoing paragraphs we have mentioned that the phonemes may either be used or may not be used initially or finally. Some phonemes are used medially. The detail phonemic phonemena in the structure of this dialect will be discussed below:

a. Consonents.—1. p, t, k, b (mb), d, dd, g (gv), ts, f, v, s, h, m, n, ng, gn, l, y, ?.

Except m and ng they are always non-syllabic.

2. M, n, ng, p, and t may end a syllable whose principal vowel is not a member of a falling diphthong (off-glide i or u). Other consonants are never used finally.

3. M and ng are sonants fully voiced and are syllabic. They may each be used as an independent syllable.

b. Vowels.—1. All the simple vowels, diphthongs and triphthong are always syllabic. They are:

i, eh, a, oh, u; iu, eu, au, ou; ei, ai, oi, ui; ie-, ieu, ia.

2. The [i] in the rising diphthongs [ia, ie-] (which may again be followed by m, n, ng, p or t) or the triphthong [ieu] is considered only a semi-vowel glide which does not play a prominent role in the syllabicity of the diphthongs or triphthong as the vowel that follows it.

3. The simple vowels [i, e, a, o, u] may be followed by [m, n, ng, p, or t].

4. Consonantoids [m and ng] are regarded as vowels here. [Ng] may be preceded by the consonant [h], thus: [hng].

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c. Syllabic finals.

1. Vowel finals:

m	ng	i	eh	a	oh	u	iu	eu	au	ou	ei	ai	oi	ui	ia	ieu

2. Finals that end in nasals:

m:	im	em	am	om	um	iem	
n:	in	en	an	on	un	ien	
ng:	ing	eng	ang	ong	ung	ieng	iang

3. Finals that end in stops:

p:	ip	ep	ap	op	up	iep
t:	it	et	at	ot	ut	iet

Those finals which begin with a fricative [y] are excluded from the list, for this [y] is never preceded by any other consonant and may be duly classified as a pure consonant as noted before.

Notes on the Yao Vocabulary

The following vocabulary contains some 850 of the most common words that are needed in daily conversation. Those marked with an asterisk are of obvious Chinese origin and form about one third of the vocabulary.

All the Yao monosyllabic nouns are to be prefixed with the particle "a" unaccented, and, if the noun is in the lower even tone (_X) it must be raised to the rising tone ′X. Thus water is [a ′m] from _m), road is [a ′tsu] (from _tsu). In form they have become two-syllabled words. It may be generally stated that words of two syllables are subject to a change of tone in the last syllable when that syllable is a lower even tone. In the vocabulary this change of tone is or is not indicated, but in speaking it should be made. Examples are ['i ′di] (from _di) (mouth), but ['i _di ¯ddip] (lips) where [_di] does not change in tone; [`tam ′tsu] (from _tsu) (big road), but [`tam _tsu 'kou] (big road far) where [_tsu] remains unchanged. When a syllable which should change in tone is followed by another syllable directly connected with it, it is not subject to change.

The Yao language keeps the prefix particle "a" for monosyllables very faithfully of persons, animals or objects. The Cantonese dialect and most southern Chinese dialects distinguish themselves only in some personal one-syllabled words while Mandarin does not use such a prefix at all in any case.

Being a tonal language homophones (tones also counted) are naturally expected. Thus river and salty have the same sound (same tone too) [`ddoi]; hot and beard both are [¯tsam]. But there are quite a few words which distinguish themselves by a slight change of initial consonants, thus, [`toi] (to come) differs from [`ddoi] by the unvoiced "t". ['tu] (fire) differs from ['ddu] (drum) in the same way. Some words that end in vowels "eh" and "ei," or

"oh" and "ou," sound very much alike at first hearing, but are actually different. Thus [ˌpeh] (four) and [ˌhei] (small), ['koh] (corner) and ['kou] (far), and many others do not exactly rime and should be distinguished. Some of these words have been recorded in both forms because the author was not quite sure of the sound when the transcription was made.

There are some inconsistencies of spelling and tones in the vocabulary. The author is not quite sure if these inconsistencies would not formulate some laws of sound changes or tone alteration.

This language presents some peculiar degeneration of initial consonants, i.e., many words of Chinese origin with an aspirated "ts," "s" and "t" have dropped these consonants but kept the aspiration "h". Here are some examples:

Cantonese			*Yao*
ts'ong	瘡	(abscess)	— hong
ts'au	秋	(autumn)	— hiu
ts'ing	請	(invite)	— heng
ts'ung	葱	(onion)	— hung
ts'aam	杉	(cedar)	— him
ts'an	親	(relative)	— hen
ts'a	差	(wrong)	— ha
ts'ak	賊	(robber)	— ha
ts'at	七	(seven)	— hut
ts'in	千	(thousand)	— hun
ts'uen	寸	(inch)	— hun
sung	送	(escort)	— hing
sin	先	(first)	— hen
suen	蒜	(garlic)	— hon
suen	孫	(grandchild)	— hun
sam	心	(heart)	— hum
saam	三	(three)	— hom
sa	沙	(sand)	— ha
sei	四	(four)	— heh
sai	細	(small)	— hei
sek	錫	(tin)	— heh
soh	蓑	(raincoat)	— hi
soh	疏	(wide apart)	— ha
soh	鎖	(lock)	— hoh
saan	傘	(umbrella)	— hon
tai	梯	(ladder)	— hai
tai	剃	(cut hair)	— hi
tiu	調(鬼)	(exorcize)	— heu
tok	托	(support)	— hoh

Other sound phenonema show that in some words more ancient initials have been preserved. Examples are:

Yao		*Cantonese*
bu	(ax)	fu 斧
pun	(grave)	fan 墳
ta	(tea)	cha 茶
diu	(wine)	tsau 酒
bong	(put)	fong 放
pong	(direction)	fong 方

The substitutions of final "p" for "k" (final "k" is not used in the Yao language) is unique in itself:

Chinese			*Yao*
hak	黑	(dark)	hup
hok tong	學堂	(school)	hop tong
lak	肋	(body)	lap
tik	滴	(drop)	dep

The process of dropping of final "p," "t" and "k" has shown in some syllables, e.g., Cantonese *suk* (familiar)>*soh*, *hok* (learn)>*hoh*, *tsek* (foot)>*sia*, *kuk* (crooked)>*ku*, *tsek* (mat)>*sia*, *pak* (white)>*ba*, etc. but has not been carried very far. There are even such examples as *map* (soft) and *bep* (grasshopper), *biem* (cave) where a labial initial is accompanied by another labial final. This has been discarded by most Chinese dialects (except Hakka for example) by dissimilation.

The reader will have noticed that in the Yao language there are two sets of numbers, one of Yao origin and the other derived from the Chinese. The former set are used as numerals while the latter set are generally reserved for ordinals.
Numerals: ¯a ˎvi ˎbu ˎpeh ˎpia 'toh ¯gni 'yat `ku ¯siep—Yao origin.
Ordinals: 'yot ¯gni 'hom ˎheh 'ng ¯lia 'hut 'pet -ku ¯siep—Chinese origin.

The use of the numerals is just like Chinese, thus, [ˎvi `lon `men] (two men), [ˎpeh 'koh ¯da ¯hing] (four-cornered table), [ˎvi `du 'lui] (two coppers), etc. Ordinals are generally used for given names which usually have a number at the end, e.g., [tam ta sa ngi], [tong long pang hom], [tong hi foh ng], etc. Separately they are called [a ¯ngi], [a 'hom], [a 'ng], respectively. The number five son (but not necessarily the fifth) is however more commonly called [a _siem], i.e., [a 'ng]. The Chinese numbers are also used as numerals in combinations, thus, 101 is [a ba liang yot] (not liang a), 15 is [siep ng] (not pia).

Another interesting feature in the use of words is shown by the fact that there are two words for "big", viz., [`tam] exclusively as an attributive adjective and [¯lou] always used predicatively. Thus, "a big tiger" is in Yao ¯*tam* `*kien*, "a big mountain" `*tam* `*peng*,

"a big road" `*tam* '*tsu;* but "tiger is big" is *a* `*kien* ¯*lou* "mountain is big" *a* `*peng* ¯*lou* "road is big" *a* _*tsu* ¯*lou* "moon is big" *a* ˎ*loh* ¯*lou.*

Inversion of word order (formula: noun+attributive) is another feature common in many so called non-Chinese dialects. Examples are:

¯*kem* `*vieng*	(gold yellow)
`*gnan* ¯*ba*	(silver white)
_*gu* ¯*ba*	(dog white)

All these adjectives are not predicatives, for if they were, the monosyllabic nouns would have been prefixed by the particle "a."

There are a few examples where the general noun is to be followed by the particular noun:

red color	—	*leu sia*	(color red)
blue color	—	*leu meng*	(color blue)

and the names of some fruits such as pear fruit, peach fruit, persimmon fruit plum fruit, are in the Yao language [¯beu `yai, ¯beu `koh, ¯beu 'ddui, ¯beu _yong], (fruit pear, fruit peach, fruit persimmon, fruit plum).

Some expressions are a mixture of both Chinese and Yao: Cantonese doll 公仔 is in Yao ['kung 'ddan] where ['ddan] means 仔 ; vegetable (white vegetable) is in Yao [¯ba _soi 'eh] where '*eh* means vegetable as *soi* (*tsoi*) in Cantonese.

As has been pointed out more than one-third of the vocabulary is of Chinese derivation. When these Chinese words were introduced into the Yao vocabulary, they followed some definite change of tones. Words in the voiced series of the *ping sheng* 平聲 , or the Cantonese lower even tone, usually take the high falling tone (`X) in the Yao language, thus:

`gnan `men `yau `hai `yiu `yang `ling `ying `tung.
銀 民 猺 鞋 油 行 涼 羊 銅

The surd series of *shang sheng* 上聲 becomes in Yao the low level tone (_X), but takes a rising tone ('X) in a final position. Thus:

-vien -bu -ben -ddi -tsu -kam -gu -ddu -beu -ku -ong -hoi -dau
碗 斧 板 底 煮 敢 狗 早 飽 九 影 海 爪

There are, of course, many exceptions to these, but generally this formula may be taken as correct. The other tones are not so definite, but still have more or less definite groupings. Words of the surd series of *ping sheng*, usually take the higher level tone ('X) or the middle level tone (¯X). This at first gives the learner the impression that the Yao people are speaking some dialect of the 四邑話 , because the 四邑 dialects do not distinguish between the surd series of the *ping sheng* and *chü sheng* 去聲 . The Chinese *chü sheng* of the surd series is in Yao usually indicated by a middle falling tone (ˎX), thus ˎ*dden* 箭 (arrow), ˎ*heh* 四 (four), ˎ*hei* 細 (small), ˎhon 炭 (charcoal), ˎ*kuà* 貴 (expensive), ˎ*ku* 夠 (enough), etc.

The voiced series of *shang sheng* and *chü sheng* are either a high level tone or a middle level tone. Examples are:

'ma 'mai 'gnan ¯lan 'ng ¯hoi 'yiu ¯hvu ¯fun ¯van ¯moi ¯mui
馬 買 眼 懶 五 亥 酉 厚 份 萬 妹 未

For reference two simple sentences each containing all the five tones are given below:

'tsia ¯gnan ˏnong -tsang `mi (I eat rice then go.)
我 吃 飯 正(才) 去

`dei ˏgnang 'tsia -tsang ¯lau (Next year I then come.)
第(二) 年 我 正(才) 來

The following interesting sentences were constructed by the author for comparison of sounds and tones. They were repeated by the Yao tutors several times and were accepted as correct sentences though unnatural.

A 'eh ´eh. (Vegetable short.)
阿 菜 矮

'Kai 'neh ´neh. (Street mud heavy.)
街 泥 重

⁺Ng -noh ´noh -bun ¯nnoh. (No bow shoot bird.)
無 有 弓 射 鳥

A ¯yeh kam a `yeh -dung -dung ⁺ng ˏyia. (Aunt and mother all not afraid.)
阿 姨 與 阿母 統 統 不 怕

`Tam ¯kien -bun ¯tam `kien. (Big Chinese fight big tiger.)
大 漢 (獞官) 打 大虎

A 'piu `piu ¯pia -piu `mi. (Fish run into house go.)
阿 魚 跳 入 屋 去

`Beu ¯lap ¯gnan ´beu ¯gnan -beu liu. (Float body (swim) eat fruit eat full.)
浮身 泗水 吃 果 吃 飽 了

`Ku 'tsa ˏgu `nung -gu ˏkeh `ku. (Nine old dog cross bridge.)
九 只 老 的 狗 過 橋

¯Bu -hong a 'pu -bu ˏbu ¯ddu `bu. (I with hand burn three bunches rice.)
我 用 阿 手 燒 三 束 禾

`Tam ´ti ¯m 'tiu `ti ˏai ¯ti. (Elder sister take stick till the farm.)
大 姊 拿 條 棍 做 地

⁺Gni ˏgnang a ¯ngi ¯ngi ˏgnang. (Last year no. 2 seven years old.)
去 年 阿 二 七 歲

¯Gni ˏgnang a ¯gnem ⁺ng -noh `gnan ¯gnen ¯gnan ´gnang, 'veh ⁺ng ¯gnen -gnem. (This year daughter-in-law no money willing eat grass, she not willing weep.)
今 年 阿 媳 無 有 銀 願 吃 草 他 不 願 哭

Grammatical Structure

The Yao language differs from Chinese in grammatical structure only very little, in some slight deviations in word order, in the use of the prefix "a" for monosyllabic nouns, and a few other very minor points which may be noted in the vocabulary. There are always some differences between any two dialects, but the grammatical difference between the Yao language and the Hakka dialect of Sam Kong is perhaps smaller than that between Hakka and Cantonese. So we may safely say that there is no striking difference in this language, and its grammatical basis is Chinese. The following is a speech in the Yao language. By comparing the speech with the Chinese text (constructed to suit the Yao sentences), one will find that there is no great difference in syntax.

A Friendship Speech in Yao

¯Na ¯na `yau -tsang, `yau ¯lien, `yau ¯loh:
個 個 獞 長 獞 練 獞 老
Every Yao Chang Yao Lien and Elder:

¯Ka 'di `geng ¯lei -nung 'bu -loh 'nai ¯ngi ¯siep 'pet 'nai ¯bu
大 家 記 得 去 月 二 十 八 日 我
We remember last month twenty-eighth day we

-ddui `men `toi `yiu `liang ˏai 'nang, ¯ni 'ken ¯ngi ¯siep `liang
們 人 來 油 嶺 玩 耍 現 在 二 十 零
people come Yau Ling take walk now twenty and more

'nai leu. `gniu -ddui `vang ⁺ng 'vieng -du `mi ˏai `liang ˏai ¯ti
日 了 你 們 天 未 光 就 去 做 田 做 地
days. You sky not bright then go do farm do land

ˏai 'kung, `vang ˏmong -tsang ¯mu -piu, ⁺ng 'dei 'hung. ¯Bu
做 工 天 晚 才 回 家 不 得 空 我
do work, night then back home not have leisure we

ˏlieu ⁺ng ¯bat 'mui, 'mui ˏlieu ⁺ng ¯bat ¯bu. `Gniu -ddui `men
看 不 見 你 你 看 不 見 我 你 們 人
see not you you see not us. You people

¯dai `kin ˏai 'kung ¯kam 'loh ¯set, -dung -dung 'sei ˏyong `men.
很 勤 做 工 和 老 實 統 統 是 好 人
very hard do work and honest, all are good men.

A ˏsang -na -ddui `men ⁺ng ¯beh 'lei `yau -ddui `men -heh ¯neng.
阿 省 那 些 人 不 知 得 獞 的 人 如 此
Canton those people not know Yao people like this.

'Tsia ˏbau `yau `men ˏyong, `yau `men ¯ti 'tu ˏyong.
我 話 獞 人 好 獞 人 地 頭 好
I say Yao people good Yao people place good.

¯Bu -ddui -na -dun `toi `yau 'men ¯ti 'tu ˏai 'nang `nung, ⁺ng
我 們 這 次 來 獞 人 地 頭 玩 耍 的 無
We this time come Yao place take walk, not

-noh 'si ¯ni -si ˏai. ¯Bu -ddui 'liang `nam `tam ¯hoh ¯tong 'bot 'hun
得 什 麼 事 做 我 們 嶺 南 大 學 堂 有 千
have what business do. We Lingnan University have thousand

`liang ⁻hoh 'ddan, ⁻sien ⁻sang 'bot ⁻ba `liang `lon, 'bot ⁻kiang `men,
零 學 子 先 生 有 百 零 位 有 男 人
students teachers have hundred and more have men
'bot ⁻sa `men, 'bot ˏku, 'bot ˏin `nung. 'Nai 'nai ⁻du 'su. ⁻Ha ₋gui
有 女 人 有 老 有 嫩 的 日 日 讀 書 夏 季
have women have old have young. Every day study. Summer
`vang `vang ⁻tsam ⁺ng ⁻du 'lei 'su. ⁻Ka 'di `mi ₋bung ₋bung ˏai
天 天 熱 不 讀 得 書 大 家 處 處 去 玩
time sky hot cannot study. We go place place take
'nang
要
walk.

⁻Gni ˏgnang ⁻bu ₋ddui `toi ₋na ⁻bung `yau `men ⁻ti `tu. ₋Na
今 年 我 們 來 此 處 猺 人 地 頭 此
This year we come this place Yao people place. This
⁻bung `vang ⁺ng ₋noh `hai ⁻tsam, ⁻du 'lei 'su ⁻siem. 'Mui ₋ddui
處 天 無 得 幾 熱 讀 得 書 添 你 們
place sky not so hot, can study yet. You
'nai 'nai ˏun ₋na ⁻loh ˏkeh, ˏlieu ⁻bat ⁻bu ₋ddui `men 'nai 'nai ⁻du
日 日 由 此 過 看 見 我 人 日 讀
every day from here pass see us people every day study
'su ₋sia 'su, `gniu `yau `men ₋meh ⁻eu ⁻bu ₋gu `kai! 'Mui ⁺ng ⁻beh 'lei
書 寫 字 你 猺 人 莫 說 我 古 怪 你 不 知 得
write, you Yao people don't say us funny! You not know
⁻bu ˏddui ˏsang 'nai 'nai 'sei ₋heh ⁻neng ₋du 'su ₋sia 'su. ₋Na `tong
我 在 省 日 日 是 如 此 讀 書 寫 字 此 間
us in Canton day day like this study and write. This
⁻hoh ⁻tong 'sei ˏyong ⁻du 'su `nung ₋piu.[5] ⁻Du 'su 'na 'na `meng ⁻li.
學 堂 是 好 讀 書 的 屋 讀 書 個 個 明 理
school is good study house. Study everyone understand reason.
⁺Ng ⁻beh 'lei ⁻doh ⁻li 'sei ⁺ng ˏyong le. ⁻Doh ⁻li ⁻dai 'tsong `nung,
不 知 得 道 理 是 不 好 了 道 理 很 多 的
Not know reason is not good. Reasons are many.
⁻hoh ⁻si ˏku ⁻hoh ⁺ng ⁻leu. 'Ng ⁻lia ⁻sie(p) ˏgnang `nung `men ⁻doh
學 到 老 學 不 了 五 六 十 歲 的 人 道
Learn till old learn not all. Fifty sixty years of age people
⁻li ⁻hoh ⁺ng 'dei ⁻ba. ₋Heh ⁻neng 'nai 'nai ˏoi `mi ⁻hoh.
理 學 不 得 完 如 此 日 日 要 去 學
reasons learn not all. Like this day day must go learn.

⁻Bu ₋ddui `toi `yiu `liang ⁻kon, 'bot ⁻dai 'tsong ⁻kung 'pu ⁺ng
我 們 來 油 嶺 住 有 很 多 東 西 未
We come Yau Ling, stay have very many things not
⁻bat ˏkeh ⁻siem, 'bot ⁻dai 'tsong ⁻kung 'pu ⁺ng ˏmang ˏkeh ⁻siem, 'bot
見 過 添 有 很 多 東 西 未 聽 過 添 有
seen yet, have very many things not heard yet, have

[5] Referring to the school house built for the Yao people of Yau-Ling by the government.

⁻dai 'tsong ⁻doh ⁻li ⁺ng ⁻beh 'lei ⁻siem. ⁻Bu ₋ddui `siang ⁻hoh ˏoi `yau
很 多 道 理 未 知 得 添 我 想 學 些 猺
very many reasons not known yet. We want learn some Yao
`men ⁻doh ⁻li. `Gniu ₋ddui `men ⁻ngga 'hom 'kong ⁻hoh 'hom 'kong
人 道 理 你 們 人 下 三 江 學 三 江
people's reason. You people down Sam Kong Market learn Sam Kong
`nung ⁻doh ⁻li, ⁻ngga ˏsang ⁻hoh ˏsang `nung ⁻doh ⁻li. ⁻Bu ₋ddui
的 道 理 下 省 學 省 的 道 理 我 們
reasons. Down Canton learn Canton reasons. We
⁻ni 'ken ˏbang `yau `men ⁻ti `tu ˏoi ⁻hoh `yau `men `nung ⁻doh ⁻li.[6]
現 在 到 猺 人 地 頭 要 學 猺 人 的 道 理
now at Yao people place must learn Yao people's reasons.

⁻Beh 'lei ₋kong ⁻dong, ⁻beh 'lei ⁻doh ⁻li. 'Tsia ⁻beh 'lei 'mui ₋kong
知 得 講 話 知 得 道 理 我 知 得 你 講
Know speak language know reason. I know you speak
'si ⁻ni, 'mui ⁻beh 'lei 'tsia ₋kong 'si ⁻ni, ⁻ka 'di `meng ⁻ba, ⁻sei 'bot
什 麼 你 知 得 我 講 什 麼 大 家 明 白 就 有
what you know, I speak what we understand, then have
'doh ⁻li 'sot `toi le. ⁻Bu ₋ddui ⁻hoh ⁻soh `yau `men ⁻dong 'sei ⁻beh 'lei
道 理 出 來 了 我 們 學 識 猺 人 話 就 知 得
reasons out come. We learn Yao people language then know
`yau `men ⁻doh ⁻li. 'Mui ₋ddui ⁻beh 'lei 'kien ⁻dong, 'sei ⁻beh 'lei
猺 人 道 理 你 們 知 得 漢 話 就 知 得
Yao reasons. You know Chinese language then know
'kien `men ⁻doh ⁻li. ⁻Ka 'di ⁻beh 'lei ⁻ka 'di `nung ⁻doh ⁻li, 'sei ⁺ng
漢 人 道 理 大 家 知 得 大 家 的 道 理 就 無
Chinese reasons. We know our reasons then not
₋noh 'si ⁻ni ⁻vai ₋si 'sot `toi liu.
得 什 麼 壞 事 出 來 了
have what bad things out come.

⁻Ni 'ken ₋heng `gniu ₋ddui `men ⁻gnan ₋diu, ˏbau ⁻gniu ⁻bet:
現 在 請 你 們 人 吃 酒 話 你(們) 知
Now invite you people eat wine; tell you
₋bu ₋na ₋ddui `men 'sei `toi ˏai 'nang `nung. ₋Na ⁻bung `gniu ₋sang
我 們 人 是 來 玩 耍 的 此 處 你 幫
we people come take walk this place you help
'tsia! `Dei 'nai `gniu ₋na ₋ddui ⁻ngga ˏsang `toi ˏai 'nang, ⁻bu ₋sang
我 第 日 你 們 下 省 來 玩 耍 我 幫
us. Next time you go down Canton take walk we help
`gniu. ⁻A `lon ₋sang `lon, ⁻a `lon ˏoi `lon.[7] ⁻Ka 'di 'sei ˏyong
你 一位(人) 幫 位(人) 一 位(人) 愛 位(人) 大 家 是 好
you. One help one, one love one. We are good
`bon ⁻yiu.
朋 友
friends.

[6] This idea is emphasized because the Chinese and the Yao people have been accusing one another of being unreasonable.

[7] Yao proverb.

A Basic Vocabulary of the Yao Language[8]

abscess 痈 ¯hong*
accompany (rice or wine) 送(送飯酒) ˎhing* (ˎnong -diu)
ache 痛 'man
affair 事 -si*
afraid 怕 ˎyia (here "a" is not stressed)
ahead (in front) 前頭 `hen ¯dong
alive 生(非死) ¯kon (ng ¯dai)
all 都,(通通) _dung _dung*
answer 答 'gap
ant 蟻 -yiu
ape 猿 'poi
arm 臂 `pu 'si
arm strength, contest of 扣手把 -au ˎba*
arrow 箭 ˎdden*
ashes 灰 -soi*
ask 問 ¯nnoi
at, in, on 在 ˎddui*
aunt 伯母 ¯lou ˎku*
aunt 叔母 -tui ¯yeh
aunt 姑母 `tam 'tai
aunt 姨母 `yeh
aunt 大舅母 `tam ˎmiang
aunt 舅母 `miang
autumn 秋天 ¯hiu -gui* ˎvang
awl 鞋錐 `hai 'tsui*
ax 斧 -bu*

baby 嬰兒 `au
back 後面 -gai ¯sin
back, go home 回,轉 ¯mu (¯mû), ¯lau
back (bone) 背,(懶骨) ˎlai ˊhing
bad 壞 ¯vai*
bag 銃袋 -tsung ¯toi*
bamboo 竹 -lau
bamboo shoot 筍 ¯beh
bamboo chair 竹椅 -lau ˊi
bathe 洗身 -ddou ¯lap
be 是 'sei*
beam of floor 樓板 ¯vang `ling
bean 豆 ¯dup
bean stalk 豆角 -dau `nga* ¯dup, ¯eh ¯dup
bean sauce 豉油 ˎsi `yiu*
beard 鬚 ¯tsam
beat 打 ¯ket
beautiful 美麗(有樣) ¯bot ˎhing
beauty 面子 ˎhing
bed 床 ˎfu
bed bug 臭虫 ¯tsang 'beh
bee 蜂 'mui
beetle, kind of 噴屎虫 -kung -gai 'tsang
behind 後面 `mai 'kong
belly 腹,肚皮 -hng, ¯hng 'ddip
below 在下 ˎddui -ddi*
belt 束腰帶 'kui 'tan 'liang
bench 櫈 ˎddang*
big 大 `tam (attributively only)
big 大 ¯lou (predicatively only)
bird 鳥 ¯nnoh
bird, a kind of 了哥 'koh ˊlieu ¯nnoh
bite 咬 ¯ngau*
bite-itchy 咬癢 ¯ngau ¯ket
bitter 苦 'em
black 黑 'kia
blind 盲 `mang*
blood 血 -yem
bloom 開花 ¯gai `biang (see "open")
blow 吹 ˎsui*
blow off 吹熄 ¯sui `lai
blue 青,藍 'meng
blunt 鈍 `dun*
board 板 -ben*
boat 船,艇 -ddong*

[8] The Yao expressions are marked with an asterisk when they are known to be derived from the Chinese dialect.

boiler 灌鍋 'hang ¯pia
boiler 鍋頭 'hang 'beh
bone 骨 -hing
book 書 'su*
born 出世 ¯sot -sei*
bottom 底 -ddi, -ti*
bow 弓 -noh
bowl 碗 -vien*
boy 男孩 -kui
bracelet 銅鈪 `tung 'hu*
branch of tree 樹枝 ¯ddiang 'gi
breakfast 早飯 ¯ddom 'tu
bridge 橋 `ku*
bright 光 'vieng
bright 光(目無光) 'tsien* (`mai 'teng 'ng 'tsien)
brother, elder 哥 'koh*, `tam 'koh
brother, younger 弟 -kui
brother-in-law 姊夫 `tam 'via
brother-in-law 妹夫 `yau 'via
brother-in-law 大舅 `tam 'nung
brother-in-law 舅子 'nung, 'nû
bud 芽 'in
bud 出芽 ¯sot 'in
build bridge (for the ghost) 架橋 ˎka `ku*
burn 燒 -bu
busy 不得空 'ng 'deh 'hung
butterfly 蝶 ¯ban ¯bai 'tsang
buttocks 屁股 -gai ¯sin ¯dung
buy 買(入來) 'mai (_pia 'lau)

cake 餅 _gvu
calf of leg 腓 ¯gieng `man
call 叫 ¯eu*
can 得(知得,做得,吃得) 'lei (¯be 'lei, ˎai 'lei, ¯gnan 'lei)
Canton 省 ˎsang*
Cantonese language 省城話 ¯ha _li ¯dong
capon 閹鷄 'kui 'ddun
capsicum 辣椒 -la ¯leu
carry 槓扛 ¯kang*
carry 担(米) ¯ddom (-meh)*
cat 貓 `mieu*
catch 捉,拿 ¯na*
cedar, Chinese 杉樹 ¯him* ˎddiang
cedar firewood 杉柴 ¯him* `hong
centipede 百足 'tsap
chair 椅 -i*
change 換 ¯vien*
charcoal 炭 ˎhon*
charcoal 火炭 'tu ˎhon
cheap 平賤 `peng*
chest 胸膛 ¯bing `tu
chicken 鷄(仔) 'kui* ('ddan)
chicken (castrated) 糠鷄 'kui 'ddun
chicken 鷄項 ¯kui _ti
child 孩童 ¯hau `kan 'ddan ("a" of kan is extremely short)
children by female line 橫'哥 `vang 'koh
children by female line 橫姊 `vang _ti
children by female line 橫孫 `vang ¯ha
children by female line 橫孫女 `vang ¯moi
Chinese people 百姓人 (漢人) ¯ba _heng `men*
Chinese, 漢人 (官人) ¯kien `men*
Chinese 漢人, 平地人 a 'kien, `peng -di `men*
chopsticks 快子 ¯tau
cicada 蟬(做田蟲) ˎai `liang 'tsang
cicada 蟬 _gun 'gni ¯yot
claw 爪(同足) -dau*
clear 清(如水) 'vieng
cloth 布(藍布) 'ddeh ('ddeh 'meng)
clothing 衣 'i*
cloud 雲 (霧) `von, `von ¯mu*
cock 生鷄, 鷄公 ¯heng 'kui,* 'kui ˊpia
cold 冷 -gung, `nam
color 色(紅色) ¯leu (¯leu 'sia . . . .)

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come 來 (入 來, 上 來) 'lau, `toi (_pia `toi, ˏho `toi)
congee 粥 _ham
cook 煮 _tsu*
cool 涼 `ling*
copper 銅 `tung*
copper, a 仙, (二 只 銅 仙) ¯lui,* (ˏvi 'du ¯lui)
corn 麥 米 _ma ¯su,* ¯ma ¯poh ′meh
corn cob 玉蜀黍, 包麥 ¯ma ¯poh*
cotton tree 木棉 ¯mu ¯mien*
cough 咳嗽 'eng `lou _heh
count 數, 算 (數 手 指) ˏhin* (ˏhin 'pu _dau)
cow 牛 `hng
crooked 曲 'ku*
cross the legs 交足 `bien _dau
crouch 蹲着 ¯gu _lou
crow 鴉 'a ¯lou ¯poh
cry 哭 (喊) _gnem*
cucumber 苦瓜 `pia ¯dut
cup 杯, (盅) ¯tsung*
cure 醫病 'i* 'man
cut 割 'kot*
cut 切 (菜) `gi ('eh)
cut hair 鬡髮 ˏhi ′beh
cut hair 剪髮 ¯kep 'peh 'fo
cut with scissors 剪 'kiep, ¯kep

dare 敢 (不敢) _kam* (ˀng _kam)
dark 暗 (月 暗) 'hup* (¯a _loh 'hup)
daughter 女 (妹) ¯dong ¯nung (nū), ¯moi*
daughter-in-law 媳 'gnem
day 日 'nai
day after tomorrow 後日 ˏnung 'nai
day before yesterday 前日 ¯han 'nai
day time 白天 ¯ba 'nai
dead 死 (打 死) ˏlai (¯ket ˏlai)
dead man 死 人 ¯dai `men, (`men ¯dai)
deaf 聾 'ddong
deer, a kind of 黃鹿 ¯kong _keh
die 死 ¯dai
difficult 難 ¯hoi
dig 掘 `nai
dirty 骯髒 (又 罵 人 語) ¯oh 'dou (¯oh 'dou `bai ˏsung)
dish 碟 (碗 碟) `vien ¯diep*
do, work 做 ˏai
dog 狗 _gu*
door 門 `man*
down 下 ¯ngga (¯ga)*
down hill 下 山 ¯ngga `gui
dragonfly 蜻蜓 `ngang 'ngeh
draw water 汲水 ¯loi _m
dream 夢 `beh ¯pat
drink 喝 'hup*
drop, a 滴 (一 滴 水) ¯dep* (¯a ¯dep ′m)
drought 旱(死了) 'hon* ¯dai ¯ba
drown 淹死 ˏem ˏlai
drum 鼓 'ddu
drunken 醉 'yon
dry 旱 (天 旱) 'hon* (`vang 'hon)
dry 乾 (天 晴) 'goi (`vang 'goi)
dry in the air, to 晾衣 _heng 'i,
duck 鴨 'ap*
dummy 啞巴 _a `ben
dung 屎 (大 便) _gai (ˏeng ′gai)
durable 耐用 ¯gun ′hong
dust 塵 ¯mang ¯mang
dysentery 痢 (紅 屎) _gai 'sia

ear 耳 (孔) `piu, `piu ¯sin, `piu ¯sin ¯gung
early 早 _ddu*
early go early come back 早去早回 `mi _ddu ¯lau ′ddu
early, so (greeting) 早呀！¯heng ′ddu
earring 耳墜 (環) 'piu ¯ddui
earth 地 (泥) 'neh,*

earthworm 蚯蚓 'kai 'ying
easy 容易 ¯i,* ¯yung ¯i*
eat 吃 ¯gnan
eel 鱔 'piu ¯nong
egg 蛋 ˏtsu
eggplant 茄 `kia
eight 八 'yat
eight (ordinal) 八 'pet
elbow 肘 'pu 'si 'kong
empty (hole) 空(濃) 'foh, 'fong
enter 進來 _pia ¯lau
evening 天晚 `vang ˏmong
evening meal 晚飯 `vang ˏmong
everyone 個個人 'koh ¯koh `men*
every kind 樣樣 ¯yung ¯yung*
everywhere 處處 _bung _bung
excrement 屎 _gai
excrete 痾 ˏeng
expensive 貴 ˏkui*
expert, master workman 師傅 ¯si 'fu*
eye 眼 `mai 'teng

face 面 'mien ¯beh
fall 跌倒 ¯ddiat* _lou
fall, shed 落 (葉落) ¯ddum (¯ddum `num)
familiar 熟 ¯soh*
fan 扇 ¯yep, ¯yap
fan a fan 撥扇 `yeu -yep
far 遠 'kou
farm 田 `liang
fast 快 _tson
fat 肥 ¯tin
fat, strong 肥大 (猛) 'mang*
fat, lard 猪油 `ting 'mi
father 父 _pia, ¯ba*
father-in-law 岳父 'ddou
fear 怕 ˏyia (here "i" is lengthened)
fence 菜園柵 'von ¯ddiang
few, little 少 ¯hvu
fifteen 十五 -siep ′m* (orig. _siep ′ng)
fight a fight 打仗 `si ′da*
fill up 裝滿 `toi ′bang
finger 指 'pu _dau
finger, the small 小指 'pu _dau ¯ddan
finger 小指 'pu ¯ka ¯ddi
finger nail 指甲 ˏvui
finish 完 (罷) _ba*
fire, a 一点火 ¯a ¯na 'tu
fire in mountains 火燒山 'tu ˏlam ˏgui
fire, to make 撇火 _da 'tu
fire place 堂灶 ¯tong `hen
fire place 火堂 'tu `tong 'gung
fire wood 柴 `hong
first 先 'hen ¯dong
fish 魚 'piu, `piu
fishy 羶臭 'ddeng
five 五 ˏpia
five (fifth son) 阿五 'a _siem
five (ordinal) 五 'ng*
flea of dog 狗虱 ¯ka 'mu
flint 火鎌石 _feh `len*
flint steal 火鐮刀 -feh `len 'yiu
flower 花 `biang
flower, to put in hair 帶花 ¯hep `biang
flute 笛 ¯tut
fly 蠅 'mong
fly, to 飛 'sei
follow behind 跟尾 `mai 'kong
foot 足 (爪) _dau*
foot, top part of 足面 ¯geng `pien
forehead 額 ¯long `pang
foreigner 番鬼老 ¯fan _gui ˏlou*
forest 山林 `tsum
fountain water 泉水 ¯m ′deng
four 四 `peh
four (ordinal) 四 ˏheh*
fowl 鷄公 ¯kui _pia
fowl 鷄母 'kui `pia
fowl 鷄項 ¯kui -ti
fowl 鷄仔 'kui 'ddan
fowl mating 鷄打生 ¯kui -pia ¯pa

¯kui `pia
friend 朋友(同年輩) `tun ′pia (`tung ′pia)
friend 火記(尊稱卑) `foh -gi*
frog 蛤蛙 ¯gup _gai, ¯gup 'ap*
front 前面 `long ¯men
fruit 果 _beu
fry 炒 (菜) -hau*('eh)
full 滿 -bang
full, eat 飽 -beu*

garlic 蒜 -hon*
garter 襪帶 -mat* 'liang
get up 起身 ˏeng 'kia
get up first 先早起 ¯ddou _ddu 'kia
ghost 鬼 -mien
ghost, to see off 送鬼 ˏhing ′mien
ghost driver 調鬼公 ¯heu -mien 'kung
girl, younger sister 女子(妹) 'moi*
give 給(分) ¯ban*
go 去 `mi
go home 回家 ¯lau -piu
go to market 趁墟 ˏkeh 'hi*
go into with head 嗌入去 ˏkung -pia `mi
goat 羊 `ying*
gold 金 'kem*
good 好 ˏyong
goose 鵝 `ngeh, `ngeh 'ap*
gore 艋 ˏddem
government 政府 'tsin ˏfu*
grandchild 孫 'hun*
grand daughter 孫女 'hun 'sa
grandfather 公 'kung*
grandmother 婆 `poh*
grass 草 -gnang, ′mia
grasshopper 蚱蜢 ¯bep
grave 墳 `pun*
great grandchild 曾孫 'hun 'ha ('moi)
great grandfather 曾祖父(王公) `vong 'kung*
great grandmother 曾祖母(王婆) `vong `poh*
green 綠 'meng
grind rice 磨(穀) ¯moh 'siu
gun 槍(銃) _tsung*

hail 雹(落雹) ¯poh* ('bun ¯poh)
hair 髮 ¯pei, ¯peh
half 半(一半) ¯pan* (¯dding 'ban)
hand 手 'pu
hand, naughty 多手 'pu 'tsong 'tsau
hard 硬 -heng*
hard, bitter 苦 `ku*
hat 帽 ¯yup
hatch 孵豆 ¯pu ˏtsu
have 有 'bot
have not 無(無得) ⁺ng -noh
hawk 鷹 `tam -kiang
he, she, it 他 'veh,
head 頭 ¯peh 'foh
hear 聽 ˏmang*
hear, not聽不到 ˏmang ⁺ng ′ddou, ˏmang ⁺ng ′num
heart 心 'hum*
heavy 重 -neh
heel 踵 `tu 'ku
hemp 苧蔴 `yeh 'du
hen 鷄母 'kui `pia
hew the tree 斬樹 ˏgui ˏddiang
hide 躲着 ¯ba _lou, ˏbieng* _lou
high 高 'yong
his, her, its 他的 'veh `nung
hoe 鋤 'kia `hu
hoe 小鋤 ¯kat
hold 執起 'm 'kia
hole 孔 ¯sin, 'gung*
honest 老實 'loh ¯set*
honey 蜜糖 'mui -m
hoof 蹄 ˏdi*
horn 角 'koh*
horse 馬 'ma*
hot 熱 ¯tsam
hot (ginger) 辣 ¯biet
house 屋 _piu
house, every 家家 'ka 'ka*
how? 怎樣? -hong ¯ti
how many, much? 幾多 ¯ka `kia

hundred 百 'ba*
hungry 饑 ¯sia
husband 夫 ¯kiang
husband, to marry a 出嫁人 'veh `ka ¯kiang

I 我 'tsia, 'bu (see "we")
idea 意思 `i -si*
in 在 ˏddui*
individual 個人(一個人) `lon (¯a `lon `men)
insect 蟲 'tsang
intestine 腸(猪腸) `kiang (¯ting `kiang)
invite 請(入來) -heng* (`men `toi)
iron 鐵 'lia
itchy 癢 ¯ket ¯ket 'ngau

jar 罌 ˏng* (or ˏm)
jump 跳(足) ¯ddeu ′dau

kettle 鉄鍋 ¯hang ′deng
kick 踢 `ddiem
kill 殺, 劏 `ddai, ˏddai
kidney 腎子 -hau
kidney 腎(猪腰) 'kin (`ting 'kin)
kitchen, Yao style 堂灶 ¯tong ˏhen
kite 鷂(鴟鷂) 'a ¯yiu*
knee 膝 `geng ′beh
knife 刀 ¯yiu
know 知得 ¯beh 'lei
know 識 -soh, ¯sot*

ladder 梯 'hai*
ladle 水勺 'ka 'siu
ladle out water 勺水 ¯yam -m
lamp light 燈火 ¯ddang* 'tu
land 地(耕地) ¯ti* (ˏai ¯ti)
language 話(說話) ¯dong (_kong ¯dong)
laugh 笑 'tut
lay eggs 生蛋 ˏeng ˏtsu
leaf 葉 `nnum
lean meat 瘦肉 'ding -deng
learn 學 ¯hoh*
left 左, 左手 ˏddoi (ˏddoi 'pu)
leg 腿 ¯tam `si
leisure 得空 'dei 'hung*
level road 平路 'peng _tsu
life 命(有命) ¯meng* ('bot ¯meng ¯kon)
light 燈火 ¯ddang 'tu
light a lamp 點(火) -ddiem*
light (not heavy) 輕(不重) ¯beu (⁺ng -neh)
lightning 電 `lung ¯mai
like this 這麽 _heh ¯neng
like this, to speak 這麽講 -heh ¯neng ′kong
limestone 石灰 'fui*
lips 唇(口皮) `i -di ¯ddip
live, 住, 生存 ¯kon
liver 肝(猪肝) ¯hong (`ting ¯hong)
lock door 鎖門(關門) ¯hap `man*
long 長 -ddu
louse 虱 -ddam
low 低, 矮 -ei*
lungs 肺 -fi*

made of 用...做 `un ....ˏai
man, people 人(民) `men*
man, male 男人 ¯kiang `men
many, much 多 'tsong
market 墟 'hi*
markets, one of the 高良墟 ¯koh `liang 'hi*
marry (woman to marry man) 嫁 ˏka*
marry (to take a wife) 娶 _nung, ¯nung
mat 蓆 ¯sia*
mattock 鋤(長形的) 'kia `hu
meat 肉 `gui
medicine 藥 'tsei
meet 撞面 ¯hop 'men (here "e" is especially low)
melon 瓜 'ka*
melon 人頭瓜 `men _peh 'ka ¯ha
melon 冬瓜 'ka 'tung* (inverted)
melt 鎔化 `ying*
middle 當中 ¯ma ˏddong

middle 中間 ¯tsung ¯kan*
mirror 銅照(鏡) 'tung ˏtsiu*
money 銀 `gnan*
monkey 猴 'biang
month 月 ˏloh
month, intercalary 閏月 ¯lun ˏloh
moon 月光 ˏloh, `ta ˏloh ′fan
morning 晨 ¯tam `tu
mosquito 蚊 'mong 'ddu ′ddu
mosquito bite 蚊痕 -dui 'kia
mosquito net 蚊帳 -tsang
mother 母 ¯ni, 'yeh
mother-in-law 婆母 -deh
mountain 山(坪) `peng*
mountain 嶺 ˏgui
mouth 口 `i ′di
mouth shut 封嘴 'u ¯ddiep 'i -di
move 動 ¯gnot,* -yan
moxa punk 艾 ¯ngeh, ¯ngei*
muddy 濁 'noh, ¯nou
murrain 瘟(牛瘟) 'ddoi, (`hng 'ddoi)
my 我的 'tsia `nung, 'bu `nung

name (given) 名ˏbu
name is what? 姓甚麼 ˏheng 'si ¯ni?
navel 臍 `gieng 'gieng 'li
near 近 ¯tsan*
neck 頸 ¯kong 'kan
neck ring 頸環 `gna 'kong
needle, pin 針 ¯tsum*
nephew 姪 'ddan
nest 巢(窠) 'fia*
net 網 'mong*
niece 姪女 ¯dong ¯nung
night time 晚間 -ba ¯man
nine 九 `ku*
nine (ordinal) 九 -ku*
nipper, iron 鉄箝 'lia ¯gnep
nipple 乳 -nen*
no, is not 不是 ⁺ng 'sei*
nose 鼻 ¯bi* `kieng
not 不沒 ⁺ng* (or ⁺m before labial)
not much 沒有多少 ⁺ng -noh `hai 'tsong
not any meaning 無甚意思 ⁺ng -noh `hai `i ′si
noun prefix 阿... a (to precede any monosyllabic noun)
now 現在(如今) ¯ni 'ken*
number (no.) 第..... `ti* .....

official 官 'kien*
official, the (of Yao) 大官(猺官也) `tam 'kien
oil 油 `yiu*
old 老('古) ˏku*
old man 老人 ¯kung ˏdeh, ˏku `men*
old women 老媽子 'po 'ku -ddam
on 在 ˏddui*
one — ¯a
one (ordinal) — ¯yot, 'yot*
onion 葱 'hung*
open 打開 -da ¯gai* (here "g" is velarized fricative)
open mouth 開口 'nga `i -di
orange 柑 ¯kong -kip
our 我們的 'bu -na -ddui `nung
out 出 'sot*
over 過 ˏkei*

pail 水桶 ¯sui `tung*
pain(ful), ache 痛 'man
pair 對 ¯yang
palm 手掌 ¯pu `pien
paper money 紙銀(銀紙) -tsi `gnan*
part 份 ¯fun*
partridge 鷓鴣 ¯ddong 'ku ¯noh
pastry 糕餅 -gvu
peach 桃 ¯beu `koh
pear 梨 ¯beu `yai
pen 筆 'pit*
penis 陽具 `sau -kang
pepper 辣椒 -la ¯leu
persimmon 柿 ¯beu 'ddui
pheasant 雉 `yeh ¯gung
pick vegetable 摘菜 -fu 'eh
pig 猪 'ting

pigeon 白鴿 ¯ba 'koh*
pin 針 'tsum*
pinetree 松樹 `hung* ˏddiang
pipe, smoking 烟筒竹 'en `tung ′kang*
place 地方(地頭) ¯ti `tu*
place 處 `nang, ¯bung
place, what? where 何處 -ba `nang, -ba ¯bung
place, this, here 此處 -na `nang, -na ¯bung
place, that, there 彼處 -ti `nang, -ti ¯bung
plain 平地 `peng -di*
plain ground 平洞地方(指漢人住地) `peng -tung ¯ti `tu*
plants "菜" ′mia (for pigs)
plants wild, for pigs 野菜 `yeh ¯ddu
plant in field 插田 ¯sieng `liang
play with water 玩水 -pim ′m
plow 犁 `heh, 'heh `tu
plow the field 犁田 'heh `liang
pluck 拔上來 ¯beng ˏhoh ¯lau
plum 李子 ¯beu -yong
plural ending of pronouns 們些 -ddui
pond 塘 `gong
pot, tea 茶瓶 'ta `peng*
potato 番薯 ¯fan 'si* `tai
powder 粉 ˏfun*
pregnant 懷孕 ¯hoi `au
prickle 刺 'ddam
priest, the Yao 道鬼公 ¯heu -mien 'kung
produce, birth to child 生孩子 ˏeng `au
produce, lay eggs 生蛋 ˏeng ˏtsu
prosperity 人旺(吉利話) `men ¯vong*
pull 拉牽(牛) ¯hun* (`hng)
purse 荷包 ¯poh 'fu
push 推 -ddun

quick 快 -tson
quilt 被 ˏsung

rabbit 兎 ¯tu -deh `mieu
rain 雨 ¯bing
rains, it 下雨 'bun ¯bing
rainbow 虹 ¯kau
rake 耙田 ¯ba `liang
rat 鼠 `kieng 'kieng
read 讀 ¯du*
reap 割禾 ¯kot 'siu
reason 道理(講理) ¯dou 'li* (-kong ¯dou 'li)
recite 背書 ¯hoi 'su
red 紅 'sia
relative 親戚 ¯hen `si*
rest at home 在家休息 ¯oh 'nei, `sa ˏhun
return 轉去 ¯mu
return home 回家 ¯lau -piu
rice, a big kind 大禾 ¯tam `bu
rice, common kind 禾 'siu
rice grain, unground 穀 'siu
rice, ground 米 -meh*
rice, cooked 飯 ˏnong
rice shoots 秧 `bieu
rice (red kind) 紅米 -meh 'sia
rice crust 飯焦 `vieng -gvu
rich man 財主人 ¯soi -tsi `men*
ride on horse back 騎馬 `gi 'ma
right, correct 對了 ¯diu 'liu, -ngam ˏsien*
right, not wrong 不錯(差) ⁺ng 'ha,* ¯diu
right hand 右手 ¯boh 'pu
river 河 `ddoi
road 大路 `tam -tsu
robber 賊民 ¯ha `men*
room 房 'deh 'kong
root 根 'tsan
round table 圓檯 `vin `toi* ¯da ¯hing
run (away) 跑 ˏpiu, `piu

saliva 口水 'yiu `yan
salt 鹽 `yem*
salt jar 鹽罌 `yem ˏm (original ˏng)*
salt water 鹽水 `yem -m (′m)

salty 鹹 `ddoi
sand 沙 'ha*
saw, to 鋸(鋸樹) ˌgai* (ˌgai ˌddiang)
scale of fish 魚鱗 'piu ˌki
scared away 怕而走 ¯ddeng
scarify for illness 揑痧氣 ¯gnep `sa _hi*
school 教書學堂 'kau 'su ¯hop ¯tong,* ¯tu 'su `nung _piu
scissors 剪 _geu*
scold 罵(人) _ma `men*
screen 帳 _tsang*
scrotum 腎囊 ¯hau 'fu
sea 海 _hoi,* `tam _hoi
see 看 ˌlieu*
see, cannot 看不到 ˌlieu ⁺ng ¯bat
seed 種子 'num
self 自家 `si 'ka*
sell 賣(出去) 'mai* (¯sot `mi)
sentence 話(就是那句話) ¯dong, 'sei _na 'kui ¯dong
set (of sun) 日落了 'a 'nai ¯ut l
seven 七 ¯gni
seven (ordinal) 七 'hut*
several 幾只 `kia 'tsa*
sew 縫衣 'ddup 'i
shadow 影 _ong*
sharp 尖 ¯heh
sheep 羊 `ying*
shoe 鞋 `hai*
shoe, sandal 布鞋(千里馬) ¯koh `hai
shoot (birds) 打(鳥) _bun ¯noh
shop 舖頭 _fu `tu*
short 短 _nang
shoulder 肩頭 ¯gen `tu*
shrimp, dry 蝦米(乾) ˆha 'kung* 'goi
shut the door 關門 _gon `man*
sick 病 'man
sickle 鐮刀 `yem 'ddou* ¯yiu
side 旁邊 `hen ¯bien
silver 銀 `gnan*
sing 唱歌 ˌai 'tsing
sister, elder 大姊 `tam _ti
sister, younger 妹 'moi*
sister-in-law 嫂 ¯loh `ku,* ¯gnem
sister-in-law 弟婦 _in 'yeh
sister-in-law 大姨 ¯tam `ku
sister-in-law's husband 大姨夫 `tam ¯ba
sister-in-law 小姨 `yeh
sister-in-law's husband 姨夫 'yeh _geu
sit down 坐下 'heh _lou
six 六 'toh
six (ordinal) 六 ¯lia*
skin 皮 ¯ddip
skirt 裙 `gon*
sky 天 `vang
slanting 斜 ¯piang
sleep 睡 ˌbui
sleep, close eye 睡目 'ep `mai 'teng, ¯yap `mai 'teng
slow 慢 ¯man*
small 細,小 ˌhei*
smallpox 天花(痘) ¯hong*
smell 聞 ˌmang*
smile 笑 'tut
smoke 煙 'en*
smoke, make eye water come out 煙 ˌun ¯sot ˋmai ˊm
snake 蛇 'nong
sneeze 噴嚏 'hat ˌtsiu
snivel 鼻涕 ¯bit
snow 雪 ˌban
snow, to 下雪 'bun ˌban
so early 這麼早 ¯heng _ddu
so many 這麼多 _heng 'tsong
sock 襪 _mat*
soft 軟 ¯map
soil 泥(街泥) 'neh ('kai 'neh)*
soldier 兵,勇 ¯biang,* `yung*
sole of foot 蹠 ¯geng _ddi
some, a bit 一些 ¯a ˌoi
son (also diminutive ending) 仔,兒 'ddan
son-in-law 婿 _veh
song 歌 'tsing
soon 就,一陣 'set ¯ti
soul, to call back the 招魂來 ¯siu `von ¯lau
sour 酸 'si
sow seeds 播種 ¯ddot 'num
sparrow 蔴雀 ¯ang ˊeng
spider 蜘蛛 'mong 'kung ˊtsang
spit 吐口水 ˌdeu 'yiu `yan
spoon 羹匙 _dau `kang*
spring season 春天 ¯sun _gui* `vang
spurt out 噴 ˌdeu
square 四方 ˌpeh 'koh
square table 四方檯 ˌpeh 'koh ¯da ¯hing
stand up 立直 _fu 'kia
star 星 ¯hut 'neng
steal 偷 ¯gnem
steep 峭 'ki*
stick 棍 `ti
sting 刺(蜂刺) ˌddan
stomach 肚(內) _hng (_hng 'gung)
stomach (of pig) 猪肚 _gai 'sei ¯poh
stone 石頭 ¯yu ˊpeh
straight 直(手指直) 'lang ('pu _dau 'lang)
straw 禾稈 ¯ku _kon
straw berry 楊梅 ¯yem `loh 'di ¯si ˊbeu
street 街 'kai*
strength 力 ¯ya
strike 打 ¯ket
sugar 甘蔗(片糖) ¯kom ¯dong*
suit of clothings, a 一身衣服 ¯a 'na 'tan 'i ˌfia
summer 夏天 ¯ha _gui* `vang
sun 日 'nai
supper 晚餐 `vang ˌmong
surname 姓 ˌheng*
swallow 燕 'fia ˊeng
swan (literally Yao woman's ghost) 天鵝(猺女鬼) ¯sa 'yau ˊmien
sweat 汗 ¯hon*
sweat, to 出汗 ¯sot ¯hon,* _hon ¯li
sweet (same as salty) 甜(同鹹) `ddoi
swim 泅水 `beu ¯lap
swing 擺來擺去 _geu ¯a _geu

table 大桌 da ¯hing
tail of bird 鳥尾 ¯ddui ¯ddi, ¯ddui 'ti
tail, feather of 尾之羽 `piang
take 拈,拿 'm
take a walk 玩耍,逛街 ˌai 'nang
take off (coat) 脫(衣) ˌdau
talk 講話 _kong* ¯dong
tasteful 甘 'kom*
tasteless 淡 _ddom*
tea (water) 茶水 `ta ˊm
tea leaf 茶葉 `ta _gai
tea pot 茶瓶 'ta `peng*
teacher of Yao 先生公 _sien _sang 'kung*
teel you, him 話你(他知) ˌbau `mui ¯veh, ˌbau 'veh ¯veh
ten 十 ¯siep*
ten (ordinal same) 十 ¯siep*
ten thousand 萬 -van *
than 過 ˌkeh*
that 那 _ti
their(s) 他們的 'veh _na _ddui `nung
then (only until then) 正(才) _tsang*
there 那兒 _ti ¯bung
these 這些 _na _ddui
they 他們 'veh _na _ddui
thin 瘦 ¯gei
thing 事物,工夫, ¯kung 'fu,* ¯kung 'pu
thing 東西,物 'tum ˌdang
thirsty 渴 _kong 'kan 'got*
this 這 _na
those 那些 _ti _ddui
thousand 千 'hun*
thread 線 ˌsi
three 三 ˌbu (here "b" is vibrating)
three (ordinal) 三 'hom*
thrush 畫眉鳥 ¯tsi `tsau ¯noh
thresh rice 打禾 ¯ang 'siu

thumb 大拇指 `pu _peh ¯ni
thunder strikes you! 雷公劈 _bia 'kung 'ka
tie, to 綁 `ddoh
tiger 虎 `kien
till 瓦 ¯nga*
tin 錫 'heh*
tired 疲乏 `lai
tobacco 煙 'en*
today 今日 ¯ni 'nai
tomorrow 明日 `vang 'nai
tongue 舌 _bet
tooth 牙 `gna, `nga*
top 頂 ˎdding*
train, bus, 車 ˎfob `tsia*
tree 樹 ˎddiang
tree root 樹根 ¯ddiang `kong
tress 髻 ¯kui _dong
tripod stove 三足灶 ¯hang `kiang
trousers 褲 ˎfia*
true 眞 'tsien*
turban 纏頭布 _geu ¯beh 'ddeh
turn up 翻轉來 'fan ˎdun `toi (¯lau)
turnip 蘿蔔 `loh _poh ′peh
two 二 ˎvi
two (ordinal) ¯gni*

uncle 伯 ¯lou 'ba*
uncle 叔 ¯tui
uncle 大舅父 `tam ¯nung (nũ)
uncle 舅 ¯nung
under 在下 ˎddui ... _ddi*
up 上 (上嶺) ˎhoh (ˎhoh ˎgui)
up go 上去 ˎhoh `mi
up (used after verb) 起 'kia
  get up 起來 ˎeng 'kia
  stand up 立起 _fu 'kia
urine 尿 (小便) 'via (ˎeng 'via)
use (verb) 用 _hong
use (noun) 用 ¯yung*
  what use? 什麼用 'si ¯ni ¯yung
  not much use 無甚用 +ng _noh `hai _yung
use strength 用力 _hong ¯ya

vagina 陰戶 ¯sau `peh
vegetable 菜 'eh
vegetable 苦菜 'eh _mui
vegetable 青菜 'eh `tsai
very 很 `sang 'ga, ¯dai
village of Yao 猺村 (寨) ¯yong
vomit 嘔 ¯fon

waist 腰 'tan
waist band 束腰帶 'kui 'tan 'liang
waist coat 背心 _ga ¯lap 'i
walk 行 `yang*
want 要, 愛 ¯nung, ¯nũ, ˎoi*
water 水 _m
water, to convey 放水 ˎbong ′m
water supervisor 放水公 ˎbong _m 'kung
water trough 水槽 ¯m ′ken
we 我們 ¯bu _na _ddui
we all 大家 ¯ka 'ddi
wear 着衣 _nong 'i
weed, to 拔草 ¯nap ′mia
weed a field 耕田 ¯nap `liang
weep 哭 _gnem
well 水井 ¯m _deng
wet 濕 ¯ddan
what 什麼 'si ¯ni
what name 什麼名 'si ¯ni ˎbu
wheel 車輪 ¯sia ¯kun, ¯sia `lun*
when 何時? _ba ¯kung ¯hung
where 哪兒? _ba ¯bung, _ba `nang
which 哪? _ba
which one 哪一個? _ba ¯na.....
white 白 ¯ba*
white of eggs 蛋白 ¯kui ˎtsu ¯pa
who 誰? ¯si `men ('si ¯ni `men)
wife 妻, 婦 'sa
wild pig 野豬 `yeh 'ting
willing 願意 ¯gnen*
willow 柳 'kai ¯mai
wind 風 ˎyau
window 窗 ¯koh 'sin
wine 酒 _diu* _ddiu*
wing 翼 ¯ddot
wink 眼眨 `mai ¯tsiep
winter 冬天 ¯ddung ˎgui* `vang

winter time 九冬十月 _ku ¯dung ¯siep ¯ngoh*
woman 人 ¯sa `men, `pia
woman, Canton 婆 (省城婆) `poh 'leh (¯ha _li `poh 'leh)
word 字 'su*
work 工 (做工) 'kung* (ˎai 'kung)
work on the field 耕田 ˎai `liang
work on the terrace 耕地 ˎai ¯ti*
worm 蟲 'tsang
write 寫 _sia*
wrong 錯 (橫) `vang (+ng ¯diu), 'ha

Yao 猺 `yau*
Yao language 猺話 `yau `men ¯dong
Yao girl 猺女 ¯sa `yau
Yao style 猺人樣 `yau `men ˎhing*
Yao people 猺民 `yau `men*
year (age) 年歲 ˎgnang*
year after next 後年 ¯hvu ˎgnang*
year, last 去年 +gni ˎgnang
year, next 明年 `dei ˎgnang
year, this 今年 ¯gni ˎgnang
yellow 黃 `vieng*
yesterday 昨日 _nung 'pu 'nai
yet 添 'siem*
yolk of eggs 蛋黃 'kui ˎtsu `mong
you (singular) 你 `mui
you (plural) 你們 `gniu _na _ddui
you (singular or plural) 你 (們) `gniu
your 你的 'mui `nung
your (plural) 你們的 `gniu _na _ddui `nung
young 嫩 ˎin (here "i" is very short)

zero 零 (101) `liang* (¯a 'ba `liang 'yot)

連州八排猺語

黃錫凌

(摘要)

廣東西北連 (連州連山) 陽 (陽山) 交界猺山中有所謂八排猺。其實八排之外尙有村落百餘處。凡數萬人。其所用語言有猺漢獞等數種。而以猺語爲最有勢力。猺語又分八排猺(蠻猺)語與過山猺 (南猺) 語兩種。而以用八排猺語者爲最多。八排猺語又以油嶺排所用者爲最正。本文所紀即油嶺排者也。該語有主要聲母十八。全無送氣輔音。捲舌破烈音〔dd〕更爲特色。主要元音有五。韻尾有 m, n, ng, p 與 t 無 k。由此所成之韻母有四十八。聲調有五。變調二 (入聲不另計)。

本文所集常用字彙八百餘字。內至少有三分之一與漢同源。足見受漢語影響之深。句法大體與三江客語無異。惟有少數短語仍保存猺語本來面目。如形容詞後於名詞。專名後於通名。數字有兩組。一以記數之多少。一以記數之次第。尤爲特色。

NOTES ON CHINESE FUNGI, IX[1]

By F. L. Tai (戴芳瀾)
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Leveillula taurica (Lev.) Arnaud (fig. 1)

Hypophyllous, mycelium persistent, effused or forming patches, conidiophores arising from the mesophyll of the leaf through the stomata, simple or branched, one-four septate, hyaline, straight or curved, 143-157×4-6μ; conidia various in shape, clavate to cylindrical, hyaline, 36-70×10-14μ.

On *Capsicum annum*, Kunming, Yunnan, July 25, 1938, T. H. Wang; Kunming, Yunnan, August 6, 1938, F. L. Tai.

Erysiphe Glycines n. sp. (fig. 8)

Amphigena, mycelio evanescente vel subpersistente; perithecio sparsis vel subgregariis, 94-126μ in diam., appendicibus 17-26 in quoque perithecio, 1-10 plo perithecii diametrium excedentibus, simplicibus v. ramosis, hyalinis; ascii 6-8 in quoque perithecio, oblongo-ovatis vel subcylindraceis, brevissime stipitatis, 63-71×29-33μ, 6-8 sporis; sporis ellipsoideis vel oblongatus, 20-24×10-13μ.

Amphigenous, mycelium evanescent to subpersistent; perithecium scattered to subgregarious, cells of the perithecial wall obscure, 94-126μ in diameter; appendages long or short, one to ten times the diameter of the perithecium, simple or branched, more or less flexuous, hyaline, seventeen to twenty-six in number, basally inserted; asci six-eight in number, usually seven, narrowly ovate to subcylindrical, short stiped, 63-71×29-33μ, six-eight spored, usually six; ascospores ellipsoid to oblong, 20-24×10-13μ.

On *Glycine* sp., Tsing Chen Shan, Kuan Hsien, Szechwan, Nov. 2, 1938, C. T. Wei (Wei 2168).

This form is close to *Erysiphe Polygoni* D.C., but differs in the subcylindrical asci which are six to eight spored.

Sphaerotheca fuliginea (Schlecht.) Pollacci

On *Impatiens balsamina*, Tali (大理), Yunnan, August 26, 1938, H. S. Yao; Kunming, Yunnan, October 12, 1938, F. L. Tai.

Microsphaera Benzoinis Tai

Microsphaera Benzoinis Tai, 1935, Bull. Ch. Bot. Soc. 1:23.
M. Alni Tai et Wei, 1932, non Salmon, Sinensia 3:118.

This species was collected again at Hengshan, Hunan, in 1937. Its description should be emended as follows:

Hypophyllous, mycelium evanescent, perithecium gregarious to scattered, 72-119μ in diameter, cells of the perithecial wall 9.5-15μ

[1] Paper no. 8 from the Division of Plant Pathology, Institute of Agricultural Research, National Tsing Hua University.

wide; appendages three-eleven, usually five, shorter than or slightly exceeding the diameter of the perithecium, usually shorter, non-septate or once-septate at base, hyaline or brownish at base, apex four-six times dichotomously branched with regularly recurved tips; asci three-five, ovate to ovate-globose, stalk short, 56-71×31-51μ; spores three-five, usually four, rarely only two, ellipsoid or oblong, 21-34×11-17μ.

On *Lindera glauca*, Hengshan, Hunan, November 18, 1937, C. C. Cheo.

Microsphaera Bidentis n. sp. (fig. 2)

Amphigena, mycelio persistente, perithecio sparsis vel gregariis; 97-126μ in diam.; appendicibus 10-21, rarius 8 v. 23, ramulis 3-5 dichotomis, patentissimis, ramulis ultimis digitatis; ascii 4-6, late ovatis vel subglobosis, brevissime stipitatis, 51-64×30-44μ; 3-5 sporis; sporidiis ellipsoideis vel oblongatus, 19-30×11-14μ.

Amphigenous, mycelium persistent, effused or forming patches; perithecium scattered to subgregarious, cells of the perithecial wall obscure, 97-126μ in diameter; appendages ten-twenty-one, rarely eight or twenty-three, shorter or slightly exceeding the diameter of the perithecium, three-five times dichotomously branched, branching spreading, ultimate branchlets finger-like and slender, never recurved, sometimes one-septate at base; asci four-six, usually five, broadly ovate or subglobose, short stiped, 51-64×30-44μ, three-five spored, usually four, ellipsoid to oblong, 19-30×11-14μ.

On *Eidens* sp., Tsing Chen Shan, Kuan Hsien (灌縣青城山), Szechwan, Nov. 2, 1938, C. T. Wei (Wei 2170).

This form is very close to *M. Grossulariae*, but differs in the larger perithecium, spreading appendages and slender ultimate branchlets.

Microsphaera Blasti n. sp. (fig. 7)

Amphigena, mycelio persistente vel evanescente, perithecio gregariis vel sparsis, 74-106μ in diam., cellulis 7-14μ latis; appendicibus 6-15, (rarius 2 vel 4), 1-2 plo perithecii diametrium excedentibus, ramulis 3-5 dichotomis, erectis, interdum geniculatis, ramulis ultimis modo rectis modo recurvatis; ascii 4-6, ovoideis vel ellipsoideis, 42-56×28-34μ non vel brevissime stipitatis, 2-4 sporis; sporidiis ellipsoideis vel oblongatus, 20-26×10-13μ.

Amphigenous, mycelium evanescent or persistent, forming patches or effused; perithecia gregarious to scattered, 74-106μ in diameter, cells of the perithecial wall 7-14μ wide; appendages six-fifteen, rarely only two or four, one-two times the diameter of the perithecium, three-five dichotomously branched, straight or sometimes geniculate, tips of ultimate branchlets not all recurved, branching often loose and vague, one-two-septate at the base, the basal cell brown, 7-8.4μ wide, branches of the second order usually long; asci four-six, ovoid or ellipsoid, 42-56×28-34μ, with or without a short stipe; two-four spored; ascospores ellipsoid or oblong, 20-26×10-13μ.

On *Blastus pauciflorus* Merr., Hengshan, Hunan, October 21, 1936, F. L. Tai (Tai 3095 and 3103).

Microsphaera Decaisoreae n. sp. (fig. 5)

Hypophylla, mycelio evanescente, perithecio gregariis vel sparsis, 98-126μ in diam., cellulis 7-14μ latis; appendicibus 5-9, ramulis 4-5 dichotomis, 1-septatis, apice ultimis recurvus; ascii 3-7, ovatis vel subglobosis, 56-67×39-52μ, non vel brevissime stipitatis, 4-8 sporis; sporidiis oblongatus, 22-25 (usque 29)×11-14μ.

Hypophyllous, mycelium evanescent; perithecium gregarious to scattered, 98-126μ in diameter, cells of the perithecial wall 7-14μ in width; appendages five-nine, commonly six, only three-fourths of, or equalling, the diameter of the perithecium, four-five dichotomously branched, one-septate, septum at one-third or one-half the length from the base, basal cell brown, ultimate branchlets regularly recurved, primary branches often longer; asci three-seven, obovate to subglobose, 56-67×39-52μ, with or without a short stipe, four-eight spored; spores oblong, 22-25 (up to 29)×11-14μ.

On *Decaisorea Fargesii* Fr. (Lardizabalaceae), Nanwutaishan, near Sian, Shensi, October 2, 1936, F. L. Tai.

Microsphaera pseudo-lonicerae (Salm.) Blumer

On *Coculus trilobus*, Yolushan, Changsha, Hunan, Nov. 25, 1937, S. T. Chao.

Microsphaera Securinegae Tai et Wei (fig. 10)

Microsphaera Securinegae Tai et Wei, 1932, Sinensia 3 :120.
M. Euphorbiae Homma, 1937, non Berkeley et Curtis, Jour. Fac. Agri. Hokkaido Imp. Univ. 38 :391.

Homma, in her monograph on the Erysiphaceae of Japan (Homma l.c.), gave *M. Securinegae* as a synonym of *M. Euphorbiae* (Peck) B. et C. (fig. 9). This led the writer to study again the type of *M. Securinegae*, and to compare it with a specimen of *M. Euphorbiae* kindly sent to him by Dr. G. M. Reed (on *Euphorbia corollata* L., Centralia-Hallsville, Mo., collected by Reed and Maneval, Oct. 6, 1917, G. M. R. 2613). The result of re-examination shows that the two species are distinct. *M. Securinegae* has smaller perithecia (75-92μ in diameter as compared with 98-134μ for *M. Euphorbiae* according to the writer's measurement), shorter asci (broadly elliptical or subglobose; ovate oblong for *M. Euphorbiae*), and fewer spores in each ascus (six to eight spored, usually eight, for *M. Securinegae*, three-seven spored, usually four, for the other species). The branching of the appendage is lax and irregular with tips rarely recurved in *M. Euphorbiae*, while the ultimate branchlets are regularly recurved in the other species. The ascospores of *M. Euphorbiae* are also longer.

The writer had no opportunity to compare the Chinese form with the Japanese as the latter was not available to him. The Japanese species of *Microsphaera* on *Securinega* was first attributed to *M.*

Euphorbiae by P. Henning. Homma either followed the determination of Henning or she has a form different from ours, but according to her description and illustrations, it seems that her material is identical with the Chinese plant.

Uncinula Aceris (D.C.) Sacc. (fig. 4)

Amphigenous, mycelium persistent, forming patches; perithecium scattered to subgregarious, 175-219μ in diameter; appendages over a hundred, about half as long as the diameter of the perithecium or shorter, one-two dichotomously branched near the apex, base thick-walled (7-8.5μ wide at base), narrowed towards the apex, closely uncinate; asci five-ten, narrowly ovate, 81-100×46-51μ, six-eight spored; spores ellipsoid to oblong, 20-25×11-14μ.

On *Acer* sp., Tsing Chen Shan, Kuan Hsien, Szechwan, Nov. 11, 1938, C. T. Wei (Wei 2204).

In this country this species has been reported only from Liaoning, by Miura (Flora of Manchuria and East Mongolia, Pt. III, 1930).

Uncinula Clintonii Peck

On *Celtis sinensis*, Kaiyuan (開遠), Yunnan, Dec. 16, 1938, T. F. Yu, T. H. Wang and S. T. Chao.

Uncinula Salicis (DC.) Winter

On *Populus* sp., Gichushan (鷄足山), near Tali, Yunnan, September 16, 1928, H. S. Yao.

Uncinula septata Salm.

On *Quercus* sp., Yolushan, Changsha, Hunan, Nov. 11, 1937, S. T. Chao.

Uncinula sinensis Tai et Wei (fig. 3)

Amphigenous, mainly epiphyllous, mycelium subpersistent, effused or forming patches; perithecium aggregate to scattered, 111-143μ in diameter, cells of the perithecial wall 10-13μ wide; appendages eleven-thirty-two, one to one and three-fourths times the diameter of the perithecium, thin-walled, thicker-walled and asperulate below, straight or slightly curved, occasionally somewhat undulating, usually swollen near the apex or only slightly so, simply or closely uncinate to helicoid, 6-7μ wide at the lower part; asci four-ten in each perithecium, broadly ovate or ovoid-oblong, short stiped, 59-69×33-43μ, four-six spored, usually five, rarely only two; spores oblong, 27-30×14-16μ.

This form is very close to *U. sinensis* except that the appendages are usually swollen near the apex, but some of them are only slightly so, and others uniform in diameter.

On *Acer oblongum*, Yolushan, Changsha, Hunan, Nov. 26, 1937. C. C. Cheo and S. T. Chao.

Uncinula yunnanensis n. sp. (fig. 6)

Amphigena, mycelio persistente, perithecio dense gregariis, 70-92μ in diam.; appendicibus brevioribus, 41-71μ long., 4-6μ latis, 2-9 in quoque perithecio, hyalinis, eseptatis, rectis, sursum versus latioribus, apice simpliciter uncinatis vel helicoideis; ascii 3-5 in quoque perithecio, late ovatis, brevissime stipitatis, 41-56×29-41μ, 4-6 sporis; sporidiis ellipsoideis vel oblongatus, 18-23×11-12μ.

Amphigenous or only epiphyllous (specimen collected at Kunming), mycelium persistent, effused or forming patches; perithecium densely gregarious, cells of the mature perithecial wall obscure, 70-92μ in diameter; appendages shorter than the diameter of the perithecium, 41-71×4-6μ (at base), two-nine in number, hyaline non-septate, thin-walled, becoming thicker-walled below, straight, loosely uncinate or helicoid, enlarged near the apex; asci three-five, broadly ovate, short stiped, 41-56×29-41μ, four-six spored, usually six; spores ellipsoid or oblong, 18-23×11-12μ, hyaline.

On *Ehretia coryllifolia*, Shishan, Kunming, December 1938, F. L. Tai; Mengtze, Yunnan, December 20, 1938, T. F. Yu, T. H. Wang and S. T. Chao.

This species differs from *Uncinula Ehretiae* in smaller perithecium and fewer asci.

Uncinulopsis Shiraianus (P. Henn.) Hara

On *Celtis sinensis*, Kaiyuan (開遠), Yunnan, December 16, 1938, T. F. Yu, T. H. Wang and S. T. Chao; I-Liang (宜良), Yunnan, December 16, 1938, T. F. Yu, T. H. Wang and S. T. Chao; Tachuan (大莊), Yunnan, Dec. 18, 1938, T. F. Yu, T. H. Wang and S. T. Chao; Mengtze (蒙自), Yunnan, Dec. 20, 1938, T. F. Yu, T. H. Wang and S. T. Chao.

中國菌類之記載 (九)

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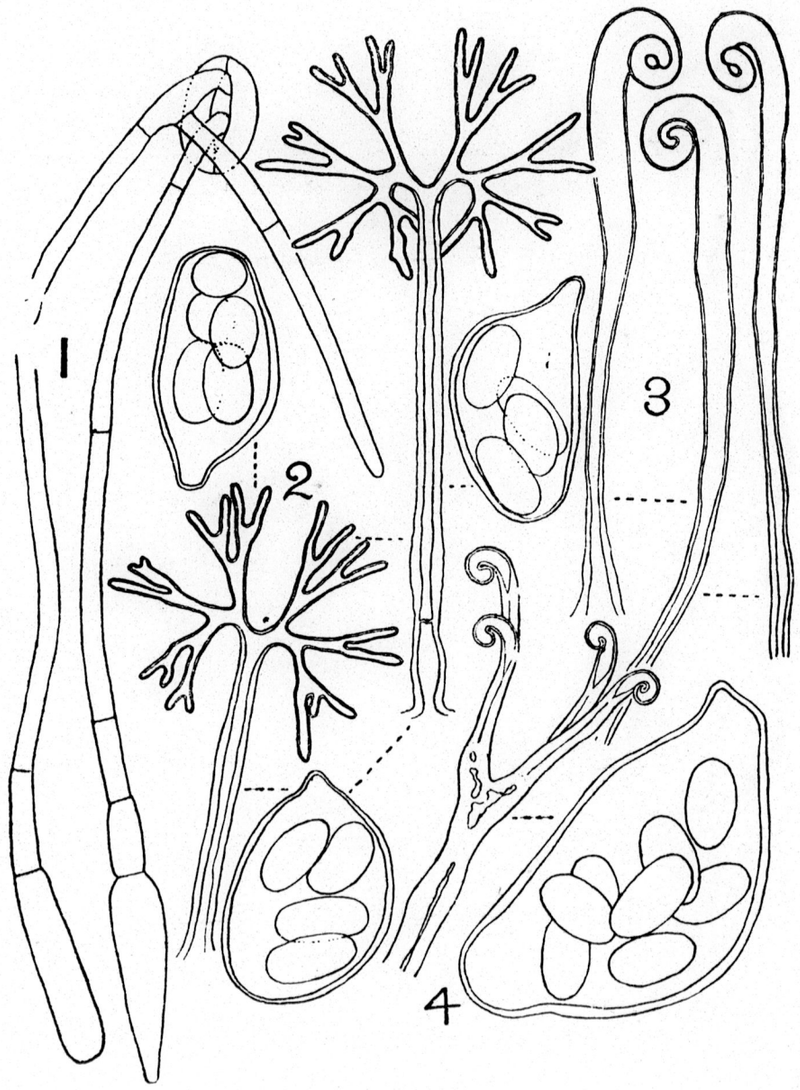
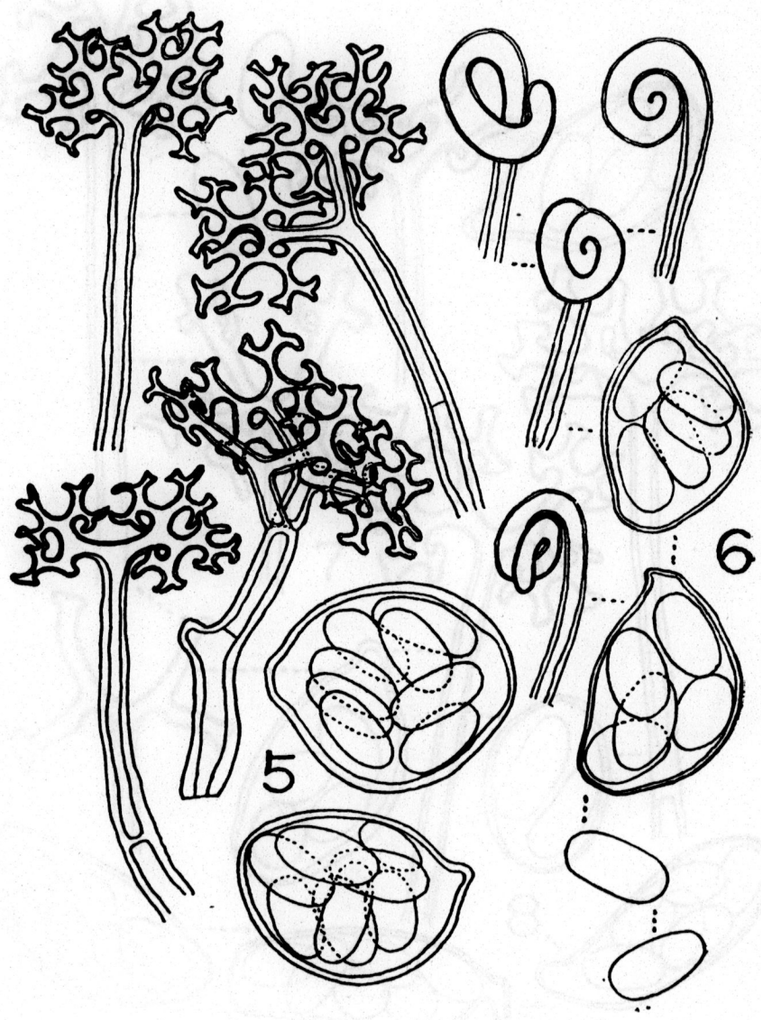
(摘要)

本文記載華西菌類十六種之生長狀態，形態，及其寄主。計屬新種者有：*Erysiphe Glycines*, *Microsphaera Bidentis*, *M. Blasti*, *M. Decaisoreae*, 及 *Uncinula yunnanensis*.

Explanation of Plates

Fig. 1. *Leveillula taurica* (Lev.) Arnaud
2. *Microsphaera Bidentis* n. sp.
3. *Uncinula sinensis* Tai et Wei
4. *Uncinula Aceris* (D.C.) Sacc.
5. *Microsphaera Decaisoreae* n. sp.
6. *Uncinula yunnanensis* n. sp.
7. *Microsphaera Blasti* n. sp.
8. *Erysiphe Glycines* n. sp.
9. *Microsphaera Euphorbiae* (Peck) B. et C.
10. *Microsphaera Securinegae* Tai et Wei

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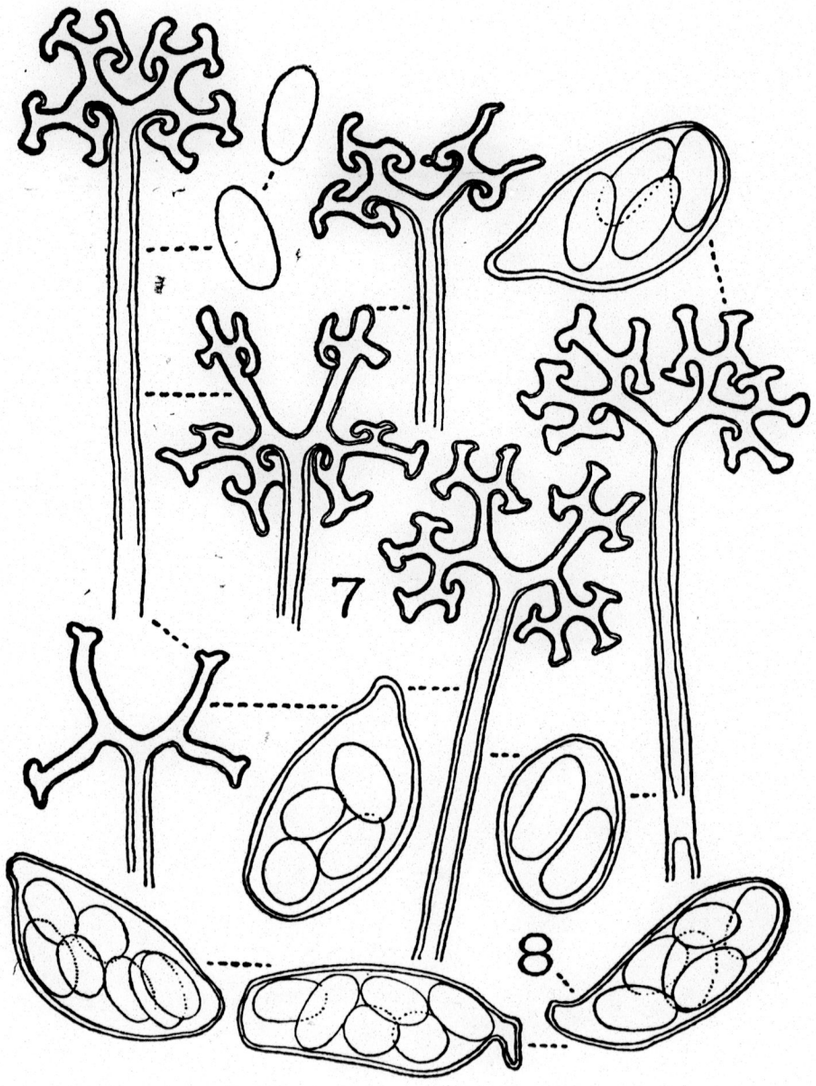
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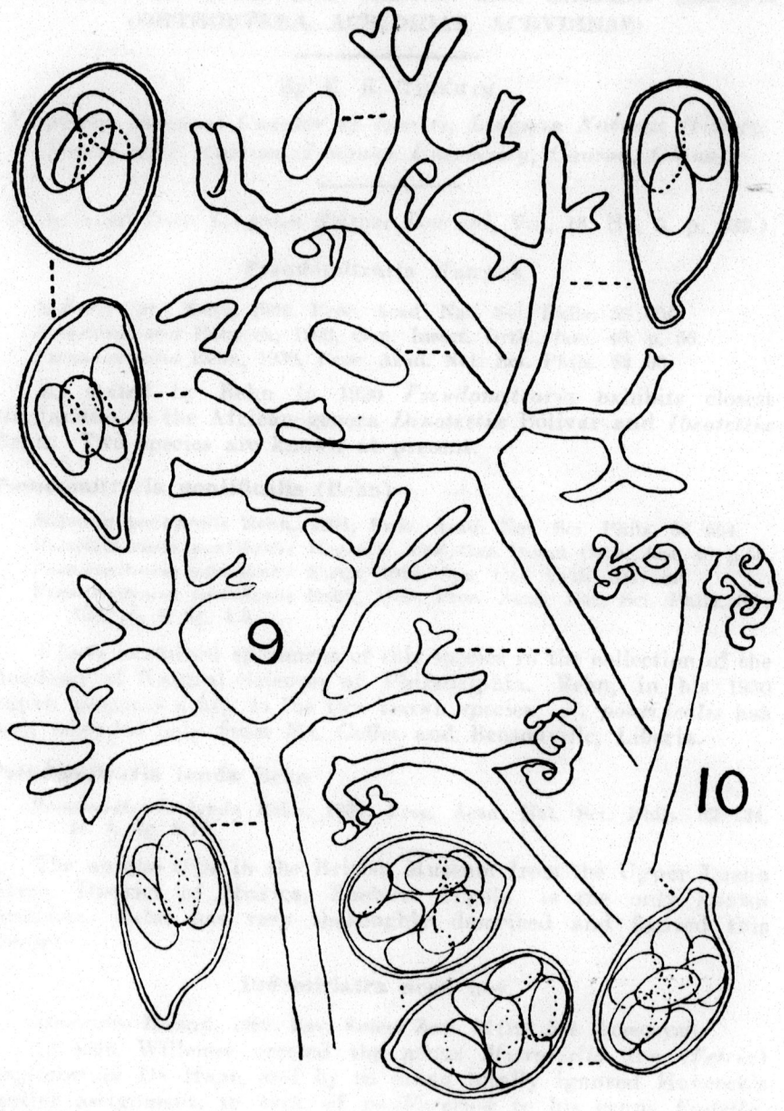
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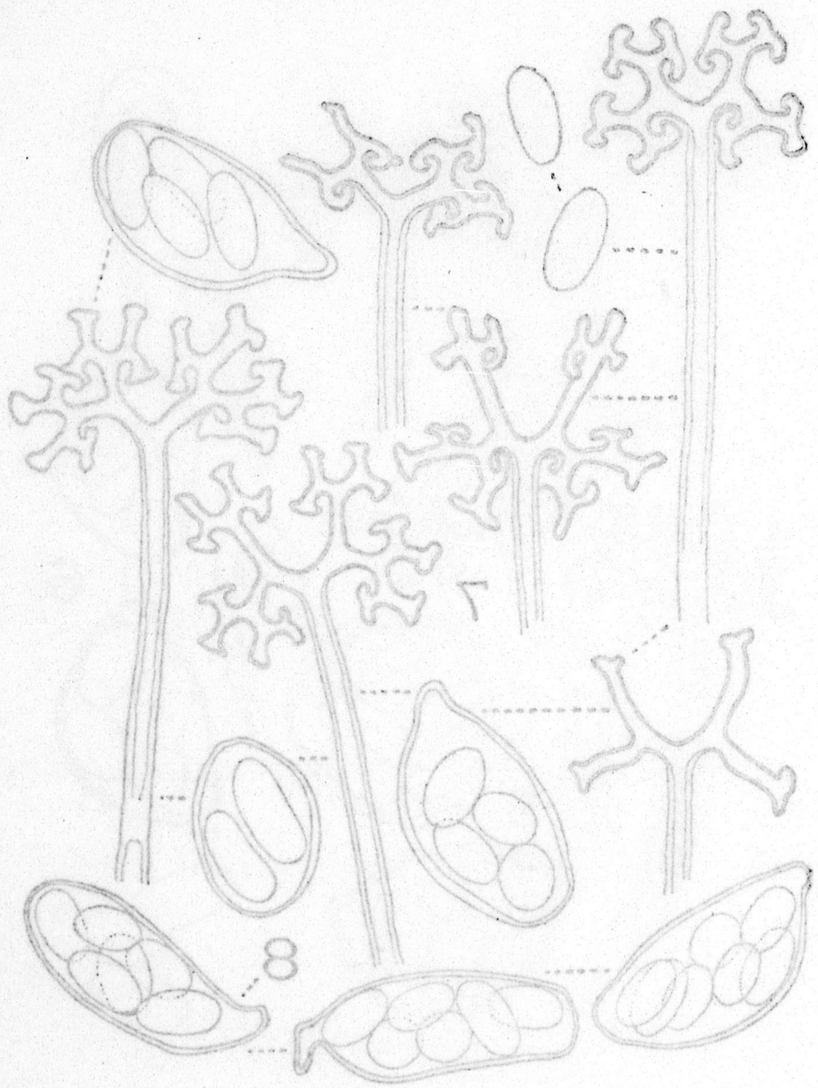
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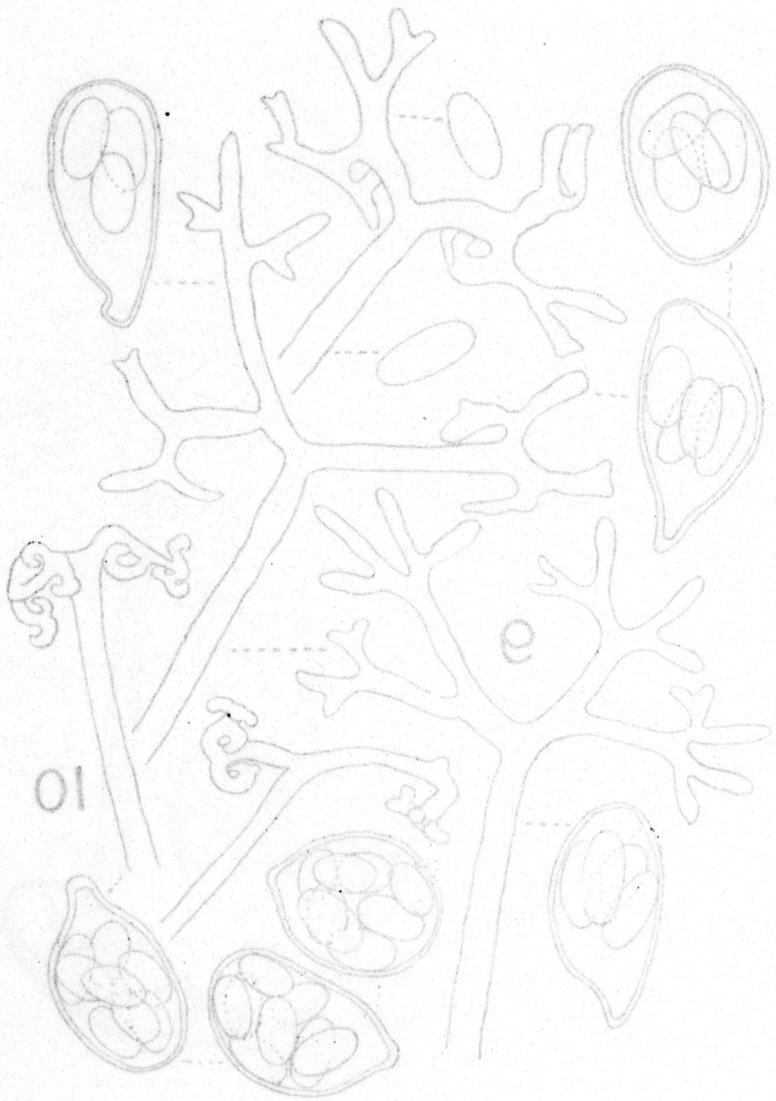

REVISION OF THE GENERA RHOPALOTETTIX HANCOCK, ROSTELLA HANCOCK AND ALLIED AND SIMILAR GENERA (ORTHOPTERA, ACRIDIDAE, ACRYDINAE)

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(Concluded from *Lingnan Science Journal*, Vol. 18, No. 3, p. 339.)

Pseudomitraria Hancock

Mitraria (pt.) Rehn, 1904, Proc. Acad. Nat. Sci. Phila. 56 :664.
Pseudomitraria Hancock, 1906, Gen. Insect. Orth., fasc. 48, p. 50.
Pseudomitraria Rehn, 1930, Proc. Acad. Nat. Sci. Phila. 82 :33.

As stated by Rehn in 1930 *Pseudomitraria* exhibits closest similarities to the African genera *Dinotettix* Bolivar and *Ibeotettix* Rehn. Two species are known at present.

Pseudomitraria pontificalis (Rehn)

Mitraria pontificalis Rehn, 1904, Proc. Acad. Nat. Sci. Phila. 56 :664.
Pseudomitraria pontificalis Hancock, 1906, Gen. Insect. Orth., fasc. 48, p.50.
Pseudomitraria pontificalis Kirby, 1910, Syn. Cat. Orth. 3(1) :29.
Pseudomitraria pontificalis Rehn, 1930, Proc. Acad. Nat. Sci. Phila. 82 : 133, pl. 4, fig. 1-5.

I have examined specimens of this species in the collection of the Academy of Natural Sciences of Philadelphia. Rehn, in his 1930 paper, presents a key to the two known species. *P. pontificalis* has been recorded only from Mt. Coffee and Bensonville, Liberia.

Pseudomitraria lunda Rehn

Pseudomitraria lunda Rehn, 1930, Proc. Acad. Nat. Sci. Phila. 82 :134, pl. 4, fig. 6-10.

The unique type in the British Museum from the Upper Luena River, District of Moxica, Eastern Angola, is the only known specimen. Rehn has very thoroughly described and figured this species.

Indomiriatra nom. nov.

Mitrariella Hebard, 1929, Rev. Suisse Zool. 36(19) :584 (homonym).

In 1928, Willemse erected the genus *Mitrariella* for (*Tetrix*) *phyllocerum* De Haan and by so doing totally ignored Hancock's earlier assignment, in 1913, of *phyllocerum* to his genus *Rostella*. Hence *Mitrariella* Willemse is a synonym and *Mitrariella* Hebard a homonym. The name *Indomiriatra* is here proposed to replace *Mitrariella* Hebard.

Hebard characterized the genus as follows: Eyes widely separated. Fastigium strongly produced, lamellate, its free margins oblique-convergent, then notched at the median carina, which is distinct only apically. Face decidedly oblique, frontal costa forking gradually and interval narrow, in lateral aspect contour broadly convex between the elongate antennae, which are inserted slightly above the ventral margins of the eyes. Pronotum caudate; cephalic margin transversely truncate, lateral carinae of the prozona parallel; medio-longitudinal carina swollen and somewhat raised between prozona and metazona, thence undulate, with two low supplementary carinae on each side; lateral lobes briefly horizontally reflexed with acute-angulate projection directed weakly caudad. Cephalic and median femora with ventral margins weakly lobate. Caudal femora unusually smooth. Cephalic and median tibiae weakly sulcate dorsad. Caudal metatarsus slightly longer than the last joint, its pulvilli with second longer than the first and the third longer than the second.

Genotype.—Spadotettix provertex Hancock.

The type, which I have examined, is deposited in the Hancock-Hebard Collection at the Academy of Natural Sciences of Philadelphia.

Indomiriatra provertex (Hancock) (pl. 13, fig. 12)

Spadotettix provertex Hancock, 1912, Mem. Dept. Agri. India 4(2) :142.
Spadotettix provertex Hancock, 1915, Rec. Ind. Mus. 11(1)5 :95.
Mitrariella provertex Hancock, 1929, Rev. Suisse Zool. 36(19) :585.

This genus, which is at present monotypic, has definite loxiloboid features. On the other hand there is only a faint suggestion of any resemblance to *Pseudomitraria* and perhaps a slightly stronger one towards *Rostella* Hancock. The general form of *Indomiriatra* and *Rostella* is much alike, and if we allow for the increased production of the fastigium in *Rostella* as due to an expansion of the knob-like carinae present in *Indomiriatra*, some linkage between the two genera may be apparent. However, the probabilities are that the two genera are not even distantly allied. Figure 12 depicts the head of the type in the Hancock-Hebard Collection.

Spadotettix Hancock

Spadotettix Hancock, 1910, Spolia Zeylanica 6(24)L146, fig. 1, 2.
Spadotettix Hancock, 1915, Rec. Ind. Mus. 11(1)5 :95.

This monotypic genus does not appear to be closely allied to *Indomiriatra* nov. nom. In the genotypic specimen which I have examined in the Hancock-Hebard Collection, tegmina are present under the pronotum but they are exceedingly minute. *Spadotettix* appears to be most closely allied to *Apterotettix* Hancock, which also is monotypic and confined to Ceylon.

Spadotettix fletcheri Hancock

Spadotettix fletcheri Hancock, 1910, Spolia Zeylanica 6(24) :146, fig. 1, 2.
Spadotettix fletcheri Kirby, 1914, Fauna Br. Ind., Orth(Acrid.), p. 71.
Spadotettix fletcheri Hancock, 1915, Rec. Ind. Mus. 11(1)5 :95.
Spadotettix fletcheri Uvarov, 1927, Spolia Zeylanica 14(1) :114.
Spadotettix fletcheri Hebard, 1932, Spolia Zeylanica 17(1) :25.

I have examined the specimen that Hebard recorded in 1932 from Mudugoda, Ceylon, as the first male of this species and find it to be an immature female. Hancock's type from Madulsima is before me and Uvarov reported the species from Lunugalla. These appear to be the only records of this Ceylonese species. Its high mountain habitat on mossy rocks probably accounts for its apterism, just as in the case of *Formosatettix arisanensis* Tinkham, a newly described species from the high mountains of Formosa. The male of *S. fletcheri* is still unknown.

Rhopalina n. gen.

Differs from *Indomiriatra*, to which it may not be closely related, by the triangularly produced fastigium of the vertex, smaller size and smooth pronotum, which lacks the acute lateral lobes found in the Indian genus. On the other hand *Rhopalina* exhibits characteristics indicating that it may be the ancestral type of *Rhopalotettix* or *Rhynchotettix*, although in the latter case this association is rather highly problematical. *Rhopalina* differs from *Rhopalotettix* in a number of features such as: shape of the much larger eyes, form of the fastigium, smaller size, and deeper face. One might be led to think that some relationship exists between *Procytettix* Bolivar, of the Seychelles and Madagascar, and *Rhopalina* but this is not true. *Rhopalina* has a flat vertex, not raised above the upper margins of the eye; lacks fastigial carinae; possesses a flattened pronotum and fully developed wings; whereas, *Procytettix* has a highly raised vertex, possesses fastigial carinae and tectate pronotum and lacks wings. Truest relationship appears to be with *Thyrsus uvarovi* Günther from the Solomon Islands, which may not be congeneric with the genotype *Thyrsus tiaratus* Bolivar. In both genera the shape of the large eyes appears to be an important feature. The position of the lateral ocelli about central between the eyes seems to be a characteristic common to both genera. The general shape and form appear closely similar. Although the fastigium in *T. uvarovi*, in lateral aspect, appears similar to that of *T. tiaratus*, the resemblance is quite misleading. The superficial similarity is due to the fact that the fastigium in *T. uvarovi* is quite short with a projecting lamellately produced fastigial carina in front.

Size small; fastigium of the vertex triangularly produced in front, its length less than the length of an eye. Eyes very large, somewhat convexo-conical in outline, subglobular; inner eye margins of the vertex parallel. Median carina evident only on the apex of the fastigium, percurrent forward and below, where it is strongly

defined. Lateral ocelli located in the center between the eyes; the antennae placed on a level with the lower margins of the eyes. Frontal costa moderately convex when viewed in profile, deeply concave at the fastigial-frontal costal junction. Seen from in front the carinae of the frontal costa are parallel and narrowly separated, forking between the lateral ocelli and extending down to the median ocellus below the eyes.

Pronotum with truncate anterior margin, posteriorly acuminately produced with acute apex not surpassing the apices of the hind femora, smooth, with rounded and well defined lateral carinae running from before the shoulders to the apex; short supplementary humeral carinulae also present on the disk of the pronotum. Lateral lobes shallow, posterior angle with the apex narrowly truncate. Tegmina oval; wings extending to the tip of the pronotum, which approximates the apices of the hind femora. Fore and middle femora evenly keeled, with gently arcuate upper keels; hind legs fairly stout and short. Valvulae of the ovipositor rather long and narrow with a few minute teeth on the upper apical margin of the dorsal valvulae and slightly larger teeth on the ventral apical margin of the ventral valvulae.

Genotype.—Rhopalina javana n. sp.

The type is based upon a unique specimen.

Rhopalina javana n. sp. (pl. 13, fig. 10, 11)

Not related to any known species.

Type.—1 ♀. Java, Tjitjoerack, Taluk, about 100 m. 23.I.24 (Karny).

Measurements in millimeters.—Total length 9.8: body length 8.5; pronotum 8.2; tegmen 1.0; hind femur 5.0; fastigium 0.5. Type No. 1322 in the Hebard Collection.

Size small; lateral margins of the fastigium very finely serrate. Inner eye margins parallel; vertex as broad as an eye. Face strongly oblique, almost straight and deep. Eyes convexo-conical, prominent, barely elevated above the vertex. Antennae long, composed of ten segments. Pronotum smoothly granular; median carina percurrent, only slightly raised; lateral carinae on the humeral angles well defined and running from before the angle posteriorly to the caudal part; lateral carinulae on the fore part of the pronotum widely separated, barely discernible and parallel. Short lateral supplementary carinae present between the humeral angles. Lateral lobes wider than deep; the posterior lateral lobe short with narrowly truncate apex. Tegmina short, oval, smoothly granular. Ovipositor slender with four small teeth on the apical margin of the upper valvulae and five-six on the lower margin, the last three most noticeably developed. Metatarsus longer than the third segment with a trilobate lower carina, which is not toothed.

Color ferrugineous brown, irregularly mottled with darker blackish brown. Antennae pale ferrugineous with the apical segments piceous. Fore and middle legs ferrugineous brown with evidence of darker fasciations. Hind femora ferrugineous with some round black dots, and the lower outer margins black. Inner face ferrugineous with irregularly placed black dots; hind tibiae ferrugineous.

Thyrsus Bolivar

Thyrsus Bolivar, 1887, Ann. Soc. Ent. Belg. 31 :254, pl. 2, fig. 21.
Thyrsus Hancock, 1906, Gen. Insect. Orth., fasc. 48, p. 50.
Thyrsus Kirby, 1910, Syn. Cat. Orth. 3(1) :29.

Without material of the genotype for comparison it is not possible to decide whether or not Günther's recently described species *Thyrsus uvarovi* is congeneric with other species of *Thyrsus*. At present I am considering it as such, due to the lack of comparative material. *Thyrsus* as represented by *uvarovi* is strikingly like *Pseudomitraria* in its slender form and shape, but in the latter the pronotal carinae are more prominently raised, the vertex is much broader and the eye outline is different. *Thyrsus uvarovi* shows closest relationships to *Rhopalina javana*, as has already been noted. Geographically these species are not as distantly separated as some of the other species here discussed, even from India. Two species are at present included in the genus, of which *T. tiaratus* is the genotype.

Thyrsus tiaratus Bolivar

Thyrsus tiaratus Bolivar, 1887, Ann. Soc. Ent. Belg. 31 :254, pl. 2, fig. 21.
Thyrsus tiaratus Hancock, 1906, Gen. Insect. Orth., fasc. 48, p. 50, fig. 19.

This species is known only from Viti-Levu, Fiji Islands, and only the originally described pair are known. Whether the types are apterous nymphs or adults can only be ascertained by a reexamination of the types in the Stockholm Museum and in the Brunner Collection. The apterism in this species may be a reponse to montane environment.

Thyrsus uvarovi Günther (pl. 13, fig. 14, 16)

Thyrsus uvarovi Günther, 1935, Zool. Anz. 111 (7-8) :200, text fig. 8, 9.

I have been fortunate in securing for study a male of this interesting species from the collection of the University of Michigan Museum, forwarded by Dr. H. T. Hubbell. It comes from Florida in the Solomon Islands. The median carina of the fastigium of the vertex is strongly laminate forward for a distance slightly greater than the length of the produced fastigium. The inner eye margins, from above, are parallel and separated by a width almost equal to that of an eye. Seen in profile the fastigium and the laminate carina are produced obliquely above the very large eyes for a distance about two-thirds the long diameter of an eye; however, of this length the

fastigium is only a small portion. From in front, the lateral ocelli are observed to be placed in the center between the narrowly separated eyes, and the antennae are placed below them but just above the level of the lower margins of the eyes. The frontal costa is very narrow, deeply sulcate, with parallel keels, commencing at the base of the laminate fastigial keel at about the upper one-quarter of the eyes and extending down to the median ocellus. The ocelli are placed considerably below the antennae and about the center of the deep face. They are white, narrowly oval, and contrast with the black of the face. The wings are perfectly explicate, reaching to the tip of the pronotum, which is considerably produced beyond the apices of the hind femora. Body form slender and narrow with its surface smoothly granular. The species is known from Tulagi and Florida in the Solomon Islands.

Procytettix Bolivar

Procytettix Bolivar, 1912, Trans. Linn. Soc. London, ser. 2, Zool. 15 :265, pl. 13, fig. 2.

Two species of this interesting genus are now known; the genotype *P. fusiformis* Bolivar from the Seychelles and the recently described *P. hova* Rehn from Madagascar. The discovery of the latter species affords a further link in the evidence of faunal similarities between Madagascar and the Seychelles.

Procytettix fusiformis Bolivar

Procytettix fusiformis Bolivar, 1912, Trans. Linn. Soc. London, ser. 2, Zool. 15 :265, pl. 13, fig. 2 (Mahe, Seychelles).

I have not seen any specimens of this species, which is indigenous to the Seychelles.

Procytettix hova Rehn

Procytettix hova Rehn, 1937, Proc. Acad. Nat. Sci. Phila. 89 :320, pl. 12, fig. 3-4 (Analamazotra, Madagascar).

This species is known to me only through the exact descriptions and excellent figures furnished by Rehn in his recent study. It portrays a remarkable resemblance to the recently described *Formosatettix arisanensis* Tinkham (1937), but the similarity seems to be purely superficial and one to be probably accounted for in the convergence of form due to the stress of somewhat similar environmental factors in the habitat. The principal dissimilarities between *P. hova* and *F. arisanensis* appear to be the absence of lateral carinae in front of the humeral angles in the latter species, as well as the unevenly arched nature of its pronotum when viewed in profile, and the metatarsal joint being longer than the third tarsal segment. This last character places *Formosatettix* in the group Acrydiae near *Acrydium*, whereas *Procytettix* has been placed towards the end of the group Metrodorae. The value of the Metrodorae has been somewhat questioned and its extent is indeterminate. For instance, *Thymochares* Rehn (1929), placed originally in the

Cladonotae, a group widely separated from the Acrydiae, has recently been put, after further study of new material, into the Acrydiae. *Procytettix* and *Formosatettix* may not be distantly related or perhaps may be even more closely allied than believed at present.

Group **Acrydiae**

Formosatettix Tinkham

Formosatettix Tinkham, 1937, Trans. Nat. Hist. Soc. Formosa 27 (169) : 229-242, 1 pl., fig. 1, 4, 7.

This interesting new genus is found only at high elevations in the mountains of Formosa. Although belonging to the Acrydiae, this genus is included here for the sake of completeness. *Formosatettix* bears the same relationship to *Acrydium* in the Old World as *Nomotettix* does to *Acrydium* in the New, namely, the character of the produced and elevated fastigium. However, *Nomotettix* is winged and *Formosatettix* is apterous. Other features of the latter genus are the strongly tectate nature of the pronotum without lateral carinae and the minute size. There are two species, the first being the genotype.

Formosatettix arisanensis Tinkham

Formosatettix arisanensis Tinkham, 1937, Trans. Nat. Hist. Soc. Formosa 27(169) :238-240, fig. 1, 4, 7.

This, the genotype, differs from the other species in its smaller size, in the more produced and elevated fastigium of the vertex, and in its geographical location, being found on the western slopes of the high mountains of northern Formosa at elevations of 8000 to 9000 feet.

Formosatettix karenkoensis Tinkham

Formosatettix karenkoensis Tinkham, 1937, Trans. Nat. Hist. Soc. Formosa 27(169) :240, fig. 3, 5, 8.

This larger species with less elevated fastigium of the vertex inhabits the eastern slopes of the mountains of northern Formosa at elevations from 3500 to 4500 feet. The types of both species are in the Tinkham Collection.

Summary and Conclusions

This group of genera from the Malagasy, African, Oriental, Polynesian and Neotropical faunal regions does not exhibit any close relationships. The fact that the genera have been placed in generic alignment in the past is entirely due to gross morphological similarities. The striking feature, the peculiar and greatly prolonged fastigium of the vertex, is purely the result of parallelism in development.

The genus *Miriatra* of the Amazon forest region is not at all related to *Rostella*, as has been supposed for many years, nor to any other genus from the other faunal regions. Its affinities are perhaps

with certain neotropical genera but its relationships are not clearly apparent. The produced fastigium and the dentate keels of the fore legs isolate it from other genera. Some relationship to *Chiriquia* is suggested in the sculpture of the pronotum and, to a less extent, in the form of the legs. The Amazon region is still incompletely known and to make definite statements at present is hazardous.

The Malagasy genus *Rhynchotettix* in the form of its pronotum shows some convergence towards pronotal characters observed in Chinese species of *Rhopalotettix*, which are distinguished by having the median keel raised and somewhat tectate, but aside from this feature there seems to be little in common between the genera. Relationship to African genera appears to be lacking. The African *Pseudomitraria* is related to *Ibeotettix* and *Dinotettix*, as Rehn stated in 1930. It bears little in common with the Malagasy genus but does show a convergence towards *Indomiriatra* in the form of the pronotum and legs, but here again the relationship may be purely superficial and deceiving. However, *Indomiriatra* does exhibit peculiarities of the pronotum that are definitely loxiloboid in character and this feature is common to both African and Indian members of *Loxilobus*.

Features connecting *Indomiriatra* with *Spadotettix*, with which it was formerly associated, appear to be lacking. *Spadotettix* has much heavier caudal femora, strong carinae and supplementary carinae and its apterous nature marks it off strongly from the winged *Indomiriatra*. *Spadotettix* is most closely allied to the Ceylonese *Apterotettix* Hancock.

Of the three Indomalayan genera *Rostella*, *Rhopalotettix* and *Rhopalina*, the latter two appear to be nearest one another but the form of the very large eyes, the fastigium, and other features in *Rhopalina* seem to be at variance from those observed in *Rhopalotettix*. *Rostella* is not related to either; the linear form of the pronotum suggests *Pseudomitraria*, though on a larger scale, but aside from this the resemblance is rather feeble.

Finally *Procytettix* and *Formosatettix* exhibit a remarkably close resemblance, but this appears to be purely a case of parallelism in features acquired in response to somewhat similar environmental conditions.

One would naturally expect that truest relationship would be most clearly expressed amongst the generic members of each of the various faunal regions. Such appears to be the case. Thus, the Neotropical *Miriatra* shows no relationship to any genus outside its faunal region; relationships, if any, appear to be with genera within the region, such as *Chiriquia*. *Rhynchotettix* and *Procytettix*, on the basis of faunal relationships, ought to be fairly closely related, but there is considerable disparity in size; the African genus *Pseudomitraria* is most closely allied to other African genera, such as *Dinotettix* and *Ibeotettix*, as one would expect, and portrays more evidence of relationships with the Indian than with the Malagasy region. *Indomiriatra* exhibits this same relationship. *Spadotettix* is most closely allied to *Apterotettix*, a member of its own insular fauna, and the Javan *Rhopalina* seems to have a closer association with *Thyrsus* of the Fiji and Solomon Islands than with any other genera. *Formosatettix* presents Chinese relationships but does not depict any true relationships with other genera discussed, despite superficial similarities.

It is evident from the above discussion that these genera do not form a composite group, nor are they truly related to one another. They have been placed arbitrarily into a group in which the fastigia bear a gross similarity, but as already demonstrated this resemblance is purely a case of convergent morphological development. All the genera with the exception of *Formosatettix* appear to belong to the section Metrodorae as at present understood, but the confines of this section are only imperfectly known and need complete revision.

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Rhopalotettix, Rostella 及其相似各屬之分類改訂

（直翅目，蝗科，亞蝗科）

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（摘 要）

著者曾將軀幹細小之蝗蟲，作一詳細之研究，查此種蟲之被歸爲一類者，以其 fastigia 粗大突出，頗相類似故也。其所以有此特徵者，蓋以形態同趨一點之進化所致。文中對每種與屬皆行詳述，而各種之互相關係，亦附加討論。所述者有：*Rhopalotettix* Hancock 三種及二亞種 *Rostella* Hancock 三種，*Miriatra producta* (Bolivar), *Rhynchotettix* Hancock 二種，*Pseudomitraria* Hancock 二種，*Indomiriatra* 即 *Mitrariella* Hebard 一種

Spadotettix fletcheri Hancock, *Rhopalina* 屬（根據 *R. javana* 新種）*Thyrsus* Bolivar 二種，*Procytettix* Bolivar 二種，*Formosatettix* Tinkham 二種，*Rhopalotettix clavipes borneensis, R. chinensis,* 及 *R. hainanensis* 爲科學界之新記錄。*Formosatettix* 屬現歸入 Acrydiae；而其他則歸入 Metrodorae 類，其中一部，未得其詳，仍候修正。

Explanation of Plate

Fig. 1. *Rhopalotettix clavipes clavipes* Hancock, female, genotype. Padang Pandjang, W. Sumatra. Lateral view of genotype.

2. *Rhopalotettix gracilis* (Willemse), male, type. (Redrawn after Willemse.) Siberut I., Mentawi. Lateral view of head.

3. *Rhopalotettix gracilis* (Willemse), male, type. (Redrawn after Willemse.) Siberut I., Mentawi. Dorsal view of head.

4. *Rhopalotettix clavipes borneensis* n. subsp., female, type. Kuching, Borneo. Lateral view of head.

5. *Rhopalotettix clavipes borneensis* n. subsp., female, type. Kuching, Borneo. Dorsal view of head.

6. *Rhopalotettix hainanensis* n. sp., female, type. Nai Sun, Hainan I. Lateral view of head.

7. *Rhopalotettix hainanensis* n. sp., female, type. Nai Sun, Hainan I. Dorsal view of head.

8. *Rhopalotettix chinensis* n. sp., female, type. Taam Yuen Tung, Kwangtung. Lateral view of head.

9. *Rhopalotettix chinensis* n. sp., female, type. Taam Yuen Tung, Kwangtung. Dorsal view of head.

10. *Rhopalina javana* n.gen. and n. sp., female, type. Tjitjoerack, Java. Dorsal view of head.

11. *Rhopalina javana* n.gen. and n. sp., female, type. Tjitjoerack, Java. Lateral view.

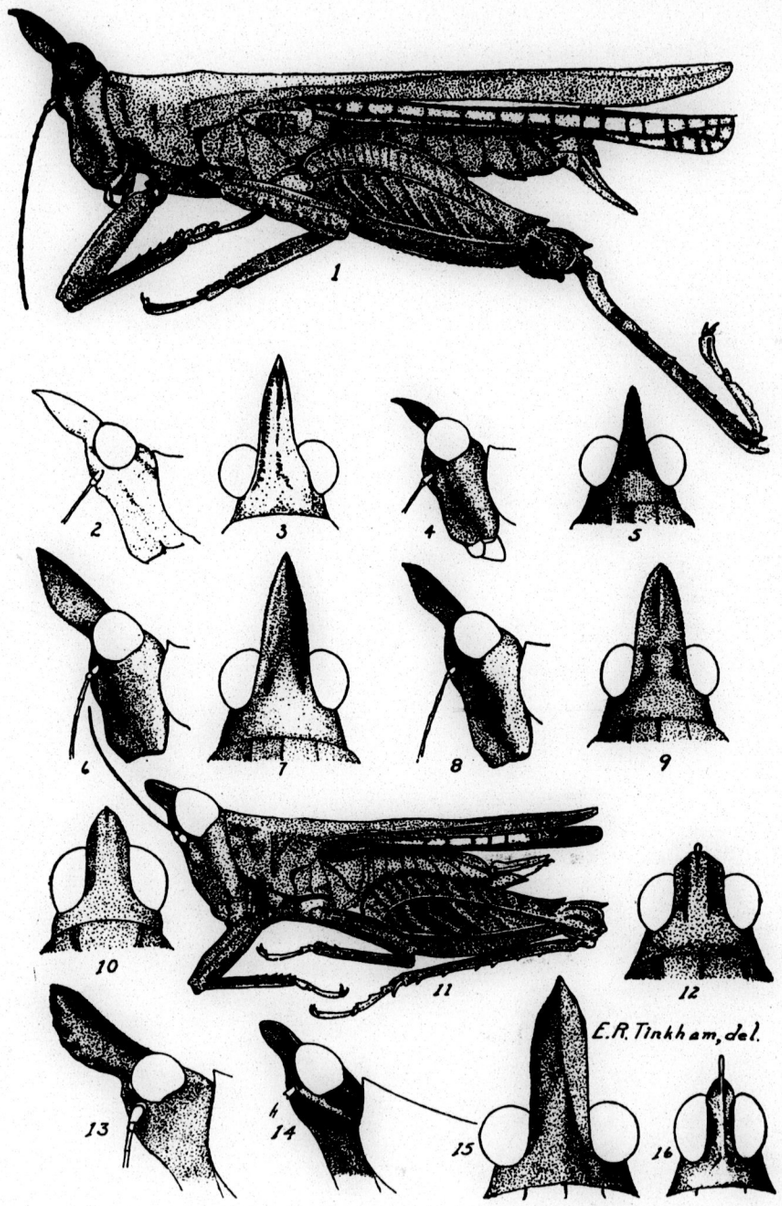
12. *Indomiriatra provertex* (Hancock), n. nom., female, type. Madras, India. Dorsal view of head.

13. *Rhopalotettix hainanensis* n. sp., male, allotype. Chung-kon-t'seun, Hainan I. Lateral view of head.

14. *Thyrsus uvarovi* Günther, male. Florida, Solomon Is. Lateral view of head and front of pronotum.

15. *Rhopalotettix hainanensis* n.sp., male, allotype. Dorsal view of head.

16. *Thyrsus uvarovi* Günther, male. Dorsal view of head.



THE CHINESE SPECIES OF BAUHINIA

By Luetta Chen (陳秀英)

(Concluded from *Lingnan Science Journal* Vol. 18, No. 3, p. 280.)

16. **Bauhinia touranensis** Gagnep.

Bauhinia touranensis Gagnep., 1912, Lec. Nat. Syst. 2 :181; Lec., 1913, Fl. Gén., Indo-Chine 2 :134, fig. 14, 8-13; Lévé., 1914, Fl. Kouy-Tcheous, 227; Rehd., 1932, Jour. Arn. Arb. 13 :321.
Bauhinia Rocheri Lévé., 1912, Fedde. Repert. Spec. Nov. 11 :31.

Scandent with terete, stout, glabrous branches. Tendrils strong, involute, sparingly pubescent. Leaves broadly orbicular to ovate, up to 8 cm. long, 6 cm. broad, subtruncate or cordate at the base, bilobed or obtuse at the apex, lobes rounded, 5-10 mm. long, more or less glabrous, but pubescent on the main nerves and between the nerves on lower surface, seven-nine-nerved, the veins very thin, closely reticulate; petioles glabrate, 1.5-2 cm. long. Inflorescences corymbose, 5-7 cm. long and broad, corymbs solitary or two-three aggregate at the apex of a branchlet, rufous pubescent; pedicels slender, rufous pubescent, 2-4 cm. long; bibracteoled at the middle, bracts and bracteoles linear, 5-6 mm. long; flower-buds subglobose; flowers whitish green; calyx-tube rounded, contracted abruptly, and gibbous at the base, 4-6 mm. long; calyx five lobed, rufous pubescent without, reflexed after flowering; petals five, unguiculate, limb ovate or suborbiculate, 5-6 mm. in diam., pubescent without; fertile stamens three, filament glabrous, up to 12 mm. long; anther elliptical, 2 mm. long; sterile stamens seven, slender, unequal in length, at the base globose and disk-like; ovary subsessile, pubescent at the middle without; style stout, glabrous; stigma capitate, obconic. Legumes stipitate, oblong, glabrous, up to 17 cm. long, 4.5 cm. broad, many-seeded; pedicels 2-4 cm. long.

Kwangsi: Hin Yen, Ching 6690, Aug. 4, 1928 (NY.AA.US.F.); also Ching 6715, Aug. 5, 1928 (NY.AA.US.F.); Lin Yuin Hsien, S. and C. 391, May 14, 1933 (NY.AA.).

Yunnan: Forrest 8510 and 11844 (AA).

Distribution: China, Tonkin, Indo-China.

17. **Bauhinia genuflexa** Craib

Bauhinia genuflexa Craib, 1913, Kew Bull. 352.
Bauhinia Henryi Craib, 1913, Kew Bull. 352. **Syn. nov.**

Shrub. Branchlets at first sparingly appressed pubescent, then becoming glabrous, with an angulate tip. Leaves suborbicular, up to 5 cm. long, 5.3 cm. broad, chartaceous, glabrous on upper surface, sparingly appressed pubescent on lower surface, ferruginous pubescent at the base of the nerves and in the axils, seven-nerved, nerves prominent on lower surface, slender, reticulate on both

surfaces, cordate at the base, bilobed at the apex, lobes rounded, up to 1.5 cm. long, 2.5 cm. broad; petioles 1-2.3 cm. long, glabrate, canaliculate above. Stipules 2-2.5 mm. long, glabrous, falcate. Inflorescences corymbose, up to 4 cm. long, 6.5 cm. in diam., the rachis, pedicels and buds more or less appressed ferruginous pubescent; pedicels up to 2.7 cm. long; bracts linear, 6.5 mm. long; bracteoles generally alternate, linear, glabrescent, 3-4 mm. long; calyx-tube sulcate, gibbous at the base, 5 mm. long; calyx five-lobed, lobes 5 mm. long, 2 mm. broad; petals spatulate, unequal, up to 6 mm. long, 5.5 mm. broad, pilose without, glabrous within; fertile stamens three; filament 5-6.5 mm. long, glabrous; anther 2 mm. long; sterile stamens 2-3; ovary stipitate, 3 mm. long, below at the sutures ferrugineous pubescent; style 3 mm. long, glabrous. Legumes not seen.

KWANGSI: Lungchow, Sim Kee Gorge, Morse 408, isotype, 1901 (US); photograph of type (NY); N. Luchen, Ching 5909, June 10, 1928 (NY.AA.US.F.UN.).

YUNNAN: Mengtse, Henry 10175, date lacking (NY.AA.).

B. Henryi Craib does not appear to be distinct from *B. genuflexa* Craib. Craib described them both in the same number of Kew Bulletin and used nearly identical characters for both. The only significant difference seemed to be the difference of locality. The writer had a specimen of the Henry 10175 material collected from Yunnan, from which Craib described *B. Henryi*, to compare with isotype material of *B. genuflexa*, the Morse 408 material from Kwangsi. She was unable to detect any consistent difference.

18. **Bauhinia Howii** Merr. and Chun

Bauhinia Howii Merr. and Chun, 1935, Sunyatsenia 2(3-4) :243, t. 48.

Woody climber, glabrous or subglabrous, except inflorescences. Branches terete to angulate; young branchlets short appressed pubescent. Leaves ovate, chartaceous or subcoriaceous, light olive, shining, glabrous on both surfaces, 7-12 cm. long, 6-9 cm. broad, nine-nerved, cordate at the base, bilobed at the apex, lobes ovate, obtuse, acuminate, 1.5-2 cm. long, approximate or imbricate; petioles 2.5-5 cm. long. Inflorescences corymbose, terminal, pedunculate, 10-15 cm. long, up to 15 cm. broad, short appressed pubescent; pedicels up to 3 cm. long, with one bracteole at middle or above; bracteoles 1-2 mm. long, lanceolate, acuminate; calyx-tube densely pubescent, about 5 mm. long, cylindrical; calyx concave two-lobed, lobes large, subreflexed, densely pubescent without, glabrous within, 7 mm. long; petals four-parted, glabrous within, short appressed pubescent without, claw 2-4 mm. long, limb orbicular or reniform, 6-8 mm. long, 8-10 mm. broad; fertile stamens three; filament glabrous, 1.5 cm. long; sterile stamens two-four, short, about 4 mm. long; ovary stipitate, compressed, lanceolate, ventral margin short,

densely subferruginous pubescent, otherwise glabrous; style curvate, 4-5 mm. long, glabrous. Legumes not seen by Merrill and Chun.

HAINAN: Po Fung Leng, Ngai district, Lau S. K. 420, Aug. 19-20, 1932, paratype (NY.AA.US.F.A.LU.); Yaichow, How 71005, type, July 11, 1933 (NY); isotype (AA.US.); Yaichow, Liang 62034, July 9, 1933 (NY.AA.); locality lacking, Wang 33423, July 28, 1933 (NY. US.LU.); 34133, Sept. 21, 1933 (NY.O.); and 36665, Jan. 14, 1934 (NY.O.); Lingshui, How 73786 and 73792 (a juvenile form), Oct. 13, 1935 (AA).

Fruit description added: Legumes sub-lanceolate, glabrous, thin, up to 15 cm. long, about 3.5 cm. broad, apex short acute, base somewhat narrow, stipitate, four-five-seeded; stipe about 3.5-4 cm. long.

HAINAN: Yaichow, How 73786, type of fruit, July 23, 1933 (AA); also represented by Liang 62256 from Lingshui, Oct. 13, 1935 (AA).

DISTRIBUTION: China.

19. **Bauhinia purpurea** Linn.

Bauhinia purpurea Linn., 1753, Sp. Pl. 1 :375; DC., 1825, Prodr. 2 :515; Roxb., 1832, Fl. Ind. 2 :320; Wight et Arn., 1834, Prodr. 1 :296; Baker, 1879, Fl. Brit. Ind. 2 :284; Gagnep., 1913, *in* Lec. Fl. Gén. Indo-Chine 2(5) :127-128.
Phanera purpurea Benth., 1852, Pl. Jungh. 2 :262; Walp., 1857, Ann. Bot. Syst. 4 :603.

Tree small to medium size, erect. Branchlets moderately stout, glabrescent. Leaves rigidly subcoriaceous, glabrous, 11-13 cm. long, 9-11 cm. broad, nine-eleven-nerved, secondary nerves transverse, finely reticulate between the veins; shallowly cordate at the base, bilobed at the apex, lobes obtuse or subacute, cleft one-third to one-half way down; petioles 4-5 cm. long, rather stout; stipules present, minute. Inflorescences corymbose, terminal and axillary, short-peduncled, few-flowered; bracts and bracteoles minute, deltoid; flowers reddish or pinkish white (white with pinkish veins and margins); calyx-tube 7-13 mm. long, calyx 2-2.5 cm. long, coriaceous, puberulent without, glabrous within, split into two valves, showing a division of teeth at tip; petals 4-5 cm. long, oblanceolate, with a long claw, glabrous, with prominent veins; fertile stamens three-four; filament glabrous, equal in length, up to 4.5 cm. long; anther oblong, about 6 mm. long; sterile stamens six-seven, varying in length, up to 1.5 cm. long; ovary gray, downy, with a stalk 1.5-2.5 cm. long; style 2-3 cm. long; stigma moderately large, oblique, pubescent. Legumes 13-23 cm. long, 2-3 cm. broad, firm, flat, glabrous, late in dehiscing, acuminate at apex, curved, base gradually narrowing with a pedicel 2 cm. long, twelve-fifteen-seeded; seeds oval, thin, about 1.5 cm. long, 1.2 cm. broad.

FUKIEN: Tsangchienshan, 3071 (Chung), Aug. 28, 1924 (AA); Black Rock Hill, Foochow, L. Chen 29, Nov. 21, 1935 (O.LU.);

Foochow and vicinity, L. Chen 44, Jan. 27, 1935 (O.LU.); locality lacking, Chao 981, Oct. 27, 1936 (A).

HONG KONG: Locality and number lacking, Ford, Dec. 1898 (US); Botanical Garden, Sargent, Nov. 4, 1903 (AA); also Chun 7892, Dec. 12, 1929 (SYS).

KWANGTUNG: German hospital, Canton, L. Chen 14, Dec. 5, 1934 (O.LU.); Lingnan campus, Metcalf 17954, Nov. 28, 1934, Metcalf 18058, Oct. 17, and 18066, Oct. 29, 1935 (O.LU.); also Metcalf 18363 and 18365, Nov. 14, 1936 (O.LU.); German hospital, Canton, Lau Fun 10, Nov. 13, 1936 (O.LU.). These cited specimens are cultivated forms.

HAINAN: Locality and date lacking, number 18368 (Ferzel) (SYS).

DISTRIBUTION: West Himalayas, Khasia Mountains, Ceylon, Penang, China.

20. **Bauhinia pyrrhoclada** Drake

Bauhinia pyrrhoclada Drake, 1891, Morot. Jour. Bot. 2 :218; Gagnep., 1913, Lec. Fl. Gén. Indo-Chine 2 :130; Merr., 1934, Ling. Sci. Jour. 13 :58.

Woody shrub with many vine-like branches. Branches robust, velvet-pubescent, then becoming glabrous, with strong, flat tendrils. Leaves ovate-orbiculate, cordate, coriaceous, glabrous on upper surface, very finely tomentose in copper-color on lower surface, 6-8.5 cm. long and broad, nine-eleven-nerved, secondary nerves small, reticulate, bilobed at the apex, lobes 1 cm. long, 2 cm. broad; petioles 2.5-3.5 cm. long. Inflorescences racemose, compact, pyramidal, 4 cm. long, 3-5 cm. broad; pedicels up to 3.5 cm. long, bibracteolate at the apex, tomentose; bracts and bracteoles linear, 6 mm. long, tomentose; flower-buds ovoid, obtuse, very tomentose, 10-12 mm. long; flower white; calyx-tube distinct from the pedicel, 5-7 mm. long; calyx five, densely tomentose without, lanceolate-acuminate, coherent, divided into two lobes; petals five, oboval-elliptical, unguiculate, 2 cm. long, 1 cm. broad, obtuse, densely hirsute without, hairy within along the claw; fertile stamens three; filament about 2 cm. long, pubescent at the base; anther 4 mm. long, dehiscent by two longitudinal slits; sterile stamens two-three; ovary hirsute, subsessile, swelling at the base; style glabrous, 6-7 mm. long; stigma discoid, 2 mm. broad. Fruit oboval-oblong, tomentose, 10-18 cm. long, 4-4.5 cm. broad, few-seeded.

HAINAN: Taai Chau, Tinhosa Island, McClure 20158, June 2, 1932 (NY.F.LU.); also McClure 20160, June 2, 1932 (NY.AA.US.F. LU.A.).

DISTRIBUTION: China, Tonkin.

21. **Bauhinia Bohniana** Chen

Bauhinia Bohniana Chen, 1938, Jour. Arn. Arb. 19 :129.

Shrub with erect branches and branchlets, glabrous, but with new growth densely, finely pubescent in grayish-brown. Leaves broadly ovate-orbicular, sub-coriaceous, 5-6 cm. long, 5-7 cm. broad, grayish puberulent on upper surface, rufous pubescent on lower surface and on the nerves, eleven-nerved, nerves reticulate, branching to margin, deeply cordate at the base, bilobed at the apex, lobes one-fourth of the whole length of the blade, rounded; petioles densely appressed tomentose, 2.5-3 cm. long. Inflorescences racemose, solitary to two, about 7 cm. in diam., few-flowered, finely, appressed, ferrugineous tomentose; bracts and bracteoles in pairs, lanceolate, acuminate, pubescent, about 1 cm. long, 2 mm. broad, originating at or above the middle of the pedicel; pedicels 1.5-2 cm. long, pubescent; calyx-tube obconical, 5 mm. long, 2.5 mm. broad, densely pubescent, furrowed; calyx lobe 1.2 mm. long, 4 mm. broad, lanceolate, acuminate, finely pubescent without, glabrous within, corolla about 3.5 cm. in diameter; petals pink, spatulate, claw about 1 cm. long, villous, limb obovate, obtuse, about 15 mm. long, 13-14 mm. broad, wooly pubescent without, glabrous within, except the base; fertile stamens three; filament 3 cm. long, glabrous; anther about 4 mm. long, 2 mm. broad, oblong; sterile stamens six-seven, slender, up to 2 cm. long, glabrous, with aborted anthers; ovary stipitate, pubescent on the suture; style glabrous, about 1 cm. long; stigma clavellate; stipe about 1.2 cm. long, villous. Legumes not seen.

YUNNAN: Yangtze watershed, Rock 3905, type, May-Oct. 1922 (AA); isotype (NY.UN.); locality unknown, Forrest 15419, 1917-1919 (AA); also Forrest 10345 (AA); Yangtze watershed, Rock 9045, 1923-1924 (NY.AA.).

DISTRIBUTION: China.

22. **Bauhinia caterviflora** Chen

Bauhinia caterviflora Chen, 1938, Jour. Arn. Arb. 19 :129-130.

Climber with ferrugineous pubescent branchlets and inflorescences. Leaves suborbicular, 5-8.5 cm. long, 5.5-9 cm. broad, membranous, thinly pubescent on both surfaces, nine-nerved, nerves conspicuous, reticulate on both surfaces, middle nerves ending in a mucro about 2 mm. long, pubescent, shallowly cordate to truncate at the base, emarginate at the apex; petioles 1.5-2.5 cm. long, pubescent. Inflorescences racemose, solitary to three, terminal, many-flowered, pubescent, subtended by paired, pubescent tendrils, 3 cm. long; pedicels 1.5-2 cm. long, ferrugineous-pubescent; bracts and bracteoles narrowly linear, 6-7 mm. long, pubescent; calyx-tube pubescent, fairly stout, narrowing slightly toward the base, 3 cm. long; calyx lobes lanceolate, acuminate, 6-7 mm. long, reflexed at anthesis, appressed-pubescent without, glabrous within, except at sinus; corolla 3 cm. in diameter, petals white, spatulate, erose

margin, claw 5 mm. long, limb about 3 mm. long, 9-13 mm. broad, pubescent without, glabrous within; fertile stamens three; filament 1.6 cm. long, glabrous; anther oblong, 3 mm. long; sterile stamens seven, minute, 4-7 mm. long; ovary stipitate, glabrous for the most part, sparingly pubescent near the base; style 5 mm. long, glabrous; stigma capitate. Legumes elliptical, thin, glabrous, 19-20 cm. long, 4.2 cm. broad, entire at margin, many-seeded.

YUNNAN: Szemao, Henry 12344, type (AA); also Henry 12344a (AA); also Henry 10763 (AA); Wen-shan Hsien, Tsai 5659, Jan. 25, 1933 (F); Ping-pien Hsien, Tsai 60496 and 61050, July 20, 1934 (F). Henry 10763 and Tsai numbers are not typical forms!

DISTRIBUTION: China.

23. **Bauhinia erythropoda** Haya.

Bauhinia erythropoda Haya., 1913, Ic. Pl. Form. 3 :83; Merr., 1927, Ling. Sci. Jour. 5(1-2) :89.

Bauhinia moningerae Merr., 1922, Phil. Jour. Sci. 21 :345.

Woody climber. Branches terete, glabrate; branchlets reddish, ferruginous tomentose. Leaves cordate, 6-9 cm. long and broad, shining, glabrous on upper surface, ferruginous pubescent on the nerves on lower surface, nine-nerved, veins elevated-reticulate on upper surface, plain on lower surface, base cordate, bilobed at apex, lobes 2-3.5 cm. long, 3-4 cm. broad; petioles 3-5 cm. long, reddish, ferruginous tomentose, swollen at the joints. Inflorescences racemose, terminal, many-flowered; bracts linear, densely pubescent, 5 mm. long; bracteoles filiform, villose, alternate, 4-5 mm. long; pedicels 4-5 cm. long; flower-buds oblong-elliptical, 1 cm. long or less, obtuse; flowers white, large; calyx-tube slender, 4 mm. long; calyx five-lobed, lobes oblong-lanceolate, acuminate reflexed, 12 mm. long, 3 mm. broad, tomentose without, glabrous within; petals five, obovate, 2.3 cm. long, 1.2 cm. broad, emarginate at the apex, abruptly unguiculate at the base, margin crisp, glabrous within, hirsute without; fertile stamens three; filament glabrous, except at the base, 1.7 cm. long; anther narrowly oblong, 6 mm. long; ovary densely ferruginous-villose; style glabrous; stigma dilatate, more or less peltate. Legumes not seen.

KWANGTUNG: Yamchow, CCC. 3744 (Tsoong), June 20, 1908 (LU).

HAINAN: Locality lacking, Moninger 160, topotype of *B. Moningerae* Merr., June, 1920 (NY); Sun Shan Lin, Ko 52101, Apr. 4. 1932 (NY.AA.US.); Yaichow, Liang 62435, Apr. 28, 1932 (NY); Poting, Lo 62435, Apr. 28, 1932 (NY.AA.); Poting, How 71701, Apr. 6, and How 72781, June 8, and 72805, June 11, 1935 (AA); collector, locality and date unknown, 27319 (SYS).

YUNNAN: N. Szemao, Henry 12059 (NY.AA.).

DISTRIBUTION: China.

B. erythropoda Haya., *B. Kerrii* Gagnep., and *B. pyrrhoclada* Drake are closely allied to each other by their general features. The leaves of *B. erythropoda* Haya. are cordate and ferruginous pubescent on the nerves on lower surface and shining glabrous on upper surface. The leaves of *B. Kerrii* Gagnep. are cordate, ovate-orbiculate, membranous, sparingly pubescent on upper surface and on the nerves, aureate-pilose on lower surface and on the nerves. The leaves of *B. pyrrhoclada* Drake are cordate, ovate-orbiculate, coriaceous, glabrous on upper surface, very finely tomentose in copper color on lower surface. The outstanding character of these three species is the ovary: the ovary of *B. erythropoda* Haya. is densely ferruginous villose; that of *B. Kerrii* Gagnep. is densely aureate pilose; that of *B. pyrrhoclada* Drake is hirsute.

24. **Bauhinia apertilobata** Merr. and Metc.

Bauhinia apertilobata Merr. and Metc., 1937, Ling. Sci. Jour. 16 :83.

Woody climber with somewhat pubescent branchlets, petioles and inflorescences. Leaves ovate to broadly elliptic to suborbicular, 8-10 cm. long, 8 cm. broad, shining, subglabrous to sparingly puberulent on upper surface, more abundantly reddish, somewhat appressed pubescent on lower surface, nine-nerved, shallowly and broadly two-lobed at the apex, lobes usually widely separated, acute, short; petioles 2.5-3.5 cm. long, slender. Inflorescences racemose, terminal, single or paired, short, few-flowered, pubescent, 4-6 cm. long; bracteoles linear, 3-6.5 mm. long, pubescent; pedicels 1-1.5 cm. long, pubescent; flowers white; calyx-tube obconic, pubescent without, very short; calyx five-lobed, lobes lanceolate, pubescent without, 5 mm. long; petals five, strap-shaped or spatulate with narrow base, 5 mm. long, pubescent at middle portion without; fertile stamens three, opposite calyx; filament 1 cm. long; anther oblong, 2 mm. long; sterile stamens two, filament 1 mm. long; ovary stipitate, oblong, pubescent on the margin; style short; stigma small. Legumes oblanceolate, compressed, glabrous, 7-9 cm. long, 3 cm. wide at the broadest part, obscurely apiculate, abruptly narrowing to an acute or cuneate base.

FUKIEN: Kutien, Chung 4043, May 30, 1928 (AA.SYS.).

KWANGTUNG: Lokchong, Tso 21008, June 8, 1929 (NY.O.); Loh Fau Shan, N. K. Chun 41159, May 29, 1930 (O.SYS.); Tai Mo Shan, Tsang 21042, type, July 1, 1932 (AA); isotype (O.LU.); Tai Mo Shan, Tsang 21137, July 10, 1932 (AA); Tsung-fa, Metcalf 18351, Oct. 25, 1936 (O.LU.).

DISTRIBUTION: China.

25. **Bauhinia Kerrii** Gagnep.

Bauhinia Kerrii Gagnep., 1912 *in* Lec. Not. Syst. 2 :173; Gagnep., 1913, *in* Lec. Fl. Gén. Indo-Chine 2(5) :128-129.

Woody climber with furrowed, soft, reddish pubescent branches. Leaves cordate, ovate-orbiculate, membranous, puberulent, 9-15 cm.

long, 8-12 cm. broad, sparingly puberulent on upper surface and on the nerves, aureate-pilose on lower surface and on the nerves, eleven-thirteen-nerved, middle nerve extended into a mucro, about 4 mm. long, densely pilose, secondary nerves finer and more densely reticulate, broadly cordate at the base, bilobed at the apex, lobes triangular, 3-4 cm. long and broad; petioles 4-9 cm. long, finely pubescent. Inflorescences corymbose, 13 cm. long, axillary, tomentose, pedunculate, bearing a pair of villous, opposite tendrils at middle; bracts 5 mm. long; bracteoles minute, alternate; pedicels 2.5-4 cm. long, with minute bracteoles at the top; flower-buds ovoid, wholly pubescent, 7-8 mm. long; flowers white; calyx-tube gradually attenuate to the pedicel, 3-4 mm. long; calyx lobes lanceolate-acute, 7 mm. long, rufous-puberulent without; petals five, unequal, densely hairy without, claw short, limb elliptical, apex emarginate, margin conspicuously wrinkled crenate; fertile stamens three, exserted; filament 2 cm. long, pilose at the base; anther elliptical, about 4.5 mm. long; sterile stamens two-three, with very short filament; ovary sessile, densely aureate-pilose; style villous at the base, stigma peltate, 1.5-2 mm.broad. Legumes not seen by Gagnepain.

HAINAN: Paak Shek Shan, LU. 17411 (Tsang), June 12, 1928 (NY.AA.US.LU.A.); locality lacking, Wang 34537, Oct. 8, 1933 (NY); Yaichow, How 70794, March-July, 1933 (NY.AA.US); Pak Shik Ling, Lei 121, Oct. 13, 1932 (NY); also Lei 717, June 6, 1933 (NY.O.LU.); Poting, How 72559, May 23, and 72629, May 27; Manning, How 73962, Oct. 24, 1935 (AA); Liamui, Gressitt 1190, Aug. 23, 1935 (AA); Loktung, Lau S. K. 26815, May 20, 1936 (O.SYS.).

DISTRIBUTION: China, Siam.

Fruit description added: Legumes oblong, woody, densely pubescent, short acute at apex, attenuate at the base, about 15 cm. long, 4 cm. broad, four-six-seeded.

HAINAN: Pak Shik Ling and vicinity, Ku Tung village, Ching Mai district, Lei 121, Oct. 13, 1932, type of fruit in New York Botanical Garden; Wang 34537, Oct. 8, 1933 (NY); Manning, How 73962, Oct. 24, 1935 (AA).

26. **Bauhinia aurea** Lévé.

Bauhinia aurea Lévé., 1907, Bull. Soc. Fran. 7:368; Lévé., 1914, Fl. Kouy-Tchéou 226; Rehd., 1932, Jour. Arn. Arb. 13:322.

Strong, woody, climber with golden brown tomentose branches. Leaves large, 16 cm. long and broad, rounded, glabrous, dark green, often spotted with white on upper surface, golden brown tomentose on lower surface, usually thirteen-nerved, base cordate, bilobed at apex, lobes divided in different lengths; petioles pubescent, 4-7 cm. long. Flowers not seen. Fruit 20-25 cm. long, 4-5 cm. broad, villose, very firm, tan, brown within, velvety (ex Tsiang); seeds ovate, compressed.

KWANGSI: Tan Ngai, Hoo Chi, N. Kwangsi, Ching 6381, July 12, 1928 (NY.NR.LU.).

KWEICHOW: Lo-fou, Cavalerie 2614, holotype, Nov. 1905, the photograph (NY.AA.); Gan-wu Lohu, south Kweichow, border of Kwangsi, Tsiang 7289, Oct. 3, 1930 (NY.AA.LU.).

DISTRIBUTION: China.

27. **Bauhinia Blakeana** Dunn

Bauhinia Blakeana Dunn, 1908, Jour. Bot. 46:325-326; Walker, 1928, Ling. Sci. Jour. 6(1-2):87-88.

Tree with slender branchlets, pubescent. Leaves rotund, leathery, 9-13 cm. in diameter, pale, sparingly puberulent on lower surface, usually eleven-thirteen-nerved, arranged like a fan, middle nerve ending in a mucro, about 2 mm. long, bilobed, lobes one-third of entire length, retuse; petioles 3.5-4 cm. long, brownish pubescent. Inflorescences racemose, sometimes slightly branched; peduncles 1.5 cm. long, with two bracts, pubescent; flowers large, strikingly beautiful; calyx concave, pubescent, streaked with reddish and greenish lines, 2.5 cm. long, opening on the lower side more or less turned or bent back, apex cut into two lobes with two-three-teeth at tip; petals five, lanceolate, unguiculate, glabrous, 5-8 cm. long, rose or reddish-purple in color, the base of upper petals deeply colored; fertile stamens five; filament 3.5-5.5 cm. long; anther 2-7 mm. long, slender; sterile stamens two-five, up to 27 mm. long, filiform; ovary stalked, equal to the stamens in length, pubescent on margin. Legumes not seen.

FUKIEN: Foochow and vicinity, L. Chen 47, Jan. 27, 1935 (O. LU.).

HONG KONG: Botanical Garden, W. H. Chun, 7891, Dec. 11, 1929 (SYS).

KWANGTUNG: Lingnan campus, Tseng 292, Nov. 16, 1933 (A); Canton and vicinity, P. K. Pang, no. lacking, Dec. 26, 1934 (A); Lingnan campus, L. Chen 13, Dec. 5, 1934 (O.LU.); also Metcalf 18057, Oct. 17, 1935, and 18333, and 18334, Oct. 19, 1936 and also 18364, Nov. 14, 1936 (O.LU.); also Metcalf 18393, 1937 (O.LU.).

DISTRIBUTION: China.

I would like to say something in greater detail about the history of this species. This is a handsome flowering tree, with large reddish-purple flowers, which blooms through the winter months. The specific name is in honor of a former governor, Sir Henry Blake and his wife, Lady Blake. This species was found by a French Father near the ruins of a house by the seashore. The origin of the tree is a mystery, but present-day scientific opinion agrees that it is probably a natural hybrid since no seeds have been found.

Professor F. P. Metcalf of Lingnan University, Canton, has taken a great interest in this species. He had watched for its fruit during five years and was unable to find any, but in the summer of 1937 he was able to collect some small, poorly developed fruits. The

following description was made from material he sent to the writer: legume with stalk 3 cm. long; pod 7 cm. long, 1.2 cm. in the widest part, sparingly pubescent on margin. Seeds not developed.

KWANGTUNG: Lingnan campus, Metcalf 18393, type of fruit in Oberlin College.

This species is found in Fukien, Hong Kong and Kwangtung only. Most of the cited specimens are cultivated. The outstanding feature of this species is the calyx opening on the lower side which is more or less turned or bent back. Its apex is cut into two narrow, pointed lobes with either two or three teeth.

28. **Bauhinia variegata** Linn.

Bauhinia variegata Linn., 1753, Sp. Pl. 375; DC., 1825, Prodr. 2:514; Roxb., 1832, Fl. Ind. ed. 2, 2:319; Walp., 1842, Repert. Bot. Syst. 1:847; Miq., 1855, Fl. Ned. Ind. 1:60; Baker, 1879, *in* Hook. f. Fl. Brit. Ind. 2:284; Forb. and Hemsl., 1887, Jour. Linn. Soc. 23:213; Gagnep., 1913, *in* Lec. Fl. Gén. Indo-Chine 2:145: Walker, 1928, Ling. Sci. Jour. 6(1-2):89-90; Merr., 1937, Jour. Arn. Arb. 18:68.

Baudinia variegata Linn. var. *chinensis* DC., 1825, Prodr. 2:514.

Bauhinia chinensis Vog., 1843, *in* Nov. Act. Acad. Leop. Carol. Nat. Cur. 19 (Suppl. 1):42.

Phanera variegata Benth., 1852, Pl. Jungh. 262.

Bauhinia purpurea Wall., 1832, List. n. 5797, non. nud., proparte, fide Index Kewensis.

Trees middle size, erect. Branches cylindrical, occasionally zigzag, glabrous. Leaves variable in size, sub-coriaceous, rather orbicular to rather obovate, broader than long, 7-9 cm. long, 9-11 cm. broad, grayish puberulent on lower surface, glabrous on upper surface, nine-thirteen-nerved, secondary nerves transverse, the veins in a fine net-work, shallowly or deeply cordate to truncate at the base, bilobed at the apex, lobes obtuse, one-fourth or one-half way down; petioles 2.5-3.5 cm. long, swollen at both ends, pubescent to glabrate. Inflorescences corymbose, lateral, sessile or short-peduncled, finely puberulent; bracts minute, deltoid; pedicels two-five, up to 13 mm. long, robust, finely puberulent; flower-buds largely fusiform, up to 2.5 cm. long, 7 mm. broad; flowers light rose, marked with red and yellow, large; calyx spathiform, entire at the tip, finely puberulent, prominently glandular, slit on one side; petals five, unilateral pairs equal, oblong with somewhat curled margin, the upper one is broader, more deeply colored and with a larger channelled claw; fertile stamens five; filament 3-3.5 cm. long, glabrous; anther 7 mm. long; sterile stamens three-five; ovary stalked, pubescent; style 5 mm. long; stigma minute. Legumes 20 cm. long or more, 1.5-2 cm. broad, glabrous, flat, marked with oblique wrinkle, dehiscent, ten-fifteen-seeded; pedicel about 2 cm. long.

FUKIEN: Foochow and vicinity, L. Chen 46, Jan. 27, 1935 (O. LU.).

HONG KONG: Wright 143, 1853-1856 (NY.G.US.); Botanical Garden, W. Y. Chun 6131 (SYS); Peak, Tsiang 334, Apr. 23, 1923 (AA).

KWANGTUNG: Tung Shan, CCC. 424 (Levene), March 10, 1917 (AA.G.US.LU.); CCC. campus, CCC. 6451 (To), Apr. 6, 1921 (NY.F. LU.); Ko Koon, LU. 10941 (To), March 9, 1923 (LU); Bo U, N. K. Chun 44413, Apr. 1933 (SYS); German hospital, Canton, L. Chen 12, Dec. 5, 1934 (AA.O.LU.); Lingnan campus, L. Chen 33 and 34, Dec. 29, 1934 (O.LU.); Canton and vicinity, L. Chen 35 and 36, Jan. 2, 1935 (O.LU.); German hospital, Canton, Lau Fun 9, Nov. 13, 1936 (O.LU.); without locality, 8116 (SYS).

KWANGSI: Locality lacking and no collector (SYS).

YUNNAN: Szemao, Henry 148 (US); Mengtse, Henry 10596, March 17 (NY.AA.); Taping Valley, Forrest 9834, 1913 (SYS); Men Koan, Ten. 361, Apr. 28, 1917 (AA.US.); Shweli River, Rock 8624, March, 1923 (US.UN.); Pang Khun, Rock 2566, Feb. 25-March 1, 1922 (AA. US.); Kien Shui Hsien, Tsai 53124, Apr. 12, 1933 (AA.F.); Lung Ling Hsien, Tsai 55797, April 15, 1934 (AA.F.); locality and number lacking, Tsai (F).

DISTRIBUTION: China, India, Siam and widely distributed all over the world.

In general habit and character of the flowers *B. purpurea* L. and *B. variegata* L. are very closely allied. The calyx of the former is slit into two valves, which show a division of five teeth; the ovary has a large oblique stigma. The calyx of the latter is slit on one side, entire at the tip; the ovary has a minute stigma.

29. **Bauhinia racemosa** Lam.

Bauhinia racemosa Lam., 1785, *in* Encycl. 390; Baker, 1879, *in* Hook. f. Fl. Brit. Ind. 276; Hook., 1887, Ic. Pl., t. 141; Forb. and Hemsl., 1887, Jour. Linn. Soc. 23:212.

Bauhinia parviflora Vahl, 1794, Sym. 3:55.

Small scandent with slender, glabrous branchlets, pubescent in young shoots. Leaves broader than long, rigidly coriaceous, 4-5 cm. long, more or less densely grayish pubescent on lower surface, slightly cordate at the base, bilobed at the apex, lobes ovate or semi-orbiculate, one-third of the whole length of the blade, four-five-nerved, secondary nerves reticulate; petioles short, about 5-10 mm. long. Inflorescences racemose, short-peduncled, terminal; pedicels 2-4 mm. long; calyx-tube turbinate, not more than 1.5 mm. long; calyx 6-10 mm. long, sparingly pubescent, not divided; petals five, oblanceolate, as long as calyx; fertile stamens ten; filament 6-7 mm. long, glabrous; anther 3 mm. long; ovary oblong, pediculate, glabrous, without style; stigma pubescent, sessile. Legumes falcate, firm, glabrous, turgid, stipitate, many-seeded; stalk about 2.5 cm. long.

YUNNAN: Vicinity of Yuankiang city, Tsiang 12984, Jan. 14, 1934, (SYS.LU.).

DISTRIBUTION: China, India, Malaya.

This species is recorded from Macao, but no specimens have been cited from there.

30. **Bauhinia Faberi** Oliv.

Bauhinia Faberi Oliv., 1888, *in* Hook. Ic. Pl. t. 1790; Farrer., 1916, Jour. Roy. Hort. Soc. 42 :61; Rehd., 1926, Jour. Arn. Arb. 7 :153.
Bauhinia densiflora Fran., 1890, Pl. Delav. 191. **Syn. nov.**
Bauhinia bryoniflora Fran., 1890, Pl. Delav. 191-192, 1890.
Bauhinia Bonatiana Pamp., 1910, Nuov. Giorn. Bot. Ital. 17 :6. **Syn. nov.**
Bauhinia Cavaleriei Lévé., 1912, Fedde, Repert. 11 :31.
Bauhinia altefissa Lévé., 1914, Fl. Kouy-Tcheou 226, pro parte, quoad Esquirol no. 3056.

Small shrub, erect or climbing with angulate, slender branchlets, pubescent, soon becoming glabrous. Leaves usually broader than long, up to 9 cm. long, 10 cm. broad, glabrous (rarely pubescent) on upper surface, pubescent on lower surface, with either few or many minute paleae, eight-ten-nerved, middle nerve ending in a short mucro, base cordate to rounded, bilobed at apex, lobes one-half to two-thirds of whole blade, rotundate; petioles up to 2.5 cm. long, pubescent; stipules narrow linear. Inflorescences racemose, pedunculated, axillary, many-flowered, pubescent; pedicels about 5 mm. long, pubescent; bracts paired, linear, deciduous; flowers white; calyx-tube short turbinate, spatulate; calyx two-lobed, lobes semi-bilobed at tip, covered with minute paleae, pubescent, 3-4 mm. long; petals five, oblanceolate, unguiculate, about 7 mm. long; fertile stamens usually ten, sometimes nine-eleven, of two lengths, five long, five short; filament about 5-6 mm. long, glabrous; anther lobed, about 1 mm. long; ovary tomentose, stout, short stipitate. Legumes closely clustered in a dense raceme, oblong, apex oblique apiculate, base long attenuate, about 7.5 cm. long, 1.2 cm. broad, pubescent to glabrate, two-five-seeded.

KWANGSI: N. I-shan, Ching 5211, May 23, 1928 (NY.NR.SYS. LU.); Hoo-chi, Ching 6432, July 12, 1928 (NY.NR.F.LU.).

YUNNAN: Locality lacking, Ducloux 5794 (NY); Szemao, Henry 11894 (NY.AA.); also Henry 10289 (NY.AA.US.); Talang, Henry 13264 (NY.AA.); Szemao, Henry 13434 (AA); Bonati 6672 (NY); Hand.-Mazz. 3411, July 3, 1914 (LU); Tong Shan, Forrest 12715, 1914 (SYS); Pe-yen-tsin, Ten 108, May 19, 1916 (AA.US.); between Chieng Law and Muang Hun, Rock 2354, Feb. 11-13, 1922 (AA.US.); between Talifu and Likiang, Rock 3189, May 6-11, 1922 (AA.US.); Yangtze, Rock 3887, May-Oct. 1922 (AA.US.UN.); between Likiang, and Talifu, Rock 6530, Sept. 13-18, 1922 (NY.AA.); region of Tung-shan, Rock 10480, 1923 (NY.AA.); Young Shan Hsien, Tsai 51185, July 16, 1932 (F); Shih-ping Hsien, Tsai 53408, May 21, 1933 (F).

KWEICHOW: Tinfan, Pinsha, Tsiang 8521, July 13, 1930 (NY. AA.LU.); Pingchow, Tsiang 7055 and 7091, Sept. 13, 1930 (NY.AA. LU.); Anlung, Tsiang 7388, Oct. 18, 1930 (NY.AA.LU.).

SZECHUAN: Henry 760, 761, isotype and also photograph of type (NY); Muli and Kulu, Rock 24577, Sept.-Oct. 1932 (NY); Wilson 3376, Sept. 1908 (AA.G.US.); Wilson 3377, Sept. 1908 (AA.US.).

DISTRIBUTION: China.

This species, *B. Faberi* Oliv., is probably one of the most misunderstood in the matter of its leaf shape, size and relative pubescence. Oliver described its leaves as broader than long, glabrous on upper surface, pubescent on lower surface. The writer had material of the isotype, photograph of type and a large series of specimens collected from Kwangsi, Yunnan, Kweichow and Szechuan for study. The outstanding feature is the legumes. They are closely clustered in a dense raceme. Their apex is oblong and oblique apiculate and their base is long attenuate.

30a. **Bauhinia Faberi** Oliv. var. **microphylla** Oliv.

Bauhinia Faberi Oliv. var. *microphylla* Oliv. ex Craib, 1914, *in* Sarg. Pl. Wils. 2 :89.

This variety is distinguished by its very small leaves, only 6-12 mm. long, and by its small flowers.

YUNNAN: Locality and date lacking, Forrest 10905 (AA); Bonati 412 and 6672 (NY); Tali Ranfe, Forrest 4228 and 4229 and 4230, Aug. 1906 (AA); Bonati 3840, Maryc, 1910 (NY.AA.US.SYS.); Yungning and Yingpeh, Schneider 1664, June 25, 1914 (AA); Chunglien, Schneider 2267, Aug. 1914 (US); Talifu, Schneider 3091, Aug. 1914 (AA.C.); Li-kiang, Schneider 3964, Oct. 1914 (AA); Hand.-Mazz. 6227, May 8, 1915 (AA); Schoch 378, also 14, 1916 (AA.US.); Red River, Rock 3071, Apr. 8-12, 1922 (AA.US.); Shia Ping, Rock 3189, May 6-11, 1922 (AA.US.); between Likiang, Youngning and Young-peh, Rock 5045, May-June, 1922 (NY.AA.US.F.LU); Yangtze watershed, Rock 7798, May-Oct. 1922 (AA); near Ngaza, Rock 8488, May 5, 1923 (NY.AA.US.); locality lacking Maire 31 and 441, 1923 (AA); Yung-jen Hsien, Tsai 52863 and Shihping, Tsai 53408, May 21-22, 1932 (F); Lu-feng Hsien, Tsai 53615 and 53625, June 28-30, 1933 (F); Tali city, Tsiang 11338, Aug. 16 and Weipao Shan, Tsiang 11763, Sept. 5, 1933 (SYS.LU.); also 11763b (SYS.LU.); locality lacking, Tsai 57292, 57301, and 57521, 1933 (F).

SZECHUAN: Locality and date lacking, Faber 762 (US); Schneider 821, 1914 (AA); Hand.-Mazz. 1321, April 7-8, 1914 (AA); Wen Chuan Hsien, Smith 2310, June 27, 1922 (AA); Yaling, Hand.-Mazz. 2074, May 9, 1914 (AA); locality lacking, Schneider 1556 and 1557, June 13, 1914 (AA); Tung-an-chou and Chang-kuan-chung, Smith 1701, May 3, 1922 (AA); Mow-hsien, Fang 1507, July 25, 1928 (NY.AA.F.); Kangtin Hsien, Fang 3706, Oct. 8, 1928 (AA.F.); Luting Hsien, Fang 3724, Oct. 10, 1928 (NY.AA.F.); Wen-chuan-hsien, Fang 6059, July 22, 1928 (NY.AA.F.); Mao-kung, Wang 21290, June 12, 1930 (AA.F.); O-pien Hsien, Yu 889, May 25, 1932 (AA.F.); He-chang Hsien, Yu 1058, June 16, 1932 (F); Yu 1061, June 16, also 1100, June

24, 1932 (AA.F.); Hsien Chang, Hsien, Yu 1347, Aug. 23, 1932 (AA. F.); Muli and Kulu, Rock 24136, May-July, 1932 (NY.AA.); Min Valley, Wilson 3374, iso-syntype, May-Sept. 1908 (AA.G.US.); locality and date lacking, Tu 4543 (F).

WESTERN HUPEH: Henry 7179, isotype, 1885-1888 (AA.G.US.).

KANSU: Ma-dja-key, Meyer 1779, Oct. 10, 1914 (NY).

SIKIANG: Fa-hsiang-ling, Liu 493, June 26, and Ni-tou, Liu 579, June 28, 1934 (F).

DISTRIBUTION: China.

This small leaf form was characterized from the material of Henry 7179 and Wilson 3374. In these specimens the leaves were described as 6-12 mm. long. In several duplicates of Henry 7179 the leaves are found to vary from 1-4.5 cm. long. Examination of the large series of specimens cited above showed that the characters are not well fixed, the leaves varying from 1.5 cm. to 10 cm., showing all types of intergradation as between the variety and the species.

31. **Bauhinia Laui** Merr.

Bauhinia Laui Merr., 1935, Ling. Sci. Jour. 14 :9.

Shrub erect, glabrate. Branchlets terete, very slender, sulcate, 0.5 mm. in diam. Leaves broadly ovate, membranous or subchartaceous, light olivaceous, glabrous on upper surface, glabrate, paler on lower surface, 4-10 cm. long, 4-9 cm. broad, usually nine-nerved, nerves prominent on lower surface, base broadly rounded, slightly cordate, pubescent, apex bilobed, lobes ovate, rounded, 2-4 cm. long and broad; petioles 1.5-3 cm. long, appressed sub-ferruginous pubescent at joint with the blade; stipules scaly, linear, two. Inflorescences racemose, axillary, solitary, 5-8 cm. long, few-flowered; pedicels 5 mm. long; bracts minute, scale-like; flower buds oblanceolate, or broadly oblanceolate, acute; calyx-tube 3-4 mm. long, glabrous or subglabrous; calyx spatulate, broadly ovate, slit on one side, glabrous or glabrate, 8 mm. long; petals five, elliptical, acute or slightly acuminate, pinnately nerved, up to 15 mm. long, 8 mm. broad, glabrous; fertile stamens ten; filaments unequal in length, longest 11 mm., shortest 8 mm., slightly villose at the base; ovary stipitate, 1.5 cm. long, pubescent; style curved; stigma bilobed, lobes thick, orbiculate, triangular; stipe 5 mm. long, subglabrate. Legumes not seen by Merrill.

HAINAN: Naan Shan Leng, Ngai district, S. K. Lau 278, type, July 17, 1932 (NY); isotype (AA.US.LU.); Yaichow, How and Chun 70059, Jan. 23, 1933 (AA.US.O.); and How 70668, May 3, 1933 (NY AA.US.); Ka Chik Shan and vicinity, Chang-kiang district, S. K. Lau 1700, May 1933 (NY.AA.O.); I Chou, Liang 61879, July 4, 1933 (NY.US.O.); locality lacking, Wang 33019, July 11, 1933 (NY.AA. O.); Ngai-yuen, Liang 62937, Sept. 7, 1933 (NY.AA.O.); Cheong-kong, Liang 66171, Dec. 13, 1933 (NY.O.); Ka Chik Shan and vicinity,

S. K. Lau 2965, Dec. 26, 1933 (AA.O.); Loktung, S. K. Lau 26819, May 21, 1936 (O) and 27048, June 9, 1936 (O).

DISTRIBUTION: China.

Fruit description added: Legumes oblanceolate, smooth, brownish, glabrous, about 9 cm. long, 1 cm. broad, apex slightly acuminate, base narrow obtuse, nine-seeded; seeds rounded, semi-compressed, 5 mm. in diam.

HAINAN: Ka Chik Shan and vicinity, Chang-kiang district, S. K. Lau 2965, type of fruit, Dec. 26, 1933, Oberlin College.

32. **Bauhinia acuminata** Linn.

Bauhinia acuminata Linn., 1753, Sp. Pl. 1 :375; Lam., 1783, Encycl. Bot. 1 :389; DC., 1825, Prodr. 2 :513; Linn., 1825, Syst. Veg. 2 :333; Roxb., 1832, Fl. Ind. 2 :324; Benth., 1852, *in* Miq. Pl. Jungh. 2 :260-261; Miq., 1855, Fl. Ned. Ind. 1 :74; Baker, 1879, *in* Hook. f. Fl. Brit. Ind. 2 :276; Forb. and Hemsl., 1887, Linn. Soc. 23 :212; 1902, Curt. Bot. Mag. 58 :7866; Gagnep., 1913, *in* Lec. Fl. Gén. Indo-Chine 2(5) :148-149.

Bauhinia purpurea Wall., 1832, num. List. No. 5795, nom. nud. pro parte fide Index Kewensis.

Small branching tree or large shrub. Branches cylindrical, glabrous. Leaves about 13 cm. long, 12 cm. broad, glabrous on upper surface, pubescent on lower surface, nine-eleven-nerved, middle nerve ending in a mucro, base sub-cordate, apex bilobed, lobes extending one-third down, acute or slightly acuminate; petioles channelled, swollen, 3-4 cm. long, pubescent; stipules very acute. Inflorescences corymbose, short-peduncled, few-flowered; bracts and bracteoles linear; pedicels 1.5-2 cm. long; flowers large; calyx spatulate, acuminate, about 3 cm. long, apex with five short, slender teeth, slit on one side; petals five, white, glabrous, oblong, concave, obtuse, 4 cm. long, 2 cm. or more broad; fertile stamens ten, ascending, five larger, more spreading and alternate with five short ones; anther oblong, 4 mm. long; ovary stipitate, slightly pubescent; style up to 2 cm. long; stigma peltate, about 3 mm. in diam. Legumes obliquely linear-lanceolate, acuminate, 11 cm. long, 1.5 cm. broad, firm, glabrous, eight-twelve-seeded.

HONG KONG: Botanical Garden, Tsiang 3327, Sept. 24, 1929, as *B. variegata* Linn. (SYS). This was introduced from Singapore (ex label).

YUNNAN: Red River, Henry 9574 (NY.AA.).

DISTRIBUTION: China, India, Indo-China, Luzon, Ceylon.

This species, *B. acuminata* Linn., is very closely allied to *B. variegata* Linn. in general appearance. The distinguishing character is that the former has a long spatulate calyx that is divided into five short and slender teeth at the apex, whereas the latter has a calyx that is spathiform and entire at the apex.

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吾國各種之 *Bauhinia*

陳秀英著

(摘要)

著者將華產之洋紫荊三十二種及其兩變種，從分類學上修正之。對於每種之敘述及其分佈皆經涉及。其見於我國各省者，則如第十四圖版所示。至 *Bauhinia Championi* Benth. var. *acutifolia* 變種一類，則爲科學界之新記錄。

Explanation of Map

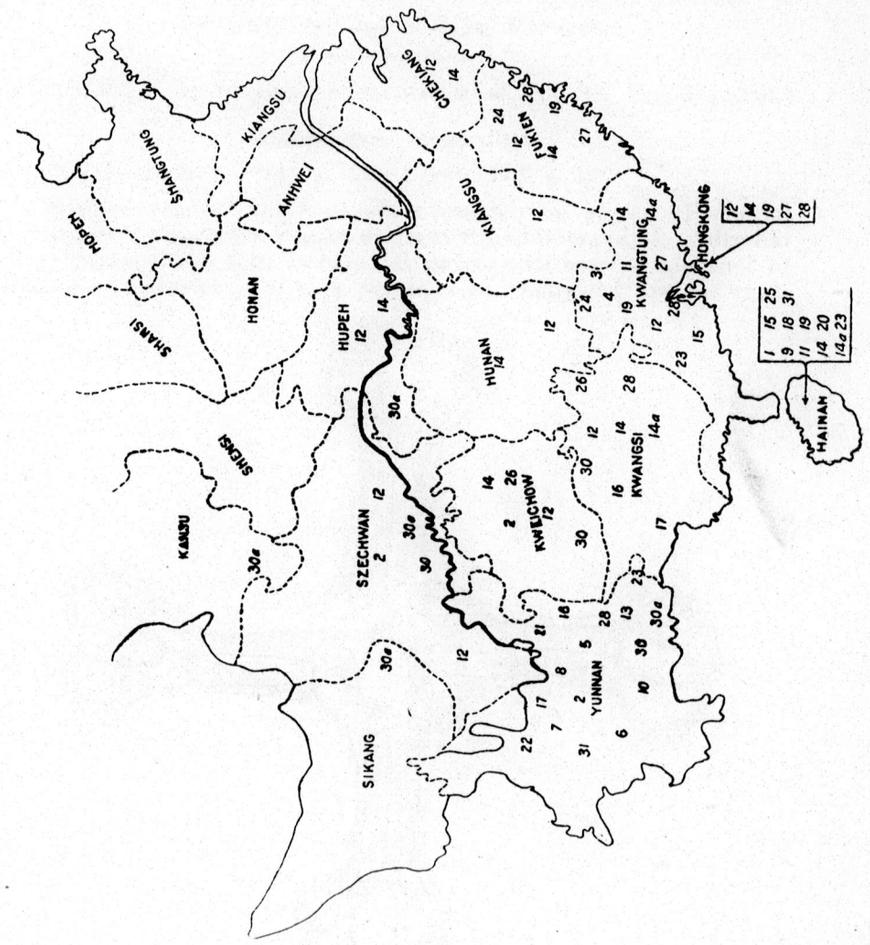
1. *B. subrhombicarpa* Merr.
2. *B. yunnanensis* Fran.
3. *B. didyma* Chen
4. *B. yingtakensis* Merr. and Metc.
5. *B. Delavayi* Fran.
6. *B. comosa* Craib
7. *B. euryantha* Chen
8. *B. chalcophylla* Chen
9. *B. hainanensis* Merr. and Chun
10. *B. pernervosa* Chen
11. *B. corymbosa* Roxb.
12. *B. hupehana* Craib
13. *B. Mairei* Harms
14. *B. Championi* Benth.

14a. *B. Championi* Benth. var. *acutifolia* n. var.

15. *B. kwangtungensis* Merr.
16. *B. touranensis* Gagnep.
17. *B. genuflexa* Craib
18. *B. Howii* Merr. and Chun
19. *B. purpurea* Linn.
20. *B. pyrrhoclada* Drake
21. *B. Bohniana* Chen
22. *B. caterviflora* Chen
23. *B. erythropoda* Hayata
24. *B. apertilobata* Merr. and Metc.
25. *B. Kerrii* Gagnep.
26. *B. aurea* Lévé.
27. *B. Blakeana* Dunn
28. *B. variegata* Linn.
29. *B. racemosa* Lam.
30. *B. Faberi* Oliv.

30a. *B. Faberi* Oliv. var. *microphylla* Oliv.

31. *B. Laui* Merr.
32. *B. acuminata* Linn.



STUDIES ON CHINESE STAUROMEDUSAE. II. FURTHER STUDIES ON SOME STAUROMEDUSAE FROM CHINA

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(Concluded from *Lingnan Science Journal* Vol. 18, No. 3, p. 291.)

Kishinouyea Mayer, 1910

Kishinouyea Mayer, 1910, p. 531; Uchida, 1929, p. 137.

Kishinouyeidae with four radial symmetrical planes. Perradial marginal notches much deeper and wider than interradial. Adradial arms grouped into four interradial pairs, each bearing a cluster of secondary tentacles. Primary tentacles and marginal anchors want-

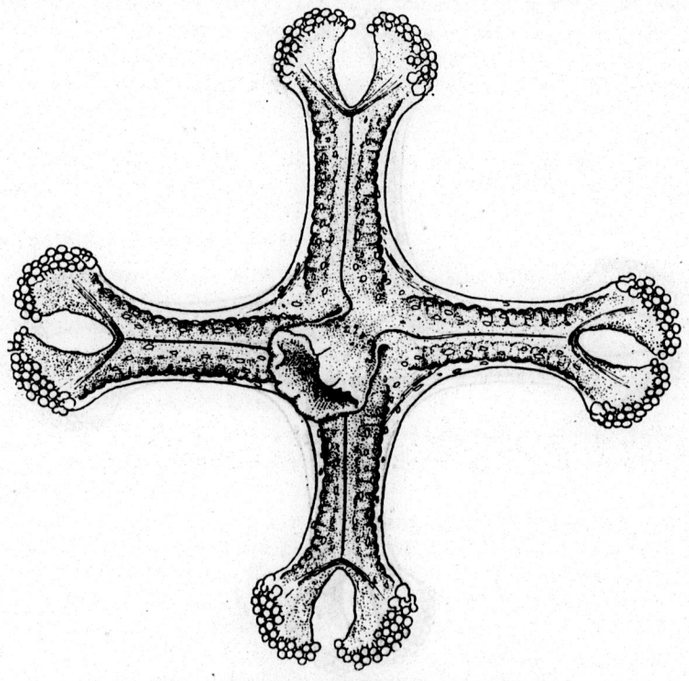

Fig. 15. *Kishinouyea nagatensis* Oka; aboral view.

ing in adult. Stomach four-chambered, mesogonial pockets absent. Coronal muscle divided into eight sectors. Peduncle four-chambered, taenoiles without muscle, aboral axial tube present.

This genus is represented by only one species, *Kishinouyea nagatensis* Oka, which has so far been reported only from Japanese waters. *Kishinouyea* differs from the closely related genus *Sasakiella* in the complete disappearance of its eight primary tentacles in the adult stage.

Kishinouyea nagatensis Oka (fig. 15-21)

Kishinouyea nagatensis Mayer, 1910, p. 531, fig. 338; Uchida, 1929, p. 137, fig. 43-45.

Measurements.—

Diameter of animal	15-24 mm.
Diameter of central disk	5-6 mm.
Length of perradial marginal notch	5-9 mm.
Length of interradial marginal notch	2-3 mm.
Number of secondary tentacles on each arm	25-50

Coloration.—The color of the animal varies a great deal according to the surrounding, generally ranging from light greenish brown

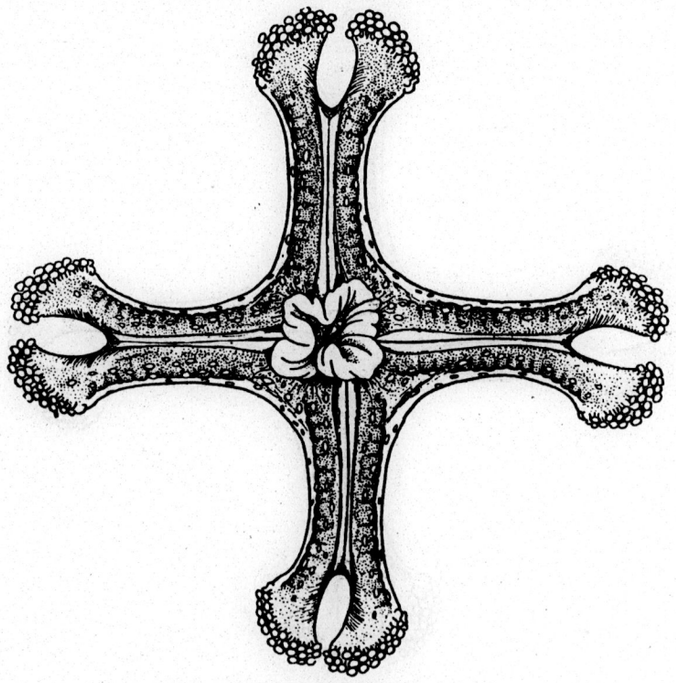

Fig. 16. *Kishinouyea nagatensis* Oka; oral view.

to grayish brown. White patches of nematocyst and gland cells are thickly scattered all over the surface, especially along the margins of arms.

Peduncle.—Peduncle short, only about 3 mm. in length; slightly four-sided, base broad (about 3 mm. in diameter), tapering considerably upward, distinctly four-chambered in cross-section, taenoiles without muscle. Aboral axial tube present at the basal third.

Bell.—Bell cruciform-shaped, wide and flat, measuring about 20 mm. in diameter and 3 mm. in height. The eight adradial arms are closely united into pairs borne on the tips of the four interradial arms, which are symmetrically placed, resembling the Greek cross. The four perradial marginal notches are more than twice as deep as the four interradial. Interradial arms long, measuring about 7 mm. long, 3.5 mm. wide and 2.5 mm. thick. Adradial arms short, only about one-third as long as the interradial. Each adradial arm bears on its tip a cluster of twenty-five to fifty short secondary tentacles arranged into more or less regular radial rows. The number of tentacles varies with the age of the animal; twenty-five were found on one arm in a specimen 15 mm. in diameter, while as many as fifty were found on that of a large specimen with a diameter of 25 mm. Each secondary tentacle consists of a short hollow stalk and a hollow globular disk-like knob. Primary tentacles completely wanting in adults. Rudiments of the four perradial primary tentacles may sometimes be seen in very young specimens. Exumbrella rather smooth, mesoglea moderately thick, white patches of gland cells and nematocysts of various size are evenly distributed all over the surface. Subumbrella with thickened margins, thickly covered with large white warts of nematocyst and gland cells. Interradial furrows prominent, one in each interradial arm, running from base of manubrium to base of adradial arm.

Manubrium short, mouth four-sided, lips simple. Stomach with numerous gastric filaments. Gonads arranged in eight adradial rows, each along one side of the interradial groove, extending from base of manubrium to tip of adradial arm. The number of vesicles in each gonad varies according to age of animal; in general each gonad contains about fourteen vesicles.

Coronal muscle divided into eight U-shaped sections. Interradial muscles well developed, four in number, each bifurcating into two adradial muscles.

Locality and date.—Four specimens of this species were collected by Mr. H. C. Chen, of the Department of Biology, National University of Shantung, from East Saddle Island, Chushan Islands (嵊山, 舟山群島), on July 19, 1936. They were found attached on seaweed growing in a tidal pool.

General Morphology: a. *Peduncle.*—Peduncle subquadrate in outline. Ectoderm thin with numerous swellings of tall vesicular cells and nematocysts scattered all over the surface. These swellings or warts are generally of two kinds; the smaller ones are almost rounded and contain small ellipsoidal nematocyst and short vesicular cells, while the larger ones are crescent-shaped with the concave

surface facing inward and contain some very tall ellipsoidal, and some small rod-shaped, nematocysts together with a few small supporting cells. Endoderm slightly higher than ectoderm, without warts of nematocysts, but highly granulated and vesiculated. Mesoglea layer fairly thick and slightly fibrillous.

Axial canal exceedingly large at the basal portion of peduncle, occupying almost half the space of the entire internal cavity of that region. The canal decreases gradually in size upward and disappears

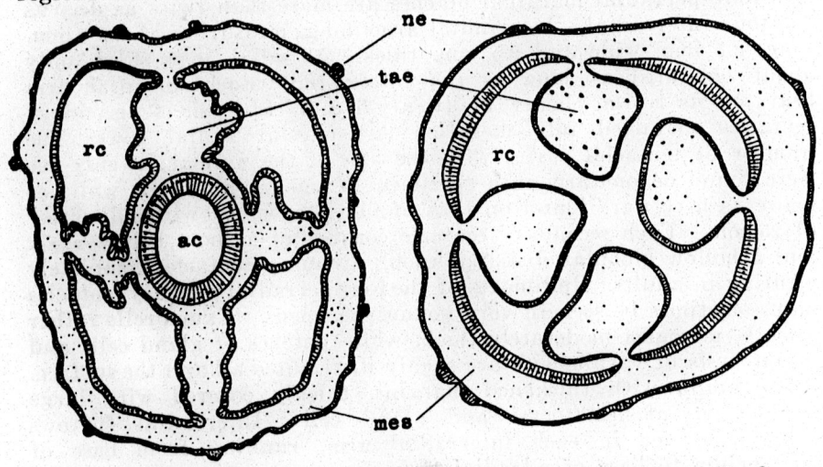

Fig. 17. *Kishinouyea nagateneis* Oka; cross-section through basal portion of peduncle.

Fig. 18. *Kishinouyea nagatensis* Oka; cross-section through distal portion of peduncle.
ac-axial canal, ne-nematocyst wart, mes-mesoglea, rc-radial chamber, tae-taenoile.

completely at about the middle of the peduncle. It is lined with a layer of very tall columnar cells, not less than three times as high as those of the endoderm, highly vesicular and granulated, with well-stained fleck. The canal is surrounded also by a thin layer of mesoglea.

Muscle bundles absent in the entire peduncle. Taenoiles united at center for most of the length except at the distal region of the peduncle. At the region where taenoiles are united the cavity of the peduncle is divided into four completely separated radial chambers. The four radial chambers become continuous one with the other at the distal region where the taenoiles are not united at center. At the junction between the peduncle and the bell, all taenoiles have disappeared and the internal cavity is now seen as a large circular chamber.

b. *Bell.*—Bell with short central disk and long arms. Ectoderm thin, with many ridges of large ellipsoidal nematocysts and vesicular gland cells, which are especially abundant along the margins of the

subumbrella. Clusters of small nematocysts and granulated cells occur also in the mesoglea layer of subumbrella. Endoderm generally thin with short columnar cells, granulated at the inner surface and

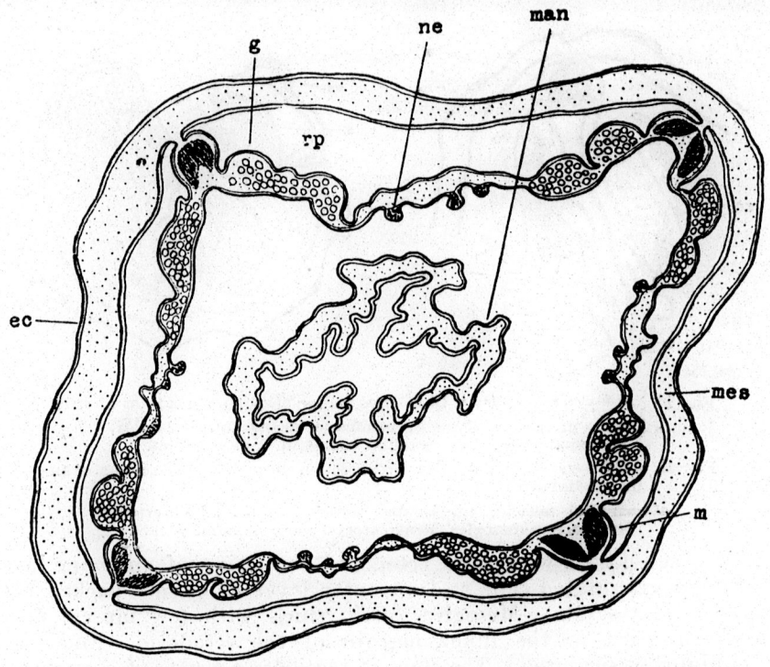

Fig. 19. *Kishinouyea nagatensis* Oka; cross-section through manubrial region of bell.
ec-ectoderm, g-gonad, m-muscle strand, man-manubrium, mes-mesoglea, ne-nematocyst wart, rp-radial pocket.

vesiculated at the outer surface, occasionally with some ellipsoidal nematocysts. Mesoglea thick, slightly fibrillous.

Infundibulum long but narrow, bounded by the large gonads on both sides for most of the length. Interradial muscle strands show signs of bifurcation. Inner ectoderm with crescentic warts of nematocysts. Mesoglea thick with clusters of glandular cells and small nematocysts.

Manubrium four-sided, slightly frilled. Mesoglea fairly thick. The inner layer of ectoderm consists of tall columnar cells, highly vesiculated at the inner surface and granulated at the other. The outer layer of ectoderm consists of low columnar cells, much lighter stained and less granulated. Gastric filaments are all lined with tall granulated cells on one side and short columnar cells on the other.

Arms with numerous warts of nematocysts, especially abundant on the margins. Each wart contains, besides some small granulated cells, both large ellipsoidal and rod-shaped nematocysts. Mesoglea

thick, fairly fibrillous, provided with clusters of small nematocysts at the sides of the interradial groove. Adradial muscle bundles well developed, more or less elongate oval in shape.

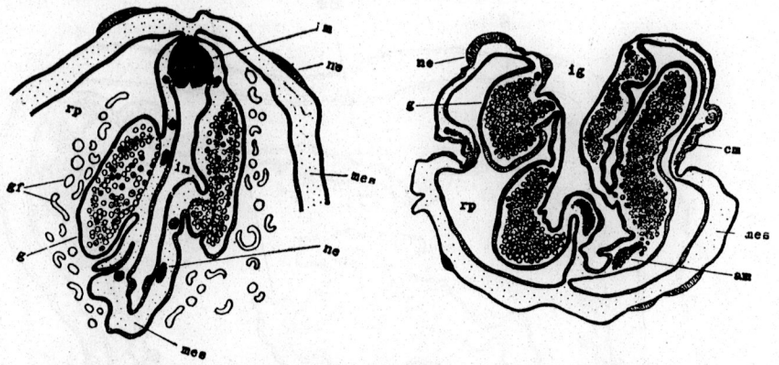

Fig. 20. *Kishinouyea nagatensis* Oka; cross-section through a quadrant of bell.
g-gonad, gf-gastric filament, m-muscle strand, mes-mesoglea, ne-nematocyst wart, rp-radial pocket, in-infundibulum.

Fig. 21. *Kishinouyea nagatensis* Oka; cross-section through middle portion of an interradial arm.
am-adradial muscle, cm-circular muscle, g-gonad, ig-interradial groove, mes-mesoglea, ne-nematocyst wart, rp-radial pocket.

Tentacle knobs with thick ectoderm, consisting of an inner layer of highly granulated cells and an outer layer of closely packed rod-shaped nematocysts. Mesoglea fairly thick with few muscle fibers closely applied to the inner margin of the ectoderm. Endoderm cells highly vesiculated. The stem of tentacles consists of a comparatively thin ectoderm with numerous vacuolated cells. Endoderm layer thicker than the ectoderm, consisting of tall columnar cells vesiculated on the outer surface and granulated on the inner. The inner margin of the ectoderm of tentacular stem is connected with a layer of muscle fiber which, in cross-section, appears as fine indentations penetrating into the mesoglea.

Genus **Sasakiella** Okubo, 1917

Sasakiella cruciformis Okubo

Sasakiella cruciformis Okubo, 1917, p. 317, fig. 1-2; Uchida, 1929, p. 140, fig. 46-58; Ling, 1937, p. 16-25, fig. 8-19.

One young specimen of medium size was collected by Mr. T. K. Liu, Department of Biology, National University of Shantung, from Chefoo (烟台), on July 25, 1936.

This is a typical Oriental species, occurring abundantly along the coast of Asamushi and Oshoro in Japan and also in the vicinity of Tsingtao, China. Its distribution at Chefoo is here reported for the first time. The specific description of this animal has already been given in the writer's previous report (Ling, 1937).

Distribution of Stauromedusae in China

It has generally been stated that the Stauromedusae are inhabitants of cold waters and are distributed in a rather limited area around the regions of the Arctic and Antarctic. However, Uchida (1929) reported the occurrence of *Kishinouyea nagatensis* and *Haliclystus auricula* in Gogoshima, near Matsuyama (ca. 33°N.). The same writer reported (1934) that *Stenoscyphus inabai* had been collected in the vicinity of the Amakusa Marine Biological Station, in Tomioka (32° 32′ N.) which was later regarded as the southern limit of the Stauromedusae on the Pacific coast of the Northern Hemisphere. The present writer (Ling, 1937) reported on the occurrence of *Haliclystus auricula*, *Haliclystus sinensis*, *Sasakiella cruciformis*, and *Sasakiella tsingtaoensis* around Tsingtao. Recently specimens of *Kishinouyea nagatensis* have been collected from East Saddle Island of the Chushan Islands (岍山，舟山羣島). East Saddle Island (30° 43′ N.) is, therefore, the new southern limit of distribution of the stalked medusae in the Pacific of the Northern Hemisphere.

The distribution of the Chinese species of Stauromedusae is shown in the following table.

TABLE 1

Distribution of Chinese Stauromedusae

SPECIES NAME	DISTRIBUTION IN CHINA	DISTRIBUTION IN JAPAN
Stenoscyphus inabai	Tsingtao	Tomioka, Gogoshima, Kataura, Misaki, Asamushi, Oshora
Haliclystus auricula	Tsingtao, Chefoo	Gogoshima, Gokasho, Asamushi, Muroran, Oshora, Rishiri, Abashiri
Haliclystus steinegeri	Chefoo	Muroran, Akkeshi, Abashiri
Haliclystus sinensis	Tsingtao	
Kishinouyea nagatensis	East Saddle Island	Gogoshima, Kogushi, Misaki, Mito
Sasakiella cruciformis	Tsingtao, Chefoo	Asamushi, Oshoro
Sasakiella tsingtaoensis	Tsingtao	

Summary

1.The five species of Stauromedusae here described are similar to those found in Japan.

2. *Haliclystus auricula* and *Sasakiella cruciformis* are here reported for the first time as occurring at Chefoo.

3. *Stenoscyphus inabai*, *Haliclystus steinegeri* and *Kishinouyea nagatensis* are for the first time found in Chinese waters.

4. Of all the seven species of stalked medusae so far found from China, five are similar to those found in Japan and two are typical Chinese forms, namely, *Haliclystus sinensis* and *Sasakiella tsingtaoensis*.

5. The occurrence of *Kishinouyea nagatensis* in East Saddle Island (30° 43′ N.) of the Chushan Islands (嵊山，舟山羣島) has made this island the southern limit of distribution of the Stauromedusae so far known to occur in the Pacific of the Northern Hemisphere.

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中國十字形水母之研究
II. 中國十字形水母續誌

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(摘要)

本文敘述中國沿海十字形水母五種，代表二科四屬，其中鐘形十字水母 (*Haliclystus auricula*) 及正十字形十字水母 (*Sasakiella cruciformis*) 二種係烟台之新紀錄；喇叭形十字水母 (*Stenoscyphus inabai*), 淺鐘形十字水母 (*Haliclystus steinegeri*) 及正十字形水母 (*Kishinouyea nagatensis*) 三種皆係中國海首次發現者。

十字形水母多係寒帶產品，於溫帶區產量極稀少，舟山羣島之嵊山 (30° 43′ N.) 正十字形水母之發現，造成此種動物於太平洋岸之分佈之最南點新紀錄。

本篇所述五種，其主要特徵及習性如下：

1. 喇叭形十字水母 (*Stenoscyphus inabai* Kishinouye) 體喇形叭，長約 14 mm. 淡棕色或重棕色，生殖腺 8, 各有圓粒狀生殖囊 50—70, 分列一行，沿口肌環狀完整不分，手短，各有觸手 22—28. 此種水母乃日本特產，此次在膠州灣之小青島發現，係新紀錄。

2. 鐘形十字水母 (*Haliclystus auricula* Clark) 此種水母，採自烟台，其特徵已於著者前文述及。

3. 淺鐘形十字水母 (*Haliclystus steinegeri* Kishinouye) 柄短，身廣淺棕色，生殖腺各 8. 各有圓粒狀生殖囊 30—50, 柄之中膠層特厚，附馬尾藻上，此種水母採自烟台。

4. 正十字形水母 (*Kishinouyea nagatensis* Oka) 體正十字形，直徑 15—24 mm. 淺綠棕色，或濃棕色，正軸及間軸無觸手，附海藻上，此種水母，採自舟山群島之嵊山。

5. 正十字形水母 (*Sasakiella cruciformis* Okubo) 此種水母採自烟台，其特徵及習性等情形，參看著者前文。

RAPHIOLEPIS NOTES

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In completing my study of *Raphiolepis* for a revision of the flora of Fukien so much difficulty was encountered in the narrow lanceolate leaved group, that an intensive study had to be made of the types, where known, and a search made for authentic material. The key to the whole problem in this closely related group was to find out what *R. salicifolia* Lindley and *R. phaeostemon* Lindley are, both representing species inadequately known and rarely represented in herbaria, and it also involved a few nomenclatural problems. No types for the oldest species were actually cited and hence considerable research was needed to determine their real status. Material for this study was borrowed from the Botanischen Gartens und Museum, Berlin-Dahlem; Royal Botanic Garden, Kew; National Museum of Natural History, Paris; Cambridge Herbarium, Cambridge; Bailey Hortorium, Ithaca, New York; and the Botanical Survey, Lingnan University, Canton, China. The work was carried out at the Arnold Arboretum. I wish to thank the directors and curators of these organizations for their help and cooperation without which nothing could have been accomplished. The results are given below. A key is also included to help characterize these closely related species.

Key to the Species with Narrow Lanceolate Leaves

A. Leaves with midrib and veins elevated and somewhat reticulate above
  B. Pedicels, branchlets and buds glabrous.....**kwangsiensis** Hu
  BB. Pedicels, branchlets and buds pubescent
    C. Leaves thin, scattered, distinctly sharp pointed, acuminate at both ends, lanceolate to lanceolate-elliptic; inflorescence many-flowered, paniculate .....**salicifolia** Lindley ex Ker
    CC. Leaves rather coriaceous, sub-fasiculate at ends of branches, elongate-lanceolate, apex acuminate, base broadly cuneate to obtuse; inflorescence few-flowered, subcorymbose.....**Cheniana** Metcalf

AA. Leaves without elevated midrib or veins, and not distinctly reticulate above
  B. Pedicels and calyx of flowers and fruit glabrous.....**hainanensis** Metcalf
  BB. Pedicels and calyx not as above
    C. Pedicals and calyx densely yellowish tomentose; leaves thick, with acute apex .....**lanceolata** Hu
    CC. Pedicels and calyx sparsely tomentose; leaves thin, with acuminate apex .....**indica** var. **phaeostemon** (Lindley) Nakai

1. **Raphiolepis indica** var. **phaeostemon** (Lindley) Nakai

Raphiolepis indica (Linn.) Lindley *ex* Ker var. *phaeostemon* (Lindley) Nakai, 1924, Jour. Arn. Arb. 5 : 65; *R. phaeostemon* Lindley 1821, Collect. in note, sub. t. 3; DC., 1823, Prodr. 2 : 630; *R. indica* Ker, 1820, *in* Bot. Reg. 6 : 468, excl. syn. *Crataegus indica, non* Lindley. *Non Crataegus indica* Sims, 1825, Bot. Mag. 1726 [= *Raphiolepis indica* (L) Lindley ex Ker].

Leaves lanceolate, serrate. Inflorescence racemose. Base of calyx tomentose and pedicels sparsely so. Petals lanceolate, stamens elongate. "Spreading red stamens, longer than calyx and much larger leaves," *ex* Lindley.

A specimen called *R. phaeostemon m.* with "China HHS [Herbarium Horticultural Society] 1824" in lower left hand corner, located in the private herbarium of J. Lindley, received on loan through the kindness of Professor H. Hamshaw Thomas, of Cambridge, undoubtedly represents what Lindley considered as *R. phaeostemon;* the "*m.*" probably refers to Lindley himself. The leaves are, however, more lanceolate than the plate Lindley refers to (*l.c.* t. 468) which shows many wider leaves. The description, however, is given as "lanceolata." If this represents the true type of *R. phaeostemon* Lindley ex Ker, and I believe it does, it is very close to the other lanceolate forms, described both as varieties and species. It is clearly not *R. salicifolia* Lindley (see later discussion for what this species is) nor *R. kwangsiensis* Hu, both of which have a distinct midrib on the upper surface and leaves with an acute apex, while Lindley's specimen has a depressed midrib above and has distinctly acuminate apices. I find no other species or varieties that closely approach it. Two cultivated specimens, one Rehder (Arnold Arboretum, *ex* Hort. Bot. Gotting. 1889), and one sheet labeled Roy. Hort. Soc. Garden, Wisley, Surrey (Feb. 1938, *ex* Herb. Bailey), a specimen received on loan through the kindness of Dr. Bailey, approach this in general form but both have raised and reticulate venation.

2. **Raphiolepis salicifolia** Lindley ex Ker

R. salicifolia[1] Lindley, 1821, Collect. Bot. in note, sub. t. 3; Ker, 1822, Bot. Reg. 8 : t. 652; DC., 1825, Prodr. 2 : 630; Nakai, 1924, Jour. Arn. Arb. 5 : 64, excl. syn. *R. indica* Lindley *salicifolia* Wenzig in Herb. (publ. ?).

Leaves elongate-lanceolate to elliptic-lanceolate, attenuate at both ends, unequally serrate, with veins distinctly elevated and slightly reticulate above, reticulate and sometimes fuscenteous beneath; petioles winged. Flowers white, in subcorymbose fastigate panicles, petals lanceolate, and with congested fasciculate, short, erect, white stamens. Calyx and pedicels pubescent. Tree with terete branches.

A serious attempt has been made to locate the type or authentic material of this species. Through the kindness of Professor H. H.

[1] Probably should be cited *R. salicifolia* Ker or Lindley *ex* Ker. Lindley only says a "4th species with long willow-like leaves."

Thomas of Cambridge five sheets of *Raphiolepis* representing the private herbarium of J. Lindley have been obtained on loan. In this lot are specimens of *R. indica*, *R. rubra* and *R. phaeostemon*. There was nothing that approached the description of *R. salicifolia* Lindley or Ker's plate. Lindley said the species was imported from China by the Horticultural Society. The plate (t. 652), Ker says, was drawn from a specimen taken from the garden of the Horticultural Society and "was supposed to have been imported from China."

Through the kindness of Director Arthur Hill of the Royal Botanic Garden, Kew, a search was made at Kew, but no specimens could be found that approached this, either in the general herbarium or the garden herbarium. It was then thought that possibly a specimen or authentic material could be found in other herbaria or gardens. In Spach. Hist. Veg. 2: 79 (1834) these notes were added "indigine en China, resista ordinairement aux hivers des environs de Paris" and Decaisne, in Nouv. Arch. Mus. Paris 10: 133 (1874), adds "China, Macao, Gaudichaud 266."

Through the kindness of Director Humbert at the Muséum National d'Histoire Naturelle at Paris, I obtained a photograph (kindly taken by Mr. MacBride), and a fragment of the Gaudichaud Macao plant, "Pl. donnees par M. Collery—No. 266" (*ex* Metman mss.), labeled *R. salicifolia* Lindley. The specimen is, however, apparently only *R. indica* Linn. Cardot added on the sheet an annotation to the same effect in May 1917.

Wenzig (Linnaea 38: 103, 1874) adds "herb. Berlin Ex Hort." Through the kindness of Dr. Ludwig Diels, Berlin, four additional sheets of *Raphiolepis* material were found and sent to me on loan. Following a suggestion of Dr. Merrill, I also wrote to Dr. L. H. Bailey, Bailey Hortorium, Ithaca, New York, who kindly sent me one sheet that also helped to some extent in solving this problem.

One sheet from the Royal Horticultural Society Garden, Wisley, London, another from Hort. Bot. Gottingen and the four sheets from the herbarium at Berlin, all represent exactly the same thing and one sheet in particular (Hort. Berol., Sept. 1847) is an exact match of the plate (t. 652). Nakai's listing of Cardot's variety *angustifolia* as a synonym of this species is incorrect, as the type of that variety (merotype and photograph in Arnold Arboretum) is entirely different, having the leaves with acute apices and the veins not raised and not reticulate above. Formerly I had associated this species with material recently collected from Fukien, distributed as *R. salicifolia* Lindley, but this authentic material now available from at least four different botanic gardens shows clearly what *R. salicifolia* Lindley really is, and that the Fukien specimens are not the same but represent something else entirely, apparently an undescribed species, which is described in this paper.

3. **Raphiolepis lanceolata** Hu

R. lanceolata Hu, 1932, Jour. Arn. Arb. 13 : 335, *non* Merr. and Chun, 1935, Sunyatsenia 2 : 242.

R. indica Lindley var. *angustifolia* Cardot, 1918, Lecom. Not. Syst. 3 : 380. **Syn. nov.**

The variety *angustifolia* of Cardot was listed as a synonym of *R. salicifolia* by Nakai (Jour. Arn. Arb. 5 : 64, 1924) and the type sheet of Cardot's variety was so marked (photograph available at AA[2]), but his interpretation was not followed by others; Rehder considered Tsang 22007 from Shap Man Taai Shan (AA) as the same as Cardot's variety, a photograph of the type and merotype of which was available (AA) for study. Hu, in describing his new species *lanceolata* overlooked Cardot's variety *angustifolia*, based on Eberhardt 2057 from Annam, which matches his type, namely, Ching 8060 from Seh-feng Dar-Shan, Kwangsi. Type material of Cardot's variety has the inflorescence distinctly hairy and the base of the calyx is densely yellowish orange tomentose. Tsang 22007 (collected in March) is more copiously tomentose, but the color and type of hairs are the same. The type of *R. lanceolata* Hu (collected in October) has mature fruits and lacks the abundant tomentose hairs. However, some similar tomentose hairs can be found on the pedicels; the leaf shape and venation is the same, so I believe they are conspecific and that they should be considered a species, rather than a variety. The material cited from Hainan (Merr. and Chun. *l.c.*) is something different. Incidentally, the material determined by Rehder as Cardot's variety (Tsang 22007) and that listed as type by Hu (Ching 8060, merotype at AA and isotype at Lingnan University, now available also at AA) actually were collected from the same mountain Shap Man Taai Shan (Seh-feng Dar-Shan). This species is distinctly not the same as *R. salicifolia* Ker *ex* Lindley.

4. **Raphiolepis kwangsiensis** Hu

R. kwangsiensis Hu, 1932, Jour. Arn. Arb. 13 : 335.

Closely allied to *R. indica* Lindley, from which it differs in the lanceolate leaves (*ex* Hu). The elevated reticulate midrib and veinlets above, however, are much more diagnostic and characteristic. This species is, however, much more closely related to *R. salicifolia* Lindley, with which I at first thought it was conspecific. However, I believe it may turn out to be a good species, but additional specimens may bring to light intermediates or information that may change its present status. The holotype is distinguished from *R. salicifolia* by thicker, less sharply pointed, and somewhat larger (6-7 mm.) fruits, with glabrous pedicels, at least when mature.

KWANGSI: Seh-feng Dar-Shan, south of Nanning, Ching 8360 (isotype LU[3], merotype AA).

[2] Arnold Arboretum.

[3] Botanical Survey, Lingnan University.

5. **Raphiolepis Cheniana** n. sp. (pl. 15)

Frutex parvus, ramis teretibus, novellis pubescentibus. Perulis margine pubescentibus. Foliis subfasciculatis ad apicem ramulorum coriaceis, elongato-lanceolatis, 8-12 cm. longis, plerumque 1.2-1.7 latis, rare 2-2.5 cm. latis, acuminatis, basi late cuneatis ad obtusis, grosse crenato-serratis, supra lucidis, costis venisque elevatis, reticulatis; subtus pallidioribus reticulatis. Inflorescentiis racemosis, subcorymbosis, paucifloris. Floribus ignotis. Pedicellis gracilibus, pubescentibus. Fructubus nigris, globosis, 6-7 mm. diam.

Small shrub with leaves mostly subfasciculate at ends of branches. Branches terete, the youngest pubescent. Bud scales with pubescent margins. Leaves coriaceous, elongate lanceolate, acuminate, base broadly cuneate to obtuse, coarsely crenate-serrate, midrib and veins elevated and reticulate above, paler and reticulate beneath (8-12 cm. long and usually 1.2-1.7 wide, rarely 2-2.5 cm. wide); inflorescence racemose to subcorymbose, few-flowered. Flowers not seen. Pedicels slender, pubescent. Fruit black, globose, 6-7 mm. diam.

FUKIEN: Nanputo, Amoy, shrub; fruit black, H. H. Chung 5912, Jan. 2, 1927 (LU and AA, duplicate types); H. H. Chung 5755, also from Nanputo, shrub, .75 m., October 28, 1922 (AA), probably represents the same species, but apparently sterile shoots; the leaves are narrower in proportion and more elongate, and in a few leaves the first pair of lateral veins are much prolonged even to the middle of the leaf.

Closely related to *R. salicifolia* Lindley and *R. kwangsiensis* Hu. From *R. salicifolia* Lindley it is distinguished by its peculiar, elongated leaves, not sharp pointed at both ends, and its few-flowered subcorymbose inflorescences. From *R. kwangsiensis* Hu it can be distinguished by its hairy pedicels and branchlets, buds with pubescent margins and subcorymbose inflorescences. *R. kwangsiensis* Hu has glabrous pedicels, branchlets and buds.

I am naming this species after Miss Chen Shui Ying (Luetta Chen), my former assistant in the herbarium, Botanical Survey, Lingnan University.

6. **Raphiolepis ferruginea** n. sp. (pl. 16)

Frutex 6 m. altus; ramis subglabrescentibus; ramulis et petiolis dense ferrugineo-tomentosis; foliis coriaceis, ellipticis (9-15 cm. longis et 3-4 cm. latis), integris, margine revolutis, acutis, basi cuneatis, supra glabris (novellis sparse pubescentis), subtus dense ferrugineo-tomentosis, nervis supra impressis, reticulatis, subtus leviter elevatis; petiolis 10-15 mm. longis, in foliis maturis nigris, tomentosis, in novellis ferrugineo-tomentosis; inflorescentiis racemosis ad 12 cm. longis, dense ferrugineo-tomentosis, racemis 2-3; fructubus paucis, immaturis dense tomentosis, submaturis subglabrescentibus, globosis, 2-loculatis apice sparse tomentosis; fructubus ignotis.

Shrub 7 meters high. Branches glabrous. Branchlets, petioles and inflorescences densely tawny to yellowish tomentose. Leaves entire with revolute margins, elliptic (9-15 cm. long, 3-4 cm. wide), acute, base acute, usually glabrous, rather dull above (but young leaves with hairy midrib and scattered hairs elsewhere), densely yellowish tomentose beneath, primary veins (7-10 pair) impressed above, reticulate, fairly distinct, slightly elevated beneath and branching before reaching margin; petioles 10-15 mm. long, blackish tomentose on older leaves but distinctly yellow tomentose on younger leaves; flowers in racemes (up to 12 cm. long), 2 or 3 arising at end of year's growth, with a few scattered fruits; calyx lobes early deciduous; young fruits densely yellowish tomentose, becoming subglabrous and black when mature, two-celled, globose (about 5 mm. diam.) with a few scattered hairs, but prominently hairy in apical region. Apex with distinct round aperture with top of style visible within; flowers not seen.

KWANGTUNG: Tai Mo Shan, Tapu district, June 26-28, 1932. Tsang 21035, and Tung Koo Shan, Tapu district, Sept. 8-29, 1932, Tsang 21587, syntypes (AA).

These two sheets, formerly determined as *Eriobotrya Cavaleriei* (Lévl.) Rehd. var. *Brackloi* (Hand.-Mazz.) Rehder, do not represent a species of the genus *Eriobotrya*. The fruits upon careful dissection definitely appear to be a *Raphiolepis*, being two-celled, and characterized by a calyx that is early deciduous; even the very young fruits are without any calyx lobes. The peculiar yellow tomentose entire leaves suggest at once species of *Machilus* and *Phoebe* in the Lauraceae, in fact in the sterile condition it can barely be separated from species in these genera. The fruit, however, is that of a *Raphiolepis*. Most of the species of this genus have glabrous leaves, only rarely being slightly pubescent on the midrib, but some species do have a tomentose inflorescence. The distinct and densely yellow tomentose leaves, petioles and inflorescences of this species are quite distinct for this genus and easily set it apart from all others.

Merrill (Ling. Sci. Jour. 7: 309, 1931) included CCC[4] 12546 and states it probably represents *Eriobotrya Brackloi* Hand.-Mazz. This specimen (AA) and also a duplicate (LU, loan at AA) are sterile specimens which at first glance do appear to suggest *E. Brackloi* Hand.-Mazz. Closer examination shows, however, that they more closely approach *R. ferruginea* Metcalf. This is especially true in regard to leaf shape, the venation and pubescence. It does not, however, closely match the syntypes of *E. ferruginea* but represents, I believe, a variety of that species. Its definite affinity cannot be ascertained until flowering or fruiting specimens are located.

[4] Canton Christian College, now Lingnan University.

6a. **Raphiolepis ferruginea** var. **serrata** n. var.

E. Brackloi Merrill in part, exclusive of Mell 659, *non* Rehder.

Species subsimilis, et foliis serratis ultra medium distanter.

A variety primarily characterized by the leaves being distinctly serrate above the middle, and less densely ferrugineous tomentose, the pubescence being rather sparse beneath except for the midrib.

KWANGTUNG: Lung-tau Mt., near Iu Village, Lingnan 12546 (To and Tsang), June 21, 1924, duplicate types, Lingnan University and Arnold Arboretum.

7. **Raphiolepis hainanensis** n. sp.

R. lanceolata Merrill and Chun, 1935, Sunyatsenia 2:242, *non* Hu.

Frutex ad 3 m. altus, ramis glabris, cinereis, teretibus. Foliis coriaceis, distanter subcrenato-serratis, anguste lanceolatis ad linearibus (5.5-7.5 cm. longis et 7-9 mm. latis) acutis, basi cuneatis, supra opacis viridibus costis in canaliculo depressis; subtus pallide viridibus venis leviter elevatis obscuris. Inflorescentiis paniculatis, pedicellis glabris. Floribus albis, rubris; staminibus rubris et luteis (fide cl. Chun and Tso); calycis lobes lanceolatis, acuminatis. Fructubus nigris, globosis, 5 mm. diam. (Liang 61489, ad 6 mm. latis), stylis 2, fructum aequantibus vel eo longioribus.

Shrubs to 3 meters high with glabrous, grayish terete branchlets. Leaves coriaceous, narrowly lanceolate to linear, acute, base cunneate, dull green, midrib in shallow groove and veins depressed above, slightly paler green with indistinct but slightly raised veins beneath, distantly and rather bluntly crenate-serrate (5.5-7.5 cm. long and 7-9 mm. wide). Inflorescence paniculate, glabrous. Pedicels glabrous. Flowers white and red, stamens red and yellow (*ex* Chun and Tso), calyx lobes lanceolate, acuminate. Fruit black, globose, 5 mm. diam. (up to 6 mm. in Liang 61989), with two styles, as long as, or longer than fruit.

HAINAN: Yaichow, shrub in woods, open places, at stream margins, fruit green, H. Y. Liang 61989, Botanical Institute, Sun Yat-Sen University, fourth Hainan expedition, July 9, 1933; Dung Ka to Wen Fa Shi, 1700 ft., shrub, corolla greenish white, red, anthers yellow, white, red, N. K. Chun and C. L. Tso 43670, type flower, second and third Hainan expeditions, Botanical Institute, Sun Yat-Sen University, in cooperation with New York Botanical Garden, 1932-33; Po-ting, shrub, 3 m., flower white, stamens red, fruit pale green, often tinged with red, F. C. How 73712, type fruit, Botanical Institute, Sun Yat-Sen University, Sept. 23, 1935.

One of these three specimens (Tso 43670) was included by Merrill and Chun (*l.c.*) with the Kwangsi material of *R. lanceolata* Hu. They are very similar in leaf shape, but represent a different species characterized primarily by the absolutely glabrous pedicels and calyx of the flowers and fruits. In *R. lanceolata* Hu, the pedicels and calyx are densely yellowish-tomentose.

春花誌要

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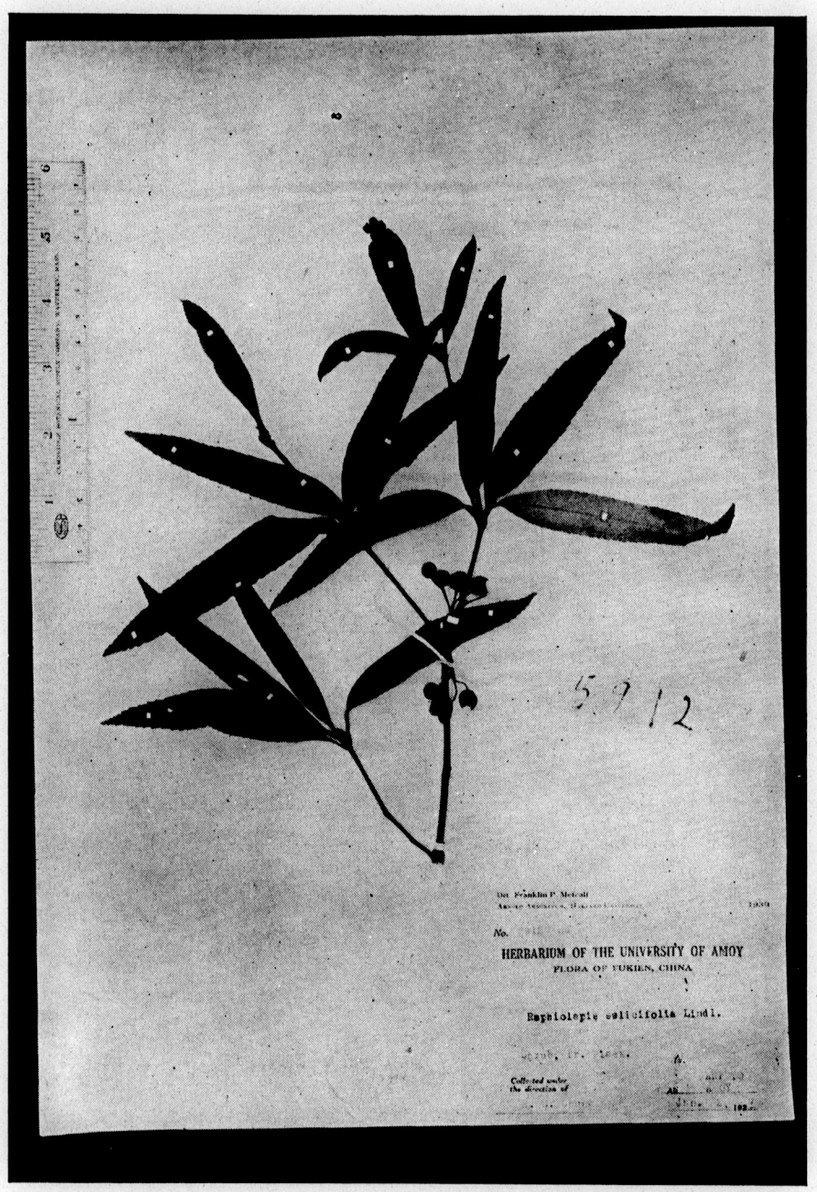
(摘要)

著者將狹葉之春花，從分類學上修正之。所述者凡五種及一變種，並附檢索表以辨別之。*R. Cheniana* 及 *R. hainanensis* 二種，爲科學界之新紀錄，前者採自福建，後者採自海南島。此外尙有闊葉之 *R. ferruginea* 與其變種 *serrata*，亦經涉及，並爲科學界之新紀錄，皆採自廣東。

Explanation of Plates

Plate 15. *Raphiolepis Cheniana* Metcalf, Chung 5912, type.

Plate 16. *Raphiolepis ferruginea* Metcalf, Tsang 21587, type.




FLORA OF KWANGTUNG

GENUS ALEURITES IN KWANGTUNG AND KWANGSI

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(Concluded from *Lingnan Science Journal* Vol. 18, No. 3, p. 327.)

Cultural and Environmental Requirements

Exposure to sunshine is physiologically important to all the species under study, but heat followed by drought is considered to be harmful to the growth and fructification of the tree (Chun, 1933; Legros, 1935). Strong winds at the moment of blossoming may interfere seriously with the process of pollination, and cause excessive desiccation, both of which eventually affect the yield of the trees. The trees may also be broken or even uprooted (Legros, 1935).

My observations in Kwangtung and Kwangsi, agree with Wilson's statement (1913) that the trees seem to have no predilection in the matter of soil type. Gardner (1935) claims that the ideal soil is an acidic sandy loam underlaid with clay three to eight feet down. According to the same author, the presence of alkali in the soil appears to be inimical to the growth of the tree, and may be fatal if it occurs in sufficiently high concentration. These observations were made in southern United States where conditions are quite different from those in our area, and should not be taken as directly applicable here. We must be guided by first hand observations and experiments carried out under local conditions. As a general rule, the more fertile the soil, the more vigorous and productive the tree.

The presence of soil moisture in excessive amounts is detrimental to the trees for two main reasons. In the first place, stagnant water around the root system interferes with the proper aeration of the soil and prevents normal respiration in the roots. In the second place, according to a very important observation made by Abbott in Florida (1929), the increased amount of soil moisture tends to retard the fruit-bud differentiation (in *A. Fordii* at least) most of which occurs during the latter half of June, but which may take place at any time between May 10 and October 1. The delay resulting from excessive soil moisture means that the tree may not have enough time properly to develop the fruit buds and to mature wood of the terminal portions of branches sufficiently to enable them to pass the winter without frost injury.

While both *Aleurites Fordii* and *A. montana* require a period of more or less complete dormancy each year, this is unnecessary for *A. moluccana*. *A. Fordii* is completely deciduous, becoming dormant and losing all its leaves during the winter months. This species requires some cold weather to break the period of repose. On the other hand, *A. montana* is only partially deciduous, although it

seems to achieve more or less complete dormancy even in our relatively warm climate.

The resistance of *A. Fordii* to either early or late sharp frost or severe cold is poor. Usually growth will be hindered at temperatures around 18°—20° F. and the tree stands very little chance of survival at temperatures below 4° F. (Chun, 1933). *A. montana*, whose native home is further south, is apparently much more sensitive to cold. Its distribution in China is limited almost entirely to the southeastern provinces. It occurs most abundantly in Kwangtung and Kwangsi. *A. moluccana* is a tropical species, with an evergreen habit and no apparent dormant period. It does surprisingly well in Hong Kong and even in the Canton delta, where temperatures around 32° F. occasionally occur locally. We even have records of its occurrence in cultivation as far west as Peh-seh district in western Kwangsi.

Thus, we have all three species, *A. Fordii*, *A. montana*, and *A. moluccana*, growing in both Kwangtung and Kwangsi. *A. Fordii*, invading from the north, does well only in the northern edge of our area. *A. moluccana*, in spite of its tropical origin, seems to be quite at home here, though its behavior has not been tested on a large scale. *A. montana*, whose native home may well include our area, is the most abundant and productive of the three.

Cultural Practices and Suggestions

The culture of T'ung oil trees in China, whether *A. Fordii* or *A. montana*, is confined almost entirely to the mountainous districts. With the exception of a few unimportant modifications, the cultural practices prevailing in our area are very much the same as those in operation elsewhere. Full descriptions of the details have been recorded from original observation by other authors (McClure, 1930; Chang, 1937; Wen, 1936). Instead of repeating the details in full, the writer will devote his attention chiefly to discussion of the bad features of current practices, and to suggestions for improvement.

1. Although T'ung oil has established for itself through our foreign trade an important place in the Chinese national economy, it is usually considered by the farmers to be a minor crop worthy of only minor attention. Chang (1937) says that seed selection is entirely neglected, and that sometimes the seeds that are left to germinate spontaneously on the ground after the harvest are the only source of new stock. Improvement can scarcely result from such practices.

As a matter of fact, seed selection is very important, though the process is simple. Theoretically, the seed should be selected from pure lines of prolific parent trees, and should be cleaned and stored under such conditions as will insure high germination. According to Chu (1937) viable seeds are characterized by high specific gravity and good color. Owing to the fact that all the species are intraspecifically cross-pollinated it is probable that the best results can scarcely be achieved by seed selection alone. Pure lines of the most desirable strains must be isolated and propagated vegetatively, by budding or grafting, or even by means of cuttings. Although very little is known about the technique of rooting cuttings of these plants, it is suggested that experiments should be carried out with some of the growth-promoting substances, such as indolacetic acid, that have given such spectacular results in some plants that are very difficult to propagate by means of cuttings under ordinary conditions.

2. According to McClure (1930) the slopes on which T'ung oil tree culture is practiced are relatively steep, and clean culture is generally practiced, the grass and weeds being removed. Erosion which results from this practice is often the cause of early, or at least ultimate, death of the trees. He showed a picture of a new planting of one-year-old T'ung oil trees on a very steep slope at Wong Ma Shan (黃麻山) near Tahokow (大河口), in Anhwei. Gullies a foot in depth had already been washed out, and some of the young trees were already on the verge of destruction.

Experimental work in Java (McClure) has resulted in the adoption of a simple kind of terracing for similar cultures on steep land. By this method narrow trenches are dug on the contour lines at appropriate intervals, and the trees planted on the bank thrown up. The land between the trenches is allowed to remain covered with wild vegetation to prevent erosion. The trenches catch the run-off, causing the water to drop any soil which it may have carried from above, thereby fertilizing the trees. The water is given time to soak into the ground, where it will be stored for further use, instead of rushing off over the surface immediately, causing erosion, and being lost to the soil. Terracing, furthermore, would render the task of gathering the fruits much easier.

Green-manuring crops, such as bush velvet beans, beggarweed, or *Crotalaria*, have been advocated (Newell, 1924) in the American plantations for years. These crops may be used to advantage in conjunction with the terracing method, especially during the early years to hold the loose soil of the terrace in place.

3. Another bad practice that should be corrected is the collecting of immature fruits (Chang, 1937), piling them up into heaps in a damp place and allowing them to undergo a decaying process for a period of about a month (McClure, 1930). As a result of such treatment, according to Chang (1937), the seeds often undergo appreciable deterioration that materially increases the acid value and lowers the refractive index of the oil. In Szechwan the fruits are boiled or scalded with boiling water, instead of being fermented, to remove the seeds for the husk. Chang (loc. cit.) says that this treatment also increases the acid value and lowers the refractive index of the oil, thus rendering the oil poor in quality. The financial losses and the difficulties of standardizing the product under these conditions must be tremendous.

Although all of these practices have a logical origin in some local condition, such as poverty, lack of legal protection for the fruits in the remote mountainous districts, or the difficulties of collecting the fruits from the ground if they are allowed to ripen and fall (Chang, 1937), it is still suggested that a way should be found to allow fruits to mature before harvesting, and then to dry them thoroughly in the sun in order to get the highest economic returns. Work should be directed toward the perfection of a satisfactory harvesting technique, including the removal of the seeds from the husks. Perhaps a simple and inexpensive hand machine could be devised for this latter process.

In conclusion, I should like to suggest for consideration four projects for improving the culture of T'ung oil trees:

a. The introduction of other species and new varieties for trial and experimental work.

b. Experiments on interspecific and inter-varietal crosses with the hope of securing new strains that may be capable of superior performance under the peculiar climatic and edaphic conditions prevailing locally.

c. The study of the comparative effects of pollen from different strains on the fruiting behavior of various strains. In other fruits, such as apple, dates, the phenomenon of metaxenia (direct pollen influence on fruits) has been found to be of sufficient importance to make it worth while to use selected trees for pollenating purposes alone.

d. Experiments on the possibility of influencing the proportion of female flowers in the inflorescences through improved nutrition. We have some indication of the possibilities here from the work of Schaffner and others on sex reversal. Abbott (1929) also hints at the promise of this line of investigation.

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廣東廣西之 *Aleurites* 屬

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(摘要)

兩廣之桐油樹，有下列三種： *A. moluccana* Willd., *Aleurites Fordii* Hemsl., **及** *A. montana* (Lour.) Wils. **文中所載各項，計有品種檢索表，品種之敘述，產地，我國栽培之之史畧，重要與價值，分佈，壽命之長短，產量，桐油之成分，及其變種。至其栽培法與環境之需要，及現在實施者之不良，均加討論。改善之方，有如下列各建議：（一）輸入其他品種及新變種，（二）舉行品種及變種配合之試驗，（三）研究花粉對於結果之作用，及（四）應用營養物以影響雌花在花序上之分配。**

Explanation of Plates

Plate 17

Aleurites montana

(All the figures in this plate are based on fresh material, secured from an 8-year-old tree grown on the Lingnan University campus. Original seeds from Lien-hsien, Kwangtung. April 20, 1938.)

Fig. 1. Lateral view of a staminate flower.
2. Vertical view of a staminate flower.
3. Stamen complement (two whorls).
4. Stamen complement with outer whorls removed.
5. Cross section of the filaments of a stamen complement, showing the relationship of the filaments of the two whorls, those of the inner whorls being fused into a column.
6. Dorsal and ventral views of an individual stamen, showing attachment of anther to the filament.
7. Lateral view of pistil.
8. Cross section of ovary.
9. Longitudinal section of one carpel.
10. Immature fruits.
11. Longitudinal section of a nearly mature fruit.
12. Cross section of young fruit.

Plate 18

Aleurites Fordii

(All the figures in this plate are based on a specimen in Lingnan University Herbarium, F. P. Metcalf No. 5449. "Hill-side, at about 1500 feet, Baek-liang and vicinity, Fukien Province, September 26, 1926.")

Fig. 1. Vertical view of pistillate flower.
2. Lateral view of pistillate flower.
3. Lateral view of pistil with surrounding staminodes.
4. Longitudinal section of ovary.
5. Vertical view of a staminate flower.
6. Lateral view of a staminate flower.
7. Stamen complement (two whorls of fertile ones, with the outer staminodes.)
8. Dorsal and ventral views of an individual stamen, showing attachment of anther to the filament.

Plate 19

Aleurites moluccana

(All the figures in this plate are based on fresh material, secured from tree grown on the Lingnan University campus. Photographed on May 6, 1938. Tree probably introduced from the Philippine Islands.)

Fig. 1. A mixed inflorescence with pistillate flowers open; staminate ones still in bud state.
2. Lateral view of a pistillate flower.
3. Vertical view of a pistillate flower.

4. Lateral view of pistil.
5. Vertical view of pistil, showing the four claw-like styles.
6. Cross section of ovary, showing two ovules of which usually only one develops.
7. Longitudinal section of ovary.
8. Immature fruits.
9. Longitudinal section of a nearly mature fruit.
10. Cross section of the fruit.
11. A staminate inflorescence.
12. Lateral view of a staminate flower.
13. Vertical view of a staminate flower.
14. Stamen complement with perianth removed.
15. Longitudinal section of a stamen complement, showing the relationship of the stamens of the two outer whorls, with the single stamen in the center.
16. Dorsal and ventral views of an individual stamen, showing attachment of anther to the filament.

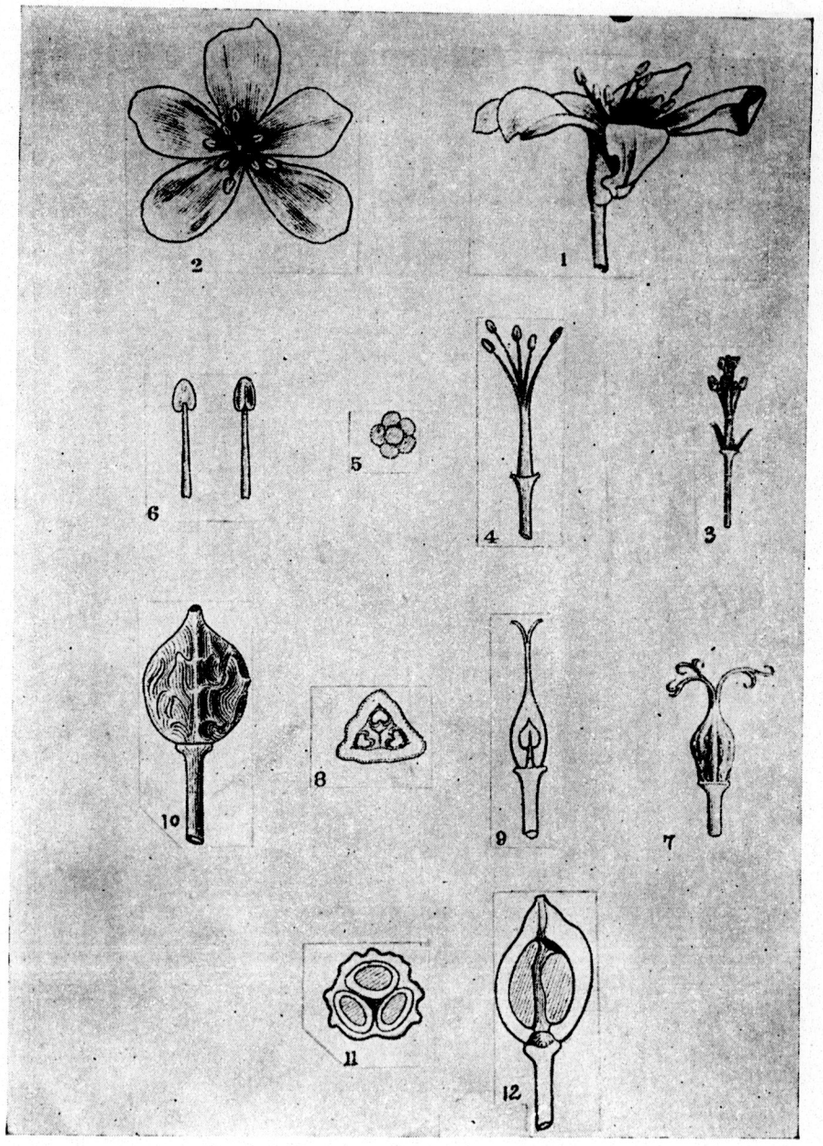
Plate 20

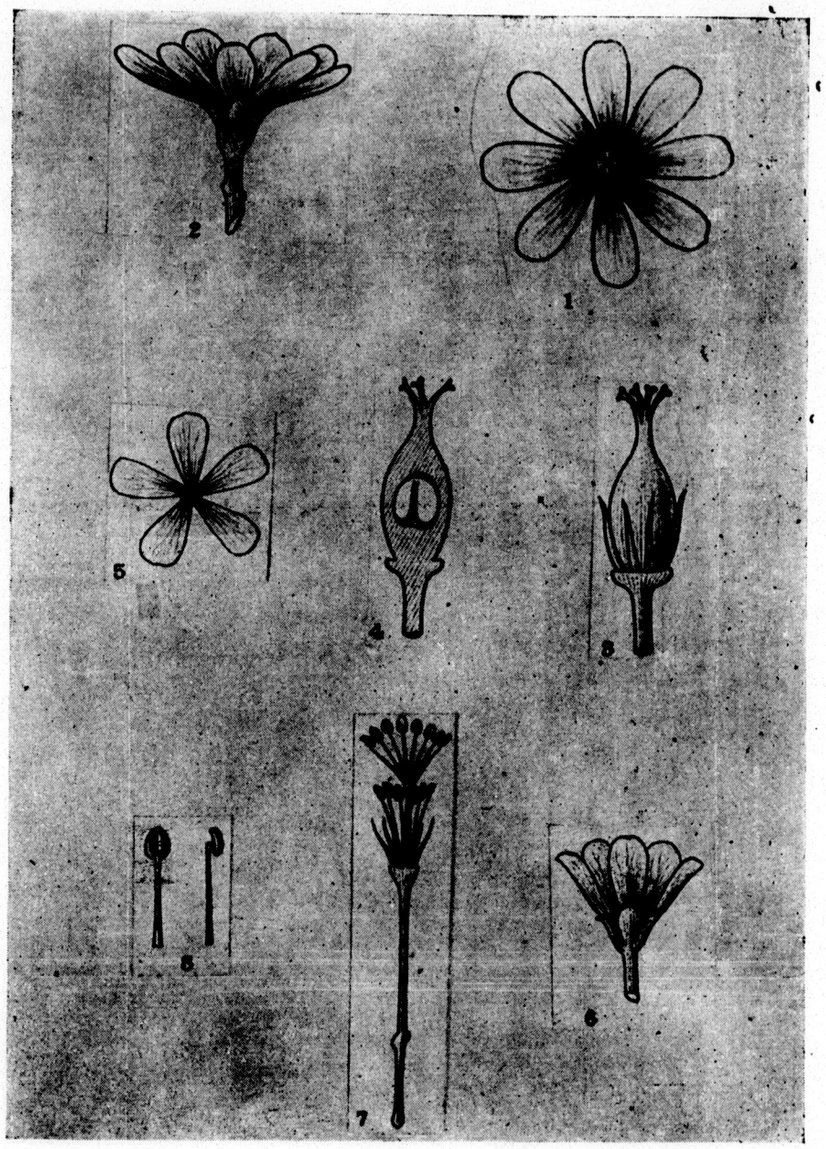
Fig. 1,2. Various forms of leaves of *A. montana* collected on Lingnan University campus from both young and old trees. Leaves 1 and 2 are rare forms; 3 juvenile form, found only on young twigs. The rest are common and typical mature forms. Photographed on April 10, 1938.
3. Typical leaf forms of *A. moluccana*. Photographed at Lingnan University on April 1, 1938.
4. One-year-old seedlings of *A. montana* in the Lingnan nursery, with bamboo and *Eucalyptus* on the northern side as a wind break. Photographed on Dec. 29, 1937.
5. Typical leaf forms of *A. Fordii*. Photographed at Lingnan University during April, 1938.
6. A mature tree of *A. moluccana* on the Lingnan University campus. Photographed during May, 1938.
7. An 8-year-old tree of *A. montana*, grown on Lingnan University campus, showing the upright habit. Photographed on April 1, 1938.

Plate 21

Fig. 1. Fruits of *A. Fordii* collected in Yang-shoh district, Kwangsi, showing the natural forms and cross-sections with the seeds exposed. Photographed during Sept., 1937.
2. A precocious young tree of *A. Fordii*, bearing unusually large clusters of fruits. Photograph by F. A. McClure, enroute Hsing-an to Hai-yang-p'ing, July 28, 1937, used here by courtesy of G. Weidman Groff, leader of National Geographic Society—Lingnan University Northern Kwangsi Expedition.
3. Root system of year-old seedling of *A. Fordii*, photographed during April, 1938.
4. Staminate inflorescence of *Aleurites montana* (Lour.) Wils. Photographed at Lingnan University during April, 1938.

5. Fruits of *A. montana,* showing the natural form, cross-section and longitudinal section with seeds exposed. Photographed at Lingnan University during September, 1937.
6. Staminate flowers from tree on Lingnan campus. Photographed on April 4, 1938.
7. Root system of year-old seedling of *A. montana,* photographed during April, 1938.
8. Root system of year-old seedling of *A. moluccana,* photographed during April, 1938.
9. Fruit cluster, foliage and bark of *A. moluccana.* Photographed at Lingnan University, May 10, 1938.





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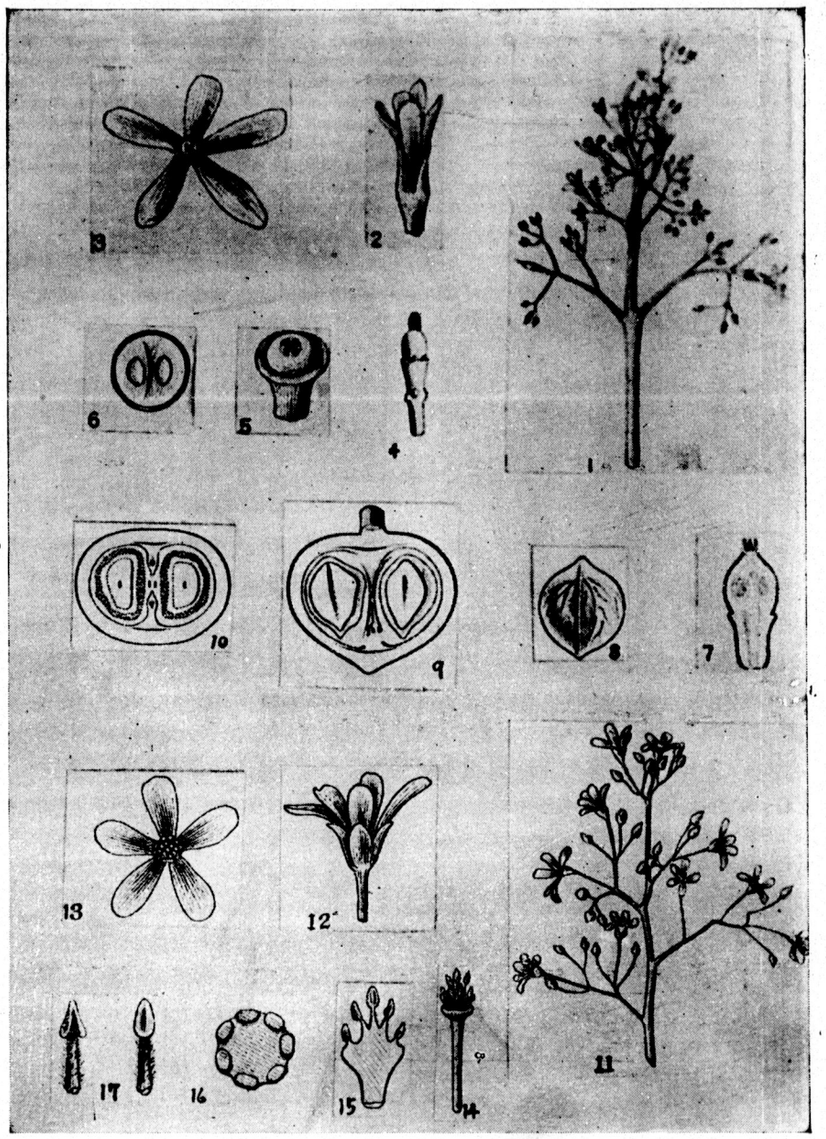
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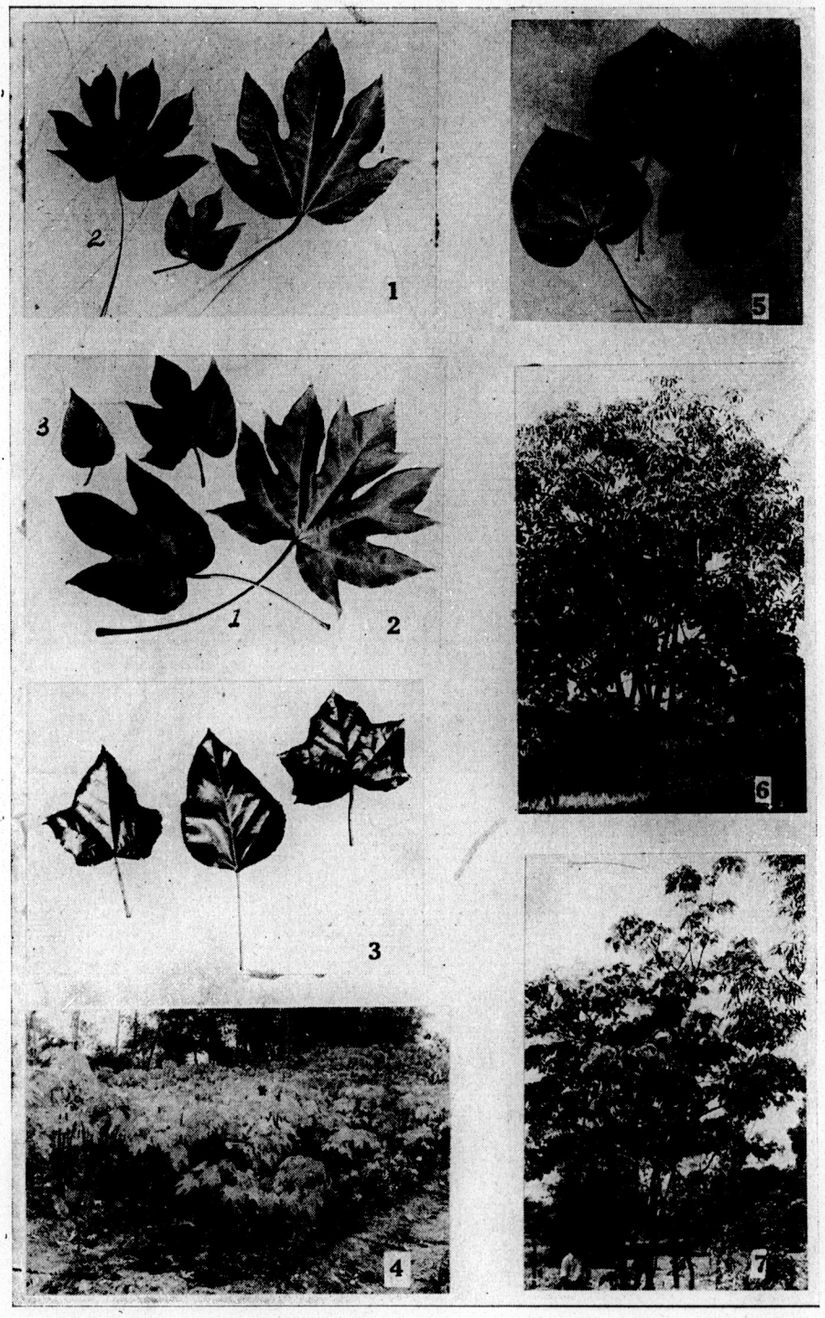
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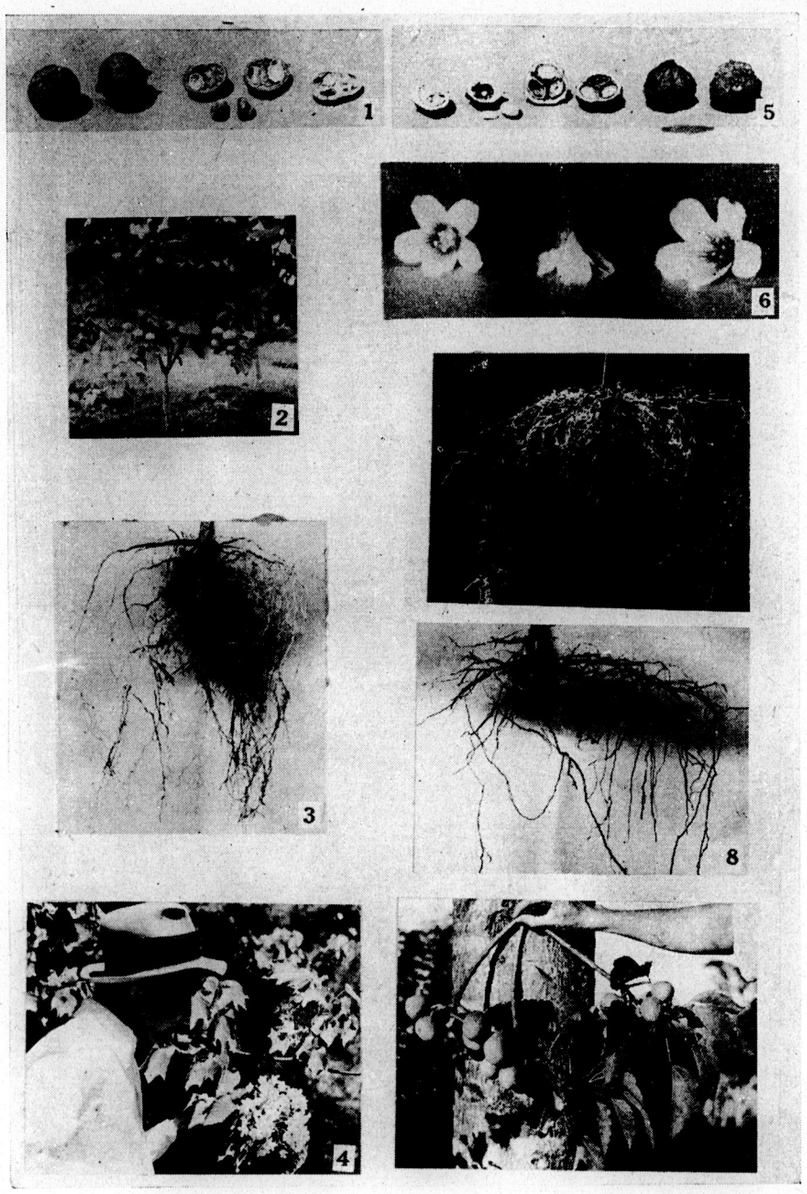
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SHORTER ARTICLES AND SCIENTIFIC NOTES

Notes on the Definitive and Intermediate Hosts of Paragonimus from Changting, Fukien.[1]—Changting is a mountainous district, situated at the western border of Fukien Province, and adjacent to Kiangsi Province. Communication in this region has been only lately developed, and therefore its fauna and flora have been very much neglected.

Last year the University of Amoy was moved to Changting on account of conditions of unrest in Amoy. In this new place the Department of Biology has found numerous interesting materials in the field. Among them is the lung fluke, *Paragonimus*. The present paper deals with the definitive and intermediate hosts of *Paragonimus* from Changting and its vicinity.

Definitive Hosts

On December 22, 1938, one wild cat, *Felis catus*, was caught from the vicinity of Changting city. By a careful examination, 104 specimens of *Paragonimus* were collected from the lungs. Subsequent examinations of the lungs of four leopards, *Felis pardus*, on December 28, 1938, January 8, and 20, and February 18, 1939, gave positive results for *Paragonimus*, the respective hosts containing 8, 180, 16 and 10 specimens. A third species of the host for *Paragonimus* is a fox, *Vulpes vulpes*, caught on January 30, 1939. Thirty specimens were obtained from this animal.

Domestic cats, dogs and pigs are present in the endemic regions but unfortunately it is not easy to secure these animals for examination. But by an examination of samples of faeces from eight dogs and from two pigs, a positive record was found for one individual of each of the two species. Human beings in this region do not ordinarily consume crabs, and so it is not likely that man is infected here. Nevertheless, this point requires further study.

All the above hosts examined, except one, were collected from Changting district, about three to fifteen miles away from the city, while the leopards were caught from Ningwha, north of Changting. The five species of mammals mentioned above are all common hosts for *Paragonimus*, but the fox and pigs are new records for China. The number of specimens found and the incidence of infection are probably interesting to the scientific world.

Intermediate Hosts

The snails and crabs for the intermediate hosts of *Paragonimus* are found in a small stream in a small town called Wangkon, about four miles west to the city, near the main bus road. The stream is

[1] The writer is indebted to Dr. H. T. Chen, Head of the Biology Department, Lingnan University, for his good suggestions, valuable criticisms, and continuous encouragement during this study.

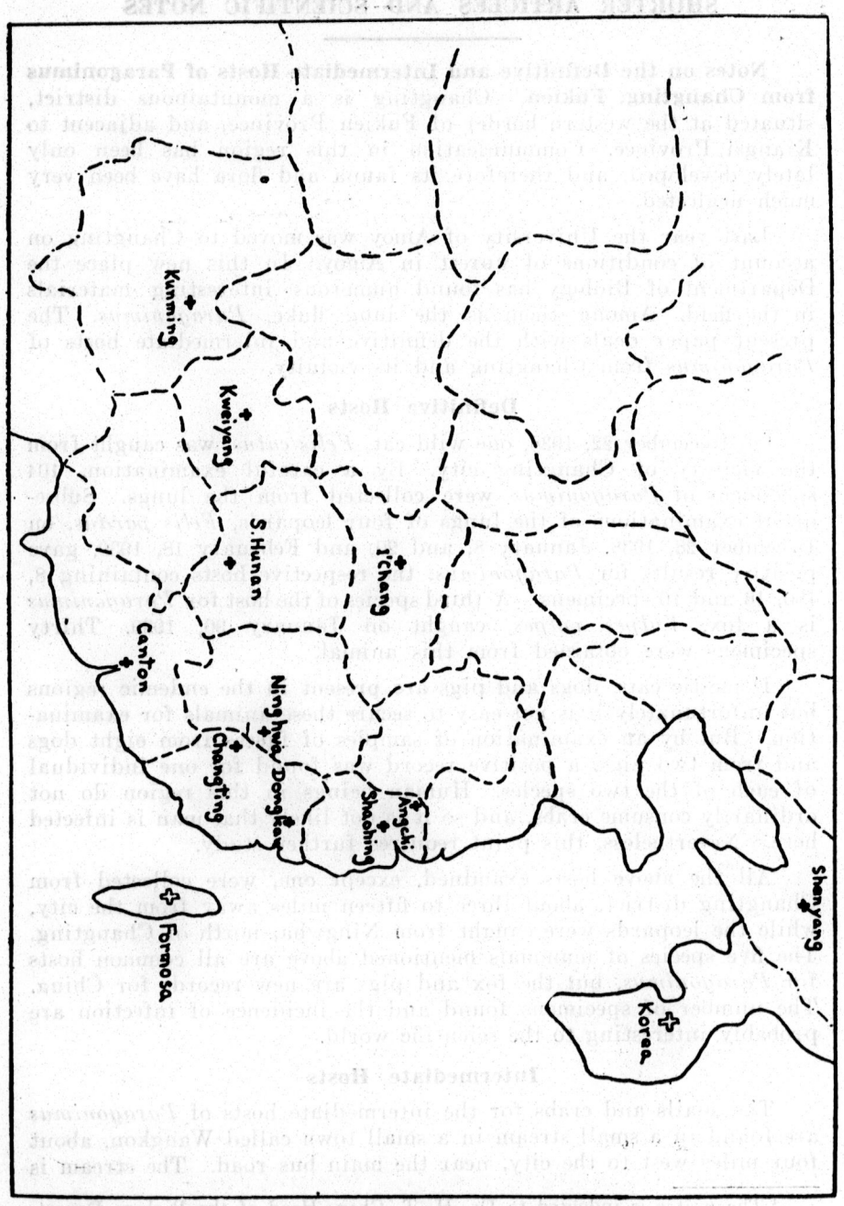

Fig. 1. Map showing distribution of *Paragonimus*.

from five to ten feet across, with numerous stones at its bottom. The water is running rapidly all the time. Besides snails and crabs numerous aquatic insect larvae are present under the stones. Small crayfishes are also present in the stream, but not a single *Paragonimus* cyst was found. In the stream were found *Spirogyra*, diatoms, and many other lower aquatic plants on which the snails may feed. The stream is usually well exposed to the open air in the winter, but is partly covered in the summer time by luxuriant vegetation on the banks.

Only one species of snail, *Melania ebenina*, is present in the water. They are quite numerous, attached to the stones or inside the green *Spirogyra* beds. The size of the snails in usually small, although some very large ones are occasionally found. The color is from dark gray to black. This snail is common in the lower Yangtze Valley.

Melania ebenina and *M. libertina* are also present in the streams in the vicinity of the city. Several hundreds of snails were examined but a negative result was obtained.

The crabs in the stream in Wankon town are *Potamon denticulatus* (H. Milne-Edwards), the characters of which are very much like Shen's description (1932) in all respects. This crab is said to be present in Fukien and may be found in mountainous streams. It is the same kind of intermediate host for *Paragonimus* found in Chekiang Province. But the writer believes that probably other species of crabs in this region may also serve as the second intermediate hosts for *Paragonimus* in Changting. All the crabs examined are positive for *Paragonimus* cysts, except a very young one, measuring ten millimeters for the breadth of the carapace.

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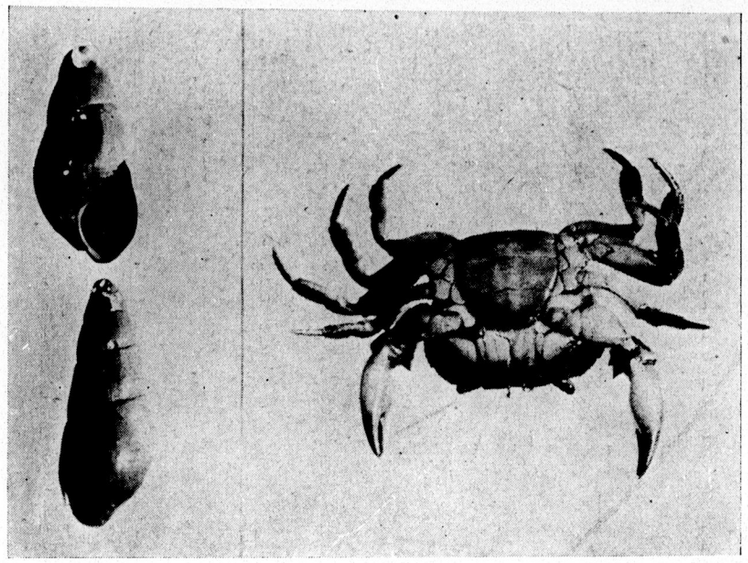
福建長汀縣肺蛭虫宿主之記載

金德祥著

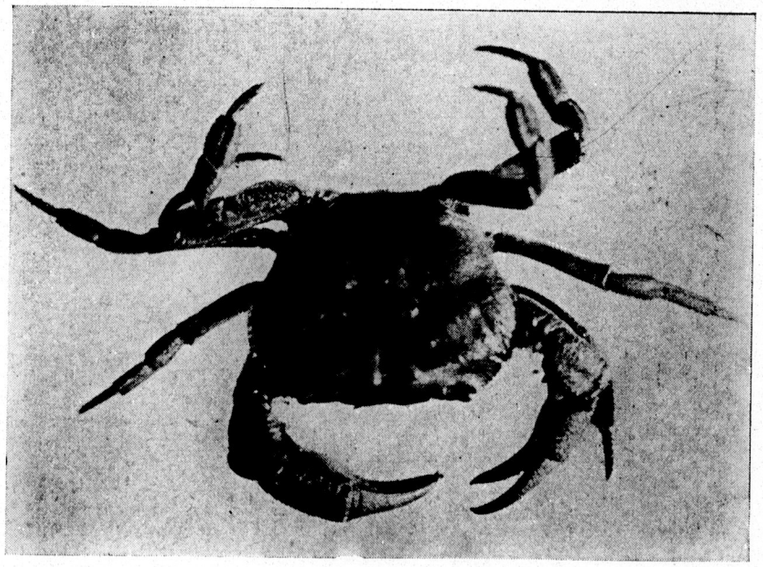
(摘要)

長汀肺蛭虫之宿主經找出及證明者有下列各種：最終宿主：一野貓 (*Felis catus*), 豹 (*Felis pardus*), 狐 (*Vulpes vulpes*)及犬豕等；第二中間宿主：一溪蟹 (*Potamon denticulatus*)，長汀附近 *Melania ebenia* 與 *M. libertina* 二種溪螺甚爲普遍其是否爲第一中間宿主尚在研究中。



Ventral view of a female *Potamon denticulatus*. Natural size. (Left).
Melania ebenina, the first intermediate host for *Paragonimus*. Natural size. (Right).

Dorsal view of a male *Potamon denticulatus*, the second intermediate host. Natural size.



ABSTRACTS AND REVIEWS

Bang-Haas, Otto. Catalogus Lepidopterorum regionis palaearcticae. 8 *Leiferung,* Dresden-Blasewita, 8°, p. 113-128, 1939.—This number treats the subfamily Hadeninae of the palaearctic region, which includes N. India, all of China, Japan and the Riukiu Islands to Formosa.

Beeson, C. F. C., and **Bhatia, B. M.** On the biology of the Cerambycidae (Coleopt.). *Indian For. Rec., Ent.,* 5(1) :1-235, *7 pl., 17 fig., 28 tab.,* 1939.—"Presents the data collected during twenty-four years on the food-plants, distribution, life-cycles, emergence-periods and other biological features of 350 species of Cerambycidae (133 Cerambycinae, 217 Lamiinae) occurring in India, Burma and Ceylon. For the dry wood borer, *Stromatium barbatum,* 311 food-plants are listed; *Shorea robusta* is the tree with the largest number, 37 species, of Cerambycidae attacking it. An alphabetical list of 568 species of Indian trees and shrubs and woody climbers, etc., with their borers is appended. The food-plants of at least 250 of the species now dealt with have not previously been published." Generalizations on life-history are dealt with in an introductory section. Many of the species reported are found in common with the Chinese and Indo-Chinese regions.

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Lin, S. Y. Description of two new carps from the New Territories, Hong Kong. *Hong Kong Nat.* 9(3) :129-132, *2 fig.*, 1939.—*Aphyocypris pooni* n. sp. is allied to *A. chinensis* Günther, but devoid of lateral line and provided with a golden lateral band and a large dark spot at the base of caudal. *Metzia fanlingensis* n. sp. is similar to *Aphyocypris normalis* Nichols and Pope, but with three rows of pharyngeal teeth and more anal rays. Both species make attractive aquarium specimens.

Matsumura, Shonen. On the genus *Lyristes* Horvath and two new species of Cicadidae. *Ins. Matsumurana* 13(2-3) :47-51, *2 fig.*, 1939.—There is a brief taxonomic discussion with a list of 12 species from Japan and the neighboring regions.

Meng, H. M. Tin deposits of China, a summary. *Bull. Geol. Soc. China* 17(3-4) :439-449, *2 fig.*, 1937.—Although China produces only about 6% of the tin of the world it contains extensive deposits in Kwangtung, Kwangsi, Hunan, Kiangsi and Yunnan. Genetically the deposits range from pegmatitic, pneumatolytic to hypothermal types. The range of tin deposition in the normal plutonic magmatic deposits is discussed.

Merrill, E. D. A critical consideration of Houttuyn's new genera and new species of plants, 1773-1783. *Jour. Arn. Arb.* 19(4) :291-375, 1938.—The author undertakes to determine the status of the names published in the large, but little-known work by the Dutch naturalist, M. Houttuyn : "Natuurlyke historie of uitvoerige beschryving der dieren, planten en mineraalen, volgens het samenstel van den Herr Linnaeus, met naauwkerige afbeeldingen," comprising more than 21,500 pages of text and 296 illustrations, "depicting selected animals, plants and minerals," published in fourteen volumes between the years 1761 and 1784, and in the work of G. F. Christmann, and G. W. F. Panzer : "Des Ritters Carl von Linné Könliglich Swedischen Leibarztes & vollständiges Pflanzensystem nach der dreyzehnten lateinischen Ausgabe und nach Anleitung des holländischen Houttuynischen Werkes übersetzt und mit einer ausfuhrlichen Erklärung ausgefertiget," which was to a large degree based on the above-mentioned work of

Houttuyn. The latter work, having been more generally available, has been used by botanists and bioliographers almost to the exclusion of Houttuyn's work, with the result that many of the latter's names have been incorrectly cited. "All attempts to locate a Houttuyn herbarium have failed, and the probability is that most of his actual types are no longer extant" and "most of the specimens usually credited to Houttuyn, whether in the Rijksherbarium at Leiden, or in the Burman (Dalessert) herbarium at Geneva, prove on examination to bear no data that would indicate Houttuyn plants. . . ." Using the illustrations and other data to supplement the descriptions which are, in many cases, very inadequate, the author has discovered that among the 210 or so names proposed and published in the original work of Houttuyn, and in that of Christmann and Panzer, there appear approximately 160 validly published new binomials which have never appeared in any index. "Of these 34 were based on specimens from Japan, 40 on material from the Indo-Malaysian region, 57 on specimens or pre-Linnean references representing the African flora, chiefly from South Africa, and about 29, largely by biobliographic citation, on plants of Europe, 14 on species from the eastern United States, about 8 from tropical America, and a few from other regions." Those names which have hitherto been overlooked or which have been cited incorrectly are indicated in the list by means of an asterisk. F. A. McCLURE

Misaka, K., and **Koreishi, K.** Studies on the infestation of fruitflies on Formosan fruits and vegetables. 1. Infestation of persimmon. 2. Infestation of papaya fruit. (In Japanese.) *Res. Bull. Pl. Quar. Sta. Formosa,* no. 3, 12 p., *2 pl.*; no. 4, 34 p., *3 pl.*, 1938.—In the first paper, the authors state that females of *Dacus ferrugineus dorsalis* Hend. oviposited in fruits of persimmon (*Diospyros kaki*) in the field in Formosa, and that adults emerged, but in experiments, the eggs did not all hatch and only some of the larvae matured. Infested fruits can be detected one day after oviposition. Fruits in barrels decay, if even one is infested, but the fly is also destroyed. *D. cucurbitae* Coq. does not attack persimmon. In the second paper, it is stated that although *D. f. dorsalis* does not infest papaya fruit in the field, in the laboratory, females oviposited on very ripe ones. Females of *D. cucurbitae* occasionally oviposit in wounded or diseased parts of very ripe fruits. REV. APPL. ENT.

Obenberger, Jan. Etudes sur les espèces du genre *Anthaxia* Eschsch. (Col. Bupr.) *Acta Mus. Nat. Pragae, B (Hist. Nat.), Zool.* 4, p. 171-249, 1938.—A taxonomic discussion of 115 species, varieties and aberrations. In addition, some aberrations are discussed only in keys. *Anthaxia Alcmaeone* n. sp. is from China and is compared with *A. Proteus* E. Saund. *A. quadrifoveolata* Solsky and *A. Popovi* n. sp. are reported from Mongolia.

Okada, Ichiji. Eine kleine Fungivoriden-Liste (Diptera) vom Berge Daisen in der Provinz Hôki (Honshu). *Ins. Matsumurana* 13 (2-3) :97-100, 1939.—Of the 12 species mentioned, *Fungivora fungorum* (Degeer) and *F. lineola* (Meigen) are from Manchuria.

Philip, Cornelius B. Ticks as vectors of animal diseases. *Canadian Ent.* 71(3) :55-65, *2 tab.*, 1939.—Notes are given on the kinds of ticks, their habits, and their transfer of disease agents. Tables list, by continents, the types of disease, animal host, tick species responsible for disease transfer and method of transmission. Twenty-five species are indicated as vectors in Asia.

Plaetschke, Bruno. Landschaftskundliche Wesenszüge der östlichen Gobi. *Wiss. Veroff. Deuts. Mus. Land.*, new ser. 7, p. 103-148, *6 fig.*, 1939.—A description of the physiographical aspects of the eastern Gobi.

Rosenberg, E. C. Neue Lyciden-Larven. *Arb. morph. tax. Ent. Berlin-Dahlem* 6(2) :124-128, *5 pl.*, 1939.—Descriptions and figures are given of 26 larvae of Lycidae. One representing an unnamed new genus and species is from China.

Sakurai, Yoshijiro. Chemical composition of different organs of citrus trees and these fruits in Taiwan. (In Japanese with title also in English.) *Formosan Agri. Rev.* 35(5) :378-382, *3 tab.*, 1939.

Sheriffs, W. Rae. Hong Kong spiders. Part V. *Hong Kong Nat.* 9(3) :133-140, *1 pl., 4 fig., 1 tab.*, 1939.—The species *Thomisus pugilis* Stol., *Tetragnatha mandibulata* Walck, *T. serra* Dol., *Lycosa* (*Pardosa*) *sumatrana* Thorell are treated, with notes on the taxonomy and biology.

Smith, Helen L. Shanghai and its hinterland. *Jour. Geog.* 38 (5) :173-180, *2 fig.*, 1939.—A popular account of the factors contributing to the political and commercial importance of Shanghai.

Sonan, Jinhaku. On the tea bark-eating borer (*Linoclostis gonatias* Meyrick). (In Japanese with title also in English.) *Formosan Agri. Rev.* 35(4) :279-283, *4 fig.*, 1939.

Stearn, William Thomas. *Epimedium* and *Vancouveria* (Berberida- a monograph. *Jour. Linn. Soc. London, Bot.*, 51(340) :409-535, *6 maps, 21 fig., 8 pl.*, 1938.—Although the author claims only to present "a working account of the wild and cultivated species and forms. . . ." he has produced what impresses one as a very complete and scholarly treatment. The paper is well illustrated, and should prove very useful, both to the taxonomist and to the horticulturist who wishes to know more about any plants of these two genera which he may have in his garden. F. A. McCLURE

Sugihara, Yuzô. A list of the species of Vespinae of the Kurile Islands. (Hymenoptera : Vespidae). *Ins. Matsumurana* 13(2-3) :101-104, 1939.—Seven species are discussed of which *Vespula austriaca* (Panzer) is also from China; *V. rufa* var. *schrenckii* (Radoszk.), *V. vulgaris* (L.), *V. lewisii* Cameron, and *V. media* (Retzius) are also from China and Manchuria.

Tagawa, Motozi. Spicilegium Pteridographiae Asiae Orientalis 18. In English with Japanese summary.) *Acta Phytotax. and Geobot.* 8(2) :91-100, 1939.—This instalment treats species no. 237 to 260 of Asiatic ferns. *Dicranopteris Blotiana* (C. Chr.) Tagawa, n. comb. for *Gleichenia Blotiana* C. Chr., is new to Formosa; it is also known in Indochina and Hainan. *D. Chinensis* (Rosenst.), n. comb. for *G. chinensis* Rosenst., is from China and new to Formosa. *Pteris linearis* Poir. is new to Formosa. *Asplenium tenuifolium* Don is from Formosa, Indochina and China; *A. exiguum* Bedd. from China, Tonkin and new to Formosa; *Cornopteris opaca* (Don), n. comb. for *Hemionitis opaca* Don, is from Formosa, China, and Tonkin; *Diplazium yaoshanense* (Wu) Tardieu-Blot is from S. China and Tonkin; *Rumohra nigrospinosa* (Ching) Ching is from China and is new to Formosa; *R. globisora* (Hayata) H. Ito is from Formosa and Yunnan; *Ctenitis apiciflora* (Wall.) Ching from Yunnan and Formosa; *C. transmorrisonensis* (Hayata), n. comb. for *Polystichum transmorrisonense* Hayata, is from Formosa, as is *C. Kawakamii* (Hayata) Ching; *C. subglandulosa* (Hance) Ching is from China; *C.* (?) *Simozawae* (Tagawa) Ching and *C. Eatoni* (Bak.) Ching are from Formosa; *Ctenitopsis kusukusensis* (Hayata) C. Chr. is redescribed and is from Indochina and Hainan; *C. fuscipes* (Wall.) C. Chr., *C. dissecta* (Forst.) Ching, and *Tectaria yunnanensis* (Bak.) Ching are from Formosa; *Thelypteris setigera* (Bl.) Ching is redescribed and is new to Formosa.

Takahashi, H. On the relation of the degree of growth of sugar-cane to the oviposition of and the heart-withering caused by borers. 1. *Diatraea venosata* Walk. and *Chilo infuscatellus* Snellen. (In Japanese.) *Jour. Formosan Sug. Plant. Assn.* 16(12) : 321-335, 1938.—Investigations in Formosa have shown that 50% of the egg-masses of *Diatraea venosata* Wlk. are found on sugar-cane leaves 24-29 ins. long. Next in order of preference are those of 12-24 and 39-58 ins. Withered hearts caused by this borer were most numerous on cane stalks of over 20 ins. in length. *Chilo infuscatellus* Sn. most frequently oviposits and causes most withered hearts in stalks 1-2 ft. long. REV. APPL. ENT.

Takahashi, Ryoichi. An interesting thrips from China (Thysanoptera). *Peking Nat. Hist. Bull.* 13(4) :303-304, *1 fig.*, 1939.—*Leewenia coriaceus* Bagnall is redescribed from Foochow.

Takahashi, Ryoichi. Life history and control methods of *Pulvinaria polygonata* Ckll. (Coccidae). (In Japanese with title and rèsumé in English.) *Formosan Agri. Rev.* 35(6) :403-414, *7 fig.*, 1939.—This scale insect occurs in lowlands of Formosa on *Citrus* and *Murraya*. No biological races were recognized. There are 3 generations annually, adults emerging in Mar.-Apr., late June and late Aug. Winter is passed in grown larval stages. No males were found. Females feed on branches, become flat and soft when about to oviposit, and crawl upwards, often to lower sides of leaves, to deposit egg masses of about 1400 eggs each. Eggs hatch in 9-13 days and larval stage lasts 40-60 days in spring and summer, 120 or more through winter. Larvae have 3 instars and feed on branches and leaves. They do not mature when fed only on leaves. Many larvae are parasitized by Coccinellids, and especially by *Aneristus ceroplastae* Howard, which keep down the numbers of the pests during the summer months.

Takahashi, S. On the fatal effect of submersion upon the sugar-cane borers. (In Japanese.) *Jour. Formosan Sug. Plant. Assn.* 16 (6) : 113-120, 1938.—In experiments in Formosa, eggs, fifth- and sixth-instar larvae in sugar-cane stalks and exposed pupae of *Chilo infuscatellus* Sn. were submerged in water. The periods of submersion that gave complete mortality were 7 days for the larvae and eggs and 5 days for the pupae. Newly laid eggs were less resistant. The pupae were least resistant soon after pupation and most so when half developed. Larvae of *Eucosma schistacaena* Sn. and *Diatraea venosata* Wlk. and pupae of *E. schistacaena* and *Sesamia inferens* Wlk. were less resistant than the corresponding stages in *C. infuscatellus*.

REV. APPL. ENT.

Takeuchi, Kichizo. A systematic study on the suborder Symphyta (Hymenoptera) of the Japanese Empire (I). *Tenthredo* 2(2): 173-229, *10 fig.*, 1938.—Keys are given to the families, genera and species and bibliographical references, description and range are given for each entity. Of the numerous species treated, 19 are from Korea, 11 from Formosa, 3 from China, 2 each from Manchuria and E. Asia, 1 from Mongolia.

Toumanoff, C., and **Martin P.** L'etude des oeufs de quelques Anophelinés du Tonkin. *Rev. Méd. Fran. Extrême-Orient* 17 (4) : 429-434, *3 pl.*, 1939.—Egg structure is described and figured for the following mosquitoes : *Anopheles minimus* Théob., *A. aconitus* Dön., *A. jeyporiensis* var. *tonkinensis* Toum., *A. vagus* Dön., *A. subpictus* Grassi and *A. fuliginosus* Giles.

Wang, Chih-yi, (王之翊) and **Li, Ju-chi** (李汝祺). Studies of the "rain frog" *Kaloula borealis* IV. The developmental changes of the limb buds during metamorphosis. *Peking Nat. Hist. Bull.* 13(4) :247-259, *1 pl.*, 1939.—The first section of this paper deals with the external changes of the limb buds, at different stages of development, the second with the internal differentiation of these buds, especially with reference to skeletal and muscular structures. In the last section attempts are made to trace the origin of the limb buds, as well as the source of nerve and blood supplies.

Watanabe, Chihisa. *Rhogas praetor* Reinhard as a parasite of *Smerinthus planus* Walker. *Ins. Matsumurana* 13(2-3) :51, 1939.—The parasite overwinters in the dead body of the host larva and emerges in the spring. The Braconid is common in Japan and Korea.

Whiteman, Elizabeth Fuller, and **Keyt, Ellen Kingsley.** Soybeans for the table. *Leaflet,* U. S. D. A., No. 166, 6 p., 1938.—Notes on the food value of soybeans with recipes for use of green beans, dried beans, soybean "milk" and soybean flour.

Wilson, Stanley D., and **Hung, Ying-ying.** The composition of the seeds of the large leaf hackberry (大葉朴) *Peking Nat. Hist. Bull.* 13(4) :265-286, *4 tab.*, 1939.—Fruits of the large leaf Chinese hackberry (*Celtis koraiensis* Nakai) were analyzed. The fleshy portions were found to be very low in moisture; the cotyledons are composed largely of protein and oil (similar to sun flower seed oil) and little water and ash and no carbohydrate. The ash of the endocarp is high in calcium oxide. It is suggested that the seed might be developed by plant breeders into either a useful fleshy fruit or into a new nut.

Wilson, Stanley D., and **Wang, Yueh** (王嶽). Studies on the control of fecal-borne diseases in north China. X. A preliminary report on the chemistry of feces cakes. *Peking Nat. Hist. Bull.* 13(4) : 269-282, *4 fig., 6 tab., 3 graphs,* 1939.—In N. China solid night soil is collected, spread on the ground to dry, and sold in cakes for fertilizer. Large numbers of analyses were made of fresh fecal specimens and of fecal cakes prepared commercially and in the laboratory. The Chinese stool probably averages about 60 grams of dry material. Normal feces "averages 6.0% nitrogen, 1.36% K_2O and 3.49% P_2O_5 calculated on the dry basis. "Commercially" prepared feces cakes average about 1.73% nitrogen. If these cakes are made with greater care to avoid dilution with soil and other material, products containing much more nitrogen are obtained. In the "commercial" preparation of feces cakes there was a loss of about 39% of the nitrogen. Where greater care was observed this loss was only 25% on the average. Loss of nitrogen on storage for long periods can be cut about one half by storing under cover."

Wu, Kuang (吳光). *Paragonimus* among leopards and tigers in China. *Peking Nat. Hist. Bull.* 13(4) :231-245, *3 pl., 5 fig., 1 tab.*, 1939.—A relatively high incidence of *Paragonimus* infection is found to exist among the leopard and the tiger in China, both being for the first time reported in this country. It is quite probable that the disease may be indigenous to Fukien Province. Anatomical differences have not been noticed between the adult lung flukes from six Chinese leopards and one tiger and those of other animals described from North America or other Asiatic countries. In the present study the shape, size and arrangement of the cuticular spines of *Paragonimus* are found to be very variable in individual specimens, so they are inadequate as a basis for distinguishing the species. The shape and size of *Paragonimus* eggs are also found to be very variable, and cannot be said to have any specific differences. An epidermoid *Paragonimus* cyst with possible early carcinomatous changes was found in the lung of a tiger from Fukien.

AUTHOR'S SUMMARY

Yamagisi, Kikuo. Farm manures in Taiwan. I. Loss of nitrogen from the farm manure by air drying. (In Japanese with English title.) *Formosan Agri. Rev.* 35(1) :32-37, 1939.

Yatomi, Tadao. The development of citrus fruits in Taiwan. (In Japanese with title also in English.) *Formosan Agri. Rev.* 35(4) :284-288, *4 tab.*, 1939.

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