

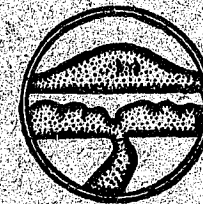
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LINGNAN SCIENCE JOURNAL

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RECORDS OF MONOCOTYLEDONOUS PLANTS NEW TO THE FLORA OF HAINAN¹

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and

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In 1938, Messrs. T. Tanaka and K. Odashima published their "Census of Hainan plants," Jour. Soc. Trop. Agr. 10: 357-402. 16 fig. Dec. 1938, reprinted without change in pagination as Contr. Hort. Inst. Taihoku Univ. 24. This was admittedly a compilation by individuals who had little personal knowledge of the Hainan flora, and who did not have access to certain important published papers which should have been consulted, and apparently the work was very hurriedly prepared. Merrill and Chun in their "Additions to our knowledge of the Hainan Flora, III," Sunyatsenia 5: 1-200. t. 1-28. f. 1-22, August, 1940, discussed this work in some detail, indicating a great many errors and omissions of one type or another, and at the same time recording 40 genera and about 220 species of phanerogams as new to the Hainan flora. In September, 1940, Odashima and Tanaka published a supplement to the Census, Jour. Soc. Trop. Agr. 12: 193-204, Sept., 1940, also reprinted without change in pagination as Contr. Hort. Inst. Taihoku Univ. 25, but this naturally does not contain a great many of the records published by Merrill and Chun one month earlier.

It is perhaps significant that at the time the Census was prepared and published that the authors also prepared and published, possibly in Japanese characters, an apparently comprehensive report on the vegetable resources of southern China. This was, according to the statement on p. 391 of the Tanaka-Odashima work, issued as an appendix to volume ten of the Jour. Soc. Trop. Agr. (1938) pp. 61-124. In view of what has happened in the Orient it is perhaps significant that copies of this report were not distributed with the Journal, at least to the foreign mailing list; nor were we able to secure a copy of it from the authors.

In the introduction to the Supplement above mentioned the authors mention a compilation by Dr. Masamune, issued in mimeographed form

¹Prepared with the assistance of a grant from the Milton-Clark fund of Harvard University.

by Toa Kenkyusho (Far Eastern Research Foundation) which is stated to have been based upon the Census mentioned above, "without making any conspicuous betterment," and later they indicate that it contained various new names, by transfer of specific epithets, that they did not accept or even mention in the Supplement; this contribution by Dr. Masamune we have not seen.

The Odashima-Tanaka paper mentioned above is the last Japanese one that we have seen appertaining to the Hainan flora. We are informed, however, that immediately after Hainan was occupied by Japanese troops a botanical survey of the island was instituted under the supervision of Dr. Tanaka. It is not impossible that various additional papers on the flora of Hainan may have been issued by Japanese botanists between September, 1940, and the present date—but regarding this we have no information. In spite of this lack of knowledge on our part, for the latest Japanese botanical periodical that we have seen was issued in June, 1941, it has been thought to be desirable to place on record the data included in this paper. While we propose no new species, the following eleven genera are recorded for the first time as having representatives in Hainan: *Monerma*, *Agrostophyllum*, *Anoetochilus*, *Arachnis*, *Biermannia*, *Bulbophyllum*, *Microstylis*, *Odontochilus*, *Podochilus*, *Saccolabium*, and *Zeuxine*. About 65 species, all previously described from extra-Hainan material are herein recorded for the first time as occurring in Hainan; many of these are also new to the flora of China. A few adjustments in nomenclature, involving new binomials are included. In some cases, those binomials preceded by an asterisk, the species were recorded by Tanaka and Odashima, without supporting data; we have here merely attempted to complete the record by adding literature references and by citing specimens, for neither in the Census nor in the Supplement are voucher specimens cited.

The specimens on which this paper is based are preserved in the Gray Herbarium of Harvard University, the Britton Herbarium, New York Botanical Garden, and the Orchid Herbarium of Oakes Ames at the Botanical Museum of Harvard University. It is the accepted policy at the Arnold Arboretum to transfer from time to time miscellaneous herbaceous specimens to the Gray Herbarium, and all specimens of orchids to the Botanical Museum to be incorporated into the Ames collection. Only those specimens are retained at the Arnold Arboretum that represent ligneous species; and in the groups covered in this paper, all the species discussed are herbaceous.

GRAMINEAE

Monerma repens (Forst. f.) Beauv. Agrost. 117. 1812; Merr. Enum. Philip. Fl. Pl. 1: 93. 1922.

Rottboellia repens Forst. f. Prodr. 9. 1786.

Lepturus repens R. Br. Prodr. 207. 1810; E. G. & A. Camus in Lecomte, Fl. Gén. Indo-Chine 7: 580. f. 44, 14. 1923.

HAINAN, Taya Islands, Pak Sz Shan, C. I. Lei 1052, July 16, 1934, fairly common on rocky seashores. A characteristic strand plant ex-

THE STUDIES OF CHINESE FERNS—XXXII

By R. C. CHING

Lu-shan Arboretum and Botanical Garden of the Fan Memorial
Institute of Biology, Likiang, Yunnan

Dryopteris neochrysocoma, sp. nov.

Species *D. chrysocomae* (Christ) valde affinis, differt habitu magis gracili, pinnis lateralibus e basi deltoidea lanceolatis, segmentis marginibus grosse denticulatis, dentibus deltoideis, acutis, venis plerique simplicibus, infimi anteriori soriferi, caeteris sterilibus, indusiis paulo parvioribus, brunneis, leviter sinuatis.

Rhizome short, thick, erect, densely clothed in ovate-lanceolate, acuminate, brown, thin, denticulate scales intermixed with linear ones; leaves fasciculate, uniform, stipe slender, stramineous, densely scaly, muricate, subglabrous upwards, 8–12 cm. long, lamina 20 cm. long or slightly longer, 6–8 cm. broad at base, the middle, bipinnatifid, acuminate; pinnae 10–14-jugate, horizontally patent, 1.5–2 cm. apart, the basal ones are farther apart, 3 cm. long, the middle ones 4–5 cm. long, 1.2–1.5 cm. broad at base, deltoid-lanceolate, acute, base broadened, oblique-truncate, short-petiolate, pinnatifid to a narrow wing along costa into 6–8 pairs of deltoid-oblong, rounded, distinctly dentate segments, teeth 6–9 to each segment, deltoid, acute or bluntish, veins 3–4-jugate, generally simple, the posterior basal one or two often forked, the anterior basal one always simple and soriferous, rachis sparingly clothed in linear brown scales, both sides glabrous; texture thin herbaceous, dry brownish; sori, as a rule, uniseriate on each side of pinnae near the costa, i.e., one to each segment, borne dorsally on the anterior basal vein below the sinus, or very rarely 2–3 to the lower basal segment in the lower pinnae, indusium crustaceous, globular, brown, with very shallow sinus, persistent.

KWANGTUNG: Jen-hwa District, Man Chi Shan, Shek Pik Ha Village, W. T. Tsang No. 26479 (type), growing in thickets on steep slope, fairly common, June 1–6, 1936, Lingnan University with the co-operation of the Arnold Arboretum, Harvard University; Loh-fau Shan, N. K. Chun No. 40905; Sam Kok Shan, Tsingfa-Lungmoon Districts, W. T. Tsang No. 20550.

A very distinct species, somewhat related to *D. chrysocoma* (Christ) C. Chr. from West China and is easily distinguished by the differences pointed out in above diagnosis. N. K. Chun No. 40905 and W. T. Tsang No. 20550 from the same region were previously referred to *D. chrysocoma* in my monograph of the genus. With ample material now before me, I can easily tell the species apart from *D. chrysocoma*, which has a much stronger habit, the linear-lanceolate pinnae with scarcely broadened base, oblong segments with rounded or rotundo-truncate apex and subentire,

by Toa Kenkyusho (Far Eastern Research Foundation) which is stated to have been based upon the Census mentioned above, "without making any conspicuous betterment," and later they indicate that it contained various new names, by transfer of specific epithets, that they did not accept or even mention in the Supplement; this contribution by Dr. Masamune we have not seen.

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HAINAN, Taya Islands, Pak Sz Shan, C. I. *Lei* 1052, July 16, 1934, fairly common on rocky seashores. A characteristic strand plant ex-

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tending from Ceylon, through Malaysia and Polynesia, to tropical Australia. The genus is new to Hainan and to China.

**Phragmites Karka* (Retz.) Trin. ex Steud. Nomencl. ed. 2, 2: 342. 1841; E. G. & A. Camus in Lecomte, Fl. Gén. Indo-Chine 7: 557. 1923.

Arundo Karka Retz. Obs. 4: 21. 1786.

A Hainan specimen so-named and distributed, and perhaps the basis of Tanaka & Odashima's record (p. 386) is *Lei* 259 from Pak Shik Ling, Dec. 6, 1932. India to the Philippines and Malaysia.

**Miscanthus japonicus* (Houtt.) Anders. Oefv. Vet. Akad. Förhandl. Stockh. 1855: 165. 1856.

Saccharum japonicum Houtt. Nat. Hist. II. 13: Aanwyz. Plaat. [1]. t. 89, f. 1. 1782; Thunb. Trans. Linn. Soc. 2: 328. 1794.

A Hainan specimen, so-named and distributed, *Lei* 263, is perhaps the basis of Tanaka & Odashima's record (p. 386). Japan to China, the Philippines, Moluccas, etc.

**Spinifex littoreus* (Burm. f.) Merr. Philip. Jour. Sci. 7: Bot. 229. 1912.

Stipa littorea Burm. f. Fl. Ind. 29. 1768.

Spinifex squarrosus Linn. Mant. 2: 163. 1771.

Tanaka & Odashima list this as *Spinifex squarrosus* Linn., as occurring in Hainan (p. 386); among the Hainan collections of this widely distributed Indo-Malaysian strand plant are Wang 33897, 35105, Fung 20401, Lau 317, and Liang 62032.

Panicum pilopodium Trin. Gram. Pan. 217. 1826.

HAINAN, Pak Shik Leng and vicinity, *Lei* 685, May 21, 1933, dry sandy places in gardens. India to Burma and the Philippines.

Chloris inflata Link, Hort. Berol. 1: 105. 1827.

Chloris barbata Sw. Fl. Ind. Occ. 1: 200. 1797, non *Andropogon barbatus* Linn.

Chloris paraguayensis Steud. Syn. Pl. Glum. 1: 204. 1854.

HAINAN, in open waste places and near the seashore, Wang 34894, Liang 66590. A pantropic species of American origin. This record merely confirms the Hainan one of Odashima & Tanaka, Jour. Soc. Trop. Agr. 9: 295. 1937 (as var. *formosana* Honda).

Link's binomial is the oldest valid one for this common and widely distributed weed, as Swartz misinterpreted *Andropogon barbatus* Linn. Link's type has been examined; see Merrill, Enum. Philip. Fl. Pl. 4: 241. 1926.

CYPERACEAE

Eleocharis equisetina Presl, Rel. Haenk. 1: 195. 1828; Svenson, Rhodora 31: 16. f. 14. 1929.

HAINAN, Man Cheung District, Po Fu Ling, C. I. *Lei* 1136, July,

1934, in wet meadows. Ceylon to Madagascar, southern China, through Malaysia to New Caledonia.

**Eleocharis dulcis* (Burm. f.) Trin. ex Henschel, Vita Rumph. 186. 1833; Merr. Interpret. Herb. Amb. 104. 1917.

Andropogon dulcis Burm. f. Fl. Ind. 219. 1768.

Eleocharis plantaginea R. Br. Prodr. 224. 1810.

Scirpus plantagineus Retz. Obs. 5: 14. 1789.

Scirpus plantaginoides Rottb. Descr. Nov. Pl. 45. 1773.

To Tanaka and Odashima's record of this widely distributed Indo-Malaysian species as occurring in Hainan may be cited the following Hainan collections: Tsang 16244, Wang 34841. This is the *ma tai* of the Chinese.

Fimbristylis rigidula Nees in Wight, Contrib. 99. 1834.

HAINAN, Man Cheung District, Po Fu Ling, C. I. Lei 1132, July, 1934, in dry sandy places. India to Indo-China and the Philippines, and in China in Szechuan, Kiangsu, Hupeh, Chekiang, and Kwangtung.

Fimbristylis polytrichoides (Retz.) Vahl, Enum. 2: 248. 1806.

Scirpus polytrichoides Retz. Obs. 4: 11. 1786.

HAINAN, Lam Ko and vicinity and Kumyun, Lei 1293, Aug. 1934, and Lau 27871, Sept. 12, 1936, in meadows. Tropical Africa and Asia to Japan, southward through Malaysia to Australia.

MARISCUS JAVANICUS (Houtt.) comb. nov.

Cyperus javanicus Houtt. Nat. Hist. II. 13: Aanwyz. Plaat. [1]. t. 88, f. 1. 1782; Merr. Jour. Arnold Arb. 19: 321. 1938.

Mariscus albescens Gaudich. Bot. Freyc. Voy. 415. 1826.

HAINAN, Yaichow, Liang 62967, Sept. 1933, in swampy places along the seashore. Tropical Africa and Madagascar, through tropical Asia to southeastern China, southward and eastward to tropical Australia, Hawaii, the Marquesas and Pitcairn Islands.

A well-known halophyte, characteristic of saline marshes and seashores, with numerous synonyms, including *Cyperus pennatus* Lam. (1791), *C. stuppeus* Forst. f. *nomen nudum* (1786), *Cyperus canescens* Vahl (1806), *Mariscus stuppeus* Merr. (1908), and *Mariscus pennatus* Domin (1915). Not previously recorded from Hainan.

Mariscus compactus (Retz.) Druce, Rep. Bot. Exch. Club Brit. Isles 4: 634. 1917.

Cyperus compactus Retz. Obs. 5: 10. 1789; Kükenth. Pflanzenr. 101 (IV. 20): 423. 1935.

Cyperus dilutus Vahl, Enum. 2: 357. 1806.

Mariscus microcephalus Presl, Rel. Haenk. 1: 182. 1828.

Mariscus dilutus Nees in Wight, Contrib. 90, 1834; Merr. Lingnan Sci. Jour. 5: 38. 1927.

Sphaeromariscus microcephalus E. G. Camus, Not. Syst. 1: 239. 1910, et in Lecomte, Fl. Gén. Indo-Chine 7: 79. 1912.

Duvaljowea diluta Palla, Allgem. Bot. Zeitschr. 17: Beil. 8. 1911.

The oldest name for this common and widely distributed sedge is *Mariscus compactus* (Retz.) Druce (*Cyperus compactus* Retz.). The species extends from the Mascarene Islands through tropical Asia to south-eastern China, southward to Malaysia and the Philippines.

ARACEAE

SCINDAPSUS MACLUREI (Merr.) comb. nov.

Raphidophora machurei Merr. Philip. Jour. Sci. 21: 337. 1922.

Scindapsus megaphyllus Merr. Lingnan Sci. Jour. 9: 36. 1930.

A re-examination of rather abundant material shows that there is but a single species here and this apparently a *Scindapsus*, as the ovules are solitary and the fruits are 1-seeded. The mature seeds are oblong-obovoid, rounded at their apices, somewhat compressed, about 6 mm. long and 3 mm. wide. Additional Hainan collections are Lei 891, Lau 5526, and Liang 62735, the latter with fully mature fruit. In some respects this Hainan species suggests *Epipremnum giganteum* (Roxb.) Schott, of Penang, the Malay Peninsula, Siam and Cochinchina, which has much larger leaves (up to 2 feet wide and, with the petioles, 6 to 8 feet long fide Hemsley, Bot. Mag. 130: t. 7952. 1904; the petioles shown here being about as long as the leaves), while its ovaries are 2-ovulate.

ERIOCAULACEAE

Eriocaulon setaceum Linn. Sp. Pl. 219. 1753; Ruhl. Pflanzenr. 13 (IV. 30): 89. f. 9. 1903; Lecomte, Fl. Gén. Indo-Chine 7: 4. 1912.

HAINAN, Lam Ko District, C. I. Lei 1420, August, 1934, in shallow water of old rice paddies. India and Ceylon, Indo-China, and recorded from northern Australia.

This has the white pubescent heads of the Linnaean species, from which *E. intermedium* Korn. is doubtfully distinct; see Fischer, Kew Bull. 259. 1931, who, following Hooker, f., unites the two. Both Ruhland and Lecomte retain *E. intermedium* Korn. as a species distinct from *E. setaceum* Linn.

ORCHIDACEAE²

Acampe multiflora (Lindl.) Lindl. Fol. Orch. Acampe 1. 1853.

Vanda multiflora Lindl. Col. Bot. t. 38. 1822.

² The Hainan records here made are based on specimens actually identified by Messrs. Tang and Wang, working at Kew, where they had, on loan, all of the Chinese orchid material in the Britton Herbarium, New York Botanical Garden. In addition to the species herein listed they also indicated certain other Hainan collections as representing undescribed species; these, however, are not as yet published. As noted by Merrill, Lingnan Sci. Jour. 5: 53. 1927, the study set of the earlier Hainan collections sent to the Botanical Museum of Harvard University for identification, was reported as lost or misplaced. Neither of us have given any special attention to the actual study of this difficult family. It is highly probable that the Hainan orchid

HAINAN, Yaichow, Pak Shik Leng, Lin Fa Shan, and other localities, Wang 36147, 36493, Tsang 406 (L. U. 15905), How 71054, Chun & Tso 43815, Lei 946, epiphytic. Southern China (Kwangsi, Kwangtung).

Agrostophyllum callosum Rehb. f. in Seem. Fl. Vit. 296. 1868; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 440. 1933.

HAINAN, without locality, Wang 35983, epiphytic. Himalayan region to Yunnan, Burma, and Siam.

Anoectochilus Roxburghii (Wall.) Lindl. Gen. Sp. Orch. Pl. 499. 1840 (*Anoectochilus*); Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 569. 1933.

Chrysobaphus Roxburghii Wall. Tent. Fl. Nepal. 37. t. 27. 1826.

HAINAN, Mo San Leng, Chun & Tso 44314, terrestrial in forests. India to Yunnan, Chekiang and Kwangtung, Indo-China and Java.

Anota densiflorum (Lindl.) Schltr. Orch. 587. 1914.

Vanda densiflora Lindl. Paxt. Fl. Gard. 2: 21. sub t. 42. 1851.

Vanda hainanensis Rolfe, Kew Bull. 1896: 199. 1896.

Anota hainanense Schltr. Orch. Deutsch. New-Guin. 986. 1913; Repert. Sp. Nov. Beih. 4: 296. 1919; Merr. Lingnan Sci. Jour. 5: 57. 1927.

HAINAN, Dung Ka, Lin Fa Shan, and Yaichow, Chun & Tso 43657, How 71014, Tsang 389 (LU 15888), epiphytic. Burma.

Aphyllorchis montana Rehb. f. Linnaea 41: 57. 1876; Hook. f. Fl. Brit. Ind. 6: 116. 1890.

HAINAN, Yaichow, Liang 62283, terrestrial in forests. India and Ceylon to Kwangtung.

Appendicula cornuta Blume, Bijdr. 302. 1825; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 541. 1933.

Appendicula bifaria Lindl. ex Benth, Hook. Jour. Bot. Kew Gard. Miscel. 7: 35. 1855; Merr. Lingnan Sci. Jour. 5: 55. 1927.

HAINAN, Dung Ka, Sha Po Shan, and other localities, Wang 33417, 34436, 36027, Liang 62190, 62674, 63495, Chun & Tso 43447, Tsang 685 (LU 16184), on rocks and cliffs in forests. India to southeastern China, southward to the Philippines and Java.

Appendicula micrantha Lindl. Ann. Mag. Nat. Hist. 15: 386. 1845.

HAINAN, Chim Shan, Fang 20206, on rocky slopes. Philippines.

Arachnis Clarkei (Rehb. f.) J. J. Sm. Nat. Tijdschr. Nederl. Ind. 72: 76. 1912.

list, previous to this compilation amounting to about fifty species, not all determined to the species however, will eventually be very considerably increased. In this rather long list of additions to the orchid flora of Hainan are also many additions to the flora of China.

Esmeralda Clarkei Rehb. f. Gard. Chron. II. 26: 552. 1886.

Vanda Clarkei Rehb. f. op. cit. 553, in nota.

Arachnanthe Clarkei Rolfe, Gard. Chron. III. 4: 567. 1888; Hook. f. Bot. Mag. 115: t. 7077. 1889.

HAINAN, Dung Ka and without locality, Wang 34417, Liang 62694, Chun & Tso 43927, epiphytic and on rocks. Himalayan region.

Arachnis labrosa (Lindl.) Rehb. f. Bot. Centralbl. 28: 343. 1886.

Arrhynchium labrosum Lindl. Paxt. Fl. Gard. 1: 142. 1850.

HAINAN, Sha Po Shan, Tsang 607, 627 (LU 16106, 16126), epiphytic. Northern India to Burma and Kwangsi.

Arundina stenopetala Gagnep. Bull. Soc. Bot. France 79: 32. 1932, Lecomte, Fl. Gén. Indo-Chine 6: 372. f. 33, 1-3. 1933.

HAINAN, without locality, Liang 64267, 64606, Wang 33333, on rocks and in rocky places along streams. Northern India to Indo-China.

BIERMANNIA DECUMBENS (Griff.) Tang & Wang in herb. comb. nov.

Aerides decumbens Griff. Not. 3: 365. 1851; Ic. Pl. Asiat. 3: t. 320, f. 1. 1851.

Kingiella decumbens Rolfe, Orch. Rev. 25: 195. 1917.

Doritis latifolia Benth. & Hook. f. ex Jackson Ind. Kew. 789. 1895.

Further Hainan collections of this are Wang 33370, Liang 61748, 62316, Tsang 264 (LU 15763), Lau 431, How 71013, Ford 475. India and Ceylon to Burma, Indo-China, and the Malay Peninsula. *Doritis latifolia* Benth. & Hook. f. is not published in the Genera Plantarum 3: 574. 1883 as listed in Index Kewensis; there it is merely stated that *Aerides latifolia* Thw. appertains to *Doritis*.

Bulbophyllum affine Lindl. in Wall. List no. 1982. 1829 *nomen nudum*, Gen. Sp. Orch. Pl. 48. 1830; Hook. f. Fl. Brit. Ind. 5: 756. 1890; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 270. 1932.

HAINAN, Yeung Ling Shan, Lau 105, epiphytic, steep slopes. Himalayan region to Indo-China.

Bulbophyllum Mannii Rehb. f. Flora 55: 275. 1872; Hook. f. Fl. Brit. Ind. 5: 780. 1890.

HAINAN, Lin Fa Shan, Ngo Ko Shan, and without locality, Liang 62166, 62722, Wang 33468, Tsang 350, 816 (LU 15849, 16315), Lau 1897, on rocks and cliffs in forests. India.

Bulbophyllum Wallichii (Lindl.) Rehb. f. in Walp. Ann. 6: 259. 1861.

Cirrhopetalum Wallichii Lindl. in Wall. Pl. As. Rar. 1: 53. t. 67. 1830; Hook. f. Fl. Brit. Ind. 5: 776. 1890.

HAINAN, Ngo Ko Shan, Lau 1880, on cliffs or ledges, in forest. Himalayan region to Yunnan and Kwangtung.

Calanthe clavata Lindl. in Wall. List no. 7343. 1832, *nomen nudum*, Gen. Sp. Orch. 251. 1833; Hook. f. Fl. Brit. Ind. 5: 854. 1890.

HAINAN, Dung Ka to Wen Fa Shi, *Chun & Tso 43812*, terrestrial in shaded ravines. Himalayan region to Burma.

Calanthe Foerstermanni Rehb. f. Gard. Chron. II. 19: 814. 1883; Hook. f. Fl. Brit. Ind. 5: 854. 1890.

HAINAN, without locality, *Wang 35800*, terrestrial in forests. Burma.

Calanthe veratrifolia (Willd.) R. Br. Bot. Reg. 9: t. 720. 1823; J. J. Sm. in Merr. Interpret. Herb. Amb. 170. 1917; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 389. 1933.

Limodorum veratrifolium Willd. Sp. Pl. 4: 122. 1805.

HAINAN, Yaichow, *Wang 33644*, *Liang 62441*, terrestrial in forested ravines. India to the Riu Kiu Islands southward through Malaysia to tropical Australia.

This was named by Messrs. Tsang & Wang as *Calanthe triplicata* (Willem.) Ames, but *Orchis triplicata* Willem. is not the same as this *Calanthe*. There is some doubt as to the identity of *Limodorum veratrifolium* Lindl.; see Ames' note in Merrill, Enum. Philip. Fl. Pl. 1: 333. 1924.

Ceratostylis teres (Griff.) Rehb. f. Bonpl. 2: 89. 1854; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 337. 1933.

Appendicula teres Griff. Not. 3: 359. 1851, Ic. Pl. Asiat. 3: t. 332. 1851. *Ceratostylis subulata* sensu Merr. Lingnan Sci. Jour. 5: 54. 1927, non Blume.

HAINAN, Fan Yah, and without locality, *Wang 34720*, *36004*, *36497*, *Chun & Tso 44143*. Himalayan region to Indo-China.

Coelogyne fimbriata Lindl. Bot. Reg. 11: t. 868. 1825; Hook. f. Fl. Brit. Ind. 5: 836. 1890.

HAINAN, Fan Yah and without locality, *Wang 34665*, *34701*, *36128*, *36496*, *Liang 63697*, *Chun & Tso 44074*, epiphytic. India to Kwangtung, Kwangsi, and Indo-China (var. *annamica* Finet).

Cymbidium Dayanum Rehb. f. Gard. Chron. 1869: 710. 1869; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 420. 1933.

HAINAN, Cheung Ip Muk Lan, *Tsang 857* (*LU 16356*), epiphytic. Himalayan region to Indo-China and the Malay Peninsula, eastward to Kwangtung.

Cymbidium floribundum Lindl. Gen. Sp. Orch. Pl. 162. 1833, *in nota*.

HAINAN, without locality, *Wang 33665*, epiphytic. Kwangtung and Kwangsi to Yunnan.

Cymbidium insigne Rolfe, Gard. Chron. III. 35: 387. 1904; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 417. 1933.

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HAINAN, Fan Yah, *Chun & Tso 44242*, epiphytic, alt. 1500 m. Indo-China.

Cymbidium Mastersii Griff. ex Lindl. Bot. Reg. 31: t. 50. 1845.

Cyperorchis Mastersii Benth. Jour. Linn. Soc. Bot. 18: 318. 1881; Hook. f. Fl. Brit. Ind. 6: 15. 1890.

HAINAN, without locality, *Liang 65296*, on large rocks along streams. Himalayan region.

Cymbidium sinense (Andr.) Willd. Sp. Pl. 4: 111. 1805.

Epidendrum sinense Andr. Bot. Rep. 3: t. 216. 1802.

HAINAN, without locality, *Wang 35852*, in forests. Southern China and Formosa.

Dendrobium acinaciforme Roxb. Hort. Beng. 63. 1814, *nomen nudum*, Fl. Ind. ed. 2, 3: 487. 1832; Hook. f. Fl. Brit. Ind. 5: 723. 1890; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 246. 1932.

HAINAN, Yaichow and Mochong Shan, *How 70426*, *Ko 52265*, epiphytic and on rocks. Himalayan region to Kwangsi and Indo-China.

Dendrobium aduncum Wall. ex Lindl. Bot. Reg. 28: Misc. 58. 1842, 32: t. 15. 1846; Hook. f. Fl. Brit. Ind. 5: 730. 1890; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 207. 1932.

HAINAN, Dung Ka to Mo San, *Wang 35305*, *Chun & Tso 43552*, epiphytic and on rocks. Himalayan region to Burma, Indo-China, and Kwangtung.

Tsang and Wang, in herb., make *Dendrobium Faulhaberianum* Schltr. Orch. 5: 58. 1911, type from Hainan, a variety of Wallich's species.

Dendrobium amabile (Lour.) O'Brien, Gard. Chron. III. 46: 393. 1909; Merr. Trans. Am. Philos. Soc. II. 24: 123. 1935 (Comment. Lour. Fl. Cochinch.), *cum syn.*

Callista amabilis Lour. Fl. Cochinch. 519. 1790.

HAINAN, Yaichow, *Liang 62660*, on rocks along streams. Indo-China.

Dendrobium hercoglossum Rehb. f. Gard. Chron. II. 26: 487. 1886; Hook. f. Fl. Brit. Ind. 6: 185. 1890; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 208. 1932.

HAINAN, Yaichow, *How 70730*, *Wang 33570*, epiphytic and on rocks. Siam, Malay Peninsula, southern China.

Dendrobium thyrsiflorum Rehb. f. Ill. Hort. 22: 88. t. 207. 1875.

HAINAN, Dung Ka to Mo San, Ka Chik Shan, *Chun & Tso 44263*, *Lau 1493*, epiphytic and on cliffs. India to Yunnan (and Indo-China?). This is reduced by Kränzlin to *Dendrobium densiflorum* Wall.

Eria Corneri Rehb. f. Gard. Chron. II. 10: 106. 1878; Kränzl. Pflanzenr. 50 (iv. 50. ii. B. 21): 83. 1911.

HAINAN, Paak Po Shan, Than Tong To, and without locality, Wang 33648, 34324, Liang 62611, 63498, 63525, Tsang 578, 739 (LU 16077, 16238), on rocks, in ravines, and in forests. Formosa, Kwangtung.

Reichenbach's type was from Formosa. Kränzl. cites only "Provinz von Süd-Formosa: Lo Fan Shan 300 m.-Exam. sp. typ. cult. Mus. Kew." Lo Fau Shan (not Lo Fan Shan), is in Kwangtung Province, China. He states that neither he nor Rolfe had seen Formosan specimens.

Eria coronaria (Lindl.) Rehb. f. in Walp. Ann. 6: 271. 1861; Kränzl. op. cit. 53.

Coelogyne coronaria Lindl. Bot. Reg. 27: Misc. 83. 1841.

HAINAN, Ngo Ko Shan and without locality, Lau 1876, Wang 35709, on ledges and cliffs. Himalayan region, Yunnan.

Eria flava Lindl. in Wall. List. no. 1973, 1829, *nomen nudum*, Gen. Sp. Orch. 65. 1830; Kränzl. Pflanzenr. 50 (iv. 50. ii. B. 21): 55. f. 12. 1911, *cum syn.*

Dendrobium pubescens Hook. Exot. Fl. 2: t. 124. 1825, non *Eria pubescens* Wight.

Ocotea pubescens Spreng. Syst. 4(2): 310. 1827.

HAINAN, Dung Ka to Wen Fa Shi and without locality, Chun & Tso 43662, Liang 62167, 64723, 65155, on rocks along streams and in forests, and on decayed trunks. Himalayan region to Indo-China and the Malay Peninsula.

The oldest binomial for this species is *Dendrobium pubescens* Hook. (1825), and had Lindley actually transferred this to *Eria* in Bot. Reg. 11: sub t. 904. 1825, as listed in Index Kewensis, there would have been no doubt as to its acceptance as *Eria pubescens* (Hook.) Lindl. It would then replace *Eria flava* Lindl., in spite of the fact that there is the accepted *Eria pubescens* Wight (1856) of British India, a totally different species. However, Lindley did not make the transfer in 1825, for the binomial *Eria pubescens* does not appear in the text; he stated that in describing the genus *Eria* it was in part based on *Dendrobium pubescens* Hook. The binomial *Eria pubescens* does not appear until 1830, and then only in synonymy, Lindley, Gen. Sp. Orch. 65. 1830, sub *Eria flava* Lindl., and Article 40 of the International Rules of Botanical Nomenclature specifically provides that a name is not validly published when it is cited merely as a synonym.

Eria pusilla (Griff.) Lindl. Jour. Linn. Soc. Bot. 3: 48. 1858.

Conchidium pusillum Griff. Not. 3: 321. 1851, Ic. Pl. Asiat. 3: t. 310. 1851.

HAINAN, without locality, Wang 34390, Liang 63539, on rocks in partial shade. Himalayan region and eastern Bengal.

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Eria rosea Lindl. Bot. Reg. 12: t. 978. 1826.

HAINAN, without locality, Liang 65172, Wang 36498, on cliffs and on wet rocks in ravines. Hongkong.

Eria sinica Lindl. Jour. Linn. Soc. Bot. 3: 48. 1858.

HAINAN, Mo San Leng, Chun & Tso 44366, epiphytic, alt. 900 m. Hongkong.

Habenaria ciliolaris Kränzl. Bot. Jahrb. 16: 169. 1892.

HAINAN, Yaichow, Liang 63295, terrestrial in forests. Chekiang to Kwangtung and Formosa.

Habenaria dentata (Sw.) Schltr. Repert. Sp. Nov. Beih. 4: 125. 1919.

Orchis dentata Sw. Nya Vet. Akad. Handl. Stockh. 207. 1800.

Habenaria Miersiana Champ. ex Benth. Hook. Jour. Bot. Kew Gard. Misc. 7: 37. 1855.

HAINAN, Yang Shan, Tsui 661, terrestrial, Kwangtung to Kwangsi, Hupeh, and Yunnan.

Habenaria lacertifera (Lindl.) Benth. Fl. Hongk. 362. 1861.

Coeloglossum lacertiferum Lindl. Gen. Sp. Orch. 302. 1835.

HAINAN, without locality, Wang 34694, in open places, terrestrial. Kwangtung to Szechuan.

Gagnepain in Lecomte, Fl. Gén. Indo-Chine 6: 605. 1934, reduces this to *Habenaria tentaculata* (Lindl.) Rehb. f., but Schlechter, Repert. Sp. Nov. Beih. 4: 130, 135, retains the two as distinct.

Liparis chloroxantha Hance, Jour. Bot. 21: 231. 1883.

HAINAN, without locality, Wang 35234, on rocks. Hongkong and Kwangtung to Yunnan.

Liparis ferruginea Lindl. Gard. Chron. 1848: 55. 1848; Hook. f. Fl. Brit. Ind. 5: 697. 1890.

HAINAN, Yaichow, Liang 62520, on the banks of streams. Siam to the Malay Peninsula and Borneo.

Liparis latifolia Lindl. Gen. Sp. Orch. 30. 1830; J. J. Sm. Orch. Jav. 271. f. 208. 1905 (Fl. Buitenz. 6: 271).

Malaxis latifolia Blume, Bijdr. 393. 1825 (non J. J. Sm.).

HAINAN, Yaichow, How 71022, on rocks in forests. Malay Peninsula and Java, Borneo.

Liparis luteola Lindl. in Wall. List no. 1944. 1829, *nomen nudum*, Gen. Sp. Orch. 32. 1830; Hook. f. Fl. Brit. Ind. 5: 704. 1890.

HAINAN, Dung Ka to Mo San, and without locality, Chun & Tso 43562, Liang 64727, along streams and on rocks in shaded ravines. Himalayan region to Burma.

Liparis plicata Franch. & Sav. Enum. Pl. Jap. 2: 22. 1877, 509. 1878.

HAINAN, Dung Ka and Fan Yah, *Chun & Tso* 43929, 44150, *Wang* 36506, on cliffs and trees. Southern Japan to Formosa, Kwangtung, Kwangsi, and Kweichow.

Liparis viridiflora (Blume) Lindl. Gen. Sp. Orch. 31. 1830; Hook. f. Fl. Brit. Ind. 5: 704. 1890.

Malaxis viridiflora Blume, Bijdr. 392. 1825.

HAINAN, without locality, *Liang* 64778, on damp rocky slopes in forests. India and Ceylon to Java.

Luisia Morsei Rolfe, Jour. Linn. Soc. Bot. 36: 33. 1903.

HAINAN, without locality, *Liang* 62523, in forests along streams. Kwangsi.

Luisia trichorhiza (Hook.) Blume, Rumphia 4: 50. 1848.

Vanda trichorhiza Hook. Exot. Fl. 1: t. 72. 1823.

Luisia teretifolia sensu Rolfe; Merr. Lingnan Sci. Jour. 5: 57. 1927, non Gaudich.

HAINAN, Dung Ka, Yaichow, Ngo Ko Shan, and Lingshui, *Tsang* 81, 526 (*LU* 15580, 17275), *Chun & Tso* 44273, *How* 70637, 70684, *Lau* 1874, *Lei* 606, *To* 62416, epiphytic and on cliffs. Himalayan region to Yunnan, Kweichow, and the Riu Kiu Islands.

Microstylis latifolia (J. E. Sm.) J. J. Sm. Orch. Jav. 248. f. 185. 1905 (Fl. Buitenz. 6: 248).

Malaxis latifolia J. E. Sm. in Rees Cyclop. 22: no. 3. 1812-13.

HAINAN, Yaichow, Dung Ka, and without locality, *Liang* 62252, 62651, 62830, *Wang* 36855, *Chun & Tso* 43659, *Tsang* 451 (*LU* 17200), along streams in ravines and on forested slopes. India and Ceylon to southeastern China southward through Malaysia to tropical Australia.

ODONTOCHILUS DENSIFLORUS (Mansf.) Tang & Wang in herb. comb. nov.

Anoetochilus densiflorus Mansf. Repert. Sp. Nov. 27: 294. 1930.

HAINAN, Fan Ta, Hung Mo Mountain, *Tsang & Fung* 17924, on rocks near streams. Kwangsi.

Pachystoma pubescens Blume, Bijdr. 376. 1825.

HAINAN, Yaichow, Lin Fa Shan and Poting, *How* 70728, *Tsang* 264 (*LU* 17013), *Ko* 52140, on grassy slopes. Philippines, Java.

Podochilus khasianus Hook. f. Fl. Brit. Ind. 6: 81. 1890.

HAINAN, without locality, *Wang* 36122. Himalayan region to Yunnan, Kwangsi.

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Pomatocalpa spicatum Breda, Gen. Sp. Orch. Kuhl & Van Hass. t. 15. 1827; Rehb. f. Allgem. Gartzeit. 219. 1856.

Cleisostoma vitellinum Rehb. f. Linnaea 41: 76. 1876.

Pomatocalpa vitellinum Ames in Merr. Enum. Philip. Fl. Pl. 1: 439. 1925.

HAINAN, Poting and Ka Chik Shan, *Lau* 1553, *Ko* 52164, *Liang* 61588, epiphytic. Malay Peninsula, Java, Philippines.

Saccolabium calceolare Lindl. in Wall. List no. 7302, 1832, *nomen nudum*, Gen. Sp. Orch. 223. 1833; Hook. f. Fl. Brit. Ind. 6: 60. 1890.

HAINAN, Yaichow, and Lin Fa Shan, *How* 70307, 71145, *Tsang* 253, 284 (*LU* 15783, 17002), epiphytic. Himalayan region to Burma, Indo-China, Yunnan, Kwangtung, Malay Peninsula, Sumatra and Java.

Saccolabium intermedium Griff. ex Lindl. Jour. Linn. Soc. Bot. 3: 33. 1858; Hook. f. Fl. Brit. Ind. 6: 61. 1890.

HAINAN, Fan Yah, *Chun & Tso* 43989, epiphytic, alt. 750 m. Himalayan region to Yunnan and Kwangtung.

Sarcanthus flagelliformis Rolfe ex Downie, Kew Bull. 1925: 393. 1925.

HAINAN, Fan Yah, *Chun & Tso* 44006, *Wang* 35875, epiphytic. Siam.

This is indicated as a stout form of Rolfe's species.

Sarcanthus hongkongensis Rolfe, Kew Bull. 1898: 198. 1898.

HAINAN, without locality, *Wang* 34744, epiphytic. Formosa, Hongkong and Kwangtung to Yunnan.

Sarcanthus paniculatus (Ker) Lindl. Ill. Orch. Pl. t. 9. 1832.

Aerides paniculatum Ker, Bot. Reg. 3: t. 220. 1817.

HAINAN, Yaichow and without locality, *Liang* 62784, *Wang* 34240, epiphytic and on rocks. The type was from "China."

Sarcanthus rostratus Lindl. Col. Bot. t. 39B. 1824.

HAINAN, Dung Ka to Wen Fa Shi and without locality, *Liang* 62176, 62653, *Wang* 33617, *Chun & Tso* 43653, *Lau* 1342, epiphytic and on rocks. The type was from "China."

Thelasis triptera Rehb. f. Bonpl. 3: 219. 1855.

Thelasis elongata Blume, Mus. Bot. Lugd.-Bat. 2: 187. 1856.

HAINAN, Dung Ka, Yaichow, and without locality, *Chun & Tso* 43381, *How* 70719, *Lau* 1881, *Tsang* 781 (*LU* 16280), epiphytic and on rocks. Southern China (*T. hongkongensis* Rolfe) to the Malay Peninsula, Sumatra, Java, Borneo, the Philippines, and the Admiralty Islands.

Thrixspermum centipeda Lour. Fl. Cochinch. 520. 1790; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 515. 1933; Merr. Trans. Am. Philos. Soc. II. 24 (2): 125. 1935 (Comment. Lour. Fl. Cochinch.)

Sarcochilus hainanensis Rolfe, Kew Bull. 1896: 199. 1896.

Thrixspermum hainanense Schltr. Repert. Sp. Nov. Beih. 4: 274. 1919.

HAINAN, Nga Ping Shan, Sai Ip Muk Lan, Tung Koo Shan, and Dung Ka, *Tsang* 390, 933, 969 (LU 15889, 16432, 16468), *Fung* 20375, *Chun & Tso* 43660, *Ko* 52193, *Liang* 64264, epiphytic, in forested ravines. Assam to Indo-China, south to Sumatra, Borneo, and Java.

Tropidia curculigoides Lindl. in Wall. List no. 7386, 1832, *nomen nudum*, Gen. Sp. Orch. 497. 1840; Gagnep. in Lecomte, Fl. Gén. Indo-Chine 6: 544. 1933.

Tropidia hongkongensis sensu Merr. Lingnan Sci. Jour. 6: 275. 1930, non Rolfe?

HAINAN, Sha Po Shan, *Tsang* 626 (LU 16125). Himalayan region to Burma, Indo-China and the Malay Peninsula.

Vanda Roxburghii R. Br. Bot. Reg. 6: t. 506. 1820; Hook. f. Fl. Brit. Ind. 6: 52. 1890.

HAINAN, Yaichow, *Liang* 64956, *Chun & Tso* 70112, epiphytic in forested ravines. India and Ceylon to Burma, Yunnan and Szechuan.

Zeuxine affinis (Lindl.) Benth. in Hook. f. Fl. Brit. Ind. 6: 108. 1890, Ic. 22: t. 2177. 1894.

Monochilus affinis Lindl. Gen. Sp. Orch. 487. 1840.

HAINAN, Yaichow, *How* 70178, terrestrial, in forests. India to Burma and Penang.

STUDIES ON THE TIPULIDAE OF CHINA (DIPTERA) VI. NEW CRANE-FLIES FROM YUNNAN, KWEICHOW AND KWANGTUNG

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The novelties discussed herewith were derived from a variety of sources. Most of the specimens were secured by Mr. J. Linsley Gressitt in Yunnan and Kweichow during the summer of 1940. A further important series was taken by Mr. Gressitt, accompanied by Mr. F. K. To, on a profitable trip to the Kau-lin San, Lien-p'ing District, northern Kwangtung, in the spring of 1940. A few further specimens were taken by Mr. E. R. Tinkham in Yunnan in the early autumn of 1934. Still other material discussed at this time is included in extensive lots of material received for determination from the Heude Museum, Shanghai, this particular series being from Loh fau shan, Kwangtung. Except where indicated to the contrary, the types of the novelties will be returned to the Zoological Museum, Lingnan University, Canton, when conditions permit.

Tipulinae

1. *Tipula* (*Acutipula*) *persegnis* n. sp. (Fig. 1)

Allied to *biramosa*; size large (wing, male, over 21 mm.); general coloration of mesonotum brown, the praescutal stripes scarcely indicated; basal flagellar segments bicolored; wings with a strong brownish tinge, costal border narrowly darker; male hypopygium with the tergal lobe bilobulate at apex; outer dististyle relatively narrow, its tip obtuse; inner dististyle with the rostrum unusually high, the face of style with two strong spines, the lower or discal one with a small lateral spine near base; caudal margin of eighth sternite very shallowly concave, the sides of the emargination with abundant and conspicuous long yellow setae.

Male.—Length, about 18 mm.; wing, 21.5 mm.; antenna, about 3 mm.

Frontal prolongation of head of moderate length, reddish brown, sparsely pruinose; nasus very long, blackened, a trifle expanded outwardly; palpi black. Antennae with scape elongate, brownish yellow; pedicel clear yellow; basal flagellar segment yellow, the succeeding ones bicolored, the basal enlargement blackened, the outer portions yellow, the bicolored nature persisting for the entire length of the flagellum excepting the terminal segment; basal enlargements moderately developed; verticils exceedingly long, the longest a little less than twice the segments. Head dark brownish gray, without vertical tubercle; eyes large, anterior vertex correspondingly reduced, a little less than twice the diameter of scape.

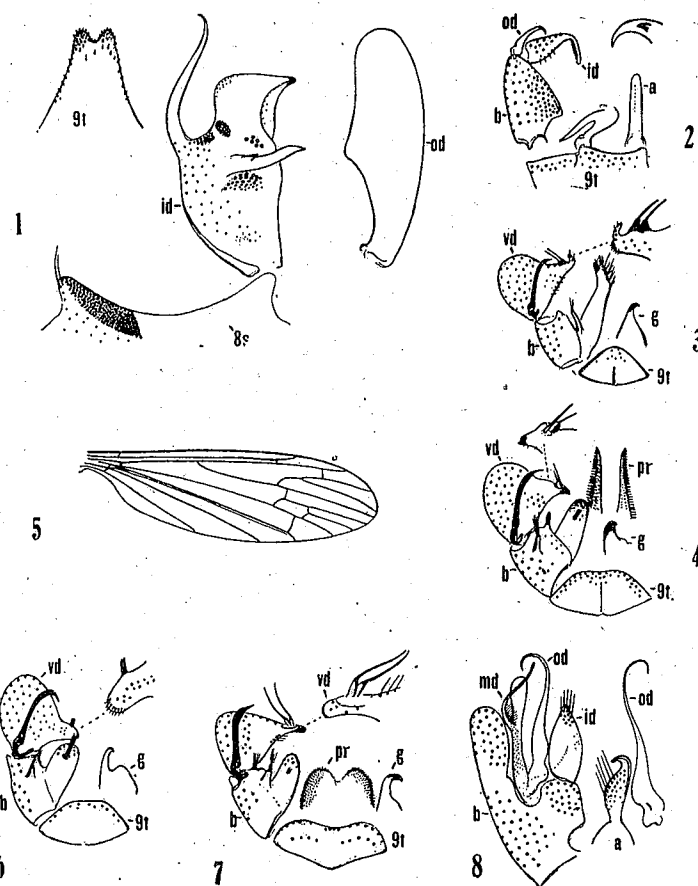


Fig. 1. *Tipula* (*Acutipula*) *persegnsis* n. sp., male hypopygium;
 2. *Helius* (*Helius*) *lienpingensis* n. sp., male hypopygium;
 3. *Limonia* (*Dicranomyia*) *rhinoceros* n. sp., male hypopygium;
 4. *Limonia* (*Dicranomyia*) *tenuifilamentosa* n. sp., male hypopygium;
 5. *Hexatoma* (*Eriocera*) *elevata* n. sp., venation;
 6. *Limonia* (*Dicranomyia*) *perobtus* n. sp., male hypopygium;
 7. *Limonia* (*Dicranomyia*) *subtristoides* n. sp., male hypopygium;
 8. *Gonomyia* (*Protagonomyia*) *praetenuis* n. sp., male hypopygium.

(Symbols: a, aedeagus; b, basistyle; g, gonapophysis; id, inner dististyle; md, intermediate dististyle; od, outer dististyle; pr, proctiger; s, sternite; t, tergite; vd, ventral dististyle.)

Pronotum infuscated medially, paler on sides. Mesonotum with praescutum and scutum brown, the former paler on sides and in humeral region; scutal lobes darker; scutellum dark gray, the sunken parascutella lighter; postnotum light gray, the mediotergite with abundant appressed yellow setae; pleurotergite obscure yellow, the anapleurotergite darker. Pleura obscure yellow, the dorsopleural region more fulvous orange. Halteres elongate, brownish black, the extreme base of stem brightened. Legs with the coxae brownish yellow, sparsely pruinose; trochanters reddish yellow; remainder of legs very long, femora obscure yellow, the tips passing into black, the amount of the latter subequal on all legs; tibiae and tarsi reddish brown; claws toothed. Wings with a strong brownish tinge, the prearcular field, costal border and stigma still darker brown; in the ground area there is an indication of a vague cloud near outer end of cell *M* immediately basad of *m-cu*; veins dark brown. Venation: *Rs* nearly straight, only a little longer than *m-cu*; cell *R*₂ pointed at base, *R*₁ and *R*₂ meeting at an acute angle; vein *R*₃ elongate and gently sinuous; second section of *M*₁₊₂ gently arcuated; petiole of cell *M*₁ varying from about two-thirds to three-fourths *m*; *m-cu* a little less than the distal section of *Cu*₁.

Basal abdominal tergites dark reddish brown, sparsely pruinose, the outer segments still darker; posterior borders of tergites very narrowly, the lateral borders somewhat more broadly, yellow; basal sternites reddish, the outer four dark brown. Male hypopygium (Fig. 1) with the ninth tergite, *9t*, relatively broad, depressed, at apex divided into two small lobes by a V-shaped apical notch; each lobe with abundant blackened spinous points which continue basad down the lobe, merging gradually with the elongate setae of the sides and base of lobe. Basistyle near the insertion of the dististyles with a low semioval lobe that is densely covered with pale erect setulae. Outer dististyle, *od*, narrow at base, widest across midlength, the apex broadly obtuse. Inner dististyle, *id*, with the beak unusually deep, the actual blackened point very small; two conspicuous spines, the outer very powerful and strongly curved, narrowed to the acute tip; lower spine arising near base of beak, about one-half the length of the outer spine, appearing as a short, nearly straight spike, bearing a small accessory spinule near its base; a group of very long setae lying between base of outer spine and the oval sensory group at base of beak; a second group of stouter black bristles before midlength of style. Ninth sternite with long hair-brushes on either side. Eighth sternite, *8s*, sheathing, the caudal margin broadly but very shallowly concave, the sides provided with abundant long yellow setae, the narrower median area lacking such vestiture.

Hab.—China (Yunnan).

Holotype, ♂, An Ning Djou, 25 miles west of Yunnan-fu, September 4, 1934 (E. R. Tinkham); Alexander Collection.

Most similar to *Tipula* (*Acutipula*) *biramosa* Alexander and T. (A.) *dicladura* Alexander, of southwestern China, differing especially in the structure of the male hypopygium, particularly the ninth tergite, outer dististyle, inner dististyle and eighth sternite. In *dicladura*, the tergal

lobe is much broader, with a deep U-shaped notch at its apex, the terminal lobes correspondingly large; the outer dististyle is broader, with the apex very narrowly obtuse; armature of the inner dististyle quite distinct, the beak much smaller and more slender; eighth sternite without modified vestiture. *Tipula biramosa* is similarly distinct in all details of the hypopygium.

2. *Tipula (Oreomyza) ingenua* n. sp.

Allied to *mutiloides*; antennal flagellum black, segments very slightly incised; mesonotal praescutum gray, the praescutum with four brown stripes, with an additional capillary median vitta; legs black; claws (male) toothed; wings with a very weak brown tinge, vaguely patterned with more subhyaline areas and darker brown washes; cells *C* and *Sc*, with the stigma, more infuscated; R_{1+2} atrophied or with only a short spur; cell 1st M_2 short-petiolate; cell M_1 about two and one-half times its petiole; abdominal tergites brownish yellow, brownish black medially, the sternites and outer segments more uniformly darkened; male hypopygium with the suture between basistyle and sternite incomplete; outer dististyle relatively slender; inner dististyle with the beak slender, gently decurved, lower beak with its upper margin produced into a lobe or flange; eighth sternite with an apical median brush of long yellow setae.

Male.—Length, about 11 mm.; wing, 11.5 mm.; antenna, about 3.5 mm.

Female.—Length, about 13 mm.; wing, 13.5 mm.

Frontal prolongation of head unusually long, nearly equal to the remainder of head, dark gray above, more reddened or piceous on sides; nasus slender; palpi black. Antennae (male) moderately long; scape infuscated basally, obscure yellow at tip; pedicel yellow, flagellum black; flagellar segments only very slightly incised; verticils of the intermediate segments a little shorter than the segments. Head gray, somewhat clearer in front and on orbits; vertical tubercle only slightly developed; anterior vertex about three times the greatest diameter of scape.

Pronotum infuscated medially above, gray on sides. Mesonotum gray, the praescutum with four brown stripes, the intermediate pair narrowed and interconnected behind, the gray ground stripe further divided by a capillary brown vitta; praescutal interspaces with conspicuous brown setigerous punctures; scutum clear gray, each lobe patterned with brown, with an additional central brown spot; posterior sclerites of notum clear gray. Pleura clear gray, the dorsopleural membrane pale yellow. Halteres infuscated, the base of stem obscure yellow. Legs with the coxae clear gray; trochanters obscure brownish yellow; remainder of legs black; claws (male) toothed. Wings with a very weak brown tinge, vaguely patterned with more subhyaline areas and darker brown washes; cells *C* and *Sc*, with the stigma, more infuscated; very restricted brown seams along cord and vein *Cu* in cell *M*, the latter interrupted by a pale ground spot at near three-fourths the length; distal portions of outer radial cells slightly infuscated; a small dark cloud at origin of *Rs*; veins brown. Venation: *Rs* about twice *m-cu*; R_{2+3} lying relatively close to R_1 ,

narrowing the cell; vein R_{1+2} atrophied except for a short basal spur; cell 1st M_2 short-pentagonal, *m* the shortest element; cell M_1 about two and one-half times its petiole, the latter nearly four times *m*.

Basal abdominal tergite brownish gray, succeeding tergites obscure brownish yellow, brownish black medially, the outer segments and most of sternites brownish black; caudal borders of segments narrowly pale; hypopygium brownish yellow. Ovipositor with genital shield obscure yellow; cerci straight and slender, hypovalvae strongly compressed. Male hypopygium with the tergite entirely separated from the sternite; accessory sclerite complete and unusually large; basistyle with its dorsal and ventral sutures well-indicated but with about one-fourth of the central portion fused with sternite. Ninth tergite having the caudal border with a very broad V-shaped notch, the lateral lobes low and obtuse; dorsal surface of tergite with an impressed median line for the entire length. Outer dististyle relatively slender, its greatest width less than one-sixth the length. Inner dististyle with the beak slender, slightly decurved at apex; dorsal crest with a row of about nine or ten strong setae, near their tips extended laterad into long hairlike points; lower beak with its upper margin dilated into a low lobe or flange; outer basal lobe only slightly developed. Gonapophyses brownish yellow, their surface microscopically setuliferous. Eighth sternite relatively large and sheathing, the posterior margin rounded, the median region and adjoining membrane with a brush of setae.

Hab.—China (Yunnan).

Holotype, ♂, Western Hills, Yunnan-fu, altitude 7,000–8,000 feet, September 1, 1934 (E. R. Tinkham); Alexander Collection. *Allotopotype*, ♀.

The most similar species is *Tipula (Oreomyza) mutiloides* Alexander, of southwestern China, which, while generally similar and evidently allied, differs conspicuously in its general appearance, wing pattern, venation, and structure of the male hypopygium. Both species have the conspicuous brush of setae at apex of the eighth sternite and the conspicuous lobe on upper margin of lower beak of inner dististyle. The row of spinous setae along the dorsal crest of the inner dististyle is much stronger and more abundant in *mutiloides*, as is also the outer basal lobe. Likewise in *mutiloides*, the beak is conspicuously stouter and flatter, while the tergal lobes are more obliquely truncated.

3. *Tipula (Oreomyza) gemula* n. sp.

General coloration gray; antennae yellow; femora obscure yellow basally, the tips blackened, more extensive on the fore legs; wings yellow, the prearcular field and cell *Sc* clearer yellow, patterned with brown, including conspicuous seams along veins *Cu* and 2nd *A*; outer radial field strongly darkened; *Rs* relatively long, nearly two and one-half times *m-cu*; R_{1+2} atrophied; cell M_1 about one-half longer than its petiole.

Female.—Length, about 13 mm.; wing, 12.5 mm.

Frontal prolongation of head relatively long, nearly equal in length to the remainder of head, dark brown, the dorsal surface heavily gray pruinose; sides near apex a trifle more yellow; nasus slender; palpi dark

brown, the terminal segment broken. Antennae with scape and pedicel yellow, the former short, only about twice as long as the latter; flagellar segments yellow, the outer ones broken. Head gray, with indications of a capillary brown median vitta.

Pronotum dark brownish gray. Mesonotum dark gray, badly discolored in type. Pleura gray; dorsopleural membrane yellow. Halteres yellow, the knobs a trifle darker. Legs with coxae gray; trochanters obscure yellow; femora obscure yellow basally, the tips blackened, very extensively so on the fore pair, on posterior legs with only about the distal third darkened; tibiae obscure yellow, the tips blackened; tarsi black. Wings with the ground color yellow, the prearcular field and cell *Sc* clear light yellow, cell *C* a trifle more brownish yellow; a conspicuous brown pattern, as follows: Stigma elongate, confluent with a large area over fork of *Rs* and anterior cord; wing-apex, more intense in outer radial field; distal two-thirds of vein *Cu* in cell *M*, more interrupted before *m-cu*; posterior cord, outer end of cell 1st *M*₂ and outer medial veins much less distinctly seamed with brown; a conspicuous brown seam over virtually the entire length of vein 2nd *A*; axillary border narrowly darkened; in one wing of type with a small cloud at origin of *Rs*, lacking on opposite side; the yellow ground color includes most of the cells basad of cord and a broad post-stigmal band that virtually crosses the wing, becoming more widened in the outer medial field; veins yellow, darker in the patterned areas. Squama naked; veins beyond cord with abundant trichia. Venation: *Rs* relatively long, nearly two and one-half times *m-cu*; *R*₁₊₂ atrophied; cell 1st *M*₂ slightly narrowed outwardly, *m* being about two-thirds as long as the basal section of *M*₁₊₂; basal section of *M*₃ longer than *M*₃₊₄; cell *M*₁ about one-half longer than its petiole.

Abdominal tergites dark brownish gray, the more basal segments reddened laterally; basal sternites blackened, the intermediate ones more reddened. Ovipositor with genital shield piceous, elongate, exceeding the slender cerci, the latter slender, virtually straight.

Hab.—China (Kwangtung).

Holotype, ♀, Kau-lin San, Lien-p'ing District, altitude 700–900 meters, April 21, 1940 (J. L. Gressitt & F. K. To).

The most similar regional species are *Tipula* (*Oreomyza*) *obnata* Alexander, of Formosa, and *T. (O.) percara* Alexander, of Kweichow, particularly the latter. While very similar in general appearance, the latter differs in certain important details of wing venation and pattern, especially the shorter *Rs* and the deep cell *M*₁ which is fully twice as long as its petiole. Unfortunately the male sex in both of these flies remains unknown.

Limoniinae

4. *Limonia* (*Dicranomyia*) *rhinoceros* n. sp. (Fig. 3)

Belongs to the *tristis* (*liberta*) group; general coloration gray; antennae black throughout; knobs of halteres infuscated; fore legs blackened, with only the femoral bases restrictedly reddened; wings relatively long and narrow, grayish subhyaline; *m-cu* before the fork of *M*; 1. ale hypo-

pygium with the tergite narrowed posteriorly, its apex obtusely rounded; ventral dististyle with the rostral prolongation bearing at its extreme tip a small upturned slender lobe; rostral spines arising from individual tubercles placed at the ends of a transverse blackened plate.

Male.—Length, about 7.5 mm.; wing, 8.2 × 1.7 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments oval, constricted at their bases; terminal segment a little longer than the penultimate; longest verticils subequal in length to the segments. Head dark gray; anterior vertex reduced to a strip that is about one-half as wide as the diameter of scape, eyes correspondingly large; head narrowed behind.

Thorax with most of surface badly discolored by moisture, apparently clear light gray pruinose, this color still evident on the posterior sclerites of mesonotum despite the discoloration; evidences of three darker praescutal stripes persist. Halteres relatively long, stem yellow, knob infuscated. Legs with coxae dark, gray pruinose; trochanters reddish brown; fore legs black, with only the proximal fifth or sixth of the femora more reddened; posterior femora paler brown, the tips more narrowly and insensibly blackened; claws almost simple, with a basal mass of scarcely developed tubercles; empodia small, setiferous. Wings relatively long and narrow, as shown by the measurements; grayish subhyaline, the base restrictedly more whitened; stigma very small to scarcely evident, very pale brown, subcircular in outline; veins brown, those along cord with conspicuous oblative areas; prearcular veins paling to yellow. Venation: *Sc*₁ ending just beyond origin of *Rs*, *Sc*₂ some distance from its tip, *Sc*₁ alone about one-fourth as long as *Rs*; cell 1st *M*₂ about as long as the distal section of *M*₁₊₂; *m-cu* about one-third its length before the fork of *M*.

Abdomen, including hypopygium, brownish black, the surface chiefly pruinose. Male hypopygium (Fig. 3) with the ninth tergite, *9t*, strongly narrowed outwardly, the caudal margin obtusely rounded. Basistyle relatively small, its ventromesal lobe elongate, subcylindrical, the apex obliquely truncated and further produced into a smaller cylindrical lobe, at extreme apex with two modified flattened spinous setae, additional to numerous longer bristles of various sizes; at base of prolongation with a small, elongate-cylindrical lobe, at its apex bearing two or three long setae. Dorsal dististyle a long, nearly straight, slender rod, on distal fifth curved, terminating in an acute spinous point. Ventral dististyle, *vd*, large and fleshy, its area about twice that of the basistyle and its lobes; rostral prolongation stout, at tip bearing a small upturned slender lobe that bears a few setae; rostral spines two, from a common basal plate that is further produced into short individual tubercles that bear the spines, the latter slender, blackened, subequal. Gonapophyses, *g*, erect, produced directly into the slender blackened mesal-apical lobe, the latter small, strongly curved to the acute tip.

Hab.—China (Yunnan).

Holotype, ♂, Western Hills, near Kunming, altitude 2,100 meters, July 7, 1940 (J. L. Gressitt).

Allied to other regional species, such as *Limonia* (*Dicranomyia*) *sordida* (Brunetti), *L. (D.) subtristis* Alexander, *L. (D.) tristis* (Schumacher) and others, differing from all in the large size, unusually narrow wings, and, especially, the structure of the male hypopygium, as the curious lobe at apex of the rostral prolongation, this feature suggesting the specific name.

5. *Limonia* (*Dicranomyia*) *tenuifilamentosa* n. sp. (Fig. 4)

Belongs to the *tristis* (*liberta*) group; size large (wing, male, over 7 mm.); mesonotal praescutum gray, with three brown stripes; male hypopygium with the rostral prolongation of the ventral dististyle blackened at apex and more or less emarginate; rostral spines very unequal in size, the smaller one from a conspicuous basal tubercle; proctiger produced into two long pale filamentous lobes that are fringed with numerous elongate spinous points.

Male.—Length, about 7–7.5 mm.; wing, 7.5–8.3 mm.

Female.—Length, about 7.5–8.5 mm.; wing, 8–8.5 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments oval, the outer ones becoming more elongate; terminal segment about one-third longer than the penultimate. Head gray; anterior vertex relatively narrow, only about one-third the diameter of scape; head narrowed behind.

Pronotum dark gray. Mesonotum gray, the praescutum with three dark brown stripes; scutal lobes patterned with brown; posterior sclerites of notum lighter gray. Pleura gray, more or less variegated with darker, especially on sternopleurite; dorsopleural membrane brownish yellow. Halteres with stem whitened, knob infuscated. Legs with coxae dark brown, pruinose; trochanters brownish yellow; femora pale brown, passing into darker brown at tips; tibiae and tarsi black. Wings narrow, whitish subhyaline, the prearcular field pale yellow; stigma very small, pale brown, becoming darker over vein R_2 ; very narrow to scarcely indicated dusky seams over the cord; veins brown, more yellowish in the prearcular field. Venation: Sc short, Sc_1 ending a slight distance beyond origin of Rs , Sc_2 opposite this origin; $m-cu$ shortly before fork of M ; vein 2nd A sinuous, narrowing cell 1st A just beyond level of arculus.

Abdomen brownish black, including the hypopygium with the exception of the chiefly yellow ventral dististyles. Male hypopygium (Fig. 4) with the tergite transverse, broadest across base, narrowed outwardly but with the apex broadly truncated and obtuse. Basistyle, b , relatively small, its total area less than that of the ventral dististyle; ventromesal lobe long-cylindrical, its tip obtuse, with the setae grouped on the distal third; besides the normal bristles, some of which are unusually strong, a small pencil comprising about eight setae on the face of style at near two-thirds the length; besides the ventromesal lobe, the main body of style provided with two tubercles, a longer one on face, tipped with several unusually long setae that exceed the tubercle in length; on mesal face near apex with a smaller tubercle that is tipped with about five long setae. Dorsal dististyle a strong blackened rod, its tip very gradually narrowed

into a long spine. Ventral dististyle, vd , yellow; rostral prolongation stout, its apex blackened, obliquely truncated or weakly emarginate; on outer face of prolongation back from tip with two rostral spines, these very unequal in size, placed close together; longer spine from a scarcely developed slender basal tubercle that merges gradually with the spine, the total length about twice that of the smaller, more slender spine which arises from a stout conspicuous tubercle. Gonapophyses, g , with mesal-apical lobes blackened, the tip decurved into a short spinous point; margin of lobe with coarse, irregular lobes or obtuse teeth. What is interpreted as representing the proctiger, pr , appears as two long pale filamentous lobes or blades, narrowed outwardly, their surface, particularly the margins, produced into very numerous elongated points; these latter are not setae but direct spinous extensions of the surface.

Hab.—China (Yunnan).

Holotype, ♂, Kunming, altitude 1,900 meters, July 5, 1940 (J. L. Gressitt). *Allotopotype*, ♀, July 1, 1940. *Paratopotypes*, 1 ♂, 1 ♀, with the allotype; *paratypes*, 3 ♀ ♀, Western Hills, near Kunming, altitude 2,100 meters, July 7, 1940 (J. L. Gressitt).

The present fly is very different from the other regional species of the group in the structure of the male hypopygium, especially the filamentous lobes of the proctiger and the rostral prolongation of the ventral dististyle. Superficially it most resembles *Limonia* (*Dicranomyia*) *rhinoceros* n. sp., but is entirely distinct.

6. *Limonia* (*Dicranomyia*) *perobtusa* n. sp. (Fig. 6)

Belongs to the *tristis* (*liberta*) group; general coloration gray, the praescutum with a brown median stripe and somewhat less evident lateral ones; wings grayish subhyaline, very restrictedly patterned with brown, including the small inconspicuous stigma; cell 1st M_2 elongate; male hypopygium with the tergite transverse, the central portion of its caudal margin truncate; rostral prolongation of the ventral dististyle unusually broad and obtuse at apex; rostral spines two, unusually small, only about one-third the width of the prolongation opposite their point of insertion; gonapophyses with mesal-apical lobe long and slender, with smooth margins.

Male.—Length, about 6 mm.; wing, 7 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments relatively short-oval. Head gray.

Pronotum dark gray. Mesonotum chiefly gray, the praescutum with a conspicuous median brown stripe that is slightly constricted at near midlength, the lateral stripes less evident; scutal lobes similarly darkened; posterior sclerites of notum lighter gray. Pleura light gray, vaguely patterned with darker. Halteres with stem whitened, knob weakly darkened. Legs with coxae dark gray; trochanters obscure testaceous yellow; femora brown, the tips passing into brownish black; tibiae and basitarsi light brown, their tips darker; remainder of tarsi black. Wings relatively long and narrow, pale grayish subhyaline, the base more whitened; very restricted to scarcely indicated darkenings at arculus; fork of Sc and

origin of R_s ; a stigmal seam over R_2 ; very vague to scarcely indicated clouds over the cord and outer end of cell 1st M_2 ; veins brown, very pale at wing-base. Venation: Sc_1 ending just beyond origin of R_s , Sc_2 at its tip; R_2 in alignment with and much longer than the free tip of Sc_2 ; cell 1st M_2 elongate, exceeding vein M_{1+2} beyond it and approximately three times as long as M_4 ; $m-cu$ close to fork of M .

Abdomen dark gray; hypopygium brownish black, the ventral dististyle pale yellow. Male hypopygium (Fig. 6) with the tergite, $9t$, transverse, broadest subbasally, narrowed outwardly, the apex extensively truncated. Basistyle, b , small, its total area approximately two-thirds that of the ventral dististyle; ventromesal lobe large and bulbous, the setae arranged at distal end, including a pencil of unusually long setae; two additional darkened tubercles tipped with long setae, the larger one on face of style beyond midlength, the second on mesal face near the outer angle. Dorsal dististyle a long slender rod, before apex a trifle wider, thence narrowed into a long straight apical spine. Ventral dististyle, vd , with the rostral prolongation unusually broad and obtuse at apex, the two rostral spines unusually small, placed close together at near midlength of outer margin of the prolongation; spines subequal in length, about one-third the width of the rostrum opposite the point of their insertion. Proctiger a broad transverse pale membrane, its caudal margin broadly rounded, the median region very shallowly emarginate; surface with abundant spinous points. Gonapophyses, g , with mesal-apical lobe long and slender, its tip slightly decurved, the margins smooth; notch formed between the lobe and the body of apophysis relatively small.

Hab.—China (Yunnan).

Holotype, ♂, Kunming, altitude 2,100 meters, July 7, 1940 (J. L. Gressitt).

The present fly is most similar to species such as *Limonia* (*Dicranomyia*) *sordida* (Brunetti), widespread in southern Asia, and particularly to the subspecies *brevicula* Alexander, of Luzon, differing especially in the venation and in the structure of the male hypopygium, including the tergite, basistyle, rostral prolongation and gonapophyses.

7. *Limonia* (*Dicranomyia*) *subtristoides* n. sp. (Fig. 7)

Belongs to the *tristis* (*liberta*) group; general coloration gray, the praescutum with a conspicuous median brown stripe and less evident lateral ones; knobs of halteres weakly infuscated; wings whitish subhyaline, almost unpatterned; male hypopygium with the ninth tergite transverse, its caudal border very gently emarginate, the cephalic margin convex, so the sclerite is widest at the midline; dorsal dististyle slightly surpassing the width of the ventral dististyle; rostral prolongation long and slender, the two spines unusually long, from conspicuous basal tubercles; gonapophyses with margins of mesal-apical lobes smooth.

Male.—Length, about 6.5 mm.; wing, 7.2 mm.

Rostrum and palpi black. Antennae black, the scape slightly pruinose; flagellar segments oval. Head gray.

Thoracic notum gray, the praescutum with a conspicuous brown

median stripe, the lateral stripes small and much less evident; scutal lobes weakly patterned with darker; parascutella and posterior border of scutellum obscure yellow. Pleura gray, the dorsopleural region dark. Halteres long and slender, stem pale, knob weakly infuscated. Legs with coxae gray; trochanters brownish yellow; femora pale yellowish brown, the tips slightly more darkened; tibiae and tarsi passing through brownish black to black. Wings narrow, whitish subhyaline, the prearcular field even clearer; stigma barely indicated as a seam over R_2 ; seams over cord and elsewhere as found in allied species are here virtually lacking; veins pale brown, more yellowed in the brightened fields. Venation: Sc relatively short, Sc_1 ending a distance before origin of R_s that slightly exceeds its own length; R_s oblique, in approximate longitudinal alignment with basal section of R_{4+5} ; cell 1st M_2 about equal in length to vein M_{1+2} beyond it.

Abdomen brownish black, the hypopygium more brownish yellow, the ventral dististyles even more conspicuously yellow. Male hypopygium (Fig. 7) with the ninth tergite, $9t$, transverse, its caudal margin very gently emarginate, leaving very low and broad lateral lobes; cephalic margin of tergite convex in outline so that the sclerite is longest (across the sclerite) at the midline. Basistyle, b , with its total area subequal to that of the ventral dististyle; ventromesal lobe cylindrical, with the setae apical and distributed obliquely down the outer margin almost to base of lobe; a group of modified stronger bristles beyond midlength of lobe; on face of style the usual two additional lobes characteristic of the group, the larger one placed near base of the ventromesal lobe, tipped with long setae; smaller lobe very low and obtuse, darkened, its position indicated chiefly by four long dark-colored bristles. Dorsal dististyle a moderately slender rod, its tip acute; the style just exceeds the width of the ventral dististyle at the point where it normally rests. Ventral dististyle, vd , relatively large, as compared with *tristoides*, broadest across the outer portion, narrowed very gradually into the rostral prolongation, the latter blackened and obtuse at tip; rostral spines unusually long, gently curved, both from strong basal tubercles that are slightly unequal in size. Gonapophyses, g , with mesal-apical lobe slender, its acute tip feebly decurved, the margins smooth. Proctiger, pr , consisting of two broad lobes separated by a median notch, the outer surface provided with abundant spinulose points, the portion near the notch glabrous or virtually so.

Hab.—China (Yunnan).

Holotype, ♂, Kunming, Yunnan-fu, altitude 1,900 meters, July 5, 1940 (J. L. Gressitt).

The most similar described species is *Limonia* (*Dicranomyia*) *tristoides* Alexander, of Manchuria. This is best distinguished by the structure of the male hypopygium, particularly the tergite, basistyle, dististyles and gonapophyses. The ventral dististyle in *tristoides* is even narrower, with the dorsal dististyle extending some distance beyond its outer margin. The shape of the structure herein called the proctiger is described in general terms only for the various species discussed. Undoubtedly excellent specific characters will be found in this structure when it is more carefully studied in *Dicranomyia*.

8. *Limonia (Alexandriaria) unibrunnea* n. sp.

General coloration of thoracic notum dark brown; thoracic pleura with anterior portion dark brown, the posterior sclerites yellow; fore coxae darkened, the others yellow; remainder of legs yellowish brown; wings with a faint brownish tinge; *Sc* relatively long, *Sc*₁ ending just before origin of *Rs*, *Sc*₁ long, nearly equal to vein *R*₁; *Rs* subequal in length to basal section of *R*₄₊₅; male hypopygium with the tergite notched medially, forming broadly rounded lateral lobes; rostral prolongation of ventral dististyle slender, with two slightly unequal rostral spines.

Male.—Length, about 4.5 mm.; wing, 5 mm.

Rostrum light brown; palpi somewhat darker. Antennae dark brown, the pedicel somewhat darker; basal flagellar segments oval, the first one-half longer than the second and with a conspicuous basal pedicel; outer segments more elongate, the terminal one only slightly less than twice as long as the penultimate. Head dark brown, brighter on occiput; anterior vertex reduced to a narrow strip.

Thoracic dorsum almost uniform dark brown, the humeral region of praescutum and the median region of scutum near the suture paler brown; pleurotergite abruptly paler, brownish yellow. Pleura with the propleura and mesepisternum dark brown; dorsopleural membrane, mesepimeron and metapleura abruptly pale. Legs with the fore coxae dark brown, the remaining coxae yellow; trochanters testaceous yellow; legs light brown or yellowish brown throughout; claws with a slender basal spine. Wings with a very faint brownish tinge, the prearcular and proximal costal fields more yellow; stigma oval, very pale brown, only a trifle darker than the ground; veins pale brown. Costal fringe at near midlength of wing long and conspicuous, becoming much shorter near wing base. Venation: *Sc* relatively long, *Sc*₁ ending immediately before origin of *Rs*, *Sc*₂ far from its tip so that *Sc*₁ alone is nearly equal to vein *R*₁; *Rs* relatively long, arcuated, subequal to basal section of *R*₄₊₅; free tip of *Sc*₂ and *R*₂ in transverse alignment; *m-cu* immediately before the fork of *M*, a little longer than the distal section of *Cu*₁; vein 2nd *A* evenly convex, not gently sinuous, as in allied species.

Abdominal tergites and most of hypopygium dark brown, the sternites and ventral dististyles paler, more yellowish. Male hypopygium with the tergite transverse, the caudal margin with a broad V-shaped notch that isolates broadly rounded lateral lobes, these provided with coarse setae. Dorsal dististyle a strongly curved sickle, widest at and just beyond midlength, thence very gradually narrowed into a long spine. Ventral dististyle large and fleshy, oval, its area approximately twice that of the basistyle; rostral prolongation slender, the tip obliquely truncated; two slightly unequal rostral spines, placed close together near the base of prolongation, the inner spine slightly longer. Gonapophyses with mesal-apical lobe long and slender, with smooth margins, the tip narrowly darkened, stout but acute.

Hab.—China (Kwangtung).

Holotype, ♂, Lin-ping to Noi-koon, Lien-p'ing District, April 14, 1940 (J. L. Gressitt & F. K. To).

The only other species of the subgenus *Alexandriaria* Garrett known from China is *L. (A.) atayal* Alexander, known from Formosa and Fukien. This is apparently the closest relative of the present fly, differing especially in the coloration of the body and wings, and in the details of venation, as the length of *Rs*, the short distal section of *Cu*₁, and the more sinuous vein 2nd *A*.

9. *Helius (Helius) lienpingensis* n. sp. (Fig. 2)

General coloration dark brown, the scutellum, postnotum and ventral pleurites more testaceous yellow; anterior vertex (male) very narrow; wings strongly tinged with brown, stigma and apex slightly darker; cell *R*₂ at margin about two and one-half times as extensive as is cell *R*₁; male hypopygium with the lateral tergal arms appearing as narrow oval blades, each with the outer margin produced laterad into a powerful spinous point, separated from the main body of blade by a narrow notch; outer dististyle with a short subapical spine; aedeagus straight.

Male.—Length, about 5.5 mm.; wing, 6 mm.

Rostrum about equal in length to the remainder of head, brown; palpi darker brown. Antennae with scape and pedicel dark brown; flagellum broken. Head dark brown, vaguely pruinose; anterior vertex reduced to a linear strip, eyes correspondingly large.

Pronotum and anterior portion of mesonotum dark brown, the scutellum and postnotum paler, more testaceous yellow. Propleura and dorsal portion of mesopleura, including the dorsopleural membrane and anepisternum, infuscated; ventral pleurites, with the pleurotergite, testaceous yellow. Halteres with stem infuscated, narrowly but abruptly yellow at base, knob broken. Legs with the coxae yellowish brown, the fore pair darker; trochanters yellow; remainder of legs broken. Wings strongly tinged with brown, slightly more yellowish brown in the prearcular and costal fields; stigma and wing apex in outer radial field a very little darker; veins brown. Costal fringe dense and relatively long. Venation: *Sc*₁ subatrophied, about opposite five-sixths the length of *Rs*, *Sc*₂ perpendicular to its tip, conspicuous; anterior branch of *Rs* gently sinuous; cell *R*₂ approximately two and one-half times as wide at margin as cell *R*₁; cell 1st *M*₂ generally rectangular in outline, a little narrowed outwardly, shorter than any of the veins beyond it; *m-cu* more than one-half its length beyond the fork of *M*.

Abdominal tergites light brown, narrowly bordered caudally and slightly more extensively on the sides with dark brown; basal sternites more uniformly pale; outer segments, including the hypopygium, more uniformly dark brown. Male hypopygium (Fig. 2) with the lateral tergal arms, *9t*, unusually narrow, appearing as slender oval blades, their outer margin produced laterad into a powerful flattened spinous point that is separated from the main body of blade by a narrow notch. Basistyle, *b*, without lobes. Outer dististyle a small blackened glabrous rod, at apex narrowed into a strongly curved point, with a small lateral denticle some distance back from tip. Inner dististyle, *id*, about twice as long as the outer, the distal half decurved. Aedeagus, *a*, apparently straight, not strongly spiraloid as in related species.

Hab.—China (Kwangtung).

Holotype, ♂, Lin-ping to Noi-koon, Lien-p'ing District, April 14, 1940 (J. L. Gressitt & F. K. To).

Helius (Helius) lienpingensis is most similar to *H. (H.) tienmuanus* Alexander, of northern Chekiang, which differs especially in the structure of the male hypopygium, particularly the tergal blades, dististyles and aedeagus. The apparently straight and relatively short aedeagus is quite different from all similar forms, yet the organ does not appear to be broken or mutilated in any manner. Although the unique type is in poor condition I do not hesitate to describe the species as new. The homologies of what I have here and elsewhere called "tergal blades" remain in question, as do certain phallosomic parts in various other groups of the Tipulidae. In some other papers I have considered these blades to represent gonapophyses but they seem rather to belong to the tergite.

10. *Hexatoma (Eriocera) elevata* n. sp. (Fig. 5)

Size small (wing, female, 8 mm.); general coloration of body dark brown; halteres relatively long, dark brown; legs yellow; wings with a strong reddish brown tinge; outer veins of wing with macrotrichia; vein R_{2+3+4} unusually arched, perpendicular at its origin; R_s and both sections of R_5 in direct longitudinal alignment; cell 1st M_2 about as long as vein M_3 beyond it; $m-cu$ at near two-thirds the length of cell 1st M_2 ; ovipositor with unusually elongate valves.

Female.—Length, about 9 mm.; wing, 8 mm.

Rostrum and palpi brownish black. Antennae with scape and pedicel dark brown to brownish black; flagellum broken. Head dark brown, the surface subopaque by a sparse pruinosity; vertical tubercle low but evident, depressed on either side; anterior vertex wide, approximately four times the diameter of scape.

Pronotum dark brown. Mesonotum almost uniformly dark brown to brownish black, the surface subnitidous, somewhat more pruinose on the scutellum and postnotum; no praescutal stripes or setae. Pleura brownish black. Halteres dark brown, relatively long. Legs with the coxae brownish black; trochanters somewhat paler; femora obscure yellow, the tips narrowly and weakly darkened; remainder of legs yellow, only the terminal tarsal segments darkened. Wings (Fig. 5) with a strong reddish brown ground, virtually undifferentiated or patterned; one wing of the unique type differs from the other as described, the proximal third or more being strongly darkened, the paler outer portion vaguely patterned by more yellowish spots, particularly in the vicinity of the cord; veins reddish. Macrotrichia of veins beyond cord numerous, long and conspicuous, occurring on R_3 , R_4 , R_5 , distal sections of M_{1+2} and M_3 , and on M_4 . Venation: Sc_1 ending about opposite $r-m$, Sc_2 some distance from its tip, Sc_1 alone subequal to $r-m$; R_s relatively long, fully equal to the distal section of R_5 ; R_{2+3+4} unusually arched or elevated, at origin perpendicular or virtually so; R_{1+2} and R_{2+3} subequal; R_s in direct longitudinal alignment with both sections of R_5 , forming a straight line to margin or virtually so; cell 1st M_2 rectangular, about equal in length to vein M_3 be-

yond it; $m-cu$ at near two-thirds the length of cell 1st M_2 , about one-half longer than the distal section of Cu_1 ; cell 2nd A relatively narrow, the vein unusually straight.

Abdomen dark brown, including the genital shield, the sternites a little paler. Ovipositor with the cerci and hypovalvae yellowish horn color, elongate, especially the nearly straight, slender cerci.

Hab.—China (Kwangtung).

Holotype, ♀, Loh fau shan, altitude 4,200 feet, July 25, 1937 (received from the Heude Museum, type to be returned).

This small species is readily told from all other described regional forms by the venation. In the arched R_{2+3+4} it suggests species such as *Hexatoma (Eriocera) kamiyai* Alexander, *H. (E.) kariyai* Alexander, and others, but is entirely distinct.

11. *Gonomyia (Protagonomyia) praetenuis* n. sp. (Fig. 8)

General coloration black, sparsely pruinose; antennae and legs black; wings whitish subhyaline, the stigma unusually long and narrow, brown; male hypopygium with the outer dististyle an unusually narrow pale blade that is drawn out into a long and slender spinous point, its tip curved; aedeagus moderately flattened, the apex a short decurved point.

Male.—Length, about 6 mm.; wing, 6.5 mm.

Rostrum and palpi black. Antennae with scape dark brown, sparsely pruinose; pedicel and flagellum black; flagellar segments elongate-oval to subcylindrical, the longest verticils about as long as the segments, unilaterally distributed. Head dark plumbeous gray, more reddened in front and on extreme posterior portion; anterior vertex broad, nearly three times the diameter of scape.

Pronotum black, the scutellum and pretergites orange yellow. Mesonotal praescutum black, the surface pruinose to produce a plumbeous effect, the stripes not or scarcely evident; humeral region orange-yellow; posterior border of scutellum vaguely reddened; postnotum plumbeous, the dorsal half of pleurotergite and extreme adjoining borders of mediotergite obscure yellow. Pleura black, sparsely pruinose, more variegated with obscure yellow on the dorsopleural membrane and ventral pteropleurite. Halteres blackened, base of stem narrowly yellow. Legs with coxae black, very sparsely pruinose; trochanters dark brown; remainder of legs black. Wings whitish subhyaline, the base a trifle more whitened; stigmal region brown, very long and narrow, adjoining vein R_1 , not reaching vein R_3 behind; veins dark brown, those in posterior portion of prearcular field paler. Venation: Sc long, Sc_1 ending only a short distance before the fork of R_s , Sc_2 some distance from its tip so Sc_1 alone is about two-fifths R_s ; R_{2+3+4} straight, about twice the basal section of R_5 ; cell 2nd M_2 nearly three times its petiole; $m-cu$ immediately before the fork of M .

Abdomen, including hypopygium, black. Male hypopygium (Fig. 8) with the outer lobes of basistyle, b , stout, flattened. Outer dististyle, od , a very long slender yellow rod, slightly expanded at base, thence unusually narrowed and attenuated, tapering gradually to a hair-like curved

tip. Intermediate style, *md*, with the stem conspicuously hairy; branches very unequal in size and shape, the outer one unusually long and slender, with a fringe of long setae on the proximal third; inner branch a flattened paddle. Inner dististyle, *id*, a flattened-triangular dark lobe, with about a dozen strong setae at the subacute tip. Aedeagus, *a*, moderately flattened, the apex a short decurved point; surface of blade with numerous elongate setae.

Hab.—China (Kweichow).

Holotype, ♂, Kweiyang, altitude 1,000 meters, July 12, 1940 (J. L. Gressitt).

In its hypopygial structure, the present fly is most similar to the type of the subgenus, *Gonomyia* (*Protogonomyia*) *confluenta* Alexander, of Formosa, while being entirely different from the other species so far discovered in China, *G. (P.) perturbata* Alexander and *G. (P.) tienmuensis* Alexander. Whether the organ of the hypopygium above described as being an inner dististyle is actually a dististyle or an inner lobe of the basistyle remains somewhat in question but in the light of more abundant material received in late years, it now appears to represent a third dististyle, as above described.

THE STUDIES OF CHINESE FERNS—XXXII

By R. C. CHING

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Dryopteris neochrysocoma, sp. nov.

Species *D. chrysocoma* (Christ) valde affinis, differt habitu magis gracili, pinnis lateralibus e basi deltoidea lanceolatis, segmentis marginibus grosse denticulatis, dentibus deltoideis, acutis, venis plerique simplicibus, infimi anteriori soriferi, caeteris sterilibus, indusiis paulo parvioribus, brunneis, leviter sinuatis.

Rhizome short, thick, erect, densely clothed in ovate-lanceolate, acuminate, brown, thin, denticulate scales intermixed with linear ones; leaves fasciculate, uniform, stipe slender, stramineous, densely scaly, muricate, subglabrous upwards, 8–12 cm. long, lamina 20 cm. long or slightly longer, 6–8 cm. broad at base, the middle, bipinnatifid, acuminate; pinnae 10–14-jugate, horizontally patent, 1.5–2 cm. apart, the basal ones are farther apart, 3 cm. long, the middle ones 4–5 cm. long, 1.2–1.5 cm. broad at base, deltoide-lanceolate, acute, base broadened, oblique-truncate, short-petiolate, pinnatifid to a narrow wing along costa into 6–8 pairs of deltoide-oblong, rounded, distinctly dentate segments, teeth 6–9 to each segment, deltoide, acute or bluntish, veins 3–4-jugate, generally simple, the posterior basal one or two often forked, the anterior basal one always simple and soriferous, rachis sparingly clothed in linear brown scales, both sides glabrous; texture thin herbaceous, dry brownish; sori, as a rule, uniseriate on each side of pinnae near the costa, i.e., one to each segment, borne dorsally on the anterior basal vein below the sinus, or very rarely 2–3 to the lower basal segment in the lower pinnae, indusium crustaceous, globular, brown, with very shallow sinus, persistent.

KWANGTUNG: Jen-hwa District, Man Chi Shan, Shek Pik Ha Village, W. T. Tsang No. 26479 (type), growing in thickets on steep slope, fairly common, June 1–6, 1936, Lingnan University with the co-operation of the Arnold Arboretum, Harvard University; Loh-fau Shan, N. K. Chun No. 40905; Sam Kok Shan, Tsingfa-Lungmoon Districts, W. T. Tsang No. 20550.

A very distinct species, somewhat related to *D. chrysocoma* (Christ) C. Chr. from West China and is easily distinguished by the differences pointed out in above diagnosis. N. K. Chun No. 40905 and W. T. Tsang No. 20550 from the same region were previously referred to *D. chrysocoma* in my monograph of the genus. With ample material now before me, I can easily tell the species apart from *D. chrysocoma*, which has a much stronger habit, the linear-lanceolate pinnae with scarcely broadened base, oblong segments with rounded or rotundo-truncate apex and subentire,

or at most suberenate margin, all the veins forked, the larger sori, 2-4 or 6 to each segment, the larger gray indusium with a very deep sinus, the leaves of thicker texture and oblique pinnae, of which the basal pair is decidedly shorter than that next above.

Cornopteris Tsangii, sp. nov.

Athyrium Tsangii Ching, in herb.

Species *Athyrium decurrenti-alatae* (Hook.) Cop. valde similis, differt dimensiones magis minoribus, simplicibus, frondes bipinnatis, haud tripinnatifidis.

Rhizome thick, erect; leaves approximate, stipe 10-15 cm long, slender, dead straw-colored, blackish and naked towards base, lamina deltoid, acuminate, to 32 cm. long, 26 cm. broad at base, bipinnatifid or subbipinnate; pinnae 7-9 pairs under the deltoid acuminate deeply pinnatifid apex, all sessile, the uppermost ones adnate, opposite and horizontally patent, 3.5 cm. apart, basal pinnae the longest, to 15 cm. long, the upper next pair to 11 cm. long, those further above are gradually shortened, the upper middle ones to 6 cm. long, apices turn upward, the basal pair 4 cm. broad, broadly lanceolate, with sharply serrate and acuminate apex, pinnatifid to a very narrow wing along costa into 10 pairs of patent, oblong, rounded segments 2-2.5 cm. long, little less than 1 cm. broad, separated by broad rounded sinuses, the posterior basal 1-3 segments greatly abbreviated or auriculate, margin subentire, or often with a few remote sharp teeth, especially at apex, the upper pinnae pinnatifid half way down with roundish entire segments and 3-4 simple veins; the veins in segments of lower pinnae 3-4 in each group, distinct on both sides; texture submembranaceous, glabrous on both sides, dry opaque, costa above grooved and provided with a large, lanceolate spine at the base of costule of each segment; sori linear or elongate oblong, exindusiate, cinnamon-brown, sparse, 1-2 pairs to each segment, sometimes forked in the lower pinnae, borne along the veins.

KWANGTUNG: Jen-hwa District, Man Chi Shan, Shek Pik Ha Village, W. T. Tsang No. 26389, in loamy soil near shaded ravine, abundant, May 21-30, 1936, Lingnan University with the co-operation of the Arnold Arboretum, Harvard University.

Cornopteris likiangensis, sp. nov.

Athyrium likiangense Ching, in herb.

Species precedentes valde affinis, differt stipite paleis brunneis lanceolatis sparse obtecto, nec non hirsuto, foliis subtus praecipue ad costas pinnarum pilis albidis multicellulatis intestiniformibus sparsis, pinnis minus profunde pinnatifidis, segmentis contiguis, sinubus nullis, apice truncatis vel rotundatis.

Rhizome thick, erect; leaves fasciculate, stipe 15-20 cm. long, pale stramineous, sparsely clothed in brown, lanceolate scales and also hairy, lamina deltoid-oblong, 18-34 cm. long, 15-23 cm. broad at base, bipinnatifid; pinnae 8-10-jugate, falcate-lanceolate, patent, opposite, 2-2.5

cm. apart, sessile; the basal pair often deflexed, as large as that next above, but broader, 8-11 cm. long, 3-3.5 cm. broad at the middle, pinnatifid to a broad wing along costa with 10 pairs of close, broadly oblong, truncate, or subtruncate, entire segments, of which the middle ones on the lower side of costa 1.5-2 cm. long, gradually abbreviated towards base, with the posterior basal one reduced into an auricle, the middle pinnae with truncate base pinnatifid only half way down with nearly square and truncate apex; veins in the segments of lower pinnae 5-6-jugate, forked, in the upper pinnae 4-5-jugate, simple; texture very thin herbaceous, soft, dry opaque, glabrous above, provided underneath and especially on rachis and costa with white septate soft hairs, costa above spiny at the base of costule; sori linear or oblong, exindusiate, 3-5 pairs to the lower large segment, 2-3 pairs to the upper ones.

N. W. YUNNAN: Likiang, mountains S. of Kai-tze on the Yangtze, K. M. Feng No. 2632, along the edge of stream under forest, 2700 m. alt.

Easily distinguished from the preceding species by a sparsely scaly, pale stramineous, or greenish stipe, which is also hairy, the hairy under side of leaves and the less deeply pinnatifid pinnae with very close, contiguous, oblong, truncate segments without sinuses between them.

Cornopteris opaca (Don), comb. nov.

Hemionitis opaca Don, Prod. Fl. Nepal. 13, 1825.

Dryopteris opaca C. Chr., Ind. Fil. 280, 1905, c. syn.

Athyrium opacum Cop., Phil. Jour. Sci. Bot. 3: 279, 1908.

Himalayas, West China to Tonkin.

Leaves large, tripinnatifid.

As a genus, *Cornopteris* Nakai (Bot. Mag. Tokio 44: 7, 1930), represented now by about a dozen species in East Asia, is a segregate from *Diplazium*, or *Athyrium* in broad sense, and characterized by a distinct habit, the very thin leaf-texture, always dry opaque or nearly so, the horizontally patent, sessile and opposite pinnae, with the basal pair always the broadest, having the segments or pinnules on the lower side of costa greatly abbreviated towards the base, the linear (sometimes forked in the lower pinnae), exindusiate, cinnamon-brown sori and the broadly winged bilateral spores. It is apparently a little offshoot of the exindusiate *Diplazium*, and also related to *Athyrium* by, among other characters, the presence of spines on the upper side of costa at the base of costules or midribs. I prefer to regard it as distinct from both *Diplazium* and *Athyrium*.

Pyrrhosia assimilis (Bak.) Ching var. *longissima*, var. nov.

A typo differt foliis linearibus ad 27 cm. longis, ad apicem caudato-attenuatis, caeteris formae normalis similis.

KWANGTUNG: Jen-hwa District, Man Chi Shan, Shek Pik Ha Village, W. T. Tsang No. 26223, on moist rocks near a ravine, fairly common, April 21-30, 1936, Lingnan University with co-operation of the Arnold Arboretum, Harvard University.

This variety is distinguished by the exceedingly long linear leaves.

All the specimens of the species including the type so far examined have leaves generally from 10-15 cm. long.

Pyrrhosia tibetica, sp. nov.

Species *Py. tonkinensis* (Christ) Ching proxime affinis, differt foliis magis longioribus tatoribusque, textura tenuioribus, inferne indumentum griseo-brunnum, pilis stellatis superioribus densissimis, radiis longioribus.

Rhizome creeping along the trunk of trees, densely clothed in ferruginous-brown, lanceolate, acuminate, ciliate scales; leaves approximate, elongate linear-lanceolate, acuminate, 50-60 cm. long, 8-14 mm. (generally 10 mm.) broad in the upper one-third part, gradually attenuate towards both ends, decurrent downward nearly down to the base of flattened greenish-gray subsessile stipe, about 3-4 mm. broad at 10 cm. above the base, margin narrowly reflexed throughout, sparsely clothed in the lower part beneath in brown stellate and deciduous hairs, the indumentum on the under side of the grown-up blade rather thin, dimorphic: the lower layer consisting of thin grayish-white furfuraceous crisped hairs, the upper stellate hairs are brown and dense with long, spreading arms, glabrous and green with distinct, sparse, not pitted hydathodes above, midrib distinct on both sides, lateral main veins none; texture subcoriaceous, soft, venation quite distinct against light; sori round, small, sparse, distinct, irregularly 3-seriate on each side of midrib, borne near the clavate apices of included free veinlets, occupying half (or less) the length of the leaves.

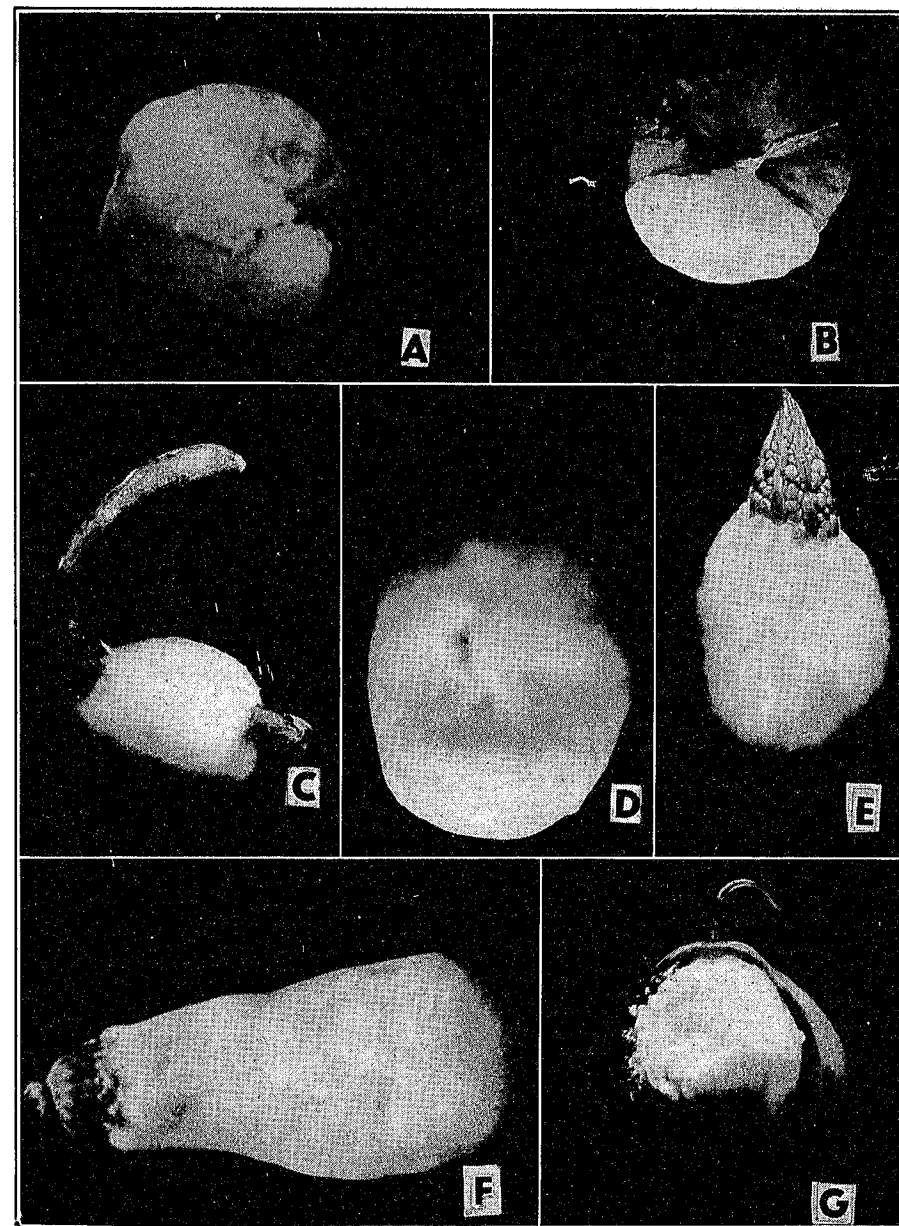
N. W. YUNNAN: Chiu-kiang Valley, N. of Tihitung, on the border of Tibet, *T. T. Yü* No. 20530 (type), upon bark of trees, 1300 m. alt., casual, Sept. 30, 1938; Taron-Taru divide, Lahpi, *T. T. Yü* No. 20861, upon tree trunks, with creeping rhizome, common, 16-2000 m. alt., Oct. 28, 1938.

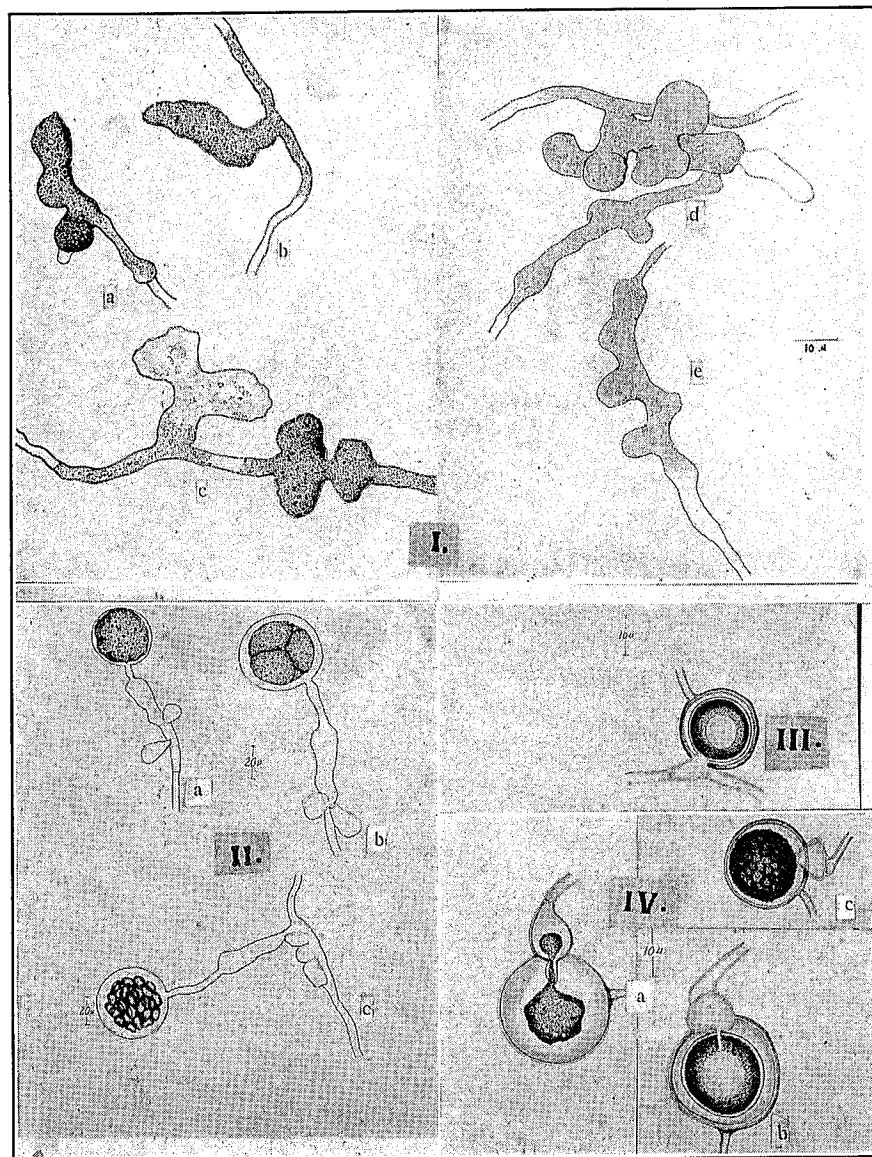
I do not know any species from the region that can favourably be compared with our new fern in habit, except *Py. tonkinensis* (Christ), which, besides a more southerly geographic area, differs in much more linear and shorter leaves with grayish indumentum, having only a few upper stellate hairs with shorter arms. The species is apparently closely related to *Py. mollis* (Kze.) Ching, which is distinguished by lanceolate or oblanceolate leaves generally 10-15 cm. long, with brighter dense brown indumentum beneath and the crowded and regularly seriate sori. Our species is decidedly distinct by its unusually long linear-lanceolate leaves of rather a soft texture, the venation distinct against light and the sparse, irregularly placed sori quite far apart.

Var. *angustata*, var. nov.

A typo differt, foliis linearibus, brevioribus, 30-37 cm. longis, angustioribus, 6-7 mm. latis, textura magis rigidiora, venis non visis, sori utraque costae latere irregulariter 2-seriatis.

N. W. YUNNAN: Chiu-kiang Valley (Taron), Michiaoton, *T. T. Yü* No. 19928, on precipitous rocks in shady and moist places, casual, 1600 m. alt., Aug. 21, 1938.





The variety seems, at first glance, very different from the typical form by its shorter, elongate linear leaves similar to *Py. tonkinensis* (Christ), of thick texture and irregularly 2-seriate sori, but agrees with the type in other more constant characters.

Vittaria (§Taeniopsis) Lauana, sp. nov.

Species *V. flexuosae* Fée himalayensae proxime affinis, differt, paleis rhizomatis nigris, iridescentibus, foliis longioribus, ad 60 cm. longis, magis latoribus, 1.2-1.7 cm. latis, textura rigide crassiora, in sicco opaco-brunneis, sori superficialibus, intramarginibus, margine foliis vix reflexis.

Rhizome creeping, rather thick, densely clothed in black, iridescent, lanceolate, long-attenuate, hair-pointed, sparsely ciliate and imbricate scales; leaves approximate, 12-17 mm. broad, 45-60 cm. long, including stipe about 10-16 cm. long, gradually attenuate to both ends, sparsely scaly on the lower part of stipe with black linear-subulate ciliate deciduous scales; texture rigidly subcoriaceous, dry opaque-brown, midrib thick, prominently raised beneath, invisible above, veins hidden, very oblique; sori superficial, linear, continuous, placed 1 mm. within the entire sterile margin which remains flat or subreflexed towards apex, paraphyses dense, top-shaped, clear brown; spores reniform-oblong, clear brownish-white, with a large round cavity in the middle on the ventral side.

HAINAN: Chim Fung Mt., near Fong Ngau Po Village, Kan-en District, S. K. Lau No. 5217, on dry steep rocks under forest, rare, Lingnan University 12th Hainan Expedition, Jan. 2-31, 1935.

A very distinct species, characterized by the broad lanceolate leaves of rigid texture, dry opaque-brown and the superficial sori with flat sterile outer margin. It seems a common fern on the island and also in the southern part of the Kwangtung mainland, wherefrom I have seen a number of similar specimens that were tentatively named by me *V. flexuosa* var. *latifolia* (ined.).

Polystichum xiphophyllum Baker

SZECHWAN: Mt. Omei, C. S. Cheng No. 322, 1200 m. alt.

Pinnæ 4-7 cm. long, with several adnate entire ovate lobes on the anterior side of the base.

Var. bipinnatum, var. nov.

A typo differt, pinnis praecipue inferioribus ad 10 cm. longis, pinnatis, vel fere ad costam pinnatis, pinnulis ovatis, integribus, basali anteriori maxima, 1.5 cm. longa, oblonga, minute serrata, petiolulataque.

SZECHWAN: Mt. Omei, C. S. Cheng No. 436, 1100 m. alt.

Var. integrum, var. nov.

A typo differt, pinnis inferioribus ad 8 cm. longis, integribus, basi inaequali, anteriori late deltoideo-auriculati, rarissime una loba ovata liberi instructis.

SZECHWAN: Mt. Omei, C. S. Cheng No. 437, 1100 m. alt.

Easily distinguished from the typical form by the entire and undivided larger pinnae, or occasionally the lower pinnae with one small, free ovate lobe on the anterior side of the base.

It seems that the typical form and the two varieties often grow in the same locality.

Pteretis orientalis (Hook.) comb. nov.

Struthiopteris orientalis Hook., 2nd. Cent. Ferns t. 4, 1860.

Onoclea orientalis Hook., Sp. Fil. 4: 161, 1862; Syn. Fil. 46, 1867.

Matteuccia orientalis Trev., Atti Ist. Veneto III. 18: 586, 1869; C. Chr. Ind. Fil. 420, 1905.

Pentarhizidium orientale Hayata, Bot. Mag. Tokio 42: 345, 1928.

Known from temperate China, East Himalayas and Japan.

Pteretis japonica (Hayata), comb. nov.

Pentarhizidium japonicum Hayata, Bot. Mag. Tokio 42: 345, 1928.

Matteuccia japonica C. Chr., Ind. Fil. Suppl. III. 127, 1934.

Known from Japan.

Scarcely different from the preceding species.

Pteretis intermedia (C. Chr.), comb. nov.

Matteuccia intermedia C. Chr., Bot. Gaz. 56: 337, 1913.

Pentarhizidium intermedium Hayata, Bot. Mag. Tokio 41: 715, 1927; 42: 346, 1928.

Known only from China (Shensi and lately from N. W. Yunnan) and Sikkim.

A very interesting species intermediate in habit between *Pt. struthiopteris* (L.) and *Pt. orientalis* (Hook.); differs from both in lack of indusium.

Protowoodsia, gen. nov.

Genus *Woodsiae* § *Euwoodsiae* habitu, configuratione et stipite continuo similis, differt praecipue folia utraque nuda, pilis articulatis et paleis brunneis linearibus desunt, indusiis inferioribus globosis griseo-membranaceis, satis magnis, apice ore rotundata contracto dehiscentibus, spores tetraedricae, transluscentibus, laevibus.

Species unica in Asia boreali-orientalis incola.

In general habit and the continuous stipe, the new genus agrees well with § *Euwoodsia*, which differs in the presence in varying degree on the leaf surfaces of the characteristically articulate brown or gray hairs, the small rudimental inferior indusium, as a rule, fringed with long articulate hairs all round the sori and the dark-colored or opaque bilateral spore with perispore. In the general appearance of indusium, the genus agrees well with § *Physematium* (Kaulf.), which differs in the leaves being more or less clothed in articulated hairs intermixed with chaffy scales, the stipe provided with a prominent joint at or near the first pair of pinnae, the globular and generally hairy indusium always finally ruptured from the top into irregular lobes and the bilateral spore with perispore. In

Protowoodsia, the large bladder-like membranaceous grayish-white indusium opens by a round hole at the top, never irregularly dehiscent, and the spores are also of very peculiar type, not yet seen in other ferns.

Protowoodsia manchuriensis (Hook.), comb. nov.

Woodsia (*Physematium*) *manchuriensis* Hook. 2nd. Cent. Ferns t. 98, 1861.

Diacalpe manchuriensis Trev., Nuov. Giorn. Bot. Ital. 7: 160, 1875.

Physematium manchuriensis Nakai, Bot. Mag. Tokio 39: 176, 1925.

Woodsia insularis Hance, Ann. Sci. Nat. IV. 15: 228, 1861 (non Baker in Hook. Syn. Fil. 47, 1867).

Confined to North China, also Korea and northern part of Japan.

The species has always been referred to § *Physematium*, but now found actually different in characters noted above.

TRICHINOSIS AMONG HOGS AND RATS IN FUKIEN

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Trichinosis has been a rare occurrence in China, although scattered cases have been reported from various animals. So far as definitely established records go, there are in all four reports. The very first was reported from Amoy in Chinese pork by Manson (1881) who found 2 positives out of 225 (0.9 per cent) diaphragm samples examined. Then it was more than fifty years later that Yugawa (1934) added a second record from Manchuria. Yugawa found that 14 out of 176 pariah dogs (8 per cent) in Liaoyang and Mukden were infected with *Trichinella spiralis*, and he also stated that the same infection had been found in swine in Harbin. Additional records were more recently made by Chin (1937) and Tang (1939). The former reported trichinosis in a cat in Mukden; the latter found a 2.19 per cent infection (3 out of 136) in rats at Shabsien, Fukien. On the other hand, many a worker in this country had done the same sort of work with negative results. Faust (1923) says, "There are no positive records of infection from inspected pork at Hankow and Tsingtao." In Canton, Riley and Chen (1932) examined diaphragm samples of 313 hogs and 32 rats with negative results. Chen (1933, 1936) continued to examine in the same area diaphragm samples of 69 rats and more than a thousand hogs but none was found by him to be positive. Tang (1939) examined 114 rats in the Foochow area without finding any evidence of the infection.

The present author became connected, in the fall of 1939, with the Fukien Provincial Medical College which is situated at Shabsien, the very locality where Tang had reported trichinosis in rats. As the infection with this parasite in hogs and rats is usually correlated, one may expect that hogs here should also be infected. We therefore made examinations of both of these mammals for *Trichinella* infection and in both, according to the expectation, positive results were obtained. The result of this investigation is here presented.

Material and Methods

Hogs in Shabsien were chiefly locally raised. The investigation was started from April 4, 1940, and was concluded on June 29 of the same year. Diaphragm samples from a total of 320 hogs were obtained and examined. For the first 178 samples, both microscopic examination and artificial digestion were employed; for the rest only the first method was adopted.

The adipose tissue on and in the muscle was removed. This is essential to later examination for, if fat globules were present, they would appear under the lens as clusters of bubble-like structures which would

greatly hinder the visibility of cysts if present. The fat-freed muscle was then teased into thin slices as far as possible and spread on to a glass plate of 200 by 100 mm. When sufficient amount of muscle was so mounted, a second glass plate of the same size and thickness was pressed on, and the two were held together by two pairs of flat wooden rods one on each end of the glass plates. The preparation was then thoroughly and carefully examined with a hand lens.

For digestion method, the muscle was first chopped into small pieces and then mixed with artificial gastric juice. The mixture was placed at 37°C. for 2 hours and was frequently stirred. The supernatant fluid after standing for some time was carefully decanted and the sediment was mounted on a slide and examined under the low power of a compound microscope.

Rats were trapped within the city wall of Shawsien with either cage traps or snap traps. During a period from February 24 to June 20, 1940, altogether 47 rats were trapped and examined. Of these, 11 were *Mus rattus* and 36 *M. norvegicus*. In the examination of rats for trichinosis, the process is much simpler. The diaphragm was removed from the host and blood rinsed off in water. It was then spread and compressed between two slide glasses tied with rubber rings or thread on both ends. The preparation could then be examined either with a hand lens or under a microscope.

Trichinosis in Hogs

In the first 251 samples, we failed to find any evidence of the infection, but on May 26, in sample No. 252, two encysted larvae were found. This sample, without the attached adipose tissue, had a total weight of 20.3 grams, and was afterward treated with artificial gastric juice. Not a single larva was found in the sediment. Four days later, a second positive case was found in sample No. 258. The infection was still lighter. In the 18.7 grams of muscle, only one cyst was found. A third case was met with in sample 262, on June 1. Again only 2 encysted larvae were recovered from a total of 20.6 grams of muscle. On June 4, a heavier infection occurred in sample 270, weighing 18.7 grams, in which we found in all 29 encysted larvae. These larvae were freed from their cysts with artificial gastric juice. Samples 271 to 319 were all negative, until we came to sample 320, the last sample we examined on June 29, in which the fifth positive was found. The infection was again very light. Only two cysts were found in 41.2 grams of the diaphragm muscle. The result may be summarized in Table 1.

As mentioned already, the total number of samples examined was 320, and the positive cases found were 5, the percentage of infection being therefore 1.56 per cent. This is slightly higher than what Manson (1881) found (0.9%) in Amoy. It should be noticed that the infection in all our cases is rather light, especially in the first three and the last samples. Such naturally light infections could easily be overlooked. So the actual percentage of infection may be higher than what is here given.

In all the cases, only a single larva was found encysting in one cyst.

TABLE 1
Positive Cases of Trichinosis Found in Hog Diaphragms

Sample No.	Date examined	Method used	Net weight of muscle	No. of cysts found
252	May 26, 1940	Microscopic examination & digestion	20.3 g.	2
258	May 30	same	18.7 g.	1
262	June 1	same	20.6 g.	2
270	June 4	same	18.7 g.	29
320	June 29	same	41.2 g.	2

Cysts measure $0.4-0.73 \times 0.22-0.27$ mm., with an average of 0.603×0.248 mm. Measurements of larvae were taken from those that were freed from cysts and are as follows: $1.04-1.15 \times 0.037-0.039$ mm., averaging 1.082×0.038 mm.

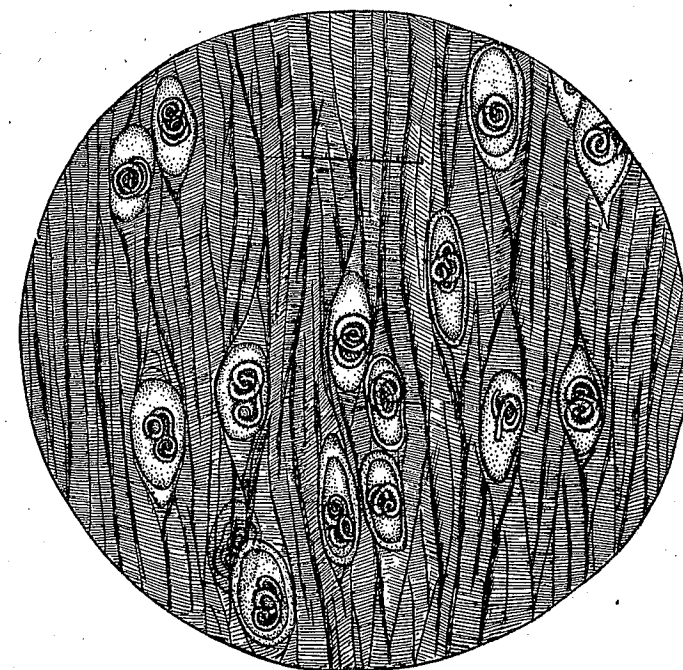


Fig. 1. A portion of the diaphragm of the brown rat under the low power objective, showing the heaviness of infection with larvae of *Trichinella spiralis*. The drawing was made with the aid of a camera lucida. The scale in the figure stands for 0.5 mm.

Trichinosis in Rats

Eleven specimens of *Mus rattus* were collected and examined, and none was found to be trichinosed. On the other hand, 4 out of 36 individuals of *Mus norvegicus* examined were found to be infected with this parasite, the incidence being therefore about 11 per cent, which is much higher than what Tang (1939) found (2.19 per cent) in the same area.

All the infected animals were fully-matured adults. One was collected in February, the other three in June. The intensity of infection was very heavy. From each diaphragm of two of the hosts, around 40 cysts were found. In the third host, over 100 cysts were counted from the whole diaphragm. The infection in the fourth one was unbelievably heavy. At least 1000 cysts were estimated in the whole diaphragm, which weighed 4.7 grams only. There were therefore about 213 cysts to each gram of muscle!

In all cases, only one larva was found in each cyst as in hog infection. This is also true even in the fourth rat which was heavily infected, in which only one cyst was found to enclose two coiled larvae.

Diaphragm, however, is not the only location where the larvae may encyst, although it is the place most convenient for examination. Except muscles of the heart and the alimentary tract, cysts were found almost everywhere in the muscles of the body. To name them in order of prevalence of infection, they are: diaphragm, neck, intercostal, tongue, abdominal, and leg muscles. In the present study only the diaphragm was examined.

Cysts and larvae were also measured. They are much smaller than those from hogs. Cysts measure $0.252-0.580 \times 0.150-0.270$ mm., with an average of 0.422×0.194 mm. Larvae measure $0.900-0.990 \times 0.030-0.037$ mm., averaging 0.941×0.034 mm.

TABLE 2

Comparison of Size between Cysts and Larvae of *Trichinella spiralis* from Hogs and Rats

	Cysts		Larvae	
	Length	Width	Length	Width
Hogs	0.603 mm.	0.248	1.082	0.038
Rats	0.422	0.194	0.941	0.034

Feeding Experiments

Muscles of rats containing *Trichinella* larvae were fed to a number of albino rats and kittens. From both of these hosts numerous adult worms of both sexes were recovered from the scrapings of the mucosa of the small intestine from 4 to 8 days after infection.

Summary

Diaphragm samples from 320 hogs and 47 rats (11 *Mus rattus* and 36 *M. norvegicus*) in Shawsien District, Fukien, were examined for *Trichinella* infection. Five out of the 320 hogs (1.56%) and 4 out of the 36 *Mus norvegicus* (11%) were found to be positive of the infection. The infections in hogs were all light, but was heavy in rats. In one rat, around 1000 cysts were estimated in the diaphragm weighing 4.7 grams.

Both cysts and larvae from hog muscles are larger than those from rats. A table of comparison is given.

Albino rats and kittens have been experimentally infected and positive results obtained in both cases.

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STUDIES ON PYTHIUM APHANIDERMATUM (EDSON)
FITZ. IN CHINA¹

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Introduction

A fruit rot of white gourd (*Bennicasa hispida* Cogn.), caused by *Pythium aphanidermatum* (Edson) Fitz. is common and destructive in certain parts of Kiangsu Province, noticeably in those regions near the river. Investigation of the disease was made since 1932. Subsequent studies reveal the facts that its casual fungus attacks a large number of crop plants under natural conditions, in addition to the white gourd, and is widely distributed in China. It is an extremely interesting and important pathogen because it causes damping off of seedlings; rots of vegetative organs; and decays of fruits and vegetables during transit, storage or at the market.

The investigations reported in the following pages are an out-growth of work on the fruit rot of white gourd. The major portion of the investigation was done at Nanking and certain other experiments on the host range and pathogenicity studies have been conducted at Chengtu in West China.

Geographic Distribution

Pythium aphanidermatum is widely distributed in the world. It has been reported from Canada, United States, England, Italy, Poland, Australia, China, Philippines, Hawaii, Japan, Dutch East Indies, India, Java, and South Africa. In China, its distribution is likewise very wide. It has been collected in places far apart in this country. Map I shows the localities from which the fungus has been reported.

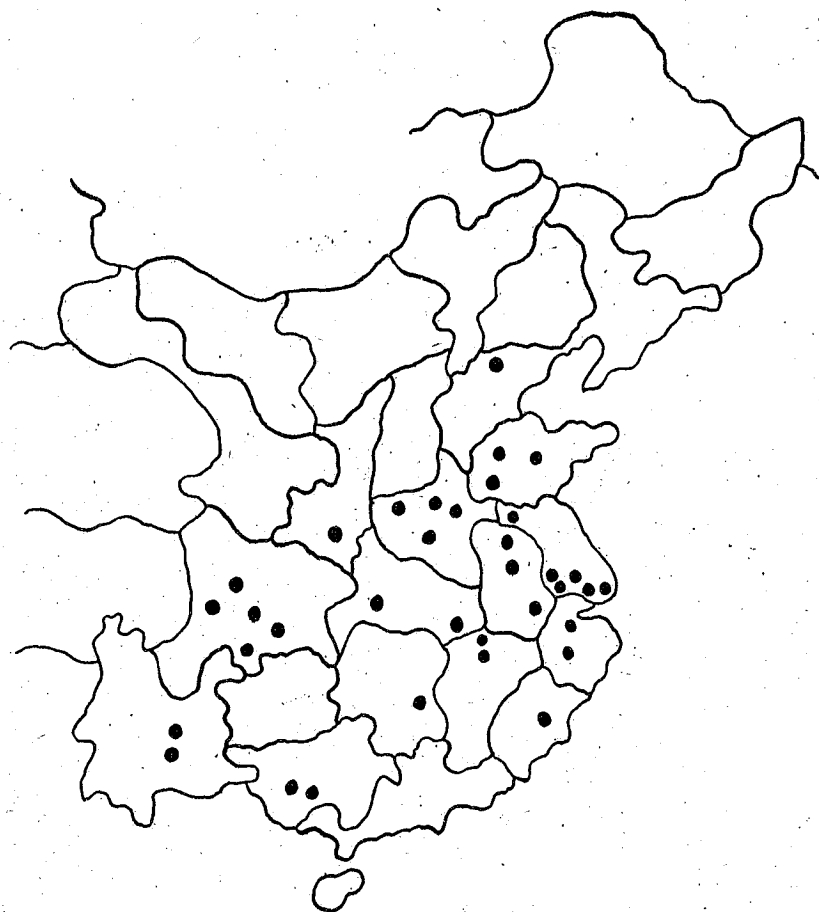
Literature Review

A comprehensive review on the literature of *Pythium aphanidermatum* has been given in a previous report (Yu, 1934). In the present paper, studies of this fungus made in China will be mentioned.

A fruit rot of white gourd was first observed in Nanking in 1930. Studies of this disease were then made by Chiu (1932) who found that it was caused by a species of *Pythium* probably *P. aphanidermatum*. He also found that egg-plant, potato, sweet potato, cantaloupe, onion, vegetable sponge (*Luffa cylindrica* Roem.), Balsam pear (*Momordica charantia* Linn.), field pumpkin, pepper, cowpea, and cabbage were susceptible to the attack of the fungus when artificially inoculated.

¹ Paper No. 60 from The Laboratory of Plant Pathology, The University of Nanking.

² Deceased.



Map I. Showing the distribution of *Pythium aphanidermatum* in China.

In 1934, the first writer reported the fungus as the cause of damping off of seedlings of cucumber (Yu, 1934), and in the following year, Teng (1935) attributed to it the damping off of cotton.

The Host Plants

The range of hosts of *Pythium aphanidermatum* is very wide. It has been reported to cause damping off of tobacco (Bunting, 1924), sugar beet, radish (Edson, 1915), pepper (McRae, 1928), hemp (Galloway, 1937), and pansy (Van Eek, 1937); stem rot of tobacco (Jochmes, 1926), and tomato (Wager, 1933); root rot of radish (Vaughan, 1924), sweet potato (Harter & Whitney, 1927a), beet (Fischer, 1931), papaw (Mittra & Subramaniam, 1928), Zinnia (Sharples, 1929), Amaranthus (Sharples, 1929), potato (Wager, 1931), and coco-yam (Wright, 1931); wilt of Zinnia

(Thompson, 1931), and pansy (Van Eek, 1937); and fruit rot of eggplant (Drechsler, 1926), bean (Harter & Whitney, 1927), and the members of Cucurbitaceae (Drechsler, 1925a; Gotred & Butler, 1939; Kheswalla, 1936; Mitra & Subramaniam, 1928; Sideris, 1933).

In a period of six years, from 1932 to 1938, records were made as to the distribution and the host range of the fungus in China. Its host plants together with the diseases caused by it are listed as follows:

Name of host plants:

Bennicasa hispida (Thunb.) Cogn.
Citrullus vulgaris Schräd.
Cucumis Melo L.
Cucumis sativus Linn.
Cucurbita maxima Duchesne.
Cucurbita pepo L.
Lagenaria leucantha (Duch.) Rusby.
Luffa acutangula Roxb.
L. cylindrica Roem.
Momordica charantia Linn.
Gossypium hirsutum L.
G. indicum L.
Capsicum annuum Linn.
Nicotiana Tabacum Linn.
Solanum Melongena Linn.
Ipomaea Batatas (Linn.) Poir.
I. reptans (Linn.) Poir.
Phaseolus vulgaris L.
Aleurites Fordii Hemsl.
Beta vulgaris L.
Amaranthus tricolor Linn.
Brassica Pekinensis Rupr.
Pachyrhizus tuberosus Spreng.

Name of disease:

Cottony leak.
 Malodorous rot.
 Cottony leak.
 Cottony leak and damping off.
 Fruit rot.
 Cottony leak.
 Cottony leak.
 Cottony leak.
 Cottony leak.
 Cottony leak.
 Damping off.
 Damping off.
 Damping off.
 Damping off.
 Cottony leak.
 Mottle necrosis.
 Stem rot.
 Cottony leak.
 Damping off.
 Damping off.
 Damping off.
 Head rot.
 Root rot.

In the list given above it is found that the fungus attacks a large number of host plants under natural conditions. *Ipomaea reptans*, *Amaranthus tricolor*, *Aleurites Fordii*, and *Pachyrhizus tuberosus* are new host plants hitherto unreported.

The Diseases

Fruit rot.—The rots of bean pod and cabbage head are found only in the market. The rot of the fruits of Cucurbitaceae may also be found in the market but are commonly seen in the fields only on those fruits which are in contact with the soils. The symptoms produced by the fungus on these fruits are very much alike. A detailed description of the cottony leak of white gourd is herein given: The fungus attacks both the young and mature fruits. Young fruits to which the calyx is still attached are infected. The infection takes place, in general, on the blossom end, and then expands to the whole fruit. Direct penetration of the epidermis by the fungus also occurs. The infected portion becomes brown and softened. It is found that the waxy epidermis remains unattacked and unbroken while the tissues underneath have lost their

hardness. Then the whitish aerial fungus growth appeared on the surface of the diseased portion, forming a cottony layer on the surface of the fruits. In this case the fruit bearing stem is often blackened. The diseased fruits are easily detached from the plants.

In most cases, the infection takes place in any portion of the fruits which is in contact with the soil surface. This portion appears watery brown and then soft. The characteristic cottony layer of the mycelium about 0.5 to 2.5 cm. in thickness appears after two days. This later expands readily to the whole fruit surface and completely covers it in 5 to 6 days. Then the diseased portion is discolored and depressed, forming a hollow on the surface of the fruit. This is the characteristic symptom of the disease under the field conditions. Sooner or later, the mycelial growth becomes withered. At last the whole fruit becomes depressed and lies upon the ground as a soft jet mass with a very disagreeable odor. Naturally infested fruits of certain species of Cucurbitaceae are shown in Plate 1.

Decays of vegetative organs.—Stem rots of tobacco and *Ipomaea reptans* in the seed beds are found to be caused by this fungus. *Ipomaea reptans* is used extensively in China as a green vegetable. It is sown in seed beds with or without transplanting. The diseases on these crop plants appear at first as watery light brown lesions on the stems at or above the soil ground. The lesions soon turn to dark brown or black and extend progressively upwards. Whitish mycelial growth then makes its appearance on the discolored regions. Then the portion or the whole stem becomes flabby and rotten. Under favorable conditions, copious whitish mycelial growth is seen spreading from one stem to the other. In severe cases, a large number of plants are thus contaminated resulting in black and watery masses of dead plant tissues on the bed. The infection is apparently of soil origin.

Damping off of seedlings.—Damping off of seedlings of various kinds of plants as listed above are commonly found elsewhere in China. Early infection of the seedlings appears as water soaked lesions on the hypocotyl above the soil surface. The infected portion becomes flabby and soon loses its turgidity. The leaves wilt and the whole seedling collapses. The diseased seedlings soon decay before the fungus growth makes its appearance.

The Fungus

The Mycelium.—In host tissue, the mycelium is non-septate, hyaline, branched and inter- or intracellular. In cultures, it is hyaline, non-septate, cylindric, slender, 2–8 μ in diameter and very rich in protoplasmic content. As it grows older, empty spaces are found. In very old ones there is no protoplasmic content present. The hyphae branch irregularly. Anastomizing of hypha is found in water cultures.

Asexual reproduction.—In water cultures, sporangia are seen within 15 hours at about 20°C. They, borne terminally or intercalary, are filamentous, composed of lobulated inflated masses of branches and cut off by a cross wall from the remainder of the mycelium. The lobulated

masses may be solitary or numerous, and measurements vary within a range from 5–14 $\times$ 10–57 μ . Sporangia are smooth and hyaline containing fine and uniform granules (Plate 2, Fig. 1). In germination the protoplasmic content of sporangia is first vacuolated and then sends out a discharging tube through which a streaming of protoplasmic substances passes and, meanwhile, the tip of the tube rounds up to form a spherical vesicle which varies greatly in size. The size of the vesicle enlarges as the protoplasmic content increases. When the sporangium becomes empty, the vesicle begins to cease its enlargement. The protoplasmic granulate substances in the vesicle, after a short period, begin to differentiate and finally round up to form zoospores in a number varying from a few to as many as 56 (Plate 2, Fig. 2). The zoospores in the vesicle at first swim slowly and then with great rapidity. Finally they break through the vesicle wall. It takes 15 to 30 minutes to complete the process under a favorable condition. Zoospores are reniform, biciliate, and measured 5–10 $\times$ 10–17 μ . After discharge, they swim for a while and cease to move and encyst. The encysted spores measure 7–13 $\times$ 9–16, mostly 7.6 $\times$ 10.2 μ . Germination takes place by the putting forth of a slender germ tube.

Sexual reproduction.—The oogonium is terminal, spherical, smooth and measures 12–35, averaging 23.8 μ . After varying stages of protoplasmic differentiation, the oogonial wall becomes more and more distinct and at the same time the protoplasmic content forms an oosphere. Oospores are spherical, smooth, free from the oogonium and measure from 12–30 μ averaging 18.7 μ (Plate 2, Fig. 3). Antheridia are intercalary as lobed cells measuring 6–14 $\times$ 10–16 μ . They are single, rarely two per oogonium. Oogonia and antheridia arise either from the same or different hyphae. From the tip of the antheridial cell which is applied to

TABLE 1

Comparative Morphological Characters of 5 Isolates of *Pythium aphanidermatum*

Cult. No.	No. 3	No. 27	No. 93	No. 213	No. 217
Source	White gourd fruit	Cucumber seedling	<i>Ipomaea reptans</i> stem	Bean pod	<i>Aleurites Fordii</i> seedling
Mycelium	2–8 μ	2–8 μ	2–8 μ	2–9 μ	2–8 μ
Sporangium	6–13 $\times$ 10–45 μ	6–12 $\times$ 11–51 μ	6–13 $\times$ 10–49 μ	6–14 $\times$ 14–44 μ	5–12 $\times$ 17–57 μ
Vesicle	29–43 $\times$ 26–43 μ	28–44 $\times$ 25–44 μ	23–45 $\times$ 20–42 μ	26–44 $\times$ 25–42 μ	20–43 $\times$ 18–50 μ
Zoospore	6–10 $\times$ 10–14 μ	5–6 $\times$ 12–17 μ	5–7 $\times$ 9–13 μ	6–7 $\times$ 10–14 μ	6–7 $\times$ 10–16 μ
Resting spore	8–13 $\times$ 9–16 μ	7–9 $\times$ 9–12 μ	9–13 $\times$ 9–15 μ	7–12 $\times$ 10–15 μ	7–13 $\times$ 10–15 μ
Oogonium	15–29 μ	14–32 μ	14–34 μ	12–35 μ	14–33 μ
Oospore	13–26 μ	12–29 μ	14–25 μ	10–26 μ	12–30 μ
Antheridium	9–12 $\times$ 10–15 μ	10–12 $\times$ 10–15 μ	6–12 $\times$ 11–15 μ	10–14 $\times$ 11–16 μ	9–13 $\times$ 10–15 μ

the oogonium wall a well marked fertilization tube is put forth. The streaming of protoplasm from the antheridium to the oogonium can be clearly seen. After the contact of young oogonium and antheridium, the immature oospore becomes gradually separated from the walls (Plate 2, Fig. 4). The center of the oospores becomes gradually differentiated from the outside layers. Finally the oospores become fully matured with heavy yellowish walls. At first they contain masses of granules of various sizes and shapes and later a big, spherical, refractory body is seen to be imbedded at the center.

The morphological characters of five isolates of the fungus are given in Table 1.

Pathogenicity

The fungus attacks readily its host plants when artificially inoculated. A small fruit of white gourd, after being sterilized with flaming alcohol, was inoculated with a bit of mycelium and placed in a moist chamber. Checks were prepared in like manner but were not inoculated. The inoculated portion became brown and softened. Two days after, a luxuriant wooly mycelium web was seen on the surface of the inoculated fruits. The whole fruits soon became covered by the thick cottony growth of the fungus. The tissues in the interior of the fruit became watery and soft and the decaying portion emitted a disagreeable odor. Infection took place both in the wounded and normal fruits. Plants which are susceptible to all of these 5 isolates are as follows: white gourd, cucumber, water melon, cantaloupe, squash, pumpkin, field pumpkin, vegetable sponge, balsam pear, dishcloth gourd, white-flowered gourd, egg-plant, tomato, pepper, common bean, cowpea, sword bean, carrot, beet, sweet potato, pear and apple. Among the Cucurbitaceae, several varieties of Chinese squash seemed less susceptible. There are, however, no differences that can be detected in pathogenicity of all of the isolates.

TABLE 2
Seedling Inoculation Experiments with *Pythium aphanidermatum*

Cult. No.	No. 3	No. 27	No. 93	No. 213	No. 217
Source	White gourd	Cucumber	<i>Ipomaea reptans</i>	Common bean	<i>Aleurites Fordii</i>
Host					
White gourd	37.0*	52.4	46.7	68.5	51.9
Cucumber	83.3	48.1	67.5	52.1	41.4
<i>Luffa cylindrica</i>	45.1	32.9	37.1	46.7	39.5
Water melon	34.4	32.5	48.1	54.0	52.2
<i>Ipomaea reptans</i>	43.2	35.0	33.8	42.4	48.9
Beet	60.3	61.6	53.7	47.2	54.9
Cotton	81.7	70.1	63.6	69.8	86.3
Tobacco	68.3	72.9	59.3	41.1	57.1
<i>Amaranthus tri-color</i>	56.6	70.3	55.2	68.0	63.3
Cabbage	41.8	34.5	42.4	30.6	37.7
<i>Aleurites Fordii</i>	48.6	28.0	23.1	39.8	42.2
Radish	56.5	68.1	48.2	51.6	49.0

* Per cent of damping off seedlings, average of 2 to 5 experiments.

The experiments on seedling inoculation with the 5 isolates as inocula were conducted by sowing superficially sterilized seeds in artificially infested soils in wooden flats. The soils were prepared by mixing in the soil diseased white gourd fruits induced by artificial inoculation. The check seeds were sown in sterilized soils without previously being mixed with the fungus. After sowing, the flats were put in moist chambers for one or two days and then transferred to the greenhouse for further observations. The experiments were conducted at different times in various localities. Table 2 gives the results of these experiments.

The severity of the seedling infection of the fungus is largely due to the environmental conditions. Comparatively high relative humidity and soil temperature favor the development of the disease. It is noted that the seedlings of the plants listed in Table 2 are all very susceptible to the disease. There is again no evidence of the difference in pathogenicity of the isolates tested.

Physiology of the Fungus

Cultural characters.—*Pythium aphanidermatum* grows well on most of the cultural media commonly used in the laboratory. In plate culture, it produces in one or two days under the room temperature, white fluffy aerial growth. The center of the colony is usually slightly sunken. Mycelial growth is most luxuriant on potato dextrose, carrot, Czapek's and Hopkin's agars; less on oat meal and rice decoction; and poor on corn meal agars. Sexual organs are produced in carrot, rice, millet, cornmeal and water agars. For observation of the asexual reproduction of the fungus, water culture is preferable.

Temperature in relation to the mycelial growth.—Harter and Whitney (1927a) found that the optimum temperature for the growth of the fungus causing the mottle necrosis of sweet potato is 32°C. The maximum temperature is slightly above 41.8°C. and the minimum 6°C.

In the present experiment, the effect of temperature on the mycelial growth of the fungus was determined as follows: A mycelial mat about 3 mm. square taken from a young culture of the fungus, was placed in the center of Petri dish containing 10 cc. of hard potato agar. Ten dishes made a set and different sets were incubated at 0°, 5°, 10°, 18°, 20°, 25°, 30°, 35° and 41°C. respectively, in constant temperature incubators. Readings were made twice a day by measuring the diameter of the colony. Results of the tests on two isolates of the fungus are shown in Table 3.

Table 3 shows that the optimum temperature for the growth of the fungus lies between 29° and 31°C. and the maximum temperature is 41°C. or higher. The plates incubated at 5°C. produced no growth at the end of 7 days. This indicates that minimum temperature is below 10° and above 5°C. The results obtained agree fairly closely to that obtained by Harter and Whitney (1927a).

As for the sporangium production some observations were made during the course of the above experiments, and it is found that 20°C. is the optimum temperature for the production of sporangia.

pH in relation to the mycelial growth.—A liquid medium containing one per cent each of peptone and dextrose was prepared. Different pH values were attained for different sets of the medium by adding either

TABLE 3
Effect of Temperature on Mycelial Growth

Cult. No.	No. 3				No. 27		
	12 hrs.	24 hrs.	36 hrs.	48 hrs.	12 hrs.	24 hrs.	36 hrs.
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	1.2	2.0	0.0	0.0	0.0
18	0.7*	2.2	3.8	4.8	0.0	0.7	1.3
20	1.2	3.1	5.4	6.1	0.0	0.7	2.2
25	2.4	4.3	6.6	7.7	0.3	4.6	7.6
30	2.8	3.7	6.2	8.9	2.0	5.6	8.9
35	1.8	2.5	4.6	6.0	2.7	5.1	7.1
41	0.0	0.0	0.0	0.0	0.0	0.2	0.5

* Cm. in diameter of the colony and average of ten plates.

HCl or NaOH and determined by the electro-hydroquinone method when the pH was 8 or above and by hydrogen-electro method when it was below 8 both before and after the sterilization. The set for each pH range consisted of 8 small flasks, each containing 25 cc. of the medium. A piece of agar culture about 3 mm. square bearing the fungus growth was introduced into each flask. They were incubated at a temperature of 26°C. As soon as full growth was attained by the fungus, the mycelial mat in all the flasks of each set were transferred to a Gooch crucible containing asbestos of known weight. They were washed repeatedly with distilled water and subsequently baked to dryness in an electric oven under a temperature of 105°C. and weighed several times until the weights became constant. The results are given in Table 4.

TABLE 4
Effect of pH on Mycelial Growth

pH	Weight of mycelial growth in mg.
2.1	0.000
2.9	0.015
4.4	0.137
5.2	0.194
6.1	0.218
7.0	0.185
7.6	0.152
8.1	0.141
9.3	0.013
10.7	0.000

As shown in the foregoing table, the fungus grows best in a range of pH 5.2 to 7.0 with 6.1 being the optimum. The acid reaction favors the growth of the fungus. No growth was found at 2.5 of the acid and 10.7 of the alkaline sides after two weeks.

Effect of temperature on the germination of sporangium.—In the previous experiment, observation points to the fact that 20°C. favors the

production of sporangia mostly. Water cultures of the fungus were thus made in separate dishes and incubated at 20°C., until an abundance of sporangia was secured. The water cultures were then transferred to different temperatures. Readings were made under microscopic examination after 24 hours. The percentage of germination was computed by counting the total number of the germinating and that of the non-germinating sporangia. In the former class both the empty and germinating ones were included. The results of three experiments are presented in Table 5.

TABLE 5
Effect of Temperature on the Germination of Sporangium

Temp. °C.	Experiment I				Experiment II				Experiment III			
	Total no. of sporangia	No. of germinating sporangia		%	Total no. of sporangia	No. of germinating sporangia		%	Total no. of sporangia	No. of germinating sporangia		%
		Germinating	Empty			Germinating	Empty			Germinating	Empty	
15	—	—	—	—	4	0	0	0	10	2	0	20
20	20	3	0	15	14	4	0	28.5	14	4	0	28
21	19	9	1	52	—	—	—	—	—	—	—	—
23	7	3	0	43	—	—	—	—	—	—	—	—
24	—	—	—	—	5	3	0	60	9	4	0	44
26	20	13	2	75	6	2	0	33	14	5	0	35
28	8	2	0	25	6	0	0	0	13	3	0	23
30	7	0	0	0	13	3	0	23	11	2	0	18
35	6	1	0	16	—	—	—	—	—	—	—	—

Sporangia germinate in a wide range of temperatures from 15 to 35°C. The optimum temperature lies between 24 and 26°C. No germination could be detected above 35°C.

Predisposing Factors

Relative humidity.—The cottony leak of white gourd and many other members of Cucurbitaceae is prevalent in rainy seasons. Copious mycelial growth usually develops on the diseased fruits after the rains. It seems that a high relative humidity in air is essential for the development of the disease. Experiments were done along this line by the following procedure: Healthy small white gourd fruits about 400 grams each were surface disinfected with flaming alcohol. Scrapings into the host tissue about 4 mm. deep and 6 mm. wide were made with scalpel and fungus growth was inserted. After inoculation, the fruits were kept in a series of sealed glass chambers in which the relative humidity was controlled by sulfuric acid of various concentrations. Each chamber, eight inches in diameter and ten inches in height, was sealed up with a cover. Each cover had two holes containing rubber stoppers through which thermometers of wet and dry bulbs might be inserted.

Readings were made as to the difference of temperatures indicated by the dry and wet bulb thermometers, every five minutes after the two thermometers were inserted. Records were taken four times a day.

Characteristic discoloration of the inoculated areas appeared about 24 hours after inoculation; and mycelial growth developed from one to two days later. At the end of five days, a large portion of the fruits became covered with the fungus growth. Since the duration of the experiment did not exceed more than five days, the daily variation of the relative humidity usually was not greater than 6 per cent. Three experiments were conducted and the results are presented in Table 6.

TABLE 6
Effect of Relative Humidity on the Development of the Disease

Experiments	Per cent of relative humidity				
	80-84	82-88	86-90	89-94	93-100
I	—	+	+++	++++	++++
II	—	++	+++	+++	+++
III	—	—	++	+++	++++

The infection is expressed by the plus and minus signs in the table. The plus sign also expresses the degree of infection. Fruits kept under conditions of 90 per cent of relative humidity, or above, produced the most prosperous growth of mycelium which covered a large portion of the fruit. Under 86 to 90 per cent of relative humidity, less mycelial growth was seen. When under a relative humidity of 84 per cent or less, the development of the disease was checked. This indicates that high relative humidity favors the development of the disease.

Temperature.—Surface sterilized white gourd fruits were inoculated with the fungus and kept in sealed glass chambers as described in the previous experiment except that the relative humidity in the chamber was maintained at 95 per cent or more by sterile distilled water. The chambers were then incubated under 10, 15, 20, 25, 30 and 35 degrees centigrade. Temperature readings were made every 12 hours by means of thermometers inserted permanently through the holes at the cover. After three days, it was found that symptoms were not seen on the fruits incubated under 10°C. Discolorations of the fruits appeared under 15°C. and sparing mycelial growth, accompanied with small rotted area on the fruits, under 20°C. At 25°C. or above, copious whitish mycelial growth was produced. Judging from the size of the diseased area as well as the amount of the mycelial growth, the optimum temperature for the development of the disease lies between 30 and 35°C. Thus a high air temperature favors the development of the disease.

Distribution of *Pythium aphanidermatum* in Soils

In various types of soil.—*Pythium aphanidermatum* can attack a large number of host plants which are grown in different types of soil; therefore its distribution in the soil must be wide. In getting soil samples, the method of taking composite soil samples was used. The soil was then put in large Petri dishes and on its top a piece of sterilized white gourd

fruit was introduced. The dishes were incubated at 30°C. As soon as mycelial growth took place, examinations were made under the microscope. The results of the test are given below:

Types of soil	Crops planted	Results
Flowering bed	Flowers of various kinds	++
Flowering bed	Pyrethrum	—
Vegetable bed	Asparagus	++
Vegetable bed	Cabbage	++
Vegetable bed	Cucumber	+++
Vegetable bed	Spinach	+
Nursery	Pear seedlings	+
Nursery	Peach seedlings	++
Orchard	Pear orchard	—
Orchard	Peach	—
Vegetable garden	Strawberry	++
Field	Cotton	+
Field	White gourd	+++
Field	Soy bean	++
Forest ground	Small conifers	+
Bare hill top	Weeds	—
Lawn	Grasses	—

The fungus is abundant in vegetable beds and fields when susceptible plants are growing. It may be present even in nurseries and the forest soils. This indicates the wide distribution of the fungus in the various types of soil. In general, it is more abundant in fertile and cultivated lands.

In soil at various depth.—The fungus causing the cottony leak of Cucurbitaceae gains its entrance into the fruits through soil contamination. This suggests that the infection is of soil origin and that the fungus must remain in the soil throughout the year. Some experiments to find out the distribution of the fungus in soil at various depths are necessary.

Four experiments were conducted. The first was made on the 3rd of July, 1935, at an average soil temperature of 29°C.; the second experiment on the 27th of July at an average temperature of 31°C.; the third on the 23rd of August at an average soil temperature of 33°C.; and the fourth on the 4th of September at an average temperature of 25°C.

Soil samples were collected from a heavily infested field near the University by means of soil gauges. In each hole, four soil samples were taken from the surface soil about 0-2 inches deep, and 2-4, 4-6 and 6-8 inches underneath the soil surface. For each sample about 400 grams of soil in weight were taken and they were put immediately in separate sterilized paper bags. The instrument was disinfected by flaming alcohol after each digging.

Within a field of one-third of an acre in area, ten holes were sampled at random. Forty soil samples from ten different holes were used in one experiment. Besides, two samples of sterile soil were used as checks. The soil samples were placed in separate sterilized porcelain dishes, numbered and wholly transferred to a large moist chamber. They were thus incubated for 24 hours. In each dish, a piece of sterilized white gourd was placed on the top of the soil as described in the previous experi-

ment. The moist chamber was moistened twice a day. Records were made microscopically on the mycelial growth whenever it made its appearance. The results of the experiments are given in Table 7.

TABLE 7
Distribution of *Pythium aphanidermatum* in Soil at Various Depths

Hole No.	Soil depth															
	0-2 inches				2-4 inches				4-6 inches				6-8 inches			
	Experiment				Experiment				Experiment				Experiment			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-	+
2	-	-	-	+	-	-	-	+	-	+	-	+	-	-	-	+
3	-	-	-	+	-	-	-	+	+	-	-	+	-	-	-	+
4	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+
5	-	+	-	-	+	+	+	+	+	-	-	+	+	-	-	+
6	-	-	-	+	-	-	-	+	-	+	-	+	-	-	-	+
7	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+
8	-	-	-	+	+	-	-	+	+	+	-	+	-	-	-	+
9	-	-	-	-	+	-	-	+	-	-	+	+	-	-	-	+
10	-	-	-	+	+	-	-	-	+	-	-	+	-	-	-	+
Ck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ppt.	0	0	0	138 mm.												

The characteristic mycelial growth of the fungus on the white gourd can be easily detected by means of microscopic examination. In addition to *Pythium aphanidermatum*, other soil fungi especially species of *Fusarium* also made their appearance on the fruit tissue. They are however readily distinguished from *Pythium*.

A general consideration of the results of these four experiments, as shown in the above table, indicates that the fungus frequently occurs from 2 to 8 inches below the soil surface. In the first, second, and third experiments, the fungus was not found in the first two inches owing to the dryness of the soil surface. The occurrence of the fungus was rather frequent between the depths of 2-4 and 4-6 inches, especially in 4-6 inches. But in the fourth experiment, the fungus was found at every depth and in every hole. This was due to the fact that during the times of the first three experiments the rainfall was very slight, but at the end of August and the beginning of September when the fourth experiment was made there was very heavy rainfall. It is evident that the distribution of the fungus in the soil is controlled primarily by the moisture content of the soil. Further experiments were therefore made with an attempt to determine the influence of the soil moisture in the distribution of the fungus in soils.

In these experiments, the methods for taking soil samples and detecting the presence of the fungus in the soils are the same as described in the preceding experiments. In addition, the soil from the four depths,

i.e., 0-2, 2-4, 4-6 and 6-8 inches, were taken and put in aluminum cans for moisture determinations.

In determining the moisture content of the soil, cans of known weight containing the soil were weighed immediately after returning to the laboratory from the field. The cans were then opened and put in an electric oven at 105°C. until all the moisture had been driven out. The cans were weighed again after being cooled down to room temperature in the desiccator. As soon as the weights became constant, the percentage of soil moisture was computed.

TABLE 8
Soil Moisture in Relation to the Distribution of *Pythium aphanidermatum* in Soil at Various Depths

Soil depths:	0-2 inches		2-4 inches		4-6 inches		6-8 inches		Average	
	Moisture %	No. of isolations yielding <i>Pythium</i>	Moisture %	No. of isolations yielding <i>Pythium</i>	Moisture %	No. of isolations yielding <i>Pythium</i>	Moisture %	No. of isolations yielding <i>Pythium</i>	Moisture %	No. of isolations yielding <i>Pythium</i>
June 20	24.2	3*	25.8	3	28.0	8	28.1	8	26.5	5.5
July 1	18.7	9	22.5	9	25.6	7	26.6	8	23.4	8.3
July 11	21.3	7	25.1	5	29.3	5	30.4	2	26.5	4.8
July 21	23.0	5	26.5	6	28.8	2	27.8	1	26.5	3.5
July 31	23.6	1	23.4	1	22.2	8	24.0	8	23.3	4.5
Aug. 10	22.8	10	24.0	7	23.1	4	23.1	4	23.2	6.3
Aug. 20	23.8	9	27.4	5	26.4	4	25.3	0	25.7	4.5
Aug. 31	26.5	4	24.0	3	24.8	4	24.5	1	25.0	3.0

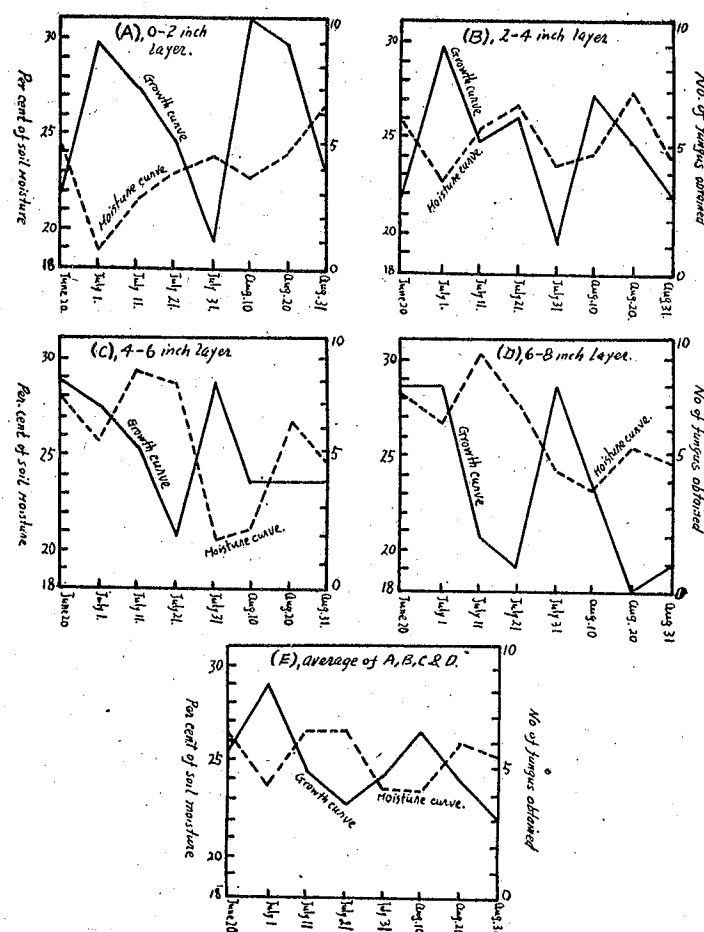
* Total number of isolations was 10.

The experiment was repeated every 10 days from June 20 to Aug. 31, 1936. The results of the experiments are shown in Table 8.

The relation of soil moisture to the distribution of the fungi in the soil at various depths can be shown more clearly by the graphs. Graphs 1, a, b, c, and d show respectively the percentages of moisture and the distribution of the fungus in soil at various depths, and e shows the average depth. These graphs show that the abundance of the fungus in soil at any depth follows rather closely the increase or reduction of soil moisture. Since the fungus growth has to take time, it is unable to increase its vegetative growth as quickly as the soil moisture increases. Thus, the growth curve of the fungus in the graphs lags behind the moisture curve.

From the experimental results given above, it is evident that the fungus is present in the soil at the depth of 0 to 8 inches below the soil surface; and its distribution as well as its abundance in the soil is regulated by soil moisture.

Longevity in soil.—The presence of the fungus in the soil, in which no susceptible plants are grown, indicates that the fungus can live saprophytically for a considerable length of time. Experiments were therefore made to determine the longevity of the fungus in soil. Big white gourds, severely rotted by the fungus as a result of artificial inoculation, were placed in big wooden barrels and covered with soil. The barrels were then buried in the soil at a depth of one-half foot. In the spring of



Graph 1. Graphs showing the relation of soil moisture to the distribution of *Pythium aphanidermatum* in soil at various depths: (A) 0-2 inch layer; (B) 2-4 inch layer; (C) 4-6 inch layer; (D) 6-8 inch layer; and (E) average of A, B, C, and D.

the following year and also in that of subsequent years, the buried fruits were dug out for inoculation experiments. These fruits were found completely decayed and the fleshy portions were wholly displaced by the soil. The diseased fruit mixed soil was taken out and put in sterilized wooden flats in which cucumber seeds were sown. As soon as diseased seedlings appeared, isolations were made to reveal the presence of the fungus. The results of the experiments are shown in Table 9.

At the end of the first year, the fungus passed a hard and severe winter and was still very virulent, producing 70.8 per cent of damping off

TABLE 9
Longevity of *Pythium aphanidermatum* in Soil

Duration	1 year	2 years	3 years	4 years
Experiment				
1	73.3*	18.5	5.7	0.0
2	85.6	11.4	7.1	0.0
3	54.9	29.0	0.0	2.2
4	69.3	12.5	1.2	0.6
Average	70.8	17.9	3.5	0.7

* Per cent of damping off seedlings.

of cucumber seedlings. By the end of the second year, its vitality was, however, greatly reduced, while at the end of the third year, a great number of them seemed to succumb. The experiment also signifies the fact that the fungus may live in the soil at least for four years under experimental conditions. It is evident that the severe losses of white gourd due to this fungus in certain parts of China might be accounted for by the continuous cropping of the same land.

Summary

Pythium aphanidermatum (Edson.) Fitz. is widely distributed in China and can attack a large number of crop plants under natural conditions. It causes the damping off of seedlings; decay of vegetative organs; and rots of fruits and vegetables in the field, during storage or in the market. The fungus has been isolated from the following diseased plants: *Bennicasa hispida* (Thunb.) Cogn., *Citrullus vulgaris* Schrad., *Cucumis Melo* L., *C. sativus* L., *Cucurbita maxima* Duch., *C. Pepo* L., *Lagenaria leucantha* (Duch.) Rusby., *Luffa acutangula* Roxb., *L. cylindrica* Roem., *Momordica charantia* L., *Gossypium hirsutum* L., *G. indicum* L., *Capsicum annum* L., *Nicotiana Tabacum* L., *Solanum Melongena* L., *Ipomaea Batatas* (L.) Poir., *Phaseolus vulgaris* L., *Beta vulgaris* L., *Brassica Pekinensis* Rupr., *Pachyrhizus tuberosus* Spreng., *Ipomaea reptans* (L.) Poir., *Amaranthus tricolor* L., and *Aleurites Fordii* Hemsl. The last four plants are new hosts of the fungus hitherto not reported.

Cross inoculation of various host plants with different isolations of the fungus does not indicate a difference in pathogenicity of the fungus.

A high relative humidity of 90 per cent or above favors the development of the disease. At 85 per cent of relative humidity or below, the disease is greatly checked. The optimum air temperature for the development of the disease is found between 30 and 35°C.

Detailed morphologic and physiologic studies of the fungus have been given. It thrives well in most of the cultural media commonly used in the laboratory. The maximum, optimum, and minimum temperatures for the mycelial growth are determined to be 41°C. or higher, 29°-31°C and 5°-10°C. respectively. The optimum pH reaction for its growth is about 6.1. No growth is found at pH 2.5 on the acid side or 10.7 on the

alkaline side. The optimum temperature for germination of sporangia lies between 24° and 26°C.

The fungus is present in various kinds of soil. It is also present at least 8 inches below the soil surface. Its distribution in the soil at various depths is controlled by the amount of soil moisture present. High soil moisture favors its growth.

Infections of crop plants under field conditions are exclusively of soil origin. The fungus can live at least for four years in the soil.

No control measures have been worked out. It is important, however, that continuous cropping of a susceptible host in the same land be strictly avoided.

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Explanation of Plates

Plate 1

Naturally infested fruits of

- (A) *Bennicasa hispida* (Thunb.) Cogn.
- (B) *Cucurbita* spp.
- (C) *Luffa cylindrica* Roem.
- (D) *Cucurbita Pepo* L.
- (E) *Momordica charantia* L.
- (F) *Lagenaria leucantha* (Duch.) Rusby.
- (G) *Citrullus vulgaris* Schrad.

Plate 2

- Fig. 1. Sporangia: (a) a terminal sporangium showing the initial formation of a discharge tube; (b) a lateral sporangium; (c) some intercalary sporangia; (d), (e) clusters of sporangia.
2. Germinating sporangia: (a) protoplasmic substance filling the vesicle; (b) cleavage of the protoplasmic substance; and (c) formation of zoospores.
3. A mature oospore showing a big, spherical, refractory body at the center.
4. The process of fertilization: (a) and (b) oogonium and antheridium during fertilization; and (c) oosphere shortly after fertilization.

NOTES ON NINE SPECIES OF THE LYMANTRIIDAE
(LEPIDOPTERA)¹

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These nine species of the Lymantriidae are rather common in Canton, but the damage done to their food plants is not serious as they have not been found abundant in number. The present paper deals with the specimens which were reared from 1937 to June 1940, on Lingnan campus. The writer is indebted to Mr. J. Gomez for making the drawings and Mr. S. Y. Lau for naming the host plants.

1. *Cifuna locuples* Walker, 1855 (Pl. 3, fig. 1, 2; Pl. 4, fig. 5, 6, 8, 14)

Cifuna locuples Wlkr., List Lep. Ins. Br. Mus. v, p. 1173 (1855).

In May, first week of June, and latter half of September caterpillars of various sizes were collected on *Rubus reflexus* Ker. and *Polygonum perfoliatum* L. The third last stadium is from 5 to 10 days; the second last stadium from 4 to 10 days; and the last stadium from 5 to 11 days. The duration of the pupal stage varies from 7 to 11 days. Adults emerged in June and early half of July.

The pale and smooth eggs are 0.82 mm. to 0.86 mm. in diameter.

The third instar caterpillars are from 11.00 mm. to 15.50 mm. long; the second last instar caterpillars from 16.00 mm. to 23.00 mm.; and the last instar caterpillars from 23.15 mm. to 30.00 mm. A caterpillar of 9.00 mm. long may be described as follows: the head is dark brown; the general color of the body is smoky with the first four and eighth abdominal segments much darker, for the tufted setae are very well developed on the above-mentioned segments. The lateral tufts, one on each side, of the prothorax are noticeable. Most parts of the thorax and the fifth abdominal segment are pale ochraceous. The eversible medio-dorsal glands located on the sixth and seventh abdominal segments are prominent. The general color of the last instar caterpillar is blackish-brown and white, and the head is reddish-brown. The conspicuous brownish medio-dorsal tufts located on the first four abdominal segments, a medio-dorsal upward pointed black tuft situated on the eighth abdominal segment, a row of short and largely white subdorsal tufted setae, some long and white lateral setae on most segments, and conspicuous lateral tufts of the first and second abdominal segments and those of the prothorax characterize the caterpillar.

The thin cocoon is light brown. The brown pupa is 20.00 mm. long, 7.00 mm. wide, and 6.00 mm. high. The cephalic end is broadly rounded; its greatest width is at the third abdominal segment, tapering toward the

¹ Contribution from the Lingnan Natural History Survey and Museum.

posterior extremity as the cremaster, which bears cremastal setae, is present. Hairs are found on the body especially on the dorsum. The eye-pieces are dark. The labial palpus is about two-thirds the width of the maxilla. The antennae are broad, tapering toward their tips and reaching half the length of the wings, which extend to the posterior portion of the fourth abdominal segment. The prothoracic legs reach about seven-eighths of the length of the wings; mesothoracic legs before the tips of that; and the metathoracic legs slightly beyond that.

The wing expanse of the male moth is 34.00 mm., the female moth is 38.00 mm. Male: UPPERSIDE: The head, thorax, and fore wings are reddish-brown. The antennae are brownish. On the fore wing there are: an indistinct, broad, irregular antemedial band; a wavy line on each side of the discocellulars; a broad irregular postmedial band; and a series of irregular marginal marks. All markings, except those on each side of the discocellulars, are somewhat purplish edged. The abdomen and hind wing are ochraceous. The indistinct dark postmedial line and discocellular marking are present. UNDERSIDE: The head, and legs are brown; abdomen and wings are ochraceous, the last irrorated with dark scales; the inner margins of both fore and hind wings are broadly pale. Two postmedial lines or a broad postmedial band, extending from the costal margin of the fore wing to near the inner margin of the hind wing, and dark discocellular marking are present.

2. *Dasychira* sp. (Pl. 3, fig. 3, 4; Pl. 4, fig. 7, 12)

Caterpillars of various sizes were collected at the end of April, in May, and at the beginning of July. They feed on *Croton polyanthum* Korth., *Triumfetta bartramia* L., *Polygonum chinensis* L., *Parthenocissus heterophylla* (Bl.) Merr. The last stadium is 8 days, and the duration of the pupal stage varies from 7 to 10 days.

The young caterpillars, about 11.00 mm. long, are yellowish-ochraceous. But the last instar caterpillar, 45.00 mm. long, 6.00 mm. wide, and 6.00 mm. high, is smoky black with the medio-dorsal line pale. On the first four and eighth abdominal segments, each bears a beautiful silky reddish-brown dorsal tuft. Tufted setae are found all over the body, so that this species is very hairy. On the lateral area few white hairs are present. The head, thorax and also prothorax are brown.

The male moth is 35.00 mm. across the fore wings, the female moth is 45.00 mm. The general color is brownish-smoky. Male: UPPERSIDE: The head, thorax, and abdomen are smoky brown. The markings found on the fore wing are: irregular dark areas occupying the basal half of the wing; a broad irregular postmedial band which is inwardly and also outwardly margined with dark zigzag line; and a series of dark marginal lunules. The zigzag lines and marginal lunules are more or less lined with purplish gray. The hind wing is ochraceous-smoky. UNDERSIDE: The general color is fuscous with the legs marked with ochraceous. A broad and darker postmedial band, extending more or less from the costal margin of the fore wing to the inner margin of the hind wing, and a discocellular marking of the hind wing are present.

3. *Euproctis bipunctapex* (Hampson), 1891 (Pl. 3, fig. 6; Pl. 4, fig. 9, 13)

Somena bipunctapex Hmps. Ill. Het. Br. Mus. viii, p. 57, pl. 140, fig. 13 (1891).

In April, June and October various sizes of caterpillars were collected on *Bischofia javanica* Blume, and *Sapium sebiferum* (L.) Roxb. From late spring to early summer the pupal stage requires from 8 to 14 days. Adults appeared in the latter half of April, at the beginning of May, and in the last week of June.

Specimens in collection were obtained in Honam Island, Canton, P'an-yu District, S. China, on June 29, 1942 (K. C. Yeung), 1 ♂.

A last instar caterpillar is 19.00 mm. long, 2.00 mm. wide, and 2.00 mm. high. The ground color is pale pinkish-ochraceous with brown markings. The head, cervical shield and the lateral prothoracic tubercles, are dark brown; the latter bears sparse white hairs. The medio-dorsal line is brown, and is margined with white lines. The subdorsal area is brown, laterad of the above-mentioned area is a white subdorsal line extending from the mesothorax to the posterior end of the abdomen. On the first and second abdominal segments there are two big dorsal projections and one on the eighth abdominal segment, bearing dark or almost black, short, and dense hairs and margined with white hairs. These velvety projections located on the first two abdominal segments are closely associated so that they look like one bilobed projection. Tufted setae are pale. The lateral area, venter, thoracic legs and also prolegs are pale.

The female moths are from 30 to 40 mm. across the fore wings. Female: UPPERSIDE: The antennae, head, thorax are ochraceous-brown; abdomen smoky-brown; and the anal tuft darker ochraceous-brown. Fore Wing: the ground color is reddish-brown irrorated with dark scales; the marginal area yellow, which is intercepted by a spur from the reddish-brown area to the center of the outer margin; and two subapical black spots are present. Hind Wing: the ground color is smoky-brown with a conspicuous, marginal yellow band. UNDERSIDE: The head, thorax, abdomen, and legs are light ochraceous-yellow. The ground color of both fore and hind wings is smoky-brown with a broad, marginal, yellow band. In the center the marginal yellow band of the fore wing is also intercepted by the spur from the smoky-brown area.

4. *Euproctis guttata* (Walker), 1855 (Pl. 3, fig. 5)

Artaxa guttata Wlkr., List Lep. Ins. Br. Mus. iv, p. 795 (1855).

Both young and medium sizes of caterpillars were collected in months of March, April, May, June, and December on *Zizyphus mauritiana* Lam., *Canarium album* Raeusch., *Eriobotrya japonica* Lindl., and *Diospyros* sp. The second last stadium is 21 days, and last stadium is 29 days (during the cold months). The duration of the pupal stage varies from 10 to 28 days. Adults emerged in the months of April, May, and June.

The male moth is 24 mm. across the fore wings, the female is 34 mm. Male: UPPERSIDE: The head, thorax, abdomen and fore wings are orange-

yellow with the anal tuft ochraceous. The markings found on the fore wings are: a yellowish-orange spot at the end of the cell; antemedial and postmedial curved pale lines which are more or less outlined with darker scales; two conspicuous subapical black spots, and another black spot toward the outer angle. **UNDERSIDE:** The general color is light orange-yellow, broadly pale toward the outer margin.

5. *Euproctis plana* Walker, 1855 (Pl. 3, fig. 7, 9)

Euproctis plana Wlkr., List Lep. Ins. Br. Mus. vii, p. 1731 (1856).

Three caterpillars were collected on June 20, 1936, on *Albizia lebbek* Benth., and a caterpillar of 34.00 mm. on February 22, 1937. In February and March, the duration of the pupal stage is about a month.

Specimens in our collection are from Honam Island, Canton, S. China, May 15, 1933; January 22, 1935; and November 2, 1936 (E. R. Tinkham), 3 ♂♂.

The male moth measures 45.00 mm. across the fore wings. **UPPER-SIDE:** The antennae, head, thorax, abdomen and fore wing are beautiful, and bright orange-yellow with the hind wing paler. On the fore wing there are: a reddish-brown area, slightly powdered with dark scales, extending from near the base of costa to the middle of the median nervure, then straight to inner margin; a postmedial band of the same color curved outwards beyond the end of the cell (dark scales are also found in the postmedial band and submarginal area); a prominent black spot at the end of the cell; and few long dark hairs on the inner margin. **UNDERSIDE:** The general color is light orange-yellow with a black discocellular spot on both the fore and hind wings.

6. *Euproctis varians* Walker, 1855 (Pl. 3, fig. 11)

Euproctis varians Wlkr., List Lep. Ins. Br. Mus. iii, p. 796 (1855).

The caterpillars were collected in May, June, July, and November. Their food plants are *Canarium album* Raeusch., *Celtis sinensis* Pers., *Croton polyanthum* Korth., *Litchi chinensis* Sonn., *Prunus persica* L., *Prunus mume* S. & Z., *Pyrus calleryana* Decunc., *Raphiolepis indica* (L.) Lindl., and *Rosa* sp.

The eggs are deposited on leaf or rearing jar in masses which are covered with grayish-white hairs. Five masses of 126 eggs are laid by a female. The smallest mass consists of 9 eggs; the largest mass of about 50. The arrangement of eggs within a mass is very irregular. Eggs deposited on June 18, hatched on June 23; that on June 19, hatched on June 24; and masses of eggs laid on June 21, hatched on June 24. The duration of the incubation period varies from 3 to 5 days, average 4 days. The egg is greenish-white, circular in outline, and slightly and dorsally depressed. The diameter of the egg is from 0.545 to 0.581 mm., and it is from 0.484 to 0.516 mm. in depth.

Newly hatched caterpillars measure from 1.61 to 1.77 mm. long. The general color is grayish; body bears conspicuous dark gray setae. The color of the second instar caterpillars changes to dark gray with a touch of yellowish. A pair of dark dorsal hairy projections located on

the first and second abdominal segments, the lateral tufts (one on each side) of the prothorax, and orange-yellow eversible glands situated on the sixth and seventh abdominal segments are prominent. The dorsal velvety dark projections of the first and second abdominal segments intermingled with brownish hairs, the lateral tubercles of the meso- and metathorax and the eversible glands being scarlet, and the pale medio-dorsal band of the abdomen, except the first two segments, in which is situated a broken reddish line especially on segments 3, 4, and 5, characterize the third instar caterpillars. In the fourth instar the tufted setae are prominent. The pale prothoracic subdorsal bands appear in the fifth instar. In the sixth instar the lateral prothoracic tufts are very conspicuous and pale transverse line caudad to the metathoracic tufted setae is present. The last instar caterpillar is about 20.00 mm. long.

The male specimen measures 22.00 mm. across the fore wings, and female specimens 25.00 mm. Female: **UPPER-SIDE:** The head, thorax, and abdomen are bright orange-yellow with hind wing paler; ante- and post-medial pale curved lines are found in the fore wing. **UNDERSIDE:** The head, legs, and abdomen are generally orange-yellow with both the fore and hind wings paler.

7. *Euproctis* sp. (Pl. 3, fig. 8; Pl. 4, fig. 1, 2, 3, 4, 10, 11)

On November 19, 1939, small caterpillars were collected on *Pyrus calleryana* Decunc. They are found passing the winter in the larval stage. In the months of April, May, and June, it takes about two months to complete its life history. Caterpillars of this species were also found on *Canarium album* Raeusch., *Cassia fistula* L., *Celtis sinensis* Pers., *Eugenia operculata* Roxb., *Rosa* sp., and *Smilax China* L.

The eggs are laid on the leaf or rearing jar in masses which are densely covered with ochraceous hairs from the female. Eight or nine masses are deposited by a female. The smallest mass consists of 15, the largest mass of over 40. The arrangement of eggs within a mass is also quite irregular. Three masses of eggs were found on April 22, two on April 23, one on April 24, and three on April 26. The first five masses hatched on May 1; the last three on May 2; and those deposited on April 24 hatched on May 5. The duration of the incubation period varies from 7 to 10 days (average 8 days). The egg is light yellow, smooth, circular in outline, and somewhat dorsally and ventrally compressed. Its diameter is 0.677-0.710 mm., and 0.581-0.613 mm. in depth.

There are eight instars. In the months of May and June, on the average about 50 days are required for the completion of the larval stage. The first stadium varies from 4 to 7 days (average 5.6 days); the second stadium from 4 to 7 days (average 5 days); the third stadium from 4 to 7 days (average 6.2 days); the fourth stadium from 5 to 8 days (average 6.8 days), the seventh stadium from 6 to 10 days (average 8.5); the eighth stadium from 7 to 11 days (average 9 days).

The newly hatched caterpillars are yellowish and hairy. They are from 1.81 mm. to 1.88 mm. long. A pair of tufted hairs appear on the dorsum of the first and second abdominal segments (one pair to each seg-

ment) as early as in the second instar. The last or eighth instar caterpillars measure from 16.00 mm. to 24.00 mm. in length, averaging 18.50 mm. The general color is dull yellowish-brown with rows of dark hairy projections, velvety and bearing setae, on the abdomen; those on the first two and eighth abdominal segments are more conspicuous. A full-grown caterpillar may be described as follows: the prothorax possesses spiracular tufts, one on each side of the body, of dark setae arising from prominent tubercles and the subspiracular one which is not so conspicuous as that on a level with the spiracles. On the meso- and metathorax, small and nearly white dorsal, subdorsal, supraspiracular, spiracular, and subventral tufted setae are present. The dorsum of the first and second abdominal segments is dark. The dorsal and supraspiracular dark brown and velvety or hairy projections are found on the first eight abdominal segments. The dark brown projections of the first and second abdominal segments intermingle with pale brown hairs, while those of abdominal segments 3, 4, 5, 6, 7, and 8 bear pale, and pale brown, setae. The first six abdominal segments possess dark brown subspiracular hairy projections which bear whitish setae. Subspiracular tufted setae of 7 and 8 abdominal segments, and subventral ones of the first eight abdominal segments are pale, nearly white. The ninth abdominal segment bears a transverse row of pale tufted setae. The thoracic legs, prolegs, and also venter are pale yellowish-brown. The crochets of prolegs are uniordinal and arranged in a longitudinal band.

The pupa is found inside the ochraceous cocoon. The pupation took place from June 19 to June 23; adults emerged from June 27 to July 2. The duration of the pupal stage varies from 7 to 8 days, average 7.6 days. It is 11.00 mm. in length, 3.8 mm. in greatest width, and 3.8 mm. in depth. The general color is light brown with the dorsum of the anterior abdominal segments darker and venter paler. The spiracles are brown. The cephalic end is broadly rounded; the caudal end is pointed at the cremaster, which bears cremastral setae about half the length of the cremaster. The pupa is characterized by the presence of setae situated around the scars of the larval tufted setae and a pair of conspicuous dorsal projections located on the first two abdominal segments, one to each segment. The eye-pieces are prominent and black. The labial palpus is about half the width of the maxilla; these two pairs of appendages extend about half the distance along the antennae. The antennae are broad, somewhat pointed at tips; they reach a level with the posterior margin of the second abdominal segment. The prothoracic legs reach slightly beyond the tips of the antennae. The mesothoracic legs extend to a level with the anterior portion of the fourth abdominal segment while the metathoracic legs extend near the posterior portion of the same segment. The wings reach slightly beyond the middle of the fourth abdominal segment.

The male moth is 24.00 mm. across the fore wings, the female 37.00 mm. Male: UPPERSIDE: The head, thorax, and fore wings are a beautiful orange-yellow; the abdomen and hind wing are paler. On the fore wing there are: an orange spot at the end of the cell, and ante- and post-medial

pale curved lines, the last usually outlined with dark scales. A conspicuous dark spot is found below the middle of the median nervure. It is generally absent in the female. UNDERSIDE: The general color is light orange-yellow with the costal margins of both the fore and hind wing broadly orange-yellow, especially the fore wing.

8. *Perina nuda* (Fabricius), 1787 (Pl. 3, fig. 13, 14)

Bombyx nuda Fabr., Mant. ii, p. 119 (1787).

In the months of February and March, caterpillars of various sizes were collected on *Ficus beecneyana* Hook & Arn., and *Ficus retusa* L. The last stadium is 11 days, and the duration of the pupal stage is 6 to 11 days. Adults appeared in the months of March, April, May, June, and July.

Adults are in our collection from: Honam Island, Canton, S. China, Dec. 11, 1932 (P. P. Ho), 1 ♀, June 20, 1933 (E. R. Tinkham), 1 ♂, and July 2, 1935 (K. C. Yeung), 1 ♀; Yen-ping, Nan-ping District, S. China, June and July 1933 (D. C. Ngu), 1 ♂; Dragon Noir (20 mi. South of Mengtz), alt. 5,000 ft., Yunnan, S. China, August 19, 1934 (E. R. Tinkham), 1 ♀.

The last instar caterpillar² is 25.00 mm. long, 5.00 mm. wide, and 5.00 mm. high. The general color of this hairy caterpillar is grayish-brown. The head is grayish-brown molted except the posterior margin which is shining brown. The prothorax possesses two groups of brown hairs. The medio-dorsal band of the meso- and metathorax is white. On sides there are some orange, bluish-orange, blue, and orange spots as one proceeds latero-ventrally. Each of the first two abdominal segments possesses a dorsal light brown tuft. A light brown dorsal band is found on the rest of the abdominal segments; the medio-dorsal line found in the above-mentioned band is dark brown. A dark velvety brown subdorsal spot, on abdominal segments 3, 4, 5, 6, 7, and 8 with a tinge of bluish in center is present. The lateral area is bluish-gray with a row of tufts accompanied by regular yellow and brownish markings.

The pupa is yellowish-green and usually with brownish and dark markings on the dorsum of the thorax and most of the abdominal segments.

The male moth is 33.00 mm. across the forewings. UPPERSIDE: The head is orange color; thorax gray; abdomen brown with segments margined with white hairs; and anal tuft bright orange. Fore wing is hyaline; the inner basal area of which is occupied by a patch of brown scales. The hind wing is smoky-brown with the apical area hyaline. UNDERSIDE: The ground is about the same as on the upperside, the legs are also orange.

The female measures 39.00 mm. across the fore wings. UPPERSIDE: The general color is pale ochraceous-white. The anal tuft is orange. On the fore wing there are some brown scales located below the cell. UNDERSIDE: The general color is also pale ochraceous-white. The head and legs are more or less light orange-yellow. The antennae are pale with brownish branches.

² The information was given by Miss H. W. Tsang and Mr. Y. W. Djou.

9. *Leucoma submarginata* (Walker), 1855 (Pl. 3, fig. 10, 12)

Redoa submarginata Wlkr., List Lep. Ins. Br. Mus. iv, p. 826 (1855).

The caterpillars were collected on the first ten days of May, in the third week of October, second week of November and December. During the early spring and summer the pupal stage requires from 3 to 4 days. In November the last stadium is 9 days. Adults emerged at the beginning of January, end of May, and in the third week of November. The food plants are *Litsea chinensis* Bl., *Litsea glutinosa* (Lour.) C. B. R., and *Cinnamomum camphora* (L.), Nees. & Ebrn.

We have specimens from: Honam Island, Canton, S. China, July 26, 1933 (E. R. Tinkham), 1 ♂, October 3, 1935 (Y. C. Ng), 1 ♀; Keung-tin-heung, Lin District, Kwangtung, S. China, July 10, 1934 (F. K. To), 1 ♂.

Caterpillar of 25.00 mm. long may be described as follows: it is very hairy; head is scarlet with whitish marking. The cervical shield is brown. The medio-dorsal line of the thorax is yellowish, while on the abdomen it is pure white. The body bears prominent pale and brownish long setae and tufted setae. A dorsal tuft of dark hairs is present. The last instar caterpillars measure about 32.00 mm. in length.

The pupa is greenish, possessing two yellow lateral lines located on the abdominal segments and black spots on each side of the thorax.

Specimens are from 35.00 mm. to 40.00 mm. across the fore wings. **UPPERSIDE:** The general color is pure white. The head is shaded with brownish especially near and between the antennae which are white with brownish branches. Both of the fore and hind wings are irrorated with silvery scales. On the fore wing there are: a black speck at the end of the cell and costa ochraceous towards the apex. **UNDERSIDE:** The general color is white with the labial palpi tinged with brownish. The legs are spotted with very dark brown especially the meso- and metathoracic legs.

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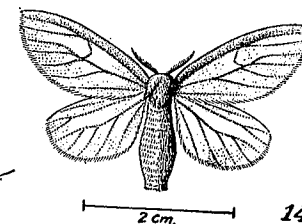
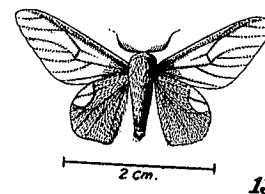
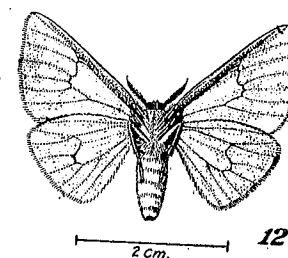
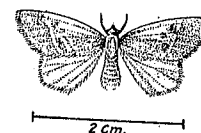
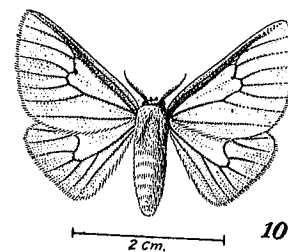
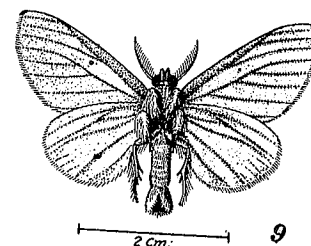
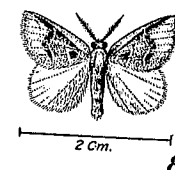
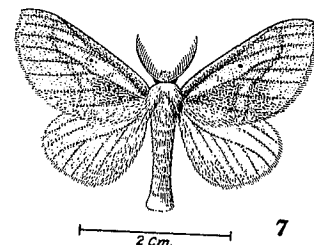
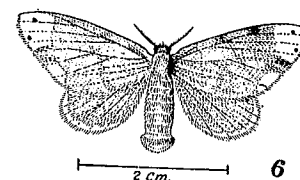
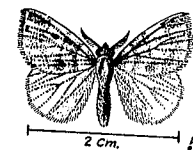
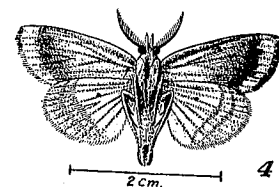
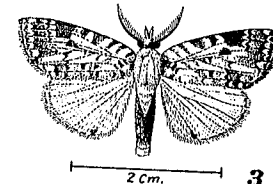
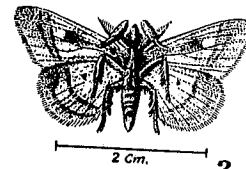
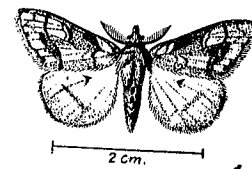
Explanation of Plates

Plate 3

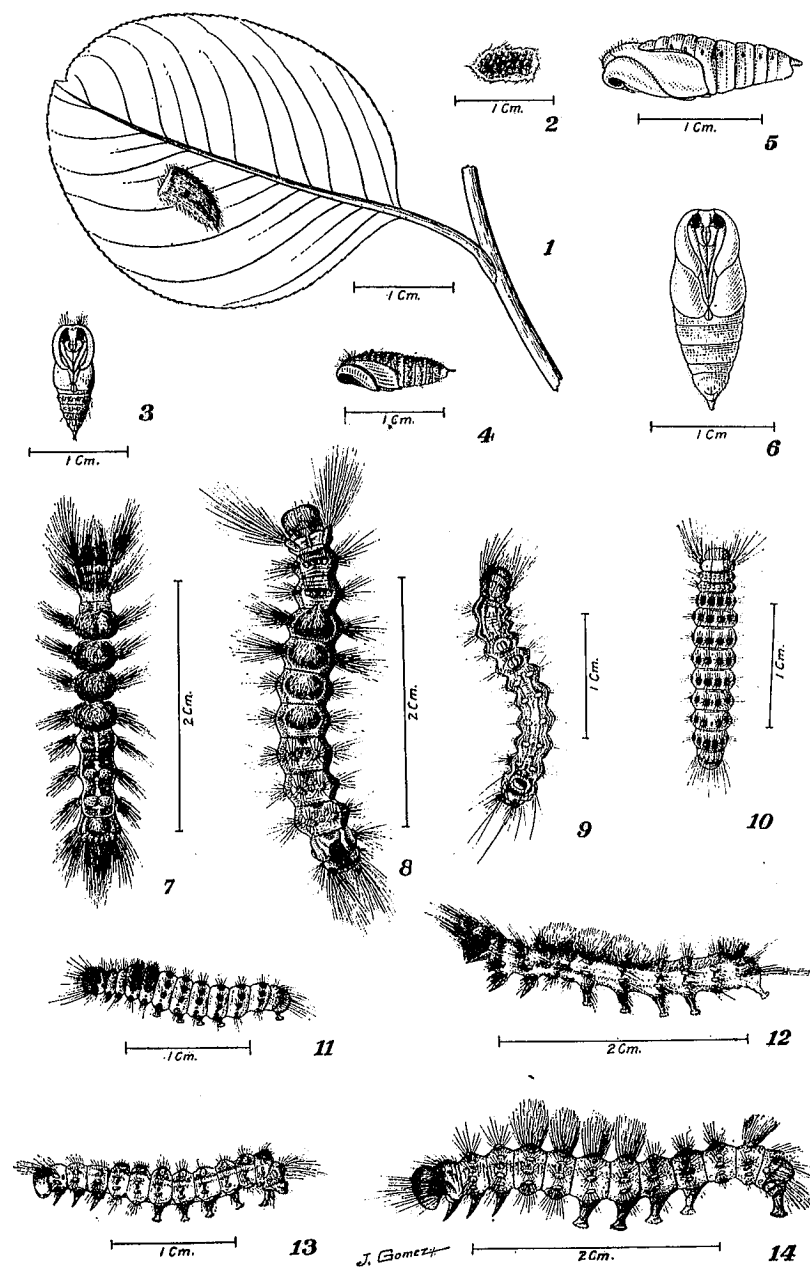
- Fig. 1. *Cifuna locuples* Walker, dorsal side, ♂.
2. *C. locuples* Walker, ventral side, ♂.
3. *Dasychira* sp., dorsal side, ♂.
4. *Dasychira* sp., ventral side, ♂.
5. *Euproctis guttata* (Walker), dorsal side, ♂.
6. *E. bipunctapex* (Hampson), dorsal side, ♀.
7. *E. plana* Walker, dorsal side, ♂.
8. *Euproctis* sp., dorsal side, ♂.
9. *E. plana* Walker, ventral side, ♂.
10. *Leucoma submarginata* (Walker), dorsal side, ♀.
11. *Euproctis varians* Walker, dorsal side, ♀.
12. *Leucoma submarginata*, ventral side, ♀.
13. *Perina nuda* (Fabricius), dorsal side, ♂.
14. *P. nuda* (Fabricius), dorsal side, ♀.

Plate 4

- Fig. 1. *Euproctis* sp., egg mass, dorsal side.
2. *Euproctis* sp., egg mass, ventral side.
3. *Euproctis* sp., pupa, ventral side.
4. *Euproctis* sp., lateral side, pupa.
5. *Cifuna locuples* Walker, pupa, lateral side.
6. *C. locuples* Walker, pupa, ventral side.
7. *Dasychira* sp., caterpillar, dorsal side.
8. *Cifuna locuples* Walker, caterpillar, dorsal side.
9. *Euproctis bipunctapex* (Hampson), caterpillar, dorsal side.
10. *Euproctis* sp., caterpillar, dorsal side.
11. *Euproctis* sp., caterpillar, lateral side.
12. *Dasychira* sp., caterpillar, lateral side.
13. *Euproctis bipunctapex* (Hampson), caterpillar, lateral side.
14. *Cifuna locuples* Walker, caterpillar, lateral side.



J. Gomez



THE USE OF THE TERM "MISAPPLIED BY" IN TAXONOMIC BOTANY

By EGBERT H. WALKER

Beginning students, amateurs, and people not acquainted with the use and value of scientific names are usually disturbed by the practice of giving an authority after each Latin name of a plant or animal. Thus the name Linnaeus in abbreviated form follows the scientific name of the common Chinese pink, *Dianthus chinensis* Linn. In general everyday use such authorities are indeed not important, but, whenever the names of plants are critically considered, the use of authorities is necessary. They are important means for avoiding confusion and should be understood and used properly by all botanists.

Beginning students of taxonomy often find it extremely difficult to learn how to use these authority names except by observing how others handle them. Unfortunately, however, our well-known and reputable botanists differ in some respects in their use of authorities and have some unfortunate practices. This confuses the beginner and often results in his adoption of the bad practices of his predecessors. One can learn the basic principles of handling authorities by studying the International Rules of Botanical Nomenclature, but beginners usually have much difficulty in understanding these rules. The proper use of authorities is treated by Professor A. S. Hitchcock in his *Methods of Descriptive Systematic Botany* (John Wiley & Sons, New York, 1925), a book which should be more widely studied by beginning taxonomists.

It is the purpose of the present paper to discuss one of these bad practices and to recommend a more satisfactory method than that commonly used by recognized botanists. This recommended method is not original with the author, but is discussed in Professor Hitchcock's book just mentioned. The bad practice referred to is that of recording as an authority after a plant name the name of a person who has merely applied that name to the wrong plant. For example, in 1861 George Bentham in his *Flora Hongkongensis* applied the name *Myrsine capitellata* Wall. (i.e. N. Wallich, the important student of the plants of India) to the common shrub of the family Myrsinaceae, which is now called *Rapanea nerifolia* (Sieb. & Zucc.) Mez. In 1902 Carl Mez, the monographer of this family for *Das Pflanzenreich*, recognized that Bentham had erroneously applied Wallich's name to this species. In recording this fact in his list of synonyms following the correct name, Mez wrote "*Myrsine capitellata* Benth. (non Wall.)." However, Bentham had not originated the name *Myrsine capitellata* for this Hongkong and China species, but had merely applied Wallich's name, or in this case unknowingly had *misapplied* it. Misapplication of a name is not publication in the same sense as the publication of a new name. Mez's use of the expression "(non Wall.)" indicates

that an error had been made. An inexperienced or uninformed worker might easily look, but without success, for the original publication of *Myrsine capitellata* Benth., assuming that both Wallich and Bentham had described new species under this name.

This bad practice causes much confusion. Often the misapplication is not indicated at all. In a revision of the Chinese species of *Aconitum* by H. Handel-Mazzetti,¹ one of our most esteemed authorities on Chinese taxonomic botany, who died before his paper on *Aconitum* appeared in print, there were published many synonyms with wrong authorities, the names of writers who had misapplied names being used in place of the proper authorities, often without even adding an expression equivalent to Mez's "(non-Wall.)." In some other papers writers have indicated these errors in application by putting the Latin name in quotation marks, as "*Myrsine capitellata*" of Benth. Fl. Hongk.

Since about 1910 such errors have been indicated by A. S. Hitchcock and a few followers by the use of the term "Misapplied by" after the original name with the original authority. Thus Mez's example cited above would have appeared as "*Myrsine capitellata* Wall., misapplied by Benth. in Fl. Hongk." Here there is no confusion as to what actually happened, and only nine more letters are used than in Mez's form. The disadvantages of this trivial increase in space are far overbalanced by the advantage of clarity.

In taxonomic botany there is a greater tendency to imitate those who have gone before than there is in some other branches of science, because in almost every step a taxonomist must build upon the work of his predecessors and make his work conform with the established system. Thus we have our recognized and adopted systematic arrangements and our International Rules. Without any system or rules there would be no progress, and chaos and confusion would result. But too slavish following of the methods of the recognized botanical authorities is equally detrimental to the needed progress in taxonomic botany. Adoption of well thought out innovations that make for clarity and simplicity are justifiable departures from the ways of our esteemed predecessors.

¹ H. Handel-Mazzetti, *Plantae Sinenses a Dre. H. Smith annis 1921-1922, 1924 et 1934 lectae. XXXIII. Ranunculaceae. Unter Benützung einiger Vorarbeiten Prof. Dr. E. Ulbrich. Act. Hort. Gothoburg. (Medd. Göteborgs Bot. Trädg.)* 13: 37-219. pl. 1. 1940.

NOTES ON SOME CHINESE ECHINODERMS

By T. L. TCHANG

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This short paper is based on the collection of echinoderms of the Fan Memorial Institute of Biology, in Peiping. The specimens were collected by the staff of the Institute from the coast of South and North China. There are in all twenty-six species representing twenty-three genera, distributed in seventeen families. Some of them are interesting for the study of classification and distribution. I wish to express my thanks to Mr. F. Y. Chang of National Academy of Peiping for his help in this study.

ORDER HOLOTHURIOIDEA

Family Stichopodidae

Stichopus japonicus Selenka

Stichopus japonicus Selenka, 1867, *Beitrage zur Anatom. u. System. d. Holoth. Zeit. f. w. Zool.* 17(1867): 318.

This is a very common species in the coast of North China. It is one kind of famous food material in China and Japan. Its mouth is at the ventral side of the oral end and the anus at the extremity of another end of the body. On the ventral surface of the body, there are many tube-feet and on the dorsal some large warts.

Peitaiho, Tsingtao and Chefoo.

Family Cucumariidae

Pentacta tuberculosa (Quoy and Gaimard)

Holothuria tuberculosa Quoy and Gaimard, 1833, *Voy. de l'Astrolabe, Zool.* T. iv, p. 131.

Fu-Tsing (Fukien).

Pentacta quadrangularis (Lesson)

Holothuria quadrangularis Lesson, 1830, *Cent. Zool.* p. 90-91. Fukien.

Actinocucumis typica Ludwig

Actinocucumis typica Ludwig, 1874, *Arb. Zool. Inst. Wurzburg.* 2: 15-16. Amoy.

Phyllophorus ordinatus Chang

Phyllophorus ordinatus Chang, 1933, *Cont. Inst. Zool. Nat. Acad. Peiping* 2(3): 4.

Tsingtao.

Family Molpadidae

Caudina chilensis (J. Müller)

Molpadia chilensis J. Müller, 1850, p. 139.

Caudina chilensis Clark, 1907, Apod. Holoth., p. 175.

The body is smooth and sausage-shaped. Its caudal portion has a long tail-like prolongation. There are 15 tentacles, each with 4 small digits. There are no tube-feet.

Yin-tao and Sin-Chia-kow (near Tsingtao).

Aphelodactyla hyaloeides (Sluiter)

Aphelodactyla hyaloeides Sluiter, 1880, Nat. Tijds. Nederl. Ind., XL, 1880, p. 345.

The body tapers posteriorly more or less into a short tail. The tentacle-ampullae are present. The skin is thin and more or less transparent.

Chiao-Chow bay.

Family Synaptidae

Protankyra bidentata (Woodward & Barrett)

Synapta bidentata Woodward and Barrett, 1858, Proc. Zool. Soc. London 26: 365.

Sha-tze-kow.

Leptosynapta ooplax (Marenzeller)

Synapta ooplax Marenzeller, 1881, Verh. K. K. Zool.-bot. Ges. Wien. 35: 122.

Peitaiho.

Polycheira rufescens (Brandt)

Chirodota rufescens Brandt, 1835, Prod. Descr. Anim. ab. H. Mertensis obs. Fas. I, p. 59.

The body is worm-like and tapering at posterior portion. There are 18 tentacles, each with 8-13 small digits.

Hong Kong.

Order ECHINOIDEA

Family Temnopleuridae

Temnopleurus hardwicki (Gray)

Toreumatica hardwicki Gray, 1855, Proc. Zool. Soc. London, p. 39.

The test is low and flat with pits along the line of suture. The ocular plates do not reach the periproct, primary spines are not banded but its base is colored.

Hong Kong.

Temnopleurus toreumaticus (Klein)

Cidaris toreumatica Klein, 1734, Nat. Disp. Ech.

The test is conical. Its primary spines are long and banded with red-violet or brownish-violet.

Tsingtao.

Temnopleurus reevesi (Gray)

Toreumatica reevesi Gray, Proc. Zool. Soc. 1855, p. 39.

The test is not so strong as that of the two preceding species. Primary spines are violet.

Chong-chow (Hong Kong).

Family Toxopneustidae

Strongylocentrotus pulcherrimus (Agassiz)

Psemmechinus pulcherrimus Agassiz, 1863, Proc. Acad. Nat. Sci. Philadelphia, p. 357.

This is a very common sea-urchin on the coast of North China. Its test is low. The spines are short and numerous.

Tsingtao, Chefoo and Yangmatao.

Family Laganidae

Peronella lesueuri (Agassiz)

Laganum lesueuri Agassiz, 1841, Mon. Ech., Mon. Scut., p. 116, pl. xxiv, fig. 3-6.

The test of this cake-urchin is much flattened. Its center is more or less raised. The anus lies near the margin. Its spines are short and delicate.

Fukien.

Family Scutellidae

Astriclypeus manni Verrill

Astriclypeus manni Verrill, 1867, Notes on Radiata, p. 311.

This is a large cake-urchin. It has five long holes on its test, which is much flattened.

Fukien.

Family Spatangidae

Echinocardium cordatum (Rennaut)

Echinus cordatus Rennaut, 1777, Brit. Zool., 4, p. 69.

The body is irregularly heart-shaped. The mouth is situated at ventral surface of the anterior part and the anus at the hind end of the test.

Tsingtao.

Order ASTEROIDEA

Family Astropectinidae

Astropecten scoparius Valenciennes

Astropecten scoparius Valenciennes, MSS. Collection Mus. Hist. Nat. Paris, Vide Perrier, Rev. Coll. Stellerides, Mus. Hist. Nat. Paris, Arch. Zool. Experimt. v, p. 359. (1876).

The arms have large marginals bearing spines. The anus is inconspicuous.

Chongchow (Hong Kong).

Family Luididae

Luidia quinaria Martens

Luidia quinaria Martens, 1865, Archiv. f. Naturg., 1865, p. 352.

The disk is small and usually with fine long, narrow arms. The tube feet are in 2 rows. The anus is inconspicuous.

Chefoo and Tsingtao.

Family Antheneidae

Anthenea pentagonula (Lamarck)

Asterias pentagonula Lamarck, 1816, Hist. Nat. Anim., t. II.

The arm has well developed marginals. Its anus is distinct. The actinal interradial areas are large and covered with pavement-like plates which bear large valvate pedicellariae.

Fukien and Chefoo.

Family Asterinidae

Asterina pectinifera Muller and Troschel

Asterina pectinifera Muller and Troschel, System der Asteriden, p. 40.

The body is stellate in form and with five, or occasionally six to seven, short, broad arms. The marginal plates are inconspicuous. The pedicellariae are absent.

Peitaiho, Yangmatao, Chefoo, Tsingtao and Wei-hai-wei.

Family Asteriidae

Asterias rollestoni Bell

Asterias rollestoni Bell, 1881, Proc. Zool. Soc. London, 1881, p. 514.

The marginal plates are inconspicuous. The tube-feet are often in 4 rows on each arm. The pedicellariae are absent.

Yangmatao, Chefoo and Tsingtao.

Family Solasteridae

Crossaster japonicus (Fisher)

Solaster japonicus Fisher, 1911, Bull. U. S. Nat. Mus. 76: 330.

Chefoo.

Order OPHIUROIDEA

Family Ophiotrichidae

Ophiotrix marenzelleri Kaehler

Ophiotrix marenzelleri Kaehler, 1904, Mem. Soc. Zool. France 17: 103.

Peitaiho, Yangmatao, Tsingtao, Chefoo, Tengchow and Amoy.

Family Amphiuridae

Ophiactis affinis Duncan

Ophiactis affinis Duncan, 1879, Jour. Linn. Soc. 14: 469.

China Sea.

Ophiopholis mirabilis Duncan

Ophiopholis mirabilis Duncan, 1879, Jour. Linn. Soc. 14: 460.

China Sea.

A NEW FERN FROM LUSHAN

By CHARLES E. DeVOL

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Lushan is a beautiful mountain range with a great variety of habitats. It is situated on the south side of the Yangtze River near the city of Kiukiang in Kiangsi Province. At least thirty-eight species of flowering plants and nine ferns have been described from this mountain.

In the summer of 1936 I collected on Lushan a very large specimen of an *Athyrium*, which is very different from any that I have collected elsewhere in China or seen in herbaria. This is described herewith as a new species.

Athyrium giganteum DeVol, sp. nov. (Pl. 5)

Rhizoma ignota, stipitibus caespitosis, 55 ad 70 cm. longis, nitidis, pallido-stramineis, ad pedem parce paleaceis; laminae ovato-lanceolatae, tripinnatifidae, 90 ad 100 cm. longae, 50 ad 60 cm. latae; pinnae breviter petiolatae, 20 ad 25 jugis, lineari-lanceolatae, 25 ad 30 cm. longae, 7 ad 8 cm. latae, infimae ca. 7 ad 8 cm. sese separatae; pinnulis breviter petiolatis, 20 ad 25 jugis, lanceolatis, 25 ad 50 mm. longis, 10 ad 15 mm. latis, marginibus aristato-serratis; venae liberae, furcatae; venulae obliquae, in dentibus protensis; sori parvi, 4 ad 8 pro segmento, indusiis membranaceis fimbriatis, ferruginis, lineis vel curvis.

Frons caespitose; *stipe* 55 to 70 cm. long, stramineous, glossy, without scales except near the base; *basal scales* few, thin, pale brown, lanceolate, entire; *lamina* ovate-lanceolate, tripinnatifid, 90 to 100 cm. long, 50 to 60 cm. broad; *rachis* stramineous, glossy, without scales; *pinnae* 20 to 25 pairs below the acuminate pinnatifid apex, petiolate, obliquely patent, linear-lanceolate in outline, 7 to 8 cm. apart on rachis, basal pairs slightly shorter than those above it; *pinnules* 20 to 25 pairs, cuneate at base, shortly petiolate, mostly alternate, 25 to 50 mm. long, 10 to 15 mm. broad, lanceolate, pinnatifid, cut nearly to costa into narrow oblong segments with serrate margins; *rachilla* narrowly winged, with spine-like trichomes on the upper surface at the base of pinnules and along the costal grooves, and glandular pubescence on the upper surface at its base, and at the base of each pinnule; *veins* free, forked, ending in short spines; *texture* herbaceous; *sori* linear, or curved and crossing the veinlets; *indusia* membranous, brown, with fimbriate margins.

This fern was collected near a Taoist temple at Ma Erh Feng (Horse-ear Peaks), August 15, 1936, along the bank of a shaded, slow flowing mountain stream; altitude 2500 feet; the type (*DeVol, 1916*) is in the United States National Herbarium (nos. 1,718,567-570), Smithsonian Institution, Washington, D. C.

Athyrium giganteum does not closely resemble any fern known from eastern central China. The only other species from this region which belongs to the *Athyrium filix-femina* group is *Athyrium Devolii* Ching. Both are tripinnatifid, and both have similarly cut fronds, spine-like trichomes on the upper surface along the rachillae, and glandular pubescence at the base of the rachillae on the upper surface. *Athyrium Devolii*, however, has a narrowly lanceolate frond with recurved pinnae and recurved pinnules. The pinnae are only 10 to 12 cm. long, and the lower pinnae are from 3.5 cm. to 4.5 cm. broad, while in *Athyrium giganteum* the pinnae are 25 to 30 cm. long and 8 to 10 cm. broad.

The fern which most nearly approaches our new species is *Athyrium Schimperi* Moug. which is fairly common in northern India but has not been known from eastern China. However, a number of ferns have been found on Lushan which were previously not known in eastern China. Most specimens of *Athyrium Schimperi* are much smaller than *Athyrium giganteum*, but a few specimens from the Himalayas are almost as large and have much the same type of cutting. They are alike in having the lower pinnae far apart on the rachis, with the pinnules cuneate and unequal at the base and far apart on the rachilla, and in having narrow fulvous wings on the upper surface along the costal grooves.

Athyrium giganteum differs from *Athyrium Schimperi*, however, in the following characteristics:

1. The lowest pinnae are scarcely shortened, while in *A. Schimperi* the lower pairs are gradually shortened and those of the lowest pair are only about half as long as those in the middle.
2. The scales near the base of the stipe are very thin and light brown, while in *A. Schimperi* they are thicker and reddish brown.
3. The stipe is relatively longer.
4. The upper surface has spine-like trichomes at the base of the pinnules and along the edges of the costal grooves. In *A. Schimperi* the raised wings along the costal grooves gradually run out into the pinnules and do not end in spines.
5. The rhizome of *A. Schimperi* is long and widely creeping and the stipes are distant. Unfortunately, we have no specimen of *A. giganteum* here with the underground parts, but, as I recall, the rhizome is short and the fronds are tufted as in *A. filix-femina*.



Athyrium giganteum DeVol, n. sp. Middle pinnae from the type specimen in the U. S. National Museum.

FISHES OF THE SUBFAMILY CARANGINAE
LISTED FROM CHINA

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For some years the writer has been making a world wide study of marine fishes belonging to the subfamily Caranginae, but has not had the good fortune to examine specimens thereof from China. In spite and partly because of this lack, the 26 species recorded by Chu, 1931, in a comprehensive list of Chinese fishes (Index Piscium Sinensium, Biol. Bull. St. John's Univ., Shanghai, No. 1, pp. 111-113) are of interest. To review and discuss them may be helpful toward further knowledge of the matter.

Chu places the 26 species mentioned in 10 genera as follows: *Megalaspis* (1 species), *Trachurus* (1), *Decapterus* (3), *Selaroides* (1), *Selar* (3), *Citula* (3), *Atropus* (1), *Alectis* (2), *Trachurops* (1), and *Caranx* (10). *Selar*, which is a small group, and *Selaroides*, which is monotypic, we recognize only as subgenera of *Caranx*. On the other hand, largely as a matter of convenience, we separate the many species which would otherwise go in *Caranx*, into *Caranx* and *Carangoides*. *Citula* again, is a small group which might be considered a subgenus of *Carangoides*. All the Caranginae are close, and sorting them into genera very much a matter of judgment.

The writer has examined 10 of the 26 species listed, all but one from elsewhere in the Orient, and recognizes them as listed. These are *Trachurus japonicus*, *Decapterus muroadsi*, *D. muroadsi*, *Caranx (Selaroides) leptolepis*, *C. (Selar) malam*, *C. (S.) kalla*, *C. melampygus*, *Citula armata*, *Alectis ciliaris*, and *Trachurops crumenophthalmus*. He is similarly familiar with *Megalaspis cordyla* (*cordyla* has priority over *rotteri*); *Trachurops boops* listed by Chu in *Selar* (see Copeia, 1942, p. 266); with *Alectis indicus*, of which the *A. gallus* listed (not of Linnaeus) is a synonym; *Carangoides malabaricus*, listed in *Citula*; and also with *Caranx sexfasciatus*, of which *C. flavocaeruleus* and *forsteri* listed, are synonyms. There seems no reason to question the Chinese record of other species with which he is not familiar, namely *Atropus atropus*, which should be easily recognized; *Carangoides chrysophrys* which is listed in *Citula*; *Caranx xanthopygus*, of which *C. carangus*, Chu (not of Bloch, an Atlantic fish) is a synonym; *Citula ophthalmotaenia*, which is listed in *Caranx*.

Caranx (Selar) djedaba is generally credited to the Orient, but related species there are not infrequently mistaken for it, and we accept the Chinese record only provisionally. *Caranx altissimus* Jordan and Seale from Hong Kong is a *Carangoides*, close to *C. malabaricus* the young of which are very deep bodied, but is described with a couple more dorsal and anal

fin rays and other slight differences, and may provisionally stand as distinct. McCulloch's Australian record of this species (1915, Australia, Fisheries, III, p. 134, Pl. XXIV) is erroneous, what he had was a *Citula*.

This leaves four inadequately described, quite unidentifiable species listed, which should be dropped. Three were described in *Caranx* by Richardson, based mainly on drawings, which were very likely inaccurate, fanciful, or composite. One may only guess that *Caranx cancroides* Richardson may be based in part on *Caranx kalla*; *Caranx cestus* Richardson on *Trachurops boops*; *Caranx margarita* Richardson on *Caranx sansun* (Forsk.), a species which may well occur on the coast of China through not yet recorded from there. The long pectoral fin and cross-marks of *Decapterus fasciatus* Bleeker suggest that it was not a *Decapterus*, and was possibly *Caranx (Selar) mate*, to be expected on the China coast.

In a general synopsis of the fishes of China, there is a later review of this group, adding newly recorded species to the list, by Fowler, 1936 (Hong Kong Naturalist, VII (3 and 4), pp. 272-298). This discards, synonymizes, or tentatively synonymizes the same five species in Chu's list that we have eliminated above, and includes the others with the exception of *Caranx altissimus*, which he considers a synonym of *Carangoides malabaricus*. The species added number eight, as follows.

Decapterus lajang and *russellii*, and *Alepes mate* [*Caranx (Selar) mate*], the writer is familiar with elsewhere in the Orient, and would have expected. *Caranx ignobilis* is a familiar Pacific species, both this and *Carangoides ferdau* reported across the Indo-Pacific from the Red Sea to Hawaii; *Carangoides equula* is from Japan. *Caranx guara* is a name the writer uses for an Atlantic fish, considering its representative in the western Pacific a different species, *Caranx platessa*. *Caranx herklotsi* has recently been described from Hong Kong in the subgenus *Leucoglossa*, a division of *Uraspis*, which last we recognize as a full genus, and Fowler makes a subgenus of *Caranx*. The species of *Uraspis* are not sufficiently well known to preclude the possibility of *herklotsi* being a synonym, but it is unlike the description of any from Oriental waters.

It may be noted that *Decapterus lajang* as here figured by Fowler, has the shape of the maxillary wrong for that species; and that his figure of *Carangoides armatus* [*Citula armata*] is rather of *ciliaria*. As there is no indication that either figure was actually based on Chinese material, this has no particular significance.

A revised Chinese list would stand as follows:

1. *Megalaspis cordyla* (Linnaeus)

Scomber cordyla Linnaeus, 1758, Syst. Nat., ed. 10, p. 298.

Scomber rotleri Bloch, 1793, Ausl. Fische, VII, p. 88.

Megalaspis rotleri, Chu, 1931, Biol. Bull. St. John's Univ., No. 1, p. 111.

2. *Trachurus japonicus* (Temminck and Schlegel)

Caranx trachurus japonicus Temminck and Schlegel, 1845, in Fauna Japonica, Pisces, p. 109, Pl. LIX, fig. 1; Japan.

Trachurus trachurus, Fowler, 1936, Hong Kong Nat., VII, p. 276.

3. *Trachurops crumenophthalmus* (Bloch)

Scomber crumenophthalmus Bloch, 1793, Ausl. Fische, VII, p. 77, Pl. 343; West Africa.

Selar crumenophthalmus, Fowler, 1936, l.c., p. 278.

4. *Trachurops boops* (Cuvier and Valenciennes)

Caranx boops Cuvier and Valenciennes, 1833, Hist. Nat. Poiss., IX, p. 46. Moluccas.

Selar boops, Chu, 1931, l.c., p. 111. Fowler, 1936, l.c., p. 278.

5. *Decapterus maruadsi maruadsi* (Temminck and Schlegel)

Caranx maruadsi Temminck and Schlegel, 1845, l.c., p. 109, Pl. LVIII, fig. 2; Japan.

6. *Decapterus russellii* (Rüppell)

Caranx russellii Rüppell, 1827, Atl. Reise nörd. Afr., Fische, p. 99; Red Sea.

7. *Decapterus muroadsi* (Temminck and Schlegel)

Caranx muroadsi Temminck and Schlegel, 1845, l.c., p. 108, Pl. LVIII, fig. 1; Japan.

8. *Decapterus lajang* Bleeker

Decapterus lajang Bleeker, 1855, Nat. Tijdschr. Ned. Ind., VIII, p. 302; Ternate.

9. *Caranx (Selar) djedaba* (Forsk.)

Scomber djedaba Forskal, 1775, Descr. Animal., p. 55; Red Sea.

Selar djiddaba, Chu, 1931, l.c., p. 111.

Alepes djedaba, Fowler, 1936, l.c., p. 280.

10. *Caranx (Selar) kalla* Cuvier and Valenciennes

Caranx kalla Cuvier and Valenciennes, 1833, l.c., p. 49; Indian Ocean. Chu, 1931, l.c., p. 113.

Alepes kalla, Fowler, 1936, l.c., p. 281.

11. *Caranx (Selar) malam* (Bleeker)

Selar malam Bleeker, 1851, Nat. Tijdschr. Ned. Ind., I, p. 362. Java. Chu, 1931, l.c., p. 111.

Alepes melanoptera, Fowler, 1936, l.c., p. 280.

12. *Caranx (Selar) mate* Cuvier and Valenciennes

Caranx mate Cuvier and Valenciennes, 1833, l.c., p. 40; Indian Ocean to New Guinea.

Alepes mate, Fowler, 1936, l.c., p. 282.

Selar affinis, Hoffmann, 1937, Lingnan Sci. Jour. XVI (1), p. 111.

13. *Caranx (Selaroides) leptolepis* Cuvier and Valenciennes

Caranx leptolepis Cuvier and Valenciennes, 1833, l.c., p. 63, Java.

Selaroides leptolepis, Chu, 1931, l.c., p. 111.

14. *Caranx sexfasciatus sexfasciatus* Quoy and Gaimard

Caranx sexfasciatus Quoy and Gaimard, 1824, Voy. de l'Uranie, p. 358 (juv.); New Guinea.

- Caranx forsteri* Cuvier and Valenciennes, 1833, l.c., p. 107; East Indies. Chu, 1931, l.c., p. 113.
Caranx flavocoeruleus Temminck and Schlegel, 1845, l.c., p. 110, Pl. LIX, fig. 2; Japan. Chu, 1931, l.c., p. 113.
15. *Caranx melampygus* Cuvier and Valenciennes
Caranx melampygus Cuvier and Valenciennes, 1833, l.c., p. 116. Indo-Pacific.
16. *Caranx xanthopygus* Cuvier and Valenciennes
Caranx xanthopygus Cuvier and Valenciennes, 1833, l.c., p. 109; Mauritius.
Caranx carangus, Weber and de Beaufort, 1931, Indo-Australian Fishes, VI, p. 257; East Indies. Chu, 1931, l.c., p. 112.
17. *Caranx ignobilis* (Forsk.)
Scomber ignobilis Forskal, 1775, Descr. Animal., pp. 12, 55; Red Sea.
18. *Caranx platessa* Cuvier and Valenciennes
Caranx platessa Cuvier and Valenciennes, 1833, l.c., p. 84; East Indian Sea.
Caranx guara, Fowler, 1936, l.c., p. 286.
19. *Uraspis herklotsi* (Herre)
Leucoglossa herklotsi Herre, 1932, Hong Kong Nat., III (2), p. 151; Hong Kong.
Caranx herklotsi, Fowler, 1936, l.c., p. 287.
20. *Carangoides equula* (Temminck and Schlegel)
Caranx equula Temminck and Schlegel, 1845, l.c., p. 111, Pl. LX, fig. 1; Japan.
21. *Carangoides chrysophrys* (Cuvier and Valenciennes)
Caranx chrysophrys Cuvier and Valenciennes, 1833, l.c., p. 77; Seychelles.
Citula chrysophrys, Chu, 1931, l.c., p. 112.
22. *Carangoides malabaricus* (Bloch and Schneider)
Scomber malabaricus Bloch and Schneider, 1801, Syst. Ich., p. 31; Malabar.
Citula malabarica, Chu, 1931, l.c., p. 112.
23. *Carangoides altissimus* (Jordan and Seale)
Caranx altissimus Jordan and Seale, 1907, Proc. Davenport Acad. Nat. Sci., X, p. 7, Pl. III; Hong Kong. Chu, 1931, l.c., p. 112.
24. *Carangoides ferdau* (Forsk.)
Scomber ferdau Forskal, 1775, Descr. Animal., pp. 12, 55; Red Sea.
25. *Citula ophthalmotaenia* (Bleeker)
Carangoides ophthalmotaenia Bleeker, 1852, Nat. Tijdschr. Ned. Ind., III, p. 270; Amboina. Fowler, 1936, l.c., p. 291.
Caranx ophthalmotaenia, Chu, 1931, l.c., p. 113.

26. *Citula armata* (Forsk.)
Sciaena armata Forskal, 1775, Descr. Animal., p. 53; Red Sea.
Carangoides armatus, Fowler, 1936, l.c., p. 292.
27. *Atropus atropus* (Bloch and Schneider)
Brama atropus Bloch and Schneider, 1801, l.c., p. 98, Pl. XXIII. East Indian Seas.
28. *Alectis indicus* (Rüppell)
Scyris indicus Rüppell, 1827, Atlas Reise n. Afr., p. 128, Pl. XXXIII, fig. 1; Red Sea. *Scyris indica*, Fowler, 1936, l.c., p. 297.
Zeus gallus, Bloch, 1788, Ausl. Fische, VI, Pl. 192 (not of Linnaeus).
Alectis gallus, Chu, 1931, l.c., p. 112.
Alectis major, Hoffmann, 1937, Lingnan Sci. Jour. XVI (1), p. 111.
29. *Alectis ciliaris* (Bloch)
Zeus ciliaris Bloch, 1788, Ausl. Fische, VI, p. 29, Pl. 191; East Indies.
Blepharis ciliaris, Fowler, 1936, l.c., p. 295.

There is no question that still other species of this subfamily will be found on the coasts of China, and the writer's recent studies of Oriental Trachurops, Decapterus and Citula (referred to in citations which follow) will suggest what to look for in these genera.

As regards *Trachurops crumenophthalmus*, the typical subspecies is world wide in distribution. A longer bodied and more cylindrical form, provisionally *T. c. torva* (*Caranx torvus* Jenyns, 1841, Zool. Voy. Beagle, p. 69, Pl. XV; Tahiti) is that which is abundant about the Hawaiian Islands, and it is also recorded from Japan. A contrastingly deeper bodied form with large eye, provisionally *T. c. macrophthalmus* (*Caranx macrophthalmus* Rüppell, 1827, Atl. Reise nörd. Afr., p. 97, Pl. XXV, fig. 4; Red Sea) is recorded from Japan, and the writer has examined specimens from Batavia and Manila, 112 to 167 mm. standard length, which have depth in this 3.2 to 3.6, eye in head 2.7 to 3. There is little doubt that this subspecies as well as *T. c. crumenophthalmus* occurs on the coast of China (1935, Amer. Mus. Novitates, No. 815, pp. 1-6).

As regards the Decapterus listed, *D. russellii*, like *D. maruadsi*, has scutes occupying the entire straight part of the lateral line, but is somewhat less deep bodied (depth 4.2 to 5.3), and with scales on top of head not reaching forward beyond at most the middle of the eye. *D. lajang* Bleeker is comparable with *D. muroadsi*, but has the lower corner of the end of the maxillary rounded and produced backward, so that the end is more or less concave. In addition to the four species listed, *D. macarellus* (Cuvier and Valenciennes) is probable. It is slender, and scutes occupy no more than the posterior half of the straight part of its lateral line. The typical race of *macarellus* is Atlantic, and one would expect specimens from the coast of China to be referable to *D. m. macrosoma* Bleeker of the East Indies, somewhat intermediate towards *D. m. pinnulatus* (Eydoux and Souleyet) described from the Hawaiian Islands. There is an East Indian race of *D. maruadsi*, approached by *Decapterus dayi*

Wakiya from Formosa. *D. dayi* is, however, closest to, and may be considered a synonym of *D. m. maruadsi* (1942, Amer. Mus. Novitates, No. 1196, pp. 1-8).

Besides those listed, there are three species of *Citula* to be expected. These are, first *C. ciliaria* Rüppell, which is close to *C. armata*, but has a long anal filament, comparable with, though shorter than that of the dorsal, versus much shorter; gill-rakers on lower limb of first arch about 16, versus 21 or 22. *C. dinema* (Bleeker) has the scutes comparatively well developed, occupying essentially the whole length of straight part of lateral line, dorsal soft rays 18 or 19, versus 20 to 23. *C. oblonga* (Cuvier and Valenciennes) is less deep bodied (depth in standard length, 2.6), has a longer straight part of the lateral line (about equal to the chord of the curve), and more numerous developed scutes, some 39 (1940, Copeia, No. 3, p. 202).

THE ROBBER FLIES AND BEE-KILLERS OF CHINA (DIPTERA: ASILIDAE)

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Introduction

The Asilidae or Robber Flies form a large family of the Diptera comprising small to large species all with a characteristic alert and lively appearance emphasized by the large eyes and active movements. All are predaceous in the adult stage feeding on other insects or such Arachnids as small spiders and mites. Many are spiny or bristly, some are hairy, a few are very slender and delicate, and a few very stout.

Many Asilids exhibit protective coloration, their colors blending with their natural surroundings while at rest, thus illustrating Nature's original "Camouflage," which helps to protect them from their vertebrate enemies that depend on sharp vision for detection of their food. Others closely resemble bees, wasps or other aculeate Hymenoptera, demonstrating the principles of Mimicry, Warning Coloration, or even Aggressive Simulation in remarkably resembling the insects upon which they are most likely to prey, an hypothesis advanced and developed in great detail by the late Professor Sir E. B. Poulton of Oxford University.

Enderlein in 1914 called attention to the fact that a number of Oriental Asilid flies were generic mimics of certain Hymenoptera, many of which possessed stings or were warningly colored. Species of *Damalis* Fabr. mimic Indian honey-bees for example; *Trigonimima* Enderlein, the stingless honey-bee *Trigona* Jur.; *Ophionimima* Enderl. the ichneumon genus *Ophion*; *Microstylum* Macquart and *Mimoscolia* Enderlein, the Scoliid wasps of the genera *Scolia* and *Elis*; and *Salimimima* Enderl., the powerful Pompilid spider wasps of the genus *Salix*.

In some of these the resemblance is specific; i.e. the Sumatran *Ophionimima solcifemur* Enderl. mimics the Ophionid, *Hybopleurax sumatranum* Enderl.; *Damalis major* v. d. W. the large dark Indian honey-bee, *Apis dorsata* Fabr., *Damalis maculatus* Wied. the common Indian honey-bee, *Apis indica* Fabr.; *Trigonimima canifrons* Enderl. the stingless honey-bee, *Trigona canifrons* Sm.

An actual case of Aggressive Mimicry was recorded by Poulton in 1907 quoting Col. C. T. Bingham (Trans. Ent. Soc. London, 336, 1902) who observed in Burma the association of *Damalina* bee-killers, mimics of the *Melipona* bees, with their prey, the bees. Colonel Bingham found the flies lurking in the neighborhood of the nests of the Dammar bees, selecting their victims from the streams of these small bees entering and leaving their nests.

The Chinese fauna of Asilids is rich and some very striking and beautiful species occur within the confines of the Celestial Nation. It is noted

worthy that many species are of a golden or yellowish coloration, as are many other Chinese insects, while sand-colored species occur in the deserts, and dark colored or metallically glistening forms occur in the tropical humid regions where vegetation is rank.

The compound eyes of the Asilidae are large, occupying a considerable portion of the upper head and indicate unusually keen vision, while their legs are strong and bristly enabling them to seize and hold their prey.

As mentioned above, in some genera, the adult flies are able to capture and overcome such powerful stinging Hymenoptera as bees and wasps. Some in the Americas, Europe, Australia, and Japan have even become of economic importance in destroying domestic bees. In the American species, the popular term "Bee-Killer" has been applied to these flies. The cosmopolitan genus *Promachus* is outstanding in this habit. *Promachus apivorus* Walker so-named because of its fondness for the large black bees of India is in the present paper recorded from China.

Asilid larvae occur either in soil or in decaying wood, where in the case of many species, they are predaceous or parasitic upon the larvae or pupae of Coleoptera. In one genus, *Hyperechia* Schiner, the larvae attack and feed upon the larvae or pupae of certain carpenter bees, *Xylocopa*, in galleries in wood, the adult bees in addition being mimicked and preyed upon by the *Hyperechia* flies. The larvae of *Promachus*, on the other hand, occur in soil where they feed on Scarabaeid grubs.

The ovipositor of female Asilids is modified in accordance with egg-laying habits. Where the ovipositor is spined—and this is frequently the case in the subfamilies *Dasygogoninae*, *Laphriinae* and *Asilinae*—egg-laying takes place in the soil, the spined tips being useful in brushing the soil over the egg emplacements thus concealing them from possible enemies. Where the ovipositor is elongate and flattened as in certain *Promachus*, *Neoitamus* or *Erax*, oviposition takes place in crevices of bark, weed heads or similar places where a pointed and flattened structure is advantageous. Where the ovipositor is short and blunt, as in the North American *Mallophora* or the Australian *Neoratus*, oviposition may take place on leaves, grass blades or other smooth flat surfaces where the eggs are deposited in exposed compact masses glued to the object of attachment. Where the ovipositor is undeveloped and undifferentiated, as in *Leptogaster* or *Dioctria*, the eggs are dropped in flight and left to the force of gravity.

The number of undescribed Asilids occurring in China is large and difficulties have been experienced in obtaining specimens. My first work on the Chinese Asilidae was published in the Novitates of the American Museum of Natural History in 1928 from a collection made by Mr. R. H. Caldwell at Yen-Ping. During 1926, 1927, and 1928, I received specimens from Dr. K. Y. Fey, Director of the National Bureau of Entomology, Kashing, Chekiang.

In 1931, I received a very interesting collection from Mr. W. E. Hoffmann of Lingnan University. This collection contained material obtained by the 5th Expedition of this University to the island of Hainan, many

specimens of which are recorded in the present annotated list.

My knowledge of Chinese species was further increased by the receipt of a collection from Mr. H. S. Parish of Toronto, Canada, who had obtained the specimens from the Reverend George Franck, a former missionary of Szechuan Province. In addition, Dr. A. L. Melander allowed me the study of his collection which contained material collected by Messrs. Gressitt and E. Suenson, as well as by the Reverend Franck. In more recent years, excellent collections were received from Dr. B. Bequaert of the Musée Heude, Shanghai, many of these collected by the Director of this museum, the Reverend O. Piel; and from the Compagnie Orientale Française of Harbin comprising the results obtained by the intrepid collectors, N. Nikitin and S. Gashey, in the dense Eastern Mountain Forests of Pinchang Province where the fauna is so remarkably related to that of North Central Europe.

Keys to Subfamilies

1. Very slender, bare species with elongate abdomen and long slender legs; antennae with a slender terminal arista; marginal cell open; palpi one jointed. LEPTOGASTRINAE
Not with this combination of characters. 2
2. Marginal cell open; palpi 2-jointed. DASYGOGONINAE
Marginal cell closed. 3
3. Palpi 2-jointed; antennae without a slender, terminal arista. LAPHRIINAE
Palpi 1-jointed; antennae with a slender, terminal arista. ASILINAE

Keys to Genera

I. Subfamily Leptogastrinae

1. Small species, under 16 mm. in length. *Leptogaster*
Large, very elongate species, over 18 mm. in length. *Lagynogaster*

II. Subfamily Dasygogoninae

1. Front tibiae with a subterminal claw-like spur. 10
Front tibiae without such a curved, claw-like spur. 2
2. Antennae with a slender, terminal, hair-like arista. *Damalis*
Antennae with or without a terminal style. 3
3. Only 6 abdominal segments visible from above in male; posterior femora thickened; third antennal segment with a short style surmounted by a minute bristle. *Trichardis*
Not with this combination of characters. 4
4. Antennae elongate, composed of 5 joints; bare species. 5
Antennae less elongate, the 3rd segment with or without a style. 6
5. First joint of antennae about 3 times the length of the second; third elongate, 4th and 5th of nearly equal length; the third and fourth at tip with 2 lobes or processes reaching to about the middle of the following joint. *Myelaphus*
3rd and 4th antennal joints not lobed at tip. *Ceraturgus*
6. Head narrow, about as high as broad; face narrow above, broader and swollen below, in large part covered with hair or bristles; abdomen elongate, cylindrical. *Stenopogon*
Head broader than high. 7

7. Large species with long, pointed proboscis and elongate neck region; vein posterior to the second posterior cell continuous or nearly so with the 4th vein beyond the discal cell, the last section of the 4th vein oblique, closing or greatly narrowing the first posterior cell. **Microstylus**
Without this combination of characters. 8
8. Face gibbous, swollen in profile; rather small, stout species, more or less hairy. **Cyrtopogon**
Face flattened or only gently convex. 9
9. Small, pollinose species; abdomen flattened. **Stichopogon**
Larger species; abdomen cylindrical, narrower than thorax. **Scylaticus**
10. Third antennal segment without style. **Archilaphria**
Third antennal segment with style. 11
11. Neck region unusually elongate; slender, bare species, abdomen coarctate; scutellum bare. **Neolaparus**
Not with this combination of characters. 12
12. Ovipositor without spines at tip. **Dasypogon**
Ovipositor with tip spinose. 13
13. Third antennal joint with short, compact style. **Saropogon**
Third antennal joint with short, more slender style. **Selidopogon**

III. Subfamily Laphriinae

1. Three submarginal cells present. **Pogonosoma**
Two submarginal cells. 2
2. First posterior cell closed and petiolate; proboscis short. **Nusa**
First posterior cell open or nearly closed at margin. 3
3. Bare metallic species; the proboscis long and slender; the palpi very small. **Maira**
More or less hairy species; the proboscis long but stouter; the palpi somewhat larger and longer but still more or less filiform. **Laphria**

IV. Subfamily Asilinae

1. Bristle of antenna pectinate. 2
Bristle of antenna bare. 3
2. Bristle of antennae pectinate below. **Ommatius**
Bristle of antennae with pectinate hairs clustered at tip. **Michotamia**
3. The posterior branch of the third vein curves forward to meet the costa at or before the tip of the wing. 4
The posterior branch of the third vein terminates beyond the tip of the wing. 5
4. Ovipositor cylindrical with a terminal circlet of spines. **Proctacanthus**
Ovipositor elongate without a terminal circlet of spines. **Erax**
5. Three submarginal cells. 6
Two submarginal cells. 7
6. Short spines on cerci; head not particularly broadened; bare species. **Philodicus**
No spines at tip of ovipositor; head broadened; more hairy. **Promachus**
7. Ovipositor elongate, slender giving the abdomen a "rat-tailed" appearance. 8
Ovipositor not elongate or produced. 10
8. Ovipositor only slightly produced; occipital bristles not proclinate. **Cerdistus**
Ovipositor very long. 9

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9. First joint of posterior tarsus thickened and spurred; head broadened. **Astochia**
First joint of posterior tarsus normal; head not broad; occipital bristles proclinate. **Neoitamus**
10. Middle femora thickened at base with an assemblage of strong bristles underneath; proboscis slender, up-turned at tip. **Hoplophomerus**
Without this combination of characters. 11
11. Tip of ovipositor with 4-6 upright spines. **Philonicus**
Tip of ovipositor without spines. **Asilus**

Key to Subgenera of Asilus

1. Each side of the abdomen near the incisures with a transverse row of bristles which are distinct from the hairs. 3
Tergites without such bristles. 2
2. Bright colored; with more or less color on wings. **Asilus sens. strict.**
Duller, grayish, more uniformly colored: wings hyaline. **Antiphrisson**
3. Yellowish, bare, species; legs mostly yellowish. 4
Species with ground color of body darker. 5
4. The 4th posterior cell bulging into discal cell; costal and radial veins thickened, the fore margin of the wing in the male more or less dilated. **Clephyroneura**
Without this combination of characters. **Orophotus**
5. Grayish species with legs more yellow than gray. **Neomochtherus**
Legs with more blackish or brownish than yellow. 6
6. Lamella of ovipositor short, blunt, bent downward with a fringe of hairs projecting downward. **Antipalus**
Without this character. 7
7. Lamella of oviduct wedged in, making ovipositor blade-like; mesonotum without thick mane of hairs or bristles. **Eutolmus**
Lamella of oviduct free. 8
8. Abdomen thickly haired with long bright-colored pile. **Trichomachimus**
Abdomen otherwise. 9
9. Posterior border of last ventral segment of male widened. **Machimus**
Posterior border of last ventral segment of male not widened. 10
10. Small fragile species with legs distinctly banded or spotted. **Epitriptus**
Larger, more blackish species. **Tolmerus**

List of Chinese Asilidae

I. Leptogastrinae

Leptogaster

Meigen, III, Mag. II, 269, 53 (1803).

Gonypes Latreille, Hist. Nat. XIV, 309 (1804).

Leptogaster is a cosmopolitan genus. The members are all very slender, fragile species with elongate abdomens. They occur in shady places for the most part among grass and herbage where many species have been found to prey on small or immature delicate spiders.

formosana Enderlein, Wien. Ent. Zeitschr. XXXIII, 154 (1914).

Ta Han, Hainan. July 7, 1935.

suensoni Frey, Notul. Ent. 17, 50 (1937).

Fukien (Frey).

Lagynogaster

Hermann, Arch. für Naturgesch. 82 (1916), A, 5, 12 (1917).

inscriptus Hermann, Arch. für Naturgesch. 82 (1916) A, 5, 17 (1917).

Hori, Formosa, June 7, 1934.

II. Dasypogoninae**Damalis**

Fabricius, Syst. Antliat. 147, 33 (1805).

Chalcidimorpha Westwood, Ann. Soc. Ent. France, IV, 684 (1835).

Damalina Doleschall, Naturkund. Tijdschr. Ned. Ind., ser. 4, III (XVII) 90 (1858).

Damalis is a widespread genus of the Oriental, Ethiopian and Neotropical regions. The slender, pointed antennal arista is a characteristic feature, while the body is more or less bare, and many of the species mimic bees.

andron Walker, List Dipt. Brit. Mus. II, 480 (1849).

T'ienmu-Shan, May 24, 1937 (O. Piel).

grossus Schiner, Nov. Reise, Dipt. 161, 8 (1868).

Ta Han, Hainan, June 23, 1935. Yen-Ping, Sept. 11, 1917.

maculatus Weidemann, Ausser. Zweifl. Ins. I, 416, 2 (1828).

Sokutsu, Formosa, Sept. 1912 (H. Sauter).

pallidus van der Wulp, Tijdschr. v. Entom., ser. 2, VIII (XV) 145.5 (1872).

Mokan Shan, June 9, 1937 (O. Piel).

vitripennis Osten Sacken, Berlin. Ent. Zeitschr. XXVI, 106 (1882).

Hong San, Kiangsi, June 28, 1936. Tai An Hong, Kiangsi, July 5, 1936. Yun Na San, Kwangtung, June 15, 1936. Ta Han, Hainan, June 7, 1935. Sokutsu, Formosa, June 1912 (H. Sauter). Kankau, Formosa, June, 1912 (H. Sauter). Yuen, Moon, Hainan, May 24, 1929.

Myelaphus

Bigot, Ann. Soc. Ent. France, ser. 6, II, Bull. XCI (1882).

Myelaphus Kertész, Cat. Dipt. IV, 96 (1909).

dispar Loew, Beschr. Europ. Dipt. III, 122, 71 (text fig. 239) (1873).

East Central Asia, Japan (Engel).

Ceraturgus

Wiedemann, Anal. Ent. 12 (1824).

hedini Engel, Ark. för Zool. 25, 22, 15 (1933).

Scylaticus

Loew, Öfv. K. Vet. Akad. Förh. XIV, 1857, 346 and 349 (1858).

Euthrix Phillippi, Verh. zool-bot. Ges. Wien, XV, 690 (1865), preoccupied.

degener Schiner, Nov. Reise. Dipt. 163, 13 (1868).

Hainan, Aug. 7, 1929.

lutescens Hermann, Ent. Mitt. III, 2-5, 38 (1914).

Cyrtopogon

Loew, Linn. Ent. II, 516 (1847).

Enarmostus Walker, List Dipt. Brit. Mus., suppl. 2, 423 (1854).

Euarmostus Walker, Insect. Saunders. Dipt. I, 102 (1851).

Eupalamus Jaenicke, Berlin Ent. Zeitschr. XI, 86, 124 (1867) preoccupied.

Grypocionus Speiser, Schr. phys.-ökon. Ges. Königs. 65, 155 (1928).

aino (*Grypocionus*) Speiser, Schrift. d. Phys. Oken. Ges. Königsberg i. Pr. LXV, 29, 156 (1928).

S. Kansu (Engel).

daimyo-chinensis Engel, Ark. för zool. 25a, 22, 13 (1933).

Kansu (Engel).

longibarbus Loew, Wien. Ent. Monat. I, 36, II (1857).

Kansu (Engel).

Stichopogon

Loew, Linn. Ent. II, 499 (1847).

Philammosius Rondani, Dipt. Ital. Prodr. I, 156, 3 (1856).

Stilopogon A. Costa, Atti R. Acad. Sc. Nap., ser. 2, I, 62 (1884).

Neopogon Bezzi, Ann. Mus. Hung. 8, 147-153 (1910).

barbiellinii Bezzi, Ann. Mus. Nat. Hung. VIII, 138, 7 (1910).

North China (Engel).

muticus Bezzi, Ann. Mus. Nat. Hung. VIII, 142, 14 (1910).

Peking, South and Southwest Mongolia (Engel).

Stenopogon

Loew, Linn. Ent. II, 453 (1847).

Scleropogon Loew, Berl. Ent. Zeitschr. X, 26 (1866).

albociliatus Engel, Flieg. Pal. Reg. 24, 285 (1929).

Tian-Schan (Engel).

callosus Pallas, Zoolog. Mag. I, 2, 30 (*Asilus*) (1878).

Tien-Shan, Fu-Shu-Shi, South Mongolia (Engel).

coracinus Loew, Linn. Ent. II, 454, 8 (1847).

Tchenkiang, May 31, 1918.

kaltenbachi Engel, Flieg. Pal. Reg. 24, 294 (1929).
Chingob-Tae (Engel).

milvus Loew, Linn. Ent. II, 454, 9 (1847).
Peking (Engel).

peregrinus Seguy, Encyc. Ent. Ser. B, II, Dipt. 6, 37 (1932).
Yunnan (Seguy).

strataegus Gerstaecker, var. *longulus* Engel, Ark-Zool. 25A, 22, 13 (1934).
S. Kansu, N. E. Szechuan, S. Mongolia (Engel).

Microstylum

Macquart, Dipt. Exot. I, 2, 26, 3 (1838).

Megapollion Bigot, Ann. Soc. Ent. France, ser. 3, V, 548 (1847).

Megapollyon Walker, Insect. Saunders. Dipt. I, 85 (1851).

Mimoscolia Enderlein, Wien. Ent. Zeit. XXXIII, 168 (1914).

bicolor Macquart, Dipt. exot. suppl. 4, 62, 17, plate VI, fig. 3 (1849).

Hong San, Kiangsi, June 26, 1936. Wong Sa Shui, Kiangsi, July 8, 1936. Chekiang, August 10, 1926 (Fey). Yen-Ping, August 10, 1917.

dux Wiedemann, Auss. Europ. Zweifl. I, 568, 55 (1828).

This large, robust, yellowish species with black markings is mimetic of one of the large Chinese hornets, *Vespa ducalis* or *V. mandarina*. *Dux* reaches a length of 45 mm. and seems to be fairly common in many parts of China. Poulton has recorded its preying upon the Cetonia beetle, *Protaetia mandarina* Weber, Hong-Kong (Bowering); the Cicada, *Rihana ochracea* Walker, Macao (Kershaw); and the Cicada, *Mogannia mandarina* Distant, Macao (Kershaw).

Hong San, Kiangsi, July 15, 1936. Yen-Ping, Aug. 4, 1920. Feng-Ta, Hang-ma-Tung, May 8, 1929.

fafner (*Mimoscolia*) Enderlein, Wien. Ent. Zeit. XXXIII, 168 (1914).
West China (Enderlein).

flaviventre Macquart, Dipt. Exot. Suppl. IV, 19 (1849).

Tonkin, April-May, 2-3000 ft. (H. Früstorfer).

sordidum Walker, List Dipt. Brit. Mus. VI, suppl. 2, 505 (1854).
"China" (Walker).

oberthurii van der Wulp, Notes Leyden Mus. XVIII, 241 (1896).

A large, powerfully built, beautifully colored species, black with some bright colored hairs, the mesonotum pale blue-gray pollinose, and deep black wings with greenish and violet metallic reflections. *Oberthurii* is mimetic of one of the large Scoliid wasps of its wide range. It occurs from China and Japan to Indo-China. *Oberthurii* reaches a maximum length of 48 mm.

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Fan Ta, Hainan, June 26, 1935. Kwan, July 20-Aug. 8, 1938.
Omei, July 15, 1929.

spectrum Wiedemann, Auss. Europ. Zweifl. I, 368, 2 (1828).
Chekiang, May 20, 1920 (Fey).

vulcan Bromley, Amer. Mus. Nov. 336, 1 (1928).
Vulcan is closely related to *oberthurii* v. d. Wulp.
Yen-Ping, August 8, 1917.

Archilaphria

Enderlein, Wien. Ent. Zeit. XXXIII, 151 (1914).

ava Enderlein, Wein. Ent. Zeit. XXXIII, 152 (1914).

Chahar, Yangkiaping, July 5, 1937 (O. Piel).

Neolaparus

Williston, Psyche, V, 255 (1889).

Laparus Loew, Progr. Real. Mes. 1851, 4 (1851) preoccupied.
Cenopogon van der Wulp, Tijdschr. v. Ent. XLI, 120 (1898).

cerco (*Dasypogon*) Walker, List Dipt. Brit. Mus. II, 349 (1849).
Hong Kong (Walker).

volcatus (*Dasypogon*) Walker, List Dipt. Brit. Mus. II, 346 (text figure 275) (1849).

Ta Hian, Hainan, June 13, 1935. Nodoo, Hainan, June 1, 1935.
Hainan, August 7, 1929.

Dasypogon

Meigen, Ill. Mag. II, 270, 55 (1802).

japonicus Bigot, Annal Soc. Ent. France, Ser. 5, VIII, 411, 2 (1878).
Kiangsu (Engel).

pekinensis Bigot, Annal Soc. Ent. France, Ser. 5, VIII, 410, 1 (1878).
Chinkiang, May 6, 1936 (E. Suenson).

teutonius Linnaeus, Syst. Nat. Ed. XII, II, 1008, 11 (*Asilus*) (1767).

Saropogon

Loew, Linn. Ent. II, 439 (1847).

Saropogon Williston, Trans. Amer. Ent. Soc. Phil. XVIII, 74 (1891).

subauratus Walker, List Dipt. Brit. Mus. VI, suppl. 2, 470, 252 (1854).
"South China" (Walker).

Selidopogon

Bezzi, Zeit. f. Syst. Hym. and Dipt. II, 192 (1902).

Ceilotogon Bigot, Ann. Soc. Ent. France, ser. 5, VIII, 220 (1878).

Cheilopogon Rondani, Dipt. Ital. Prodr. I, 157, 8 (1856).
Chilopogon Bigot, Ann. Soc. Ent. France, ser. 5, VIII, 219 (1878).
Seilopogon Rondani, Dipt. Ital. Prodr. IV, 7 (1861).

octonotatus-rubidus Hermann, Berl. Ent. Zeitschr. L., 35 (1905).
 Tian-Schan (Engel).

Trichardis

Hermann, Zeit. f. Syst. Hym. and Dipt. VI, 136, 3, plate 5, fig. 7 (1906).
leucocoma van der Wulp, Trans. Ent. Soc. London, 90, 15 (*Hoplistomera*) (1899).
 S. W. Mongolia (Engel).

III. Laphriinae

Pogonosoma

Rondani, Dipt. Ital. Prodr. I, 160, 1 (1856).
funbris Hermann, Ent. Mitt. III, 5, 129, (1914).
 Kuraru, Formosa, June, 1935.

Nusa

Walker, Insect. Saunders. Dipt. I, 105 (1851).
formio Walker, Insect. Saunders. Dipt. I, 106 (1851).
 Shanghai, August 7, 1936 (E. Suenson).

Laphria

Meigen, Ill. Mag. II, 270, 57 (1803).
Choerades Walker, Insect. Saunders. Dipt. I, 109 (1851).
Pagidolaphria Hermann, Ent. Mitt. III, 2-5, 85 (1914).
Saliomima Enderlein, Zool. Anzeig., XLIV, 6, 243 (1914).
caspiaca Hermann, Berlin. Ent. Zeitschr. L, 18 (1905).
 S. Kansu (Engel).
fulva Meigen, Klassif. I, 264, 9 (1804).
 S. Kansu, N. E. Szechuan (Engel).
laterepunctata Macquart, Dipt. Exot. I, 2, 66, 9 (1838).
 Ku-Ling, July 27, 1935 (O. Piel).
mitsukurii Coquillett, Proc. U. S. Nat. Mus. XII, 316 (1898).
 Chahar, Yangkiaping, July 7, 1937 (O. Piel).
chrysotela (*Saliomima*) Walker, List. Dipt. Brit. Mus. VII, suppl. 3, 552, 131 (1855).

The largest known species of *Laphria*. I have a specimen 45 mm. in length. It is a beautiful striking insect, the dark portion of the body be-

ing a deep rich brown, contrasting with the bright golden-yellow color of the long, fine woolly pile. It is related to *Laphria horrida* Walker and *L. gigas* Macquart, both of which belong to Enderlein's subgenus *Saliomima* and are mimetic of either the large spider wasps of the genus *Salius* or of the hornets of the genus *Vespa*.

Tonkin, Montes Manson, April-May, elevation 2-3000 ft. (H. Frühstorfer).

Maira

Schiner, Verh. zool-bot. Ges. Wien, XVI, 673 (1866).
aterrima Hermann, Ent. Mitt. 36, 110 (1914).
 Canton (Hermann).

IV. Asilinae

Michotamia

Macquart, Dipt. Exot. I, 272, 6 (1838).
Allocotosia Schiner, Verh. zool-bot. Ges. Wien, XVI, 845 (1866).
Allocotosia van der Wulp, Tijdschr. v. Ent., ser. 2, VII (XV) 249, X, (1872).

Dr. A. Earl Pritchard called my attention to the fact that Macquart's *Michotamia* was Schiner's *Allocotosia* with the antennal arista broken off!

aurata Fabricius, Ent. Syst. IV, 387, 48 (*Asilus*) (1794).
 Hainan, June 24, 1929.

Ommatius

Wiedemann, Dipt. Exot. 213 (1821).
Emphysomera Schiner, Verh. zool-bot. Ges. Wien, XVI, 845 (1866).
Merodontina Enderlein, Zool. Anzeig. XLIV, 6, 262 (1914).
Ommatinus Becker, Ent. Mitt. 14, 84 (1925).

aequalis (*Emphysomera*) Becker, Ent. Mitt. 14, 80 (1925).
 Formosa (Becker).

biseriata (*Emphysomera*) Becker, Ent. Mitt. 14, 81 (1925).
 Formosa (Becker).

chinensis Fabricius, Ent. Syst. IV, 383, 34 (*Asilus*) (1794).

This robust, golden-brown species with an exceptionally wide head and large eyes is the largest *Ommatius* known, reaching a length of 27 mm. Throughout its wide range, from India to Australia, north to North China, Japan and the Philippines, it is undoubtedly abundant as it is represented in almost every collection from those regions. There is some variation evident, particularly in coloration, and it is possible if not probable that subsequent study may result in breaking up the *chinensis* complex into a number of species, particularly if a study of the aedeagus is undertaken such as Professor Hobby did for the African *Promachus fasciatus* group, but for the time being, I am accepting Engel's synonymy which

includes: *Androcles* Walker, *concinens* v. d. Wulp, *coryphe* Walker, *flavescens* Fabr., *fulvidus* Wied., *garnotii* Guerin, *inextricatus* Walker and *pennus* Walker. Engel gives *chinensis* as the genotype of *Ommatius*, although Coquillett in 1910 had already designated the American species, *marginellus* Fabr. as type of the genus.

Tchenkiang, May 2, 1938. Hangchow, July 3 and 16, 1929. Kashing (K. Y. Fey).

compactus (*Ommatius*) Becker, Ent. Mitt. 14, 127 (1925).

Formosa (Becker).

conopsoides (*Emphysomera*) Wiedemann, Auss. Zweifl. Ins. I, 422, 7 (1828).

Kankau, Formosa, IX, 12 (H. Sauter). Fan Ta, Hainan, June 4 and July 17, 1935. Ta Hian, Hainan, June 18, 1935. Sung-yang, Chekiang, Aug. 10, 1927. Hainan, July 19-Aug. 15, Lingnan University 5th Hainan Expedition 1929.

flavipyga Becker, Ent. Mitt. 14 (130) (1925).

Formosa (Becker).

griseipennis (*Ommatius*) Becker, Ent. Mitt. 14, 131 (1925).

Formosa (Becker).

major (*Ommatius*) Becker, Ent. Mitt., 14, 125 (1925).

Formosa (Becker).

medius (*Ommatius*) Becker, Ent. Mitt., 14, 128 (1925).

Formosa (Becker).

nigripes (*Ommatius*) Becker, Ent. Mitt., 14, 130 (1925).

Formosa (Becker).

pauper (*Ommatius*) Becker, Ent. Mitt., 14, 128 (1925).

Formosa (Becker).

similis (*Ommatius*) Becker, Ent. Mitt., 14, 129 (1925).

Formosa (Becker).

tenellus van der Wulp, Trans. Ent. Soc. London 1899, 97, 23, Plate III, fig. 14-15 (1899).

Yim Na San, Kwangtung June 11, 1936. Hong San, Kiangsi, June 24, 1936. Tai an Hong, Kiangsi, July 6, 1936.

torulosus (*Ommatius*) Becker, Ent. Mitt. 14, 126 (1925).

Formosa (Becker).

unicolor (*Ommatius*) Becker, Ent. Mitt., 14, 124 (1925).

Formosa (Becker).

Becker in Ent. Mitt. 14 (1925) pp. 80-84 gives a key to the subgenus *Ommatius* in Formosa.

Promachus

Loew, Linn. Ent. III, 390, 2 (1848).

Trupanea Macquart, Dipt. exot. I, 2, 91, 3 (1838) preoccupied.

Trypanoides Becker, Ent. Mitt. 1 (1925).

Keys to the Palaearctic species of *Promachus* are given by both Engel in Lintner 24, 22-23 (1930) and Paramonov in Trav. Mus. Zool. Kiev #10, 25 (1931).

albopilosus Macquart, Dipt. exot. suppl. 5, 57, 53, plate II, fig. 4 (1855).

Omei, July 8, 1929. Kwan, Aug. 9, 1930. Kwan Hsien, Szechuan, Aug. 3-22, 1938. Chekiang, April 2, 1931 (O. Piel). Hangchow, May 1930.

anicus Walker, List Dipt. Brit. Mus. II, 392 (*Asilus*) (1849).

Poulton records the following prey from this species: the cicada, *Mogannia nasalis* White, Macao, May 1906 (J. C. Kershaw); the ichneumonid, *Chrysopimpla ornaticipes* Cam., Macao, May 1906 (J. C. Kershaw); the winged ant, *Camponotus rufoglaucus* Jerd., Macao, May 1906 (J. C. Kershaw); the Rutelid beetle, *Anomala* near *idiocnema* Burm., Macao, May 1906 (J. C. Kershaw).

Mei-Hsien, Kwangtung, June 9, 1936. Chekiang, Aug. 25, 1931 (O. Piel). Kashing, 1926 (Fey). Canton, July 1, 1926 (W. E. Hoffmann).

apivorus Walker, Trans. Ent. Soc. London, n. ser. V, 282 (1860).

A fairly common species of India, here recorded from China for the first time. It is a dark colored species, gray pollinose, with the abdomen banded with gray. The ovipositor is shortened; the hypopygium bears a small tuft of white pile on the base of the upper portion. *Apivorus* reaches a length of 33 mm.

Nodoa, Hainan, May 30, 1935; June 1, 1935; June 27, 1929. Grove 1½ miles south of Nodoa (5th Hainan Expedition of Lingnan University). Hainan, south of Nodoa, July 9, 1929 (W. E. Hoffmann).

chinensis Ricardo, Ann. Mag. Nat. Hist. 5, 226 (1920).

This beautiful golden-brown species averages somewhat smaller in size than *testacipes* and the ovipositor is not so elongate and compressed as in that species. My largest specimen is 40 mm. in length.

Chekiang (O. Piel).

fulviventris (*Trypanoides*) Becker, Ent. Mitt. 14, 72 (1925).

Kwan, Aug. 9, 1938 (Franck). Kwanhsien, Aug. 18, 1939 (Franck).

indigenus (*Trypanoides*) Becker, Ent. Mitt. 14, 74 (1925).

Formosa (Becker).

leucopygus Walker, Trans. Ent. Soc. London, n. ser. IV, 129 (1857).

"China" (Walker).

maculipes Walker, List. Dipt. Brit. Mus. VII, suppl. 3, 605, 72 (1855).

"Hong Kong" (Walker).

nigribarbatus (*Trypanoides*) Becker, Ent. Mitt. 14, 73 (1925).

Formosa (Becker).

pallipennis Macquart, Dipt. Exot. suppl. 5, 58, 55 (*Trupanea*) (1855).

"North China" (Macquart).

testaceipes Macquart, Dipt. exot. suppl. 5, 56, 52 (*Trupanea*) (1855).

This huge, golden-yellow species is the largest known species of the genus. Engel gives the length as ranging from 33 to 50 mm. The next largest *Promachus* is *giganteus* Hine from Texas and Mexico. This reaches a length of 47 mm., but is decidedly less robust than the Chinese *testaceipes*. *Testaceipes* is widely distributed in the Orient, occurring in China, Formosa and Sumatra. It is powerful enough to overcome the large orange belted hornets in spite of the terrible stings of the latter. Poulton recorded these hornets *Vespa cincta* var. *affinis* Fabr. (workers), as prey of *testaceipes* at Macao, July 18, 1905 (Kershaw).

Hori, Formosa, May 1934. Yen-Ping, June 13, 1917.

viridiventris Macquart, Dipt. exot. suppl. 5, 58, 54 (*Trupanea*) (1855).

Hong San, Kiangsi, June 23, 1936. Moka Shan, June 10, 1937 (O. Piel).

Astochia

Becker, Ann. Mus. Zool. St. Petersburg, 538 (1913).

inermis Hermann, Arch. für Naturg. 82, A, 5, 29 (1916).

Ta Hian, Hainan, July 4-23, 1935. Hainan, June 25, 1929.

griseus Wiedemann, Dipt. exot. 192, 17 (*Asilus*) (1821).

Bukai, Formosa, June 14, 1934 (L. Gressitt).

longistyla Wiedemann, Auss. zweif. Ins. I, 483, 13 (*Asilus*) (1828).

S. Kansu (Engel).

philus Walker, List. Dipt. Brit. Mus. II, 393 (*Asilus*) (1849).

Ta Hian, Hainan, June 17, 1935. Hainan, August 20, 1929.

scalaris Hermann, Arch. für Naturg. 82, A, 5, 27 (1916).

Tsin Leang, Kwangtung, June 2, 1936.

trigemina Becker, Ent. Mitt. 14, 244 (1925).

Formosa (Becker).

Neoitamus

Osten Sacken, Cat. N. A. Dipt. Ed. II, 82 and 235, 134 (1878).

Itamus Loew, Linn. Ent. IV, 84, 7 (1849) preoccupied.

aurifer Hermann, Arch. für Naturg. 82, A, 5, 20 (1916).

Kiangsu. Tchenkiang, April 25, 1929.

cothurnatus Meigen, Syst. Beschrieb. II, 317, 16 (*Asilus*) (1820).

N. E. Szechuan (Engel).

dolichurus Becker, Ent. Mitt. 14, 244 (1925).

Formosa (Becker).

fertilis Becker, Ent. Mitt. 14, 243 (1925).

Formosa (Becker).

pediformis Becker, Ent. Mitt. 14, 24 (1925).

Formosa (Becker).

rubrofemorata Ricardo, Ann. Mag. Nat. Hist. 3, 67 (1919).

Tientsin.

Cerdistus

Loew, Linnaea Entomol., IV, 74, 5 (1849).

laetus Becker, Ent. Mitt. 14, 246 (1925).

Formosa (Becker).

Erax

Macquart, Dipt. Exot. 1, 2, 107-119 (1838).

Of the 14 species described as *Erax* by Scopoli (Ent. Carn., 1763) all have been subsequently transferred to other genera. Hobby has pointed out that *Erax barbatus* Scopoli, the genotype as designated by Coquillett in 1910 is a *Protophanes*! Rather than adopt the absurdity of upsetting these long established genera, I am following Macquart and Hine in their interpretation of the genus *Erax*, with the genotype, the North America *Erax rufibarbis* Macquart.

ochreiventrus Becker, Ent. Mitt. 14, 71 (1925).

Formosa (Becker).

sinensis Macquart, Dipt. Exot. I, 2, 108, 2 (1838).

"China" (Macquart).

Philodicus

Loew, Linn. Ent. III, 391, 3 (1848).

chinensis Schiner, Novara Reise, Dipt. 179, 58 (1868).

Fo-Kien Province (G. Suenson). Sung-yang, Chekiang, July 8, 1927 and Aug. 16, 1929 (K. Y. Fey). Hainan (5th Lingnan Univ. Expedition 1929).

javanus Wiedemann, Zool. Mag. 1, 3, 4, 5 (*Asilus*) (1819).

Yo-Lan, Hainan, July 9, 1935. Fan Ta, Hainan, July 17, 1935.

longipes Schiner, Novara Reise, Dipt. 179, 59 (1868).

Kankau, Formosa, Aug. 1912 (H. Sauter). Hainan, July 9, 1929. Chekiang, July 6, 1927 (K. Y. Fey).

ochraceus Becker, Ent. Mitt. 14, 75 (1925).

Formosa (Becker).

Proctacanthus

Macquart, Dipt. exot. I, 2, 120, 6 (1838).

Acanthodelphia Bigot, Ann. Soc. Ent. France, ser. 3, V, 545 (1857).

Proctacantha Scudder, Nom. Zool. Univ. Index, 262 (1884).

Satanas Jacobson, Horae Soc. Ent. Ross. 13 (1908).

agha (*Satanas*) Engel, Ark. Zool. 25A, 22, 5 (1934).

S. W. Mongolia (Engel).

chan (*Satanas*) Engel, Ark. Zool. 25A, 22, 3 (1934).

S. W. Mongolia (Engel).

fuscanipennis Macquart, Dipt. exot. suppl. 5, 59, 14, plate III, f. 5 (1855).

North China (Macquart).

gigas Eversmann, Bull. Soc. Imp. Nat. Moscow XXVII, 200 (1854).

The largest *Proctacanthus* known, *gigas* has a very wide range from Morocco in North Africa, Egypt and South Russia to the desert regions of southwest Mongolia. It is a somewhat slender, elongate, light brownish-gray pollinose species. E. Efflatoun Bey in recording *gigas* from Egypt noted the difficulty of seeing it in the field due to its protective coloration as it alights on grass stems near waterways or oases in the arid country it inhabits. Engel gives its length as 38-50 mm. which is somewhat larger than our largest North American species, the reddish *P. heros* Wied. which reaches a length of 45 mm.

S. W. Mongolia (Engel).

testaceicornis Macquart, Dipt. exot. suppl. 5, 59, 15 (1855).

North China (Macquart).

Philonicus

Loew, Linn. Ent. IV, 144, 16 (1849).

Philonotus Neuhaus, Dipt. Marchica, 67 (1886).

dorsiger Weidemann, Ausser. Europ. Zweifl. I, 436, 17 (1828).

S. W. Mongolia (Engel).

nigrosetosus van der Wulp, Sumatra Expedition, Dipt. 24, 1 (1881).

N. E. Szechuan (Engel).

Hoplophomerus

Becker, Ent. Mitt. 14, 241 (1925).

armatipes Macquart, Dipt. exot., suppl. 5, 63, 82, plate II, fig. 8 (1885).

Tsin Leong San, Kwangtung, June 7, 1936. Hori, Formosa, May 25, 1932. Bukai, Formosa, June 11, 1934 (L. Gressitt). Yen Ping, Aug. 10, 1917. Hangchow, July 3, 1930.

hirtiventris Becker, Ent. Mitt. 14, 241 (1925).

Kwanhsien, Szechuan, Aug. 17, 1938. Kwan, Aug. 12, 1938 (female with bumblebee, *Bombus* sp. as prey). Yu Chi Valley, Szechuan, Sept. 19, 1928.

Asilus

Linnaeus, Syst. Nat. Ed. X, 605, 227 (1758).

Subgenus Clephyroneura

Becker, Ent. Mitt. XIV, p. 68 (1925).

Synolcus authors not Loew, Ofv. Kong. Vet. Akad. Förh. XIV (1857), 361 and 362, 25 (1858).

xanthopus Wiedemann, Zool. Mag. I, 3, 5, 6 (*Asilus*) (1819).

Hainan, Aug. 10, 1929 (5th Expedition, Lingnan University). Dwa Bi, Hainan, July 24, 1935.

Subgenus Antipalus

Loew, Linn. Ent. IV, 136, 14 (1849).

pedestris Becker, Ent. Mitt. 14, 132 (1925).

Formosa (Becker).

Subgenus Antiphrisson

Loew, Linn. Ent. IV, 124, 10 (1849).

sareptanus Lichtwardt, Ann. Mus. Nat. Hung. I, 103, 3 (1903).

Subgenus Neomochtherus

Osten Sacken, Cat. N. A. Dipt. Ed. II, 82 and 235, 134 (1878).

Mochtherus Loew, Linn. Ent. IV, 58, 4 (1849) preoccupied.

flavicornis Ruthe, Isis, 1831, XI, 1217 (*Asilus*) (1831).

Chahar, July 19, 1937 (O. Piel).

flavipes Meigen, Syst. Beschreib. 325, 28 (1820).

S. Mongolia (Engel).

perplexus Becker, Revis. Loew Dipt. Asil. 74, 103, pl. 5, fig. 48 (1923).

S. W. Mongolia (Engel).

Subgenus Orophotus

Becker, Ent. Mitt. 14, 137 (1925).

Orophotus is closely related to the African Subgenus *Heligmoneura* Bigot, which Engel states is restricted to the Ethiopian region. Both are related to *Cinadus*.

chrysogaster Becker, Ent. Mitt. 14, 240 (1925).

Formosa (Becker).

fulvidus Becker, Ent. Mitt. 14, 240 (1925).

Formosa (Becker).

mandarinus Bromley, Amer. Mus. Nov. 336, 1 (*Asilus*) (1928).

Yen-Ping, June 26, 1917. Ku-Ling, July 8, 1935 (O. Piel).

sinensis (*Heligmoneura*) Ricardo, Ann. Mag. Nat. Hist. 3, 75 (1919).
China (Ricardo).

univittatus Becker, Ent. Mitt. 14, 137 (1925).

Formosa (Becker).

yenpingensis Bromley, Amer. Mus. Nov. 336, 2 (*Asilus*) (1928).

Yen-Ping, May 20, 1920.

Subgenus *Eutolmus*

Loew, Linn. Ent. III, 459, 2 (1848).

rufibarbis Meigen, Syst. Beschreib. II, 311, 6 (*Asilus*) (1820).

N. E. Szechuan, S. Kansu (Engel).

sedakofii Loew, Neue Beitr. II, 12, 25 (1854).

Siberia.

tolmeroides Bromley, Amer. Mus. Nov. 336, 3 (1928).

Hong San, Kiangsu, June 23, 1936.

ussuriensis Engel, Lintner 24, Asilidae, 148 (1930).

Soochow, Sept. 6, 1922 (K. Y. Fey).

Subgenus *Trichomachimus*

Engel, Arkiv. för Zool. 25 A, 22, 10 (1933).

excelsus Ricardo, Ann. Mag. Nat. Hist. Ser. 9, vol. X, 68 (1922).

Shanghai, July 15, 1936 (E. Suenson).

pubescens Ricardo, Ann. Mag. Nat. Hist. Ser. 9, vol. X, 67 (1922).

Shanghai, Sept. 21, 1936 (E. Suenson).

Subgenus *Machimus*

Loew, Linn. Ent. IV, 1, 3 (1849).

Tolmerus Loew, Linn. Ent. IV, 94, 8 (1849).

aurimystax (*Tolmerus*) Bromley, Amer. Mus. Nov. 336, 3 (1928).

Yen-Ping VIII, 17, 1917.

aurulentus Becker, Ent. Mitt. 14, 249 (1925).

Formosa (Becker).

chinensis Ricardo, Ann. Mag. Nat. Hist. 3, 45 (1919).

China (Ricardo).

gratiosus Loew, Beschreib. Eur. Dipt. II, 175, 95 (1871).

N. E. Szechuan, S. Kansu (Engel).

scutellaris Coquillett, Proc. U. S. N. Mus. XII, 315 (text fig. 153) (1898).

Chahar, Yangkipaing, July 10, 1937 (O. Piel).

asiaticus (*Tolmerus*) Becker, Ent. Mitt. 14, 247 (1925).

Formosa (Becker).

impeditus (*Tolmerus*) Becker, Ent. Mitt. 14, 246 (1925).

Formosa (Becker).

Subgenus *Epitriptus*

Loew, Linn. Ent. IV, 108, 9 (1849).

arthriticus Zeller, Isis, 1840, I, 64, 16 (*Asilus*) (1840).

N. E. Szechuan, S. Kansu (Engel).

cingulatus Fabricius, Species Insect. II, 464, 25 (*Asilus*) (1781).

S. W. Mongolia (Engel).

inconstans Wiedemann, After Meigen, Syst. Beschreib. II, 323, 25 (*Asilus*) (1820).

S. Mongolia (Engel).

Asilus Ssensu strictu

ephippium Macquart, Dipt. exot., suppl. 5, 62, 80 (1855).

S. W. Mongolia (Engel).

limbipennis Macquart, Dipt. exot. Suppl. 5, 63, 83, plate II, fig. 9 (1855).

"North China" (Macquart).

maculifemora Macquart, Dipt. exot. suppl. 5, 62, 81, Plate II, fig. 7 (1855).

"North China" (Macquart).

misao Macquart, Dipt. exot. suppl. 5, 64, 84 (1855).

"North China" (Macquart).

shalumus Walker, Trans. Ent. Soc. London, n. ser. IV, 131 (1857).

"China." Ricardo [Ann. Mag. Nat. Hist. (9) 10: 45 (1922)] says *Shalumus* is a synonym of (*Hoplophomerus*) *armatipes* Macquart.

sinis Seguy, Ann. Soc. Ent. France, 99, 48 (1930).

Harbin, July 20, 1940.

MARINE FISHES FROM THE CHUSAN ARCHIPELAGO AND THE CHINESE COAST

By ALBERT W. C. T. HERRE

The fishing grounds of the Chusan Archipelago are the richest and most productive of any along the entire coast of China. This is due to the highly favorable strategic position of the group. The Chusan Islands are said to be more than 500 in number; most of them are small, and a number are mere uninhabited rocks. They are really the drowned eastern end of the mountain chain that crosses Chekiang Province eastward and northward of Ningpo, then plunges into the Yellow Sea. These islands lie across the mouth of Hangchow Bay and not far south of the mouth of the Yangtse. Their waters therefore receive not only the rich detritus of the Tsien Tang River and other Chekiang streams, but are also a natural settling basin for a large portion of the material poured forth by the mighty Yangtse River. At the same time the outer portion of the archipelago extends eastward beyond the muddy riches brought by these streams into the clear, blue, and highly saline water of a branch of the Kuro Siwo flowing toward the Yellow Sea and the west coast of Korea. The region about the archipelago accordingly abounds not only in fishes of the shallow and muddy banks along shore, but also in pelagic or semi-pelagic fishes that migrate in vast schools off the Asiatic coast.

During September and October, 1936, it was my privilege to work at the Chekiang Provincial Fisheries Station, at Tinghai. This city is on Chusan Island, the largest and most important one of the Chusan Archipelago. Through the cooperation of Mr. T. P. Chen, director of the Station, and Mr. S. Y. Lin, his chief assistant, intensive studies of the freshwater fishes of the Tsien Tang River, of Chusan Island, and of the vicinity of Ningpo, were completed, and large collections of marine fishes were studied. To make a more complete study of the marine fishes it would be necessary to spend at least a year among the Chusan Islands, collecting and studying the fishes in the field during all the seasons and all their migrations.

Few tide pool fishes were obtained. At first sight, Chusan Island and its near neighbors seem ideal for tide pool collecting. It was soon discovered that the vast amount of silt carried in the water had filled up nearly all tide pools and made them practically uninhabitable for most fishes. The only fishes to be found on the shores of Chusan Island and the other inner islands of the archipelago were young mullet and a very few kinds of mud-dwelling gobies. A visit to Pu Taw Island revealed that its outer end extended beyond the permanently muddy water, and around its eastern extremity were real tide pools, with a considerable variety of fishes, including blennies, gobies, labrids, pomacentrids, and other reef fishes. The outer fringe of islands, such as East Saddle Island, has a rich and varied tide pool and reef fish fauna. As the station had no

boat, transportation about the archipelago was very difficult, and it was not possible to visit the islands eastward and north of Pu Taw. Mr. Lin had been able to make a small collection at East Saddle Island the preceding year, which gave some idea of the richness of the fish fauna living there.

Some of the marine fishes studied showed that as yet our knowledge of their distribution is only fragmentary. A number of fishes were discovered living in the Chusan Archipelago that had previously been known only from Japan. It is therefore evident that a considerable number of fishes supposed to be characteristic of Japan really occur all along the Chinese coast, not only to the Chusan Archipelago but far southward along the coast of Chekiang Province. One of the Japanese fishes taken at Saddle Island was a rare *Chimaera*, known only from a few specimens. Along with other rarities, it was retained in the collection of the Experiment Station, which was overwhelmed by the Japanese Army a few months later. Those not in Dr. Y. T. Chu's *Index Piscium Sinensium* are indicated by a note in each case.

The most important group of fishes in the fisheries of the Chusan Archipelago is that of the croakers, or *Sciaenidae*. They are caught in enormous quantities, the bulk of the catch being iced during the summer season and shipped to Shanghai and various Chekiang ports, to be eaten fresh. Large quantities are also salted and dried. The pike-eel, *Muraenesox cinereus*, is taken in great numbers, ranking next in importance to the *Sciaenidae*. The annual catch of this eel is valued at a million dollars. Two or three species of hair tail occur in the area, but the one of commercial importance is *Trichiurus japonicus*, large quantities being caught and used both fresh and dried. This big fish is the largest of the hair tails, and ranges south to the Ilokano coast of Luzon in the Philippines, where it is also caught in quantity and is an important dried fish. As commonly seen in the markets it ranges from three-fourths of a meter to nearly two meters in length. No specimens were secured at Chusan, as only dried ones were seen. The annual value of the Chusan Archipelago fisheries, according to provincial government data, was more than \$20,000,000.

The Chinese fishermen with their sailing junks were using only old traditional methods. No motor vessels or power boats were used. A good deal of ice was cut and stored each winter from fresh-water ponds along the Chusan coast, and used freely by the fishermen. In this way they were able to get fish in good condition to Shanghai, Ningpo, Hangchow, Wenchow, and other cities along the coast. The staff of the Chekiang Provincial Fisheries Station had embarked upon a program looking toward the gradual improvement of fishery methods, and a great deal of valuable preliminary work had been done. When the war is over the establishment of a well equipped and amply financed station at Tinghai should be one of the first steps taken to ensure the improvement and development of the fisheries of the archipelago, and thus augment and cheapen the most important source of protein food for the people of the adjacent coastal area.

Family HEMISCYLLIDAE

1. *Chiloscyllium punctatum* Müller and Henle
2 juvenile specimens, each 145 mm. long, from Tinghai.

Family GALEIDAE

2. *Scoliodon sorrakowah* (Cuvier)
4 examples from Tinghai, 200 to 255 mm. in length.
3. *Carcharinus menisorrh* (Müller and Henle)
A specimen from Tinghai is 385 mm. long, with an overall length of 520 mm.
4. *Carcharinus sorrah* (Müller and Henle)
An example from Tinghai is 405 mm. long, or 585 mm. including the tail. Not in Dr. Chu's *Index*.
5. *Aprionodon brevipinna* (Müller and Henle)
A specimen from Tinghai measures 375 mm., or 525 mm. with the caudal. Not in Dr. Chu's *Index*.

Family SPHYRNIDAE

6. *Sphyrna zygaena* (L.)
A small specimen was purchased in the market at Tinghai.

Family RAJIDAE

7. *Raja kenojei* Müller and Henle
A specimen from Tinghai has the disk 140 mm. broad and 108 mm. long to the root of the tail, its overall length 205 mm.
8. *Raja porosa* Günther
6 specimens from Tinghai have the breadth of the disk from 70 to 106 mm., its length 122 to 156 mm. 2 other examples, each with the disk 370 mm. long, have its breadth 264 and 272 mm.

Family TORPEDINIDAE

9. *Narke dipterygia* (Bl. and Schn.)
A specimen 112 mm. long was taken at Tinghai.

Family DASYATIDAE

10. *Dasyatis akajei* (Müller and Henle)
A Chusan example with a total length of 490 mm. has the disk 230 mm. wide and 178 mm. long. 2 others, with total lengths of 355 and 358 mm., have their disks respectively 150 and 161 mm. broad, and 123 and 136 mm. long.
11. *Dasyatis zugei* (Müller and Henle)
A specimen from Tinghai has the length of the disk 150 mm., its breadth 152 mm.; with the tail included the length is 392 mm.

12. *Pteroplatea bimaculata* Norman

This species, with its pair of singular large white spots near the eyes, is well known at Tinghai. A specimen with a breadth of 415 mm. has a disk 185 mm. long and with the tail is 295 mm. long.

13. *Pteroplatea japonica* Schlegel

This is the commonest butterfly ray of the area. A specimen with a disk 250 mm. long has a breadth of 345 mm. The total length with the tail is 250 mm.

Family ELOPIDAE

14. *Elops hawaiiensis* Regan

A specimen 182 mm. long was taken from the sea on the coast of Chusan Island.

15. *Elops machnata* (Forskål)

An example 140 mm. long was caught in a fresh-water canal at Tinghai.

Family CLUPEIDAE

16. *Hilsa reevesi* (Richardson)

5 juvenile examples taken at Tinghai are 40 to 48 mm. in length.

17. *Ilisia elongata* (Bennett)

4 specimens were purchased in the Tinghai market, their lengths 215 to 335 mm.

Family DOROSOMATIDAE

18. *Nematalosa japonica* Regan

2 specimens taken at Tinghai are 110 and 156 mm. in length. The depth of the larger one is 3.2, that of the other 3.33 times in the length. The ventral scutes are 18 or 19 + 14.

Family ENGRAULIDAE

19. *Coilia ectenes* Jordan and Seale

5 specimens, 140 to 215 mm. in length, were secured at Tinghai.

20. *Setipinna taty* (Cuv. and Val.)

A specimen 155 mm. long was taken at Tinghai.

Family SALANGIDAE

21. *Leucosoma chinensis* (Osbeck)

20 specimens, 58 to 66 mm. in length, were taken at Tinghai.

22. *Parasalanx acuticeps* Regan

A specimen 106 mm. long was obtained from Pakhoi, Kwangtung Province.

23. *Salanx brachyrostralis* Fang

I refer here with grave doubt 9 specimens, 95 to 114 mm. in length. They were purchased Nov. 12, 1936, in the market at Tai Po, New Territory, Hong Kong. All have been gutted, but one is a female much distended with eggs ready to spawn. All but this specimen and one other have a broad curved band above the anal base; it is smooth, hard, and glistening, like a piece of cellophane, and is apparently a series of modified scales, fused into a single piece.

Dorsal 14; anal 21 to 26, mostly 24; pectoral I—6 or 7, the spine much elongated, the last ray divided, but both branches spring from the same actinost.

The anal origin is opposite the dorsal origin or under the first or second dorsal ray. The depth is 14.5 to 14.7 times in the length, the depth of males being almost as great at the anal origin as that of the gravid female at the point of greatest distension. The head is 6.25 to 6.33 times in the length; the breadth of the head is about 3 times in its own length; the snout is 3 times in the head and more than 1.5 times in the postorbital. The eye is 6.6 to 6.5 times in the head. The presymphysial appendage is minute, less than one-thirtieth of the head length. The distance from the ventral origin to the anal is three-fourths of the distance from ventral to pectoral origin. The distance from the dorsal origin to the caudal is 3 to 3.3 times in the distance from the dorsal origin to the tip of the snout.

The probabilities are that this is a new species. The Salangidae are still in a muddle, in spite of Dr. Fang's paper which has done a good deal to clarify the situation. A revision based on ample material, collected throughout the year, is much needed. The Salangidae undergo considerable change during their development to maturity, while at least some of the species are sexually dimorphic. A study of hundreds of specimens of each species, instead of the single specimen or perhaps two on which a number of species are based, might well revolutionize our ideas of the Salangidae. Such series can only be obtained by ransacking the markets of the coastal cities of China, Korea, Formosa, and Japan. No doubt such a study would reduce to synonymy several species and probably some genera too. At the same time it would very probably discover several species as yet unknown.

Family ANGUILLIDAE

24. *Anguilla japonica* Schlegel

Juvenile specimens are abundant in tide pools. Only 7 specimens 210 to 254 mm. in length were kept of those taken along the shore of Chusan Island, and 1 of 255 mm. at Pu Taw Island.

Family MURAENESOCIDAE

25. *Muraenesox cinereus* (Forskål)

Seen in quantity in the Tinghai market, many being of large size. 4 specimens were taken, from 280 to 775 mm. in length.

Family CONGRIDAE

26. *Leptocephalus myriaster* (Brevoort)

4 specimens from Tinghai are 395 to 600 mm. in length. Apparently new to China.

Family MYRIDAE

27. *Sinomyrus angustus* Lin

This remarkable little eel, which probably does not belong to the Myridae but should be placed in a new family, is common in the Chusan Islands. It has been known previously from the type and sole specimen, 335 mm. long; taken at Hoihow, Hainan, which may be near the southern limit of its range. 32 examples, from 270 to 405 mm. in length, were obtained in the Tinghai market. Another specimen in good physical condition measured but 215 mm., as the tail had been bitten off close to the trunk; the wound had healed and the fish seemed to have fared well in spite of this handicap.

Sinomyrus angustus is very slimy, while the flesh is soft and unattractive. It is one of the exceedingly limited number of fishes not directly poisonous that is not eaten or utilized in any way. Practically all inedible or worthless fish are used to feed pigs and poultry, but this brownish gray slimy eel is not even fit for that. Even the poorest or most economical villagers would not buy it, so that it was the only fish the market vendors gave us, thus saving themselves the trouble of disposing of them.

It is a bottom dweller, and is taken in nets and trawls used for catching croakers and other desirable fish living on the muddy bottom of the shallow sea about the archipelago.

Family OPHICHTHYIDAE

28. *Pisoodonophis cancrivorus* (Richardson)

1 example 420 mm. long was secured at Hong Kong.

Family MURAENIDAE

29. *Gymnothorax reticularis* Bloch

1 specimen 230 mm. long was collected at Hong Kong.

Family ARIIDAE

30. *Arius falcarius* Richardson

2 specimens 236 and 315 mm. in length were collected at Tinghai, and also a juvenile example of 85 mm.

Family SYNODONTIDAE

31. *Trachinocephalus myops* (Bl. and Schn.)

2 examples from Tai Po, New Territory, Hong Kong, are 205 and 208 mm. in length.

Family HARPODONTIDAE

32. *Harpodon nehereus* (Buch. Ham.)

5 specimens, 60 to 170 mm. in length, from Tinghai.

Family BELONIDAE

33. *Ablennes hians* (Cuv. and Val.)

A fine example 735 mm. long, from Tinghai. Not recorded by Dr. Chu.

Family BOTHIDAE

34. *Pseudorhombeus cinnamomeus* (Schlegel)

An example from Tinghai is 200 mm. long.

35. *Pseudorhombeus javanicus* (Bleeker)

A Tinghai specimen is 129 mm. long.

Family PLEURONECTIDAE

36. *Pleuronichthys cornutus* (Schlegel)

2 specimens from Tinghai are respectively 112 and 190 mm. in length, and 2 from Hong Kong are 106 and 125 mm.

Family SOLEIDAE

37. *Zebrias zebra* (Bloch)

3 examples from Tinghai are 175 to 200 mm. in length.

Family CYNOGLOSSIDAE

38. *Cynoglossus abbreviatus* (Gray)

2 from Tinghai are 260 and 275 mm. in length.

39. *Cynoglossus lighti* Norman

A specimen 120 mm. long, from Tinghai, has the depth 5 times in the length.

40. *Cynoglossus robustus* Günther

4 specimens from Tinghai, 290 to 305 mm. in length.

41. *Cynoglossus sinicus* Wu

A fine example 560 mm. long was bought in the Tinghai market. Known previously from only the 3 examples obtained by Dr. Wu from Wen Chow, Fukien Province. His largest specimen was 305 mm. in length.

Family SYNGNATHIDAE

42. *Syngnathus argyrostictus* Kaup

4 specimens taken among rocks on the coast of Chusan Island are 65 to 85 mm. in length. This is the *Corthoichthys quinquarius* of Snyder, described from Tanegashima, Japan. Not in the *Index Piscium Sinen-sium*, but recorded by me from Hong Kong in 1935.

Family FISTULARIIDAE

43. *Fistularia villosa* Klunzinger
2 specimens were taken at Tinghai, their lengths 254 and 505 mm.

Family MUGILIDAE

44. *Liza menada* Tanaka
3 examples from Tinghai are 188 to 203 mm. in length.
45. *Mugil affinis* Günther
2 specimens 88 and 90 mm. in length from Pu Taw Island, and 1 of 305 mm. from Hong Kong.
46. *Mugil carinatus* (Ehrenberg)
The young of this species swarm in the Chusan tide pools, from which I had 28 specimens, 49 to 118 mm. in length; 2 specimens, each 68 mm. long, were taken at Pu Taw Island.
47. *Mugil cephalus* L.
2 specimens from Tinghai measured 260 and 265 mm.
48. *Mugil haematochilus* Schlegel
Juvenile examples of this species were likewise common in Chusan tide pools, where 10 specimens from 66 to 78 mm. in length were secured.

Family SPHYRAENIDAE

49. *Sphyræna barracuda* (Walbaum)
A specimen was collected at Tinghai, its length 300 mm.; 2 others, 220 and 235 mm. in length, were obtained at Tai Po, New Territory, Hong Kong.

Family POLYNEMIDAE

50. *Eleutheronema tetradactylum* (Shaw)
2 specimens from a Chusan Island tide pool are 102 and 115 mm. in length.

Family SCOMBRIDAE

51. *Rastrelliger chrysozonus* (Rüppell)
A specimen 390 mm. long was purchased at Tinghai.
52. *Scomberomorus guttatus* (Bl. and Schn.)
A specimen 552 mm. long from the Tinghai market and another of 320 mm. from Hong Kong.

Family THUNNIDAE

53. *Euthynnus yaito* Kishinouye
Not rare in the Chusan Archipelago; 1 specimen from the Tinghai market.

Family TRICHIURIDAE

54. *Trichiurus japonicus* (Schlegel)
Very abundant in the Chusan Islands. A medium-sized specimen from Tinghai has a length of 1020 mm. Specimens from Tai Po, New Territory, Hong Kong, were much smaller. In life or while still very fresh there are two longitudinal yellow stripes on each side of the body, as in *Trichiurus haumela*.

Family PAMPIDAE

55. *Pampus argenteus* (Euphrasen)
2 examples from the Tinghai market, 107 and 196 mm., and 4 from tide pools, 55 to 70 mm. in length.

Family STROMATEIDAE

56. *Psenopsis anomala* (Schlegel)
2 Tinghai market specimens measure 117 and 140 mm.

Family CARANGIDAE

57. *Atropus atropus* (Bl. and Schn.)
6 specimens, 104 to 120 mm. in length, were taken at Tai Po, New Territory, Hong Kong.
58. *Caranx malabaricus* (Bl. and Schn.)
2 specimens, each 150 mm. long, were collected at Hong Kong.
59. *Decapterus lajang* Bleeker
A specimen 85 mm. long was taken at Hong Kong.

Family AMBASSIDAE

60. *Ambassis buruensis* Bleeker
6 specimens from Hong Kong, 30 to 32 mm. in length.
61. *Ambassis vachelli* Richardson
18 specimens, 28 to 48 mm. in length, of this little known fish were secured at Hong Kong, and 1 of 35 mm. at Tai Po, New Territory. The lateral line is interrupted; predorsal scales usually 11 or 12; one specimen has 14. There is a patch of teeth on the tongue. There are 2 to 4 supra-orbital spines posteriorly. This species was described by Richardson from Canton, in 1846, and apparently has not been collected since. It was listed by Bleeker in 1873, but he had no specimens.

Family SERRANIDAE

62. *Epinephelus awoara* (Schlegel)
3 specimens from a tide pool on Pu Taw Island are 88 to 94 mm. in length.

63. *Epinephelus brunneus* Bloch
3 specimens 56 to 61 mm. in length were collected from a Pu Taw pool.
64. *Epinephelus diacanthus* (Cuv. and Val.)
A specimen from Tinghai is 74 mm. long.
65. *Epinephelus fario* (Thunberg)
A specimen 65 mm. long was caught in a Pu Taw tide pool.
66. *Epinephelus fasciato-maculatus* (Peters)
A specimen from Tinghai is 68 mm. long.
67. *Epinephelus megachir* (Richardson)
1 example from the Tinghai market, 212 mm. long.
68. *Lateolabrax japonicus* (Cuv. and Val.)
Besides numerous specimens from fresh water, a specimen 139 mm. long was caught in a tide pool at Pu Taw Island.

Family LUTIANIDAE

69. *Lutianus fulviflamma* (Forskål)
A specimen 75 mm. long was taken at Tinghai.
70. *Lutianus monostigma* (Cuv. and Val.)
2 examples, 55 and 79 mm. long, were collected from a tide pool on Pu Taw Island.
71. *Lutianus vitta* (Quoy and Gaim.)
A specimen 150 mm. long was obtained at the market in Tai Po, New Territory.

Family POMADASIDAE

72. *Pomadasys hasta* (Bloch)
Juvenile examples were taken from tide pools as follows: 1 of 73 mm. from Pu Taw Island; 1 of 68 mm. from Chusan Island near Tinghai; and 4 from 21 to 28 mm. in length, at Hong Kong.
73. *Hapalogenys mucronatus* (Eydoux and Souleyet)
2 specimens from Tinghai, 122 and 150 mm. in length. It was a great surprise to collect this fish of the China coast and southern Japan a couple of months later at Sandakan, British North Borneo, where I secured one 196 mm. in length.
74. *Hapalogenys nigripinnis* (Schlegel)
2 examples were collected at Tinghai, their lengths 60 and 137 mm.
75. *Parapristipoma trilineatum* (Thunberg)
2 specimens, each 160 mm. long, were collected at Tai Po, New Territory, Hong Kong. Not in Dr. Chu's *Index*.

Family SPARIDAE

76. *Pagrus spinifer* (Forskål)
2 specimens from the Tinghai market are 150 and 152 mm. in length. Previously reported by me from Hong Kong, where I secured a second specimen of 152 mm. One of the specimens had 60 scales in the lateral line, instead of the usual 54.
77. *Pagrosomus major* (Schlegel)
A Tinghai specimen measures 122 mm.
78. *Nemipterus virgatus* (Houttuyn)
A specimen from Tinghai is 242 mm. long.

Family GIRELLIDAE

79. *Girella melanichthys* (Richardson)
A specimen 77 mm. long was collected from a tide pool at Pu Taw Island.

Family OPLEGNATHIDAE

80. *Oplegnathus punctatus* Schlegel
A specimen was obtained at Tinghai, its length 74 mm.

Family SCIAENIDAE

The general principles laid down by Weber and De Beaufort for the classification of the Sciaenidae are undoubtedly correct. It is believed that some of their groups should be further divided, and the classification used by S. Y. Lin has been adopted here for the most part. Until ample material from the southern and eastern coasts of Asia, and from the adjacent islands, has been carefully compared, the classification of the Indo-Pacific sciaenids will lack clarity and precision. See Lin, *Lingnan Science Journal*, vol. 17, nos. 1-4, 1938.

81. *Collichthys lucida* (Richardson)
5 specimens from Tinghai are 66 to 100 mm. in length.
82. *Pseudosciaena crocea* (Richardson)
(*P. amblyceps* Bleeker and *P. undovittata* Jordan and Seale.)
4 examples from Tinghai, 360 to 390 mm. in length; 2 from Tsingtao, Shantung Province, 265 and 355 mm. in length.
83. *Pseudosciaena manchurica* (Jordan and Thompson)
(This is *P. undovittatus* of various authors.)
7 specimens from Tinghai, 100 to 205 mm. in length; and 1 of 255 mm. from Tsingtao, Shantung Province.
84. *Pseudosciaena mi-iuy* (Basilewsky)
2 examples from Tinghai are 215 and 342 mm. in length.

85. *Argyrosomus iharae* (Jordan and Metz)
3 Tinghai specimens are 63 to 264 mm. in length.
86. *Argyrosomus nibe* (Jordan and Thompson)
4 examples from Tinghai are 160 to 168 mm. in length.
87. *Nibea albiflora* (Richardson)
5 specimens from Tinghai, 115 to 272 mm. in length.
88. *Johnius belengeri* (Cuv. and Val.)
18 specimens, 80 to 134 mm. in length, were collected at Tinghai.

89. *Johnius dussumieri* (Cuv. and Val.)
A specimen 150 mm. long was collected at Tinghai. Omitted by Lin from "Further Notes on the Sciaenid Fishes of China," but surely occurring along the coast.

Family SILLAGINIDAE

90. *Sillago japonica* Schlegel
2 specimens, 190 and 198 mm. in length, were collected at Hong Kong.

Family DREPANIDAE

91. *Drepane longimana* (Bl. and Schn.)
1 example, 95 mm. long, from Tinghai.

Family CHAETODONTIDAE

92. *Chaetodon bella-maris* Seale
2 juvenile examples, 40 and 61 mm. in length, were taken at Hong Kong.

Family SCORPAENIDAE

93. *Scorpaena neglecta* Schlegel
A specimen 80 mm. long was collected at Tinghai.
94. *Sebastiscus marmoratus* (Cuv. and Val.)
4 specimens from Tinghai are from 150 to 199 mm. in length, and 1 from Hong Kong is 198 mm. long.
95. *Minous monodactylus* (Bl. and Schn.)
1 example from Tinghai, its length 93 mm.

Family HEXAGRAMMIDAE

96. *Hexagrammos otakii* Jordan and Starks
A specimen 198 mm. long from Tinghai.

Family PLATYCEPHALIDAE

97. *Platycephalus indicus* (L.)
A specimen from Tinghai, 146 mm. long.
98. *Cocius crocodilus* (Tilesius)
A specimen 220 mm. long from Tinghai, 1 of 330 mm. from Tai Po, New Territory, Hong Kong; and 1 about as large from the Southwest Experiment Station, near Pakhoi, Kwangtung Province.

Family BEMBRIDAE

99. *Parabembras curtus* (Schlegel)
A specimen 142 mm. long was collected at Tinghai, apparently the first record of this Japanese fish in Chinese waters. Dorsal VIII—8; anal II—6; scales in lateral line 40.

Family LIPARIDAE

100. *Liparis tanakae* (Gilbert and Burke)
3 specimens from the coast of Chusan Island are 240 to 318 mm. in length. Dorsal 42; anal 33; pectoral 40—42. Apparently new to the fauna of China.

Family POMACENTRIDAE

101. *Amphiprion polymnus* (L.)
A specimen 43 mm. long was taken at Hong Kong.

Family ELEOTRIDAE

102. *Eleotris balia* Jordan and Seale
A specimen 90 mm. long was taken at Hong Kong.
103. *Bostrichthys sinensis* (Lacépède)
5 specimens, 91 to 134 mm. in length, were taken from muddy puddles at the salt works on a beach of Chusan Island.

Family GOBIIDAE

104. *Bathygobius fuscus* (Rüppell)
10 specimens were taken from a tide pool on Pu Taw Island, their lengths 18 to 37 mm.
105. *Ctenogobius decoratus* Herre
A specimen 20 mm. long was collected at Fan Ling, New Territory, Hong Kong.
106. *Stigmatogobius javanicus* (Bleeker)
2 specimens 27 and 29 mm. in length, taken from a ditch with *Ctenogobius myxodermus* Herre, at Lingnan University, Canton. Determination by Dr. F. P. Koumans. Not previously known from China.

107. *Acanthogobius ommaturus* (Richardson)

36 specimens were taken from tidal mud puddles on an islet opposite the city of Tinghai, their lengths 26 to 160 mm. In spite of their surroundings, these fishes were marked by bars of lovely blue, while their prominent eyes were brilliant blue-green to zircon green.

108. *Amblychaeturichthys hexanema* Bleeker

3 specimens, 69 to 86 mm., were collected at Tinghai.

109. *Chaeturichthys stigmatius* Richardson

A specimen 81 mm. long was collected near Tinghai.

110. *Chasmichthys petschiliensis* (Rendahl)

21 specimens, 27 to 42 mm. long, were taken at East Saddle Island. Previously known only from 6 specimens collected in Chihli Province.

111. *Synechogobius hasta* (Schlegel)

2 fine specimens were taken from tidal mud puddles at a saltworks near Tinghai, their lengths 120 and 162 mm.

112. *Triaenopogon barbatus* Günther

4 specimens, 58 to 85 mm. in length, were obtained from Pu Taw tide pools.

113. *Tridentiger bifasciatus* Steindachner

47 specimens were taken on the shores of Chusan Island and 4 from Pu Taw Island, their lengths from 17 to 49 mm.

114. *Tridentiger trigonocephalus* (Gill)

83 specimens, 17 to 65 mm. in length, were collected at Pu Taw Island. Dorsal VI—1—12 or 13; anal I—10 or 11. This is very different from the preceding species, which has been confused with it. The pale yellow ground color is grayish punctate everywhere, including the belly, with very minute dark specks, the top and sides of the head mottled with brown streaks; a short longitudinal dark bar behind the eye. Eight dusky or brown cross-bands on the body, inclined backward, the posterior ones forked below; the first one is above the pectoral base, the last one on the caudal base. The first dorsal spine and the spine of the second dorsal are dotted with alternate white and brown spots. The second dorsal has a basal yellow stripe; both dorsals are pale, with brown longitudinal stripes; the caudal has many dark brown crossbands, with a black spot at the upper end of its caudal base; the anal is dusky.

Family PERIOPHTHALMIDAE

115. *Boleophthalmus chinensis* (Osbeck)

10 specimens, 43 to 122 mm. in length, from tidal mud puddles at the saltworks, Chusan Island, and 1 of 95 mm. from a Hong Kong tide pool.

116. *Periophthalmus barbarus* (L.)

14 specimens from mud flats near Tinghai are 12 to 68 mm. in length; 3 from Hong Kong are 46 to 65 mm.; and 2 from Lantau Island are 30 and 31 mm. in length.

Family GOBIOIDIDAE

117. *Odontamblyopus rubicundus* (Buch. Ham.)

5 specimens from the muddy shores around Tinghai are 71 to 250 mm. in length. Not in Chu's *Index*.

118. *Nudagobioides nankaii* Shaw

5 specimens 79 to 116 mm. in length, purchased in the Tai Po market, New Territory, Hong Kong. Hitherto known from a single specimen, 105 mm. long, collected on the campus of Nankai University, Tientsin.

119. *Sericagobioides lighti* Herre

4 specimens, 122 and 130 mm. in length, from Amoy. Only known from Amoy, and described from specimens presented to the Philippine Bureau of Science by Dr. S. F. Light.

Family TRYPACHENIDAE

120. *Trypauchen vagina* Bl. and Schn.

4 specimens from Tinghai are 91 to 120 mm. in length. These specimens are identical with *Trypauchen wakae*, Jordan and Snyder, of Japan, which is a synonym of *T. vagina*. I have compared the type of *T. wakae* with a series of *T. vagina* from the Philippines and elsewhere, and it does not differ from them in any essential.

Family URANOSCOPIDAE

121. *Uranoscopus japonicus* Houttuyn

4 specimens from Tinghai are 153 to 180 mm. in length.

122. *Gnathagnus elongatus* (Schlegel)

5 examples from Tinghai are 43 to 146 mm. in length. This seems to be the first Chinese record of this Japanese uranoscopid.

Family BLENNIIDAE

123. *Blennius yatabei* Jordan and Snyder

1 specimen, 41 mm. long, was taken from a Pu Taw tide pool. This is the first Chinese record of this Japanese fish. Dorsal XII—17; anal II—18. There are 8 more or less double crossbands over the back, extending on the dorsal base and down to the middle of the side, where they break up into spots. There is a large dusky spot on the preopercle; the sides and top of the head are thickly sprinkled with brown dots; the dorsal and caudal fins are spotted with violaceous; the anal has a dusky sub-marginal band, its rays white tipped.

124. *Petroscirtes japonicus* Bleeker

This blenny, only known previously from the coasts of Japan, is very abundant in the tide pools of Pu Taw Island. 102 specimens, 24 to 87 mm. in length, were collected. They are identical with *P. dasson* Jordan and Snyder, which is a synonym of *P. japonicus*.

125. *Salarias edentulus* (Bl. and Schn.)

2 specimens, each 42 mm. in length, were taken from a Pu Taw tide pool. Apparently new to the Chinese fauna.

Family TETRAODONTIDAE

126. *Spheroides niphobles* Jordan and Snyder

3 specimens, 60 to 76 mm. in length, from Hong Kong. This Japanese fish is apparently new to the fauna of China.

127. *Spheroides ocellatus* (Osbeck) var. *bimaculatus* Günther

A specimen 112 mm. long was taken at Tanghai.

Family ANTENNARIIDAE

128. *Antennarius nummifer* (Cuvier)

A specimen 44 mm. long was collected at Hong Kong.

129. *Antennarius tridens* (Schlegel)

2 examples, 50 and 65 mm. in length, were caught at Tanghai.

Family OGCOEPHALIDAE

130. *Halieutaea stellata* (Vahl)

2 specimens were obtained at Tanghai, their lengths 50 and 90 mm.

NEW LONGICORN BEETLES FROM CHINA, XI
(Col. Ceramb.)

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The present installment of this series¹ concerns eight new species and new records of some others. A few keys are presented which are additional or supplementary to those published in "A provisional synopsis of the longicorn beetles of China—subfamily Cerambycinae."² The material comes from the collections of the College of Agriculture of the University of Nanking, the Biology Department of West China Union University, the Academia Sinica and the National Agriculture Research Bureau. The type specimens³ are to be deposited in the respective institutions. Four of the new species are from Sikang Province, three from Szechuan Province and one from Kweichow Province, all in West China. The species with additional locality records come from various parts of China. The writer is indebted to Prof. B. A. Slocum, Dr. Chang Min-cheung, Miss D. S. Pen, Dr. Sicien Chen and Dr. Gideon T. W. Liu for their kindness in loaning him this and other material for study.

Subfamily Cerambycinae

Tribe Cerambycini

1. *Pseudaolesthes chrysothrix tibetanus* Gressitt

Pseudaolesthes chrysothrix subsp. *tibetanus* Gressitt, Spec. Publ. Lingnan Nat. Hist. Surv. & Mus. 2: 2, 1942 (Tibet).

One specimen (Kweiyang Agriculture Experiment Station) was taken at Ping-tan, Kweichow Province, July 16, 1930.

Distribution.—Tibet; Kweichow.

2. *Zegriades aurovirgatus* Gressitt

Zegriades aurovirgatus Gressitt, Notes d'Ent. Chinoise 6: 96, pl. 3, fig. 3, 1939 (Chekiang).

One specimen (University of Nanking) was taken west of Kuanghsien, near the Szechuan-Sikang border, W. China, Aug. 6, 1938, by K. F. Chen.

Distribution.—Chekiang; Szechuan-Sikang border.

¹ For part X, see *Spec. Publ. Lingnan Nat. Hist. Surv. & Mus.* 7: 1-12, 1 pl., 2 text-figs., 1942.

² *Spec. Publ. Lingnan Nat. Hist. Surv. & Mus.* 4: 1-34, 1942.

³ Type specimens of species described by the writer which have been designated as on "loan deposit, California Academy of Sciences, San Francisco," are now permanently deposited therein, with the donation of the writer's collections in the United States to the Academy.

Tribe Phoracanthini

3. *Allotraeus (Allotraeus) grahami* Gressitt

Allotraeus grahami Gressitt, Lingnan Sci. Jour. 16: 89, 1937 (Suifu, Szechuan).

One example (University of Nanking) was collected at Moupin, Sikang Prov., W. China on July 29, 1939, by S. N. Hsia.

Distribution.—Szechuan; Sikang.

Tribe Necydalini

4. *Necydalis lateralis* Pic

Necydalis lateralis Pic, Échange hors-texte 55: 2, 1939 (Peking).

One specimen (Academia Sinica) was taken at the Eastern Tomb, near Peiping (no. 2693). This specimen does not have the elytra so distinctly marked as indicated of the type in the original description. The elytra are not black basally, and not distinctly black at their sides. The specimen is 29 millimeters long.

Distribution.—Hopei.

Key to the Chinese species of *Necydalis*

Antennae entirely red; elytra marked with pitchy black at sides; length of body 27–29 millimeters; N.E. China.....*lateralis* Pic
Antennae not entirely red; elytra marked with black only at apices; length of body 19 millimeters; W. China.....*sericella* Ganglb.

Tribe Eroschemini

5. *Corennys sericata* Bates

Corennys sericata Bates, Jour. Linn. Soc. London, Zool. 18: 225, pl. 1, fig. 2, 1884 (Japan: Honshu).

One specimen (Academia Sinica) was taken at the Eastern Tomb, near Peiping, Hopei. New to China.

Distribution.—Hopei; Honshu; Formosa.

Tribe Compsocerini

6. *Rosalia (Eurybatus) formosa pallens* Gressitt, new subspecies

Male.—Orange-yellow, black on head, antennae, legs, and areas adjacent to coxae; pronotum with a medium-sized black spot behind center and three smaller black spots on disc: one anterior to center, other two on supralateral tubercles; scutellum black; each elytron with a basal band, two obliquely placed rounded spots and a postmedian band, narrowed at suture and broadest near external margin, of black. Prothorax and elytra very densely pubescent.

Head no broader than anterior margin of prothorax; mandibles simple; vertex finely punctured; antennal supports coarsely punctured. Antennae not quite twice as long as body; scape slender, pyriform; third to sixth segments with endoapical curved teeth of successively decreasing size; third to fifth segments subequal in length; sixth to tenth gradually

decreasing in length. Prothorax broader than long, rounded at sides, with a small tubercle on each side of pronotal disc above middle of side. Scutellum broadly rounded, finely punctulate and fairly pubescent nearly to apex. Elytra parallel, subobliquely and separately rounded apically. Legs fairly shiny; sparsely pubescent; femora with approximately distal two-thirds swollen in anterior pair and distal two-fifths in middle and posterior pairs; tibiae fairly straight; tarsi with first segment slightly more than one-half as long as remaining segments in first pair, two-thirds as long in middle pair and nearly as long as remaining segments in last pair. Length 25.5 mm.; breadth 7.

Holotype, male (Kweiyang Agriculture Experiment Station), Chih-chin, 100 km. west of Kweiyang, Kweichow Province, SW. China, Aug. 26. Kindly loaned to the writer for study by Dr. Gideon T. W. Liu.

Differs from *R. formosa* Saund. in having the basal black portion of the elytra incomplete and deeply emarginate on the sides below the humeri, from *R. formosa conviva* Csiki in having the basal black portion of the elytra in part reaching the external margins below the humeri, and from both of these forms in having the pubescence yellow-orange instead of vermilion, and in having the supralateral thoracic tubercles much smaller and the scutellum more pubescent. In the color of the derm and pubescence this form differs strikingly from the other members of the subgenus *Eurybatus*, but in all other characters it seems to represent only a geographical subspecies of *R. (Eurybatus) formosa* Saund.

Distribution.—SW. China (Kweichow).

Key to the Chinese species of *Rosalia*

1. Third to fifth or sixth antennal segments each with a curved spine or tooth endoapically; body largely blue, red or orange.....2
Third to sixth antennal segments not spined endoapically; body brownish yellow; elytra with six or more spots or bands on each; antennae ringed with black and yellow (subgenus *Eurybatodes*).....*bouvieri* Boppe
2. Pubescence clothing body largely blue, with black spots or bands; antennae with distinct tufts of hair; mandibles of male with a dorsal tooth (subgenus *Rosalia*, s. str.).....3
Pubescence clothing body largely vermilion or orange, marked with spots or bands of black; antennae with feeble tufts of hair; mandibles of male lacking a dorsal tooth (subgenus *Eurybatus*).....4
3. Elytral humeri pale; prothorax tuberculate laterally; external tooth of mandible blunt.....*houiberti* Vuillet
Elytral humeri black; prothorax non-tuberculate laterally; external tooth of mandible robust, recurved interiorly.....*lameerei* Brongn.
4. Ventral surfaces of body entirely black, or only anterior border of prosternum of female red; pronotum and elytra red with black spots.....5
Ventral surfaces of body at least partly red.....6
5. Antennae of female with strong tufts of hairs; third to fifth antennal segments of male strongly angulate but not spined apically.....*lateritia* (Hope)
Antennae of female lacking strong tufts of hairs; third to fifth antennal segments of male each with a small apical spine.....*dejeani* Vuillet
6. Abdomen red, or largely red or orange.....7

Abdomen black; pronotum and elytra red, each elytron with several black spots.....*decempunctata* (Westw.)

7. Pronotum and elytra red, former with three or four black spots, latter with two broad bands, some spots, and apices, black.....*formosa nigroapicalis* Pic

Pronotum and elytra orange, former with four black spots, latter with basal and postmedian black bands, and four intervening subtransversely arranged black spots; elytral apices unmarked. *formosa pallens* Gress.

Tribe Clytini

7. *Rhaphuma pictiventris* Gressitt

Rhaphuma pictiventris Gressitt, Lingnan Sci. Jour. 18: 40, pl. 2, fig. 1, 1939 (Chui-nam, Kwangtung).

A specimen (Academia Sinica) was taken on Hainan Island on May 23, 1934, by the Chinese National Hainan Expedition. New to Hainan. *Distribution*.—Hainan; Kwangtung.

8. *Demonax sikangensis* Gressitt, new species

Female.—Elongate, very narrow, parallel-sided, cylindrical. Body largely black, clothed with dull reddish brown, gray and white pubescence: head black, pitchy red-brown on mouthparts, moderately clothed with pale gray hairs; antennae pitchy black, with bases and extreme apices of segments reddish; prothorax black, clothed with pale gray pubescence, denser and more whitish beneath and along base, a large transversely rounded oval area just behind center, glabrous in middle and with reddish hairs on periphery; scutellum black, with thin pale gray pubescence; elytra brownish black, clothed with dull reddish brown pubescence, except for the following bands of silvery white on each: (1) a narrow basal band becoming grayish on humerus, (2) a very narrow arcuate band at suture only a short distance behind scutellum, extending obliquely almost to end of basal third, near midline, where it curves forward again, stopping before reaching external margin, (3) a slightly oblique band at end of second third, broadest at suture, narrowing and disappearing just before reaching external margin, and (4) a slightly broader apical band; ventral surfaces black, brownish black on abdomen, clothed with dense silvery white pubescence, grayish on bases of first two abdominal segments and brownish on bases of following three; legs reddish brown, pitchy in part, thinly clothed with grayish buff pubescence and sparsely with short suberect golden hairs.

Head narrower than prothorax, finely granulose-punctate; frons plane, fully as high as wide; vertex rounded-concave. Antennae slender, reaching to last third of elytra; scape a little shorter than third segment; fourth shorter than scape; fifth as long as scape, subequal to sixth and seventh; last four shorter; third, fourth and fifth segments distinctly spined endoapically, spine of fourth segment longest. Prothorax a little longer than broad, swollen in middle, subglobose; base constricted and narrower than apex; surface minutely vermiculate-punctate. Scutellum broadly triangular, rounded apically. Elytra narrow, subparallel-sided, sub-

sinuate-truncate apically; surfaces micropunctulate. Ventral surfaces finely and closely punctured. Legs slender; posterior femora extending slightly beyond elytral apices; first hind tarsal segment one-third longer than remaining segments combined. Length 7.5 mm.; breadth 2.1.

Holotype, female (University of Nanking), Mou-pin, Sikang Province, W. China, Aug. 30, 1939, S. N. Hsia, collector.

Differs from *D. bowringii* (Pasc.) in being largely black, with the antennae spined on the third to fifth segments instead of only the third and fourth, the pronotum with a central darkened area instead of two spots, and the elytra black with four narrow white fasciae, the second deeply arcuate. Similar in pattern to *Rhaphuma diminuta* (Bates) and *R. limaticollis* Gressitt.

Distribution.—W. China.

Tribe Cleomenini

9. *Cleomenes semiargentens* Gressitt, new species

Very slender, parallel-sided; appendages fine. Body dark-reddish brown to blackish, paler on elytra and appendages: antennae and legs reddish ochraceous, the former slightly darker on last three segments; elytra testaceous, ochraceous on humeral stripe, marked with (1-3) three irregular pitchy-black stripes along external margin, middle of disc and suture—the first two merging near end of basal quarter and the second and third meeting a little farther posteriorly, (4) a large triangular brownish spot at middle, the widest side along external margin, (5) an oblique brown band near beginning of last quarter and (6) an indistinct oblique brownish band before apex; head (except reddish mandibles, clypeus and labrum) and prothorax black, largely clothed with silvery pubescence; pronotum glabrous except for an incomplete median silver stripe; scutellum black, densely clothed with silvery pubescence; ventral surface dark reddish brown, almost completely clothed with silvery pubescence which is somewhat sparser on sides of metathorax and anterior borders of sides of abdominal segments.

Head barely broader than prothorax; front of head oblique, fairly plane; frons subrectangular, somewhat closely and deeply punctured; antennal supports distinctly raised, punctured. Antennae slightly longer than body; slender; scape three times as long as second segment; third only twice as long as second, subequal to fourth and fifth; sixth and seventh successively shorter than fifth; eighth subequal in length to seventh, slightly thicker distally; ninth to eleventh shorter and stouter, subequal. Prothorax only one-half again as long as broad, widest just behind middle, constricted before and behind middle, nearly as broad at apex as at base; pronotal disc irregular, concave on midline between center and base, a low tubercle on each side of depression, anterior portion less irregular; surface somewhat densely and coarsely punctured. Scutellum parallel-sided, rounded apically. Elytra parallel-sided, narrowed posteriorly and obliquely emarginate-truncate on endoapical angles; surface completely and somewhat closely and subregularly punctured.

Ventral surfaces minutely punctured on thorax, less finely so on sides of abdominal segments. Legs very slender; femora swollen for not quite apical half in fore legs, apical two-fifths in middle pair, and apical one-third in hind pair; tibiae slightly sinuate; tarsi with first segment in middle and hind pairs not quite as long as remaining combined. Length 9.5 mm.; breadth 1.35.

Holotype (West China Union University), Paohsin, Sikong (Sikang Province), W. China, July 23, 1939, Miss D. S. Pen, collector.

Differs from *C. rufofemoratus* Pic in being largely clothed with silvery pubescence, with the basal elytral stripes shorter, the posterior femoral clubs reddish, etc.

Distribution.—W. China.

Key to the Chinese species of Cleomenes

1. Ventral surfaces of body clothed with silvery pubescence; swollen portion of posterior femora pale.....2
- Ventral surfaces of body clothed with golden pubescence; elytra yellowish testaceous, ochraceous laterally and apically, each marked on posterior half with three fasciae: first narrow, oblique, just before middle, second narrow, strongly oblique, third much wider, covering subapical area; swollen portion of posterior femora black..... *tenuipes* Gress.
2. Elytra yellow, each marked with a narrow discal stripe, another lateral, and a third sutural, each hardly extending beyond middle, with two spots behind; swollen portions of posterior femora testaceous.....
- *rufofemoratus* Pic
- Elytra testaceous, ochraceous on humeri, each marked with discal, lateral and sutural stripes, fusing before middle, and three splotches or bands, meeting along external margin; head, pronotum and scutellum with silvery pubescence, swollen portions of hind femora reddish.....
- *semiargentens* Gress.

Subfamily Lamiinae

Tribe Batocerini

10. *Apriona swainsoni* (Hope)

Lamia swainsoni Hope, Proc. Linn. Soc. London 1: 79, 1840 (Assam).

One specimen (University of Nanking) was taken on Mt. Omei, Szechuan Province, W. China, Aug. 23, 1938, by C. S. Tsi. New to West China. The pubescence in this specimen is largely of a rich reddish brown, giving the insect a rather different appearance from Hainan specimens which have the pubescence largely grayish brown to tawny.

Distribution.—Assam; Tonkin; Szechuan; Hainan I.

Tribe Niphonini

11. *Pterolophia omeishana* Gressitt, new species

Male.—Relatively narrow and elongate, subacute apically. Body reddish brown to pitchy black, irregularly clothed with pale buff to rusty pubescence: head pitchy red in front, blackish posteriorly; labrum distinctly reddish; frons and vertex with dense tawny pubescence, two stripes of same on occiput; antennae reddish brown, scape and apices of following

segments pitchy, basal portions of segments with whitish pubescence, third and following segments fringed with golden brown hairs internally; prothorax black, reddish at apical and basal margins, disc irregularly clothed with tawny pubescence, a distinct mid-longitudinal stripe and an incomplete one on each side, of dense tawny pubescence; scutellum pitchy, with similar pubescence; elytra blackish basally, largely ochraceous brown beyond middle, an irregular band of whitish buff pubescence just behind middle, preceded by a few spots of same and followed by a narrower irregular pitchy band, apical fifth reddish with thin pale pubescence, extreme apex pitchy; ventral surfaces pitchy black, reddish on metasternum; legs pitchy red to black, all with thin whitish buff pubescence.

Head narrower than prothorax, deeply but sparsely punctured; frons deeper than wide, parallel-sided, emarginate above; vertex deeply and angularly concave; occiput feebly concave medially. Antennae barely longer than body, tapering; scape swollen, thickest in middle, four-fifths as long as third segment; fourth nearly as long as third; fifth and following shorter, diminishing in length towards apex. Prothorax slightly broader than long, widest at middle, feebly constricted near base; disc irregularly swollen on each side of middle, subcarinate medially; surfaces grossly rugose-punctate. Scutellum rounded behind, hardly punctured. Elytra subparallel-sided, narrowed and each obliquely truncate and subacute apically; surfaces grossly punctured, each with four longitudinal carinae, the innermost consisting in part of a prominent subbasal crest and a lesser one just before middle, the two unconnected. Ventral surfaces sparsely punctured at sides, deeply so on thoracic pleura. Legs with femora moderately swollen and first hind tarsal segment subequal in length to following two united. Length 9.6 mm.; breadth 3.2.

Holotype, male (University of Nanking), Mt. Omei, Szechuan Province, W. China, Aug. 25, 1938, K. F. Chen, collector.

Differs from *P. caudata* (Bates) in having the elytra more narrowly cristate and obliquely instead of emarginately truncate, and less produced apically, and the prothorax more densely punctured, ridged and striped medially with a small swelling on each side.

Distribution.—W. China.

Tribe Hippopsini

12. *Metopoplectus similis* Gressitt, new species

Male.—Fairly slender, narrowed posteriorly; antennae more than three times as long as body. Reddish brown to blackish brown, clothed with pubescence varying from whitish and golden buff to dark brown: head reddish brown, darker on occiput and genae, thinly clothed with auburn pubescence; antennae reddish brown basally, dark brown beyond sixth segments and on apical portion of scape, with pale pubescence at base of each segment and short erect hairs on underside of basal segments; prothorax brownish black, reddish on constricted and depressed areas, very thinly clothed with pale pubescence; elytra dark reddish brown, paler on bases, external margins and disc before middle, thinly clothed

with pale and brown pubescence basally with a suggestion of longitudinal stripes, a large triangular dark brown area at middle, broad at external margin, narrow at suture, and posterior portion with subregular brown and pale gray stripes; ventral surfaces brownish black, reddish at bases or sides of segments, clothed with golden buff pubescence; legs dark brown, reddish on bases and apices of segments and most of tarsi, nearly black on femora.

Head nearly as broad as prothorax, forming slightly less than a right angle at vertex in side view; frons convex, sparsely and heavily punctured; vertex narrowly concave between antennal insertions; occiput and genae subcoarsely punctured; inferior eye-lobes subpyriform, occupying fully one-half distance between antennal insertions and genal margins. Antennae three and one-third times as long as body, very slender beyond scape, which is gradually thickened to just before apex; third segment distinctly longer than scape, subequal to fourth; fifth to tenth subequal, each not quite as long as fourth; last nearly three times as long as tenth. Prothorax nearly as broad as long, slightly narrowed at apex, constricted near apex and base, somewhat swollen at each side behind middle and on each side of midline of pronotal disc before center and slightly raised along median line behind center; surfaces rather coarsely punctured. Scutellum small, subvertical, rounded behind. Elytra more or less gradually narrowed posteriorly, narrowly and separately rounded-truncate apically; surfaces densely and deeply punctured at bases, more finely so towards apices. Ventral surfaces of body not distinctly punctate, except on prosternum, mesosternum and mesepisternum. Length 14.4 mm.; breadth 3.4.

Holotype, male (University of Nanking), Mt. Omei, Szechuan Province, W. China, Aug. 15, 1938, C. S. Tsi, collector.

Differs from *M. taiwanensis* Gress. in being larger, more narrowed posteriorly, less distinctly marked, with the middle elytral spot subtriangular instead of oblique and the abdomen indistinctly punctured, and from *M. minor* Gress. in having the elytra much more than twice as long as head and prothorax combined, the prothorax less punctate and the metasternum not heavily punctured.

Distribution.—W. China.

Tribe Acanthocinini

13. *Ostedes binodosa* Gressitt, new species

Male.—Body pale reddish brown to blackish brown, marked or speckled with dark brown and buff pubescence: head dark brown, reddish on parts of mandibles and clypeo-frontal suture, clothed with golden buff pubescence, mottled with dark brown and with erect black bristles on frons and vertex; antennae reddish brown, paler on distal segments and bases of other segments; third to tenth segments with whitish pubescence basally; first to eighth segments with numerous internal bristles; prothorax reddish brown, darker on tubercles and sides, clothed with pale golden-buff pubescence, but with scattered dark brown punctures, with

considerable brown mottling on disc at beginning of apical quarter and with some spots of pale pubescence on dark areas; ventral surfaces dark brown with golden-buff pubescence and a few dark brown spots along sides; legs reddish brown, darker near apices of femora and tibiae; femora with pale pubescence and a few dark spots; tibiae pale, with pale pubescence on second and third fifth, and with long hairs more or less corresponding with ground color and pubescence.

Head nearly as broad as prothorax at lateral tubercles, rounded-concave between antennal supports, hardly punctured and feebly grooved; frons broader than high, sparsely punctured; inferior eye-lobes about as wide as deep, occupying nearly three-fourths distance between antennal insertions and genal angles. Antennae one-fourth longer than body, tapering; scape slightly and gradually thickened distally; third segment one-third longer than scape, nearly as long as fourth; fifth nearly as long as third; sixth to tenth gradually decreasing in length; last equal to tenth. Prothorax about as long as breadth at lateral tubercles, constricted near apex and base, with a strong round swelling on each side of disc before middle, a feeble one on each side near base, and a large subacute tubercle at middle of each side; surfaces sparsely punctured. Scutellum broad, rounded-truncate. Elytra slightly narrowed posteriorly, subobliquely truncate apically with exterior angles obtuse and internal angles rounded; disc of each with a distinctly raised crest with black bristles near base; surfaces irregularly punctured, more deeply and densely so on basal portions and along median portion of each to beyond middle. Ventral surfaces indistinctly punctured. Legs with femora fairly thick, and first segment of posterior tarsi nearly as long as remaining segments combined. Length 12.2 mm.; breadth 3.3.

Holotype (University of Nanking), Moupin, Sikang Province, W. China, Aug. 6, 1939, S. N. Hsia, collector.

Differs from *O. inermis* Schw. in being more elongate, with the prothorax more strongly nodose, the elytral crests narrower and hairy, the elytral apices less oblique, etc. and from *O. inermis dwabinus* Gress. in having the pronotum much more uneven, etc.

Distribution.—W. China.

14. *Ostedes dentata* Pic

Ostedes dentata Pic, Mel. Exot. Ent. 67: 18, 1936 (Tali, Yunnan).

A specimen (University of Nanking) was taken at Moupin, Sikang Province, W. China, July 24, 1939, by S. N. Hsia.

Distribution.—Yunnan; Sikang.

Tribe Ptericoptini

15. *Atimura apicalis* Gahan

Atimura apicalis Gahan, Ann. Mus. Civ. Genova 34: 76, 1895 (Burma).

One specimen (University of Nanking) was collected in mountains west of Kuan-hsien, near the Szechuan-Sikang border, W. China, Aug. 2, 1938, by K. F. Chen. New to West China.

Distribution.—Burma; Hainan I.; W. China.

Tribe Saperdini

16. *Eutetrappa metallescens* (Motschulsky)

Saperda metallescens Motsch., Schrenk's Reisen Amurl., Col.: 150, pl. 10, fig. 2, 1860 (Amur).

A specimen (Academia Sinica) was taken at the Eastern Tomb, near Peiping, Hopei. New to China.

Distribution.—E. Siberia; NE. China.

17. *Menesia immaculata* Gressitt, new species

Male.—Somewhat elongate, gradually narrowed posteriorly. Body largely black or blackish brown, almost entirely clothed with dense sulphur-yellow pubescence; appendages largely testaceous: head black, with dense pubescence except for three incomplete black stripes on occiput; clypeus and palpi ochraceous; antennae black on first two segments, pitchy on basal half and apex of third, and for increasing portions on apices of following segments, the remainder ochraceous; prothorax and scutellum black, entirely clothed with yellow pubescence; elytra reddish brown with sides and four or five discal spots faintly showing through pubescence, black; ventral surfaces black, densely clothed with sulphur-yellow pubescence along sides and sparsely so along median portion; legs pale ochraceous with whitish buff hairs.

Head broader than prothorax, plane in front; surfaces finely punctured; frons about as high as wide, subsquarish; vertex hardly depressed in middle; occiput slightly convex; inferior eye-lobes a little deeper than wide, oblong-oval. Antennae a little longer than body, tapering; scape closely punctulate, four-fifths as long as third segment; fourth barely longer than scape; fourth to tenth gradually shorter; last subequal to eighth. Prothorax barely longer than broad, subcylindrical, slightly constricted behind middle; disc feebly swollen on each side, with a fine median carina; surfaces irregularly punctured. Scutellum broad, narrowed posteriorly and emarginate apically. Elytra gradually narrowed, separately rounded apically; surfaces somewhat deeply though finely punctured in twelve or more subregular longitudinal rows. Ventral surfaces nearly impunctate. Legs slender; tarsi short, first segment of hind pair subequal in length to following segments combined. Length 12.6 mm.; breadth 3.45.

Holotype, male (University of Nanking), Chengtu, Szechuan Province, W. China, July 21, 1939.

Differs from *M. sulphurata* (Gebler) in having the prothorax more constricted near its base, the third antennal segment relatively longer in comparison with the scape, the elytra swollen near their bases and rounded apically, and the dorsum entirely pubescent.

Distribution.—W. China.

Tribe Gleneini

18. *Glenea humerosa* Gressitt

Glenea humerosa Gressitt, Philippine Jour. Sci. 72: 206, pl. 6, fig. 4, 1940 (Hainan I.).

One specimen (Academia Sinica) was taken on Hainan Island by the National Hainan Expedition on March 26, 1934. This specimen, a female, here designated as allotype, differs from the unique male type in having the elytral humeri a little less prominent, the occipital stripes practically fused, the elytra lacking the small lateral spot between, and external to, first and second major spots, and having a minute spot added on outer side of, and slightly anterior to middle of, first major spot, and the second major spot less rounded and somewhat longitudinal. Length 13.2 mm.; breadth 3.85.

Distribution.—Hainan Island.

19. *Glenea hwasiana* Gressitt, new species

Female.—Slender, deeper than wide, narrowed posteriorly. Body black, in part ochraceous, incompletely clothed with pale greenish yellow pubescence: head black, ochraceous on parts of clypeus and palpi, largely dotted with sulphur-yellow pubescence; antennae with scape black (remainder missing); prothorax black, clothed with dense sulphur-yellow on three longitudinal stripes on disc, narrowly on anterior margin, and extensively on lower parts of sides; scutellum black, clothed with sulphur-yellow pubescence; elytra black, each with four moderately large, subrounded, evenly spaced ochraceous discal spots clothed with yellow pubescence, as are parts of sides, bases and extreme apices; ventral surfaces black, largely clothed with greenish yellow pubescence, densest at sides; legs ochraceous except for most of femora, which are pitchy black, sparsely clothed with golden hairs on ochraceous portions and greenish on black portions.

Head a little broader than prothorax, deeply and somewhat closely punctured; frons subrectangular, a little wider than high; vertex nearly horizontal; occiput convex, declivitous, inferior eye-lobes slightly deeper than wide. Antennae with scape subcylindrical, slightly thickened to beyond middle. Prothorax slightly broader than long, transversely depressed near base, slightly swollen on each side of disc; surfaces deeply and closely punctured. Scutellum subsquarish, concave on middle of apical portion. Elytra long, narrowed posteriorly, laterally bicarinate; apices emarginate-truncate with external angles acutely produced, and internal angles briefly toothed; surfaces somewhat heavily punctured. Ventral surfaces not distinctly punctured. Legs slender; posterior femora reaching to middle of fourth abdominal segment; first hind tarsal segment nearly as long as following two segments combined. Length 11 mm.; breadth 2.8.

Holotype, female (West China Union University), Tienchuan, Sikang Province, W. China, July 24, 1939, Miss D. S. Pen, collector.

Differs from *G. semiluctuosa* (Fairm.) in being marked with yellowish green instead of whitish pubescence, in having the vertex and the occiput entirely pubescent instead of striped, the prothorax not distinctly striped on its sides, the elytra lacking a sutural stripe, with the spots differently arranged. The trivial name refers to West China and West China Union University.

Distribution.—W. China.

ON SOME GENERA OF ORSODACNINAE AND EUMOLPINAE (Col. Chrysom.)

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This paper treats the oriental genera of Orsodacninae together with certain more or less aberrant oriental genera of the subfamily Eumolpinae. In a previous paper (Gressitt, 1942) the writer described six Chinese species of Chrysomelidae under the genus *Syneta* in the subfamily Orsodacninae as the result of the use of existing keys without sufficient comparative material or literature. These species prove to belong instead to the genus *Aulexis* of the tribe Leprotini of the subfamily Eumolpinae, though they possess a number of the key characters used for the genus *Syneta*. In preparing to straighten out this error the writer was struck with the fact that several oriental genera placed in the tribe Leprotini differ from the bulk of the genera of Eumolpinae in most of the supposed fundamental characters which have been used to separate the subfamily, or the major division Cyclica, from the Eupodes, which includes the Orsodacninae. The members of the Eumolpinae are supposed to have complete lateral margins on the prothorax, eyes which are not prominent, and a broad prosternum, that is, widely separated, as well as not very prominent, anterior coxae. The genera discussed in this paper following the Orsodacninae have these characters reversed in almost every case, and the only readily discerned distinguishing character seems to be that they do not have the head narrowed behind the eyes, as is the case in all the Eupodes. Further might be mentioned, particularly in the case of *Aulexis*, that the resemblance to the Orsodacninae is augmented by the elytra in some species suggesting lateral carinae and being somewhat concave on the sides and also not closely fitting to the abdomen as they do in most of the Leprotini. Also, in some *Aulexis* species the head is less vertical than in the Eumolpinae as a whole. On the other hand, of course, the lateral teeth of the prothorax may be considered as vestigial lateral margins, but *Syneta* possesses the same sort of teeth, contrary to the rule of an unmarginated prothorax for the Eupodes.

The writer is inclined to feel that these exceptions and similarities are not necessarily merely accidental or a case of "parallelism," but may in fact be indicative of a relationship between the subfamilies Eumolpinae and Orsodacninae. The latter is obviously a heterogeneous, though small, group, for *Syneta* differs widely from *Zeugophora*, as well as from *Orsodacne*, and the subfamily is also very primitive (Chen, 1940a). Thus the Eumolpinae may have originated from extinct ancestors of *Syneta*, or a *Syneta*-like form. Further study, particularly of larvae and habits, may shed light on this question. At any rate, the genera in question

must be retained in the Eumolpinae, and do, for that matter, gradually merge into the group as a whole. *Nephrella* has a more or less typical eumolpine body form, and other genera not discussed here provide additional links. Most of the characters mentioned above must be discarded or qualified, and the character of the head not being narrowed behind the eyes must be stressed in separating the subfamilies.

The material reported upon herein is from the California Academy of Sciences,¹ with the exception of one specimen from the American Museum of Natural History. The writer is indebted to Dr. E. C. Van Dyke of the former institution and Dr. Herbert Schwarz and Miss Annette Bacon of the latter, for their kindness in making the material available for study, and to Dr. Roderik Craig and Mr. R. W. L. Potts for aid in preparing the illustration.

Subfamily Orsodacninae

Key to the oriental genera

1. Prothorax with a broad blunt tubercle at each side and without swellings at apex; elytra even, lacking carinae.....2
Prothorax with a few teeth, or fused teeth, at middle of each side and a swelling on each side at apex; elytra carinate; tarsal claws bifid.....*Syneta*
2. Eyes deeply emarginate; tarsal claws appendiculate.....*Zeugophora*
Eyes entire, lacking emarginations.....*Pedrilliomorpha*

Genus *Syneta* Lacordaire

Syneta Lacordaire, 1845, Monogr. Phytoph. 1: 226 (type: *Crioceris betulae* Fabr.).

1. *Syneta adamsi* Baly

Syneta adamsi Baly, 1877, Ann. Mag. Nat. Hist. (4) 20: 378 (Japan).

Several specimens (California Academy of Sciences) were taken at Mt. Takao, Tokyo Prefecture, Japan, May 3, 1908, by E. Gallois, and Nikko, Gumma Prefecture, Japan, July 6, 1930, by J. L. Gressitt.

Distribution.—Japan; Manchuria; Amur.

Genus *Pedrilliomorpha* Pic

Pedrilliomorpha Pic, 1917, Mel. Exot. Ent. 24: 9 (type: *P. atosuturalis* Pic).

2. *Pedrilliomorpha atosuturalis* Pic

Pedrilliomorpha atosuturalis Pic, 1917, Mel. Exot. Ent. 24: 9 (Sikkim).

The writer has seen no material of this species.

Distribution.—Sikkim.

¹ The writer's collection in the United States was recently donated to the California Academy of Sciences in San Francisco. Types previously recorded as in the writer's collection or on loan deposit in the California Academy of Sciences are now permanently deposited in that institution.

Genus *Zeugophora* Kunze

Zeugophora Kunze, 1818, Neue Schrift. Ges. Halle (2) 4: 71 (type: *Crioceris subspinosus* Fabr.).

Pedrillia Westwood, 1864, Trans. Ent. Soc. London (3) 2: 280 (type: *P. longicornis* Westw.).

Macrozeugophora Achard, 1914, Bull. Soc. Ent. France 83: 288 (type: *M. ornata* Achard), new synonym.

The writer is synonymizing *Macrozeugophora* with *Zeugophora*, since the type of the former is congeneric with the oriental species of *Zeugophora* seen by him. If it should ever prove advisable to separate the oriental species as a weak subgenus, the name *Pedrillia* will be available for that purpose. The writer has not seen the type of *Zeugophora*, but the oriental species are congeneric with American species. *Pedrillia* was recently synonymized with *Zeugophora* (Bryant, 1943). The following key includes all the Chinese species, and a few additional.

Partial key to the oriental species of *Zeugophora*

1. Elytra largely reddish or tawny, unicolorous or marked with slightly.. darker at sides near humeri and near middle.....2
Elytra largely black or marked with black along suture or behind middle.3
2. Dorsal surfaces uniformly red; appendages and ventral surfaces black.....*dimorpha* (female)
Dorsal surfaces dull testaceous, darker brown on pronotum and sides of elytra near humeri and behind middle; body very broad.....*ornata*
3. Elytra bluish black with a pale band or pale with a black ring on each behind middle.....4
Elytra marked with black along suture and near apices, or only apices black.....5
4. Elytra bluish black with a median transverse pale band.....*pallidicincta*
Elytra brownish testaceous with a black ring-mark with white interior behind middle of each.....*annulata*
5. Elytra black along suture; either pronotum black or elytra black before apices.....6
Dorsal surfaces pale testaceous except for apices and external margins of elytra which are black.....*murrayi*
6. Pronotum and a broad sutural stripe black.....*dimorpha* (male)
Pronotum testaceous; elytra with a black stripe along suture, broadening at scutellum and joining a subtransverse black band before apices...*ancora*
3. *Zeugophora ancora* Reitter
Zeugophora ancora Reitter, 1900, Wien. Ent. Zeit. 19: 164, pl. 1, fig. 9 (Donkyr).
Distribution.—C. Asia (Donkyr).
4. *Zeugophora annulata* (Baly), new combination
Pedrillia annulata Baly, 1873, Trans. Ent. Soc. London: 79 (Japan); Kraatz, 1879, Deutsche Ent. Zeits. 23: 120, pl. 2, fig. 7 (Amur).
Several specimens (California Academy of Sciences) were collected at Yumoto, Japan, by Koebele, and one at Nikko, Japan, April 25, 1934,

in an oak forest by the writer. Length 3.7-4.5 mm.; breadth 1.7-2.

Distribution.—Japan.

5. *Zeugophora dimorpha* Gressitt, new species (Pl. 6, fig. 6, male; fig. 9, female)

Male.—Fairly narrow, parallel-sided; tarsi and antennae broad and flattened. Body brownish black to black, tinged with reddish on coxae, trochanters, pro- and mesosterna, posterior border of metasternum and tarsi; head reddish testaceous, pitchy black between, and bordering, superior eye-lobes and on post-occiput, black on sides of neck, leaving a rounded occipital area of reddish; elytra ochraceous, broadly striped with black along suture to just before apices; scutellum and extreme basal margin of pronotum dull reddish; tip of last antennal segment pale; palpi testaceous. Body clothed beneath with subrecumbent pale buff hairs and above with subrecumbent reddish buff hairs, paler on head.

Head fully as broad as prothorax, and about as large, finely and not very densely punctured, deeply grooved between fronto-clypeus and antennal insertions; eyes deeply emarginate, occupying most of sides of head. Antennae fully two-thirds as long as body, somewhat flattened; scape somewhat arched, over twice as long as second segment; third barely longer than scape and fourth segment; fifth three-fourths as long as third, one-fourth longer than sixth; sixth to tenth subequal, each about two-fifths again as long as broad; last segment slightly longer, acute. Prothorax broader than long, strongly swollen at sides, suddenly constricted near base and gradually narrowed to apex; surface of pronotum finely punctured except for a small area on posterior portion of each lateral tubercle, most densely punctured on upper portions of sides. Scutellum narrow, truncate apically. Elytra parallel-sided, separately rounded apically, heavily and closely punctured, partly in incomplete subtransverse rows. Ventral surfaces finely punctured. Legs stout; tibiae slightly arched, subcarinate; tarsi broad, first three segments combined about one-half as broad as long. Length 5.4 mm.; breadth 1.95.

Female.—Head, pronotum and elytra entirely reddish castaneous. Antennae barely three-fifths as long as body. Length 5.5 mm.; breadth 1.95.

Paratypes.—Male with head more pitchy than blackish above, more broadly reddish along base of pronotum and narrowly and indistinctly darkened along elytral suture. Length 4-4.5 mm.; breadth 1.5-1.7.

Holotype, male (No. 5449, California Academy of Sciences), Hong Shan, alt. 1,000 meters, SE. Kiangsi Province, SE. China, June 29, 1936, J. L. Gressitt, collector; allotype, female (No. 5450, Cal. Acad. Sci.), Tai-yong, alt. 700 meters, SE. Kwangtung Province, SE. China, Aug. 4, 1936, J. L. Gressitt; paratype, male (Lingnan Natural History Museum), Tai-yong, Aug. 4; paratype, female (Cal. Acad. Sci.), Tai-yong, Aug. 5.

Differs from *Z. ancora* Reitter in having the prothorax black and the elytra without a subtransverse preapical band (male) or in having the dorsal surfaces entirely reddish (female).

Distribution.—SE. China.

6. *Zeugophora murrayi* (Clark), new combination (Pl. 6, fig. 8)

Pedrillia murrayi Clark, 1886, App. Cat. Phytoph.: 87 (Ceylon).

Zeugophora apicalis Motschulsky, 1866, Bull. Mosc. 39: 406 (Ceylon).

Two specimens (California Academy of Sciences) were taken on Ceylon: one by Albert Koebele, the other labelled: "Kat. Kandy, Ceylon, Hughes, A. Fenyes coll." Length 4-4.4 mm.; breadth 1.9-2.1.

Distribution.—Ceylon.

7. *Zeugophora ornata* (Achard), new combination (Pl. 6, fig. 5)

Macrozeugophora ornata Achard, 1914, Bull. Soc. Ent. France 83: 289, fig. 1 (Shin-Gouy-Foo).

One specimen (California Academy of Sciences) was taken at Hong Shan, alt. 1,000 meters, SE. Kiangsi Province, SE. China, July 16, 1936, by J. L. Gressitt. This species differs from others examined only in having the body a little broader. Length 5.4 mm.; breadth 2.6.

Distribution.—S. China.

8. *Zeugophora pallidicincta* Gressitt, new name

Zeugophora unifasciata Pic, 1917, Mel. Exot. Ent. 24: 9 (Sikkim); (nec Baly, 1885).

Distribution.—N. India (Sikkim).

The following new combinations or new names are necessitated by the union of *Pedrillia* with *Zeugophora*. Bryant (1943) has already shown that *Pedrillia flavipes* Jacoby is a synonym of *Zeugophora indica* Jacoby, and that *Z. andrewesi* Jac. is a synonym of *Z. longicornis* (Westwood).

9. *Zeugophora bicolor* (Kraatz), new combination

Pedrillia bicolor Kr., 1879, Deutsche Ent. Zeits. 23: 120, pl. 2, fig. 9 (Amur).

10. *Zeugophora bicoloriventris* (Pic), new combination

Pedrillia bicoloriventris Pic, 1911, L'Echange, Rev. Linn. 27: 144 (India).

11. *Zeugophora biguttata* (Kraatz), new combination

Pedrillia biguttata Kr., 1879, Deutsche Ent. Zeits. 23: 119, pl. 2, fig. 8 (Amur).

12. *Zeugophora decorata* (Chujo), new combination

Pedrillia decorata Chujo, 1937, Trans. Nat. Hist. Soc. Formosa 27: 146, fig. 1 (Formosa).

13. *Zeugophora flavonotata* (Chujo), new combination

Pedrillia flavonotata Chujo, 1935, Trans. Nat. Hist. Soc. Formosa 25: 69 (Iriomote, Loochoo Is.).

14. *Zeugophora formosana* Gressitt, new name
Pedrillia ornata Chujo, 1937, Trans. Nat. Hist. Soc. Formosa 27: 148, fig. 3 (Formosa); (nec Achard, 1914).
15. *Zeugophora gracilis* (Chujo), new combination
Pedrillia gracilis Chujo, 1937, Trans. Nat. Hist. Soc. Formosa 27: 149, fig. 4 (Formosa).
16. *Zeugophora grandis* (Chujo), new combination
Pedrillia grandis Chujo, 1937, Trans. Nat. Hist. Soc. Formosa 27: 147, fig. 2 (Formosa).
17. *Zeugophora luzonica* (Weise), new combination
Pedrillia luzonica Ws., 1922, Philippine Jour. Sci. 21: 429 (Luzon).
18. *Zeugophora nigricollis* (Jacoby), new combination
Pedrillia nigricollis Jac., 1885, Proc. Zool. Soc. London: 195 (Japan); Doi, 1927, Dobuts. Zasshi, 39: 326 (Korea).
19. *Zeugophora nitida* (Chujo), new combination
Pedrillia nitida Chujo, 1932, Trans. Nat. Hist. Soc. Formosa 22: 340, fig. 1 (Formosa).
20. *Zeugophora ruficollis* (Chujo), new combination
Pedrillia ruficollis Chujo, 1932, Trans. Nat. Hist. Soc. Formosa 22: 342, fig. 2 (Formosa).
21. *Zeugophora sumatrana* (Jacoby), new combination
Pedrillia sumatrana Jac., 1896, Ann. Mus. Civ. Stor. Nat. Genova 36: 380 (Sumatra).
22. *Zeugophora unifasciata* (Jacoby), new combination
Pedrillia unifasciata Jac., 1885, Proc. Zool. Soc. London: 197, pl. 11, fig. 14 (Japan).
23. *Zeugophora varipes* (Jacoby), new combination
Pedrillia varipes Jac., 1885, Proc. Zool. Soc. London: 196 (Japan).

Subfamily Eumolpinae

Tribe Leptotini

Key to oriental genera discussed

1. Prothorax toothed along each side near middle. 2
Prothorax not toothed along each side near middle, swollen or plane at sides. 3
2. Prothorax much narrower than elytra; pronotum transversely grooved, at least near sides; tibiae not greatly expanded apically; fore-legs not particularly long. *Aulexis*
Prothorax very little narrower than elytra; pronotum plane, not grooved; tibiae distinctly expanded apically; fore-legs long. *Orthaulexis*

3. Prothorax expanded at sides; eyes nearly entire, strongly convex; pronotum distinctly depressed, transversely, near middle. . . *Xanthophorus*
Prothorax nearly straight at sides; eyes reniform, not strongly convex; pronotum not distinctly depressed across middle. *Nephrella*

Genus *Aulexis* Baly

Aulexis Baly, 1863, Jour. Ent. 2: 153 (type: *A. nigricollis* Baly).

This genus is characterized by having the prothorax without lateral margins, but with a few small teeth near middle of each side, by the head not very strictly vertical, the eyes swollen and prominent, the anterior coxae fairly close with the prosternum narrow, and the elytra loosely covering the abdomen and not meeting it closely and in some species with a suggestion of a lateral ridge at the top of the lateral declivity.

Range.—Oriental Region, including E. Indies and Philippines.

Key to the Chinese species of *Aulexis*

1. Each side of prothorax with a group of more or less fused teeth at middle. 2
Each side of prothorax with two or three small, separate, more or less equal teeth. 4
2. Prothorax with lateral teeth more or less indefinite or fused and forming a tubercle. 3
Prothorax with three distinct lateral teeth on a common base; length of body 9–10.5 mm.; antennae two-thirds as long as body. *hochii*
3. Pronotum with transverse grooves only near sides; center of pronotal disc nearly impunctate; elytra in part pitchy; length 4.5 mm. *obscura*
Pronotum with groove almost complete, barely interrupted at middle, disc distinctly punctured; elytra testaceous; abdomen black; length 7 mm. *ventralis*
4. Elytra testaceous or reddish. 5
Elytra and ventral surfaces of body black; length 7 mm. *atripennis*
5. Sides of elytra vertical, each with a strong ridge extending from humerus almost to apex. 6
Sides of elytra rounded, without any ridge extending posteriorly from humerus. 7
6. Antennal scape very large and strongly swollen, larger than eye; third to seventh segments strongly flattened and longer than following segments; occiput with a median swelling. *magniscapa*
Antennal scape not unusually large or swollen, much smaller than eye; third to sixth segments not compressed, more slender, and only slightly longer than following segments; occiput without a median swelling. *unicolor*
7. Length of body less than 4 mm.; body reddish brown, without any cupreous sheen. 8
Length of body 6.5 mm.; body fulvous with a cupreous sheen; pronotum pitchy. *chengana*
8. Antennae strongly thickened distally; center of pronotum at least as closely punctured as elytra. 9
Antennae but slightly thickened distally; center of pronotum very sparsely punctured, much less closely so than elytra. *abbreviata*
9. Prothorax with lateral teeth slightly behind middle; clypeus without deep depressions; pronotum grooved only at sides. *brevidentata*

- Prothorax with lateral teeth at middle; clypeus with two deep depressions; pronotum with transverse groove complete.....*sinensis*
24. *Aulexis abbreviata* (Gressitt), new combination
Syneta abbreviata Gress., 1942, Lingnan Sci. Jour. 20: 279, pl. 11, fig. 1 (N. Kwangtung).
 A paratopotype is in the California Academy of Sciences.
Distribution.—S. China.
25. *Aulexis atripennis* Pic
Aulexis atripennis Pic, 1923, Mel. Exot. Ent. 40: 17 (China).
Distribution.—Yunnan.
26. *Aulexis brevidentata* (Gressitt), new combination
Syneta brevidentata Gress., 1942, Lingnan Sci. Jour. 20: 279, pl. 11, fig. 2. (Hainan I.)
Distribution.—Hainan Island.
27. *Aulexis chengana* Chen
Aulexis chengana Chen, 1940, Sinensia, 11: 518 (Montingshan, Sikang).
Distribution.—W. China.
28. *Aulexis hochii* Chen
Aulexis hochii Chen, 1940, Sinensia, 11: 519 (Hainan I.).
Syneta hainana Gressitt, 1942, Lingnan Sci. Jour. 20: 280, pl. 12, fig. 2 (Hainan); new synonym.
Distribution.—Hainan Island.
29. *Aulexis magniscapa* (Gressitt), new combination
Syneta magniscapa Gress., 1942, Lingnan Sci. Jour. 20: 281, pl. 11, fig. 3 (N. Kwangtung).
 A paratopotype is in the California Academy of Sciences.
Distribution.—S. China.
30. *Aulexis obscura* Gressitt, new species (Pl. 6, fig. 3)
 Moderately broad and dorso-ventrally compressed, slightly widened posteriorly. Body dull reddish brown, more brilliant on head and pronotum; elytra dark pitchy red-brown on basal halves and declivitous portions of sides and apices, testaceous brown on remainder; seventh and following antennal segments darkened. Body irregularly clothed with thin buff pubescence, sparsest on head and pronotum, and densest on elytra.
 Head narrower than prothorax, constricted behind eyes, sparsely and finely punctured; eyes prominent, entire, subrounded, separated by twice their diameters; frons transversely raised between lower portions of antennal insertions, which are hardly more than one-half as widely separated as eyes; vertex depressed and smooth above transverse ridge; occiput plane; clypeus with a dentate projection over each side of labrum. Antennae less than one-half as long as body (incomplete), thickened be-

yond middle; scape slightly swollen, nearly twice as long as second segment; third to sixth segments slender, subequal, each hardly as long as scape; seventh and eighth segments subequal, each barely longer than preceding, but nearly twice as thick, subcylindrical but slightly thicker distally. Prothorax three-fourths as broad as elytral humeri, two-thirds as long as broad, narrower at apex than at base, broadest at middle; each side somewhat projecting at middle of border with two or three fused teeth, their tips barely projecting; pronotum feebly convex on disc, subobliquely grooved on each side just behind middle, minutely and sparsely punctured except near basal angles behind grooves, where puncturation is close and slightly heavier. Scutellum subtrapeziform, about as long as broad, subtruncate apically. Elytra less than twice as long as broad, slightly broadened behind middle, conjointly subobtusely rounded apically; sides somewhat overhanging, each with a fairly distinct obtuse ridge from humerus to commencement of apical third; margins distinctly expanded horizontally to near apices; epipleurae broadest near bases; surfaces of elytra minutely, irregularly and somewhat closely, punctured. Tarsi with first segment slightly narrower than third, not quite as long as second and third segments combined. Length 4.5 mm.; breadth 2.6.

Holotype (American Museum of Natural History), "Tibet Prov., China, F 4722." Additional data supplied by museum: Ouisi or Weisi, Yunnan Prov.: Loutsechian, near Salween River, between 1700 and 5000 meters alt.; purchased 1923; Father A. Genestier.

Differs from *A. chengana* Chen in being smaller, less hairy, with the head, pronotum and tibiae reddish, the elytra duller, the pronotal groove much less complete and the prothorax less distinctly toothed at sides.

Distribution.—W. China.

31. *Aulexis sinensis* Chen

Aulexis sinensis Chen, 1934, Sinensia 6: 356 (Kweichow).

Distribution.—SW. China.

32. *Aulexis unicolor* (Gressitt), new combination

Syneta unicolor Gress., 1942, Lingnan Sci. Jour. 20: 282, pl. 11, fig. 4 (N. Kwangtung).

A paratype is in the California Academy of Sciences. An additional specimen (Cal. Acad. Sci.), probably referable to this species, was taken at Ta-hian, near Five Finger Mts., central Hainan Island, June 18, 1935, by J. L. Gressitt. New to Hainan. This species may possibly prove to be the female of *A. magnipennis* (Gress.), as the peculiarities of the latter appear possibly to represent sexual dimorphism rather than specific or generic differences, as first supposed.

Distribution.—S. China; Hainan Island.

33. *Aulexis ventralis* (Gressitt), new combination

Syneta ventralis Gress., 1942, Lingnan Sci. Jour. 20: 282, pl. 12, fig. 1 (Sikang; Szechuan).

The Mt. Omei specimen (University of Nanking), which has the abdomen pale, is possibly *chengana* Chen, or still a different species from both.

Distribution.—W. China.

***Orthaulexis* Gressitt, new genus**

Head vertical, plane in front; eyes entire, prominent, separated by more than twice their diameters; antennal insertions nearly as widely separated as eyes; clypeus with an anterior process on each side of labrum; antennae slender, more than one-half as long as body; prothorax about as broad as long, nearly as broad as elytra, plane above, armed at each side with a few short teeth; elytra long, parallel-sided, minutely and irregularly punctured, with lateral margins slightly deflexed, forming distinct epipleurae; anterior coxae very prominent, rather closely approximated, the prosternal process much longer than broad; fore legs longer than others (male); all tibiae pleuricarinate and prominently lobed externally at apices; tarsi with first segment fully as broad as following segments; claws bifid.

Genotype.—*Orthaulexis philippina* Gressitt, new species.

Range.—Philippine Islands.

This genus differs from *Aulexis* in its more elongate, parallel form and in having the head more strongly vertical, the prothorax broader basally, the elytra parallel-sided and flat above, the legs longer, particularly the anterior pair, etc.

34. *Orthaulexis philippina* Gressitt, new species (Pl. 6, fig. 1)

Male.—Parallel-sided; plane above; long-legged. Body reddish ochraceous, slightly paler on femora and abdomen; elytra dull pitchy brown, nearly black at sides and somewhat reddish near suture, with pale silvery buff adpressed hairs giving a grayish effect; head and pronotum with golden buff hairs; ventral surfaces with whitish buff pubescence.

Head, at eyes, nearly as broad as prothorax; surface even, finely and closely punctured, raised at inner sides of antennal sockets; clypeus with anterior processes tooth-like; labrum large and flat; mandibles each with an accessory tooth behind. Antennae fairly slender, reaching beyond middle of body; scape stout, swollen anteriorly, nearly twice as long as broad, one-half again as long and one-half again as broad as second segment; third more slender, nearly as long as scape; fourth to eighth subequal, each a little longer than third. Prothorax nearly as broad as humeri, narrowed anteriorly, broadest near middle, armed along central portion of each side with three short widely separated teeth, the last smallest; pronotal disc even, finely and closely punctured, nearly horizontal along both median longitudinal line and basal margin. Scutellum as long as broad, strongly narrowed and subtruncate posteriorly. Elytra nearly three times as long as head and prothorax combined, very slightly broadened behind humeri, broadest at beginning of apical third, broadly and conjointly rounded apically; external margins somewhat deflexed horizontally, with distinct epipleurae to sutural angles; elytral sur-

faces finely and closely punctured. Ventral surfaces with thorax micro-punctulate and abdomen more sparsely and distinctly swollen, narrowed at apices; tibiae moderately stout, each with five or six fairly distinct carinae and a broad apical lobe arising from one of the carinae; tarsi fairly broad, the first segment of fore and middle tarsi larger and broader than following segments. Length 5.5 mm.; breadth 2.3.

Holotype, male (No. 5451, California Academy of Sciences), Subig Bay, Luzon, Philippine Islands, May 1907, Dr. J. C. Thompson, collector.

This new species differs in appearance from those of *Aulexis* in being longer, more parallel-sided, flat above on both the pronotum and the elytra, and in having the prothorax nearly as broad as the elytra and the legs rather long, with the tibiae greatly widened at their apices.

Distribution.—Philippine Islands.

Genus *Xanthophorus* Jacoby

Xanthophorus Jacoby, 1908, Fauna Brit. Ind., Chrysom.: 404 (type: *Xanthonia flavopilosus* Jac.).

35. *Xanthophorus fuscipennis* Jacoby (Pl. 6, fig. 4, male; fig. 7, female)

Xanthophorus fuscipennis Jac., Fauna Brit. Ind., Chrysom.: 407 (Ceylon).

Three specimens (California Academy of Sciences) were collected on Ceylon by Albert Koebele. Though there is considerable difference in size, as well as some in coloration, between the specimen shown in figure 4, and the other two (fig. 7), the writer feels that the former probably represents the male of *fuscipennis*. The male is almost entirely testaceous, and measures only 3.8 mm. in length. The females are more brownish on head and prothorax and have the sides of the elytra, and the sutural borders anteriorly, tinged with dusky; length 5.6 mm. As indicated in the original description, specimens may be still darker.

Distribution.—Ceylon.

Genus *Nephrella* Baly

Nephrella Baly, 1863, Jour. Ent. 2: 155 (type: *N. elongata* Baly).

36. *Nephrella elongata* Baly (Pl. 6, fig. 2)

Nephrella elongata Baly, 1863, Jour. Ent. 2: 155 (Ceylon); Jacoby, 1908, Fauna Brit. Ind., Chrysom.: 416, fig. 147.

One specimen (California Academy of Sciences) was collected on Ceylon by Albert Koebele. It is brown with grayish buff pubescence, the femora yellow. Length 7.2 mm.

Distribution.—Ceylon.

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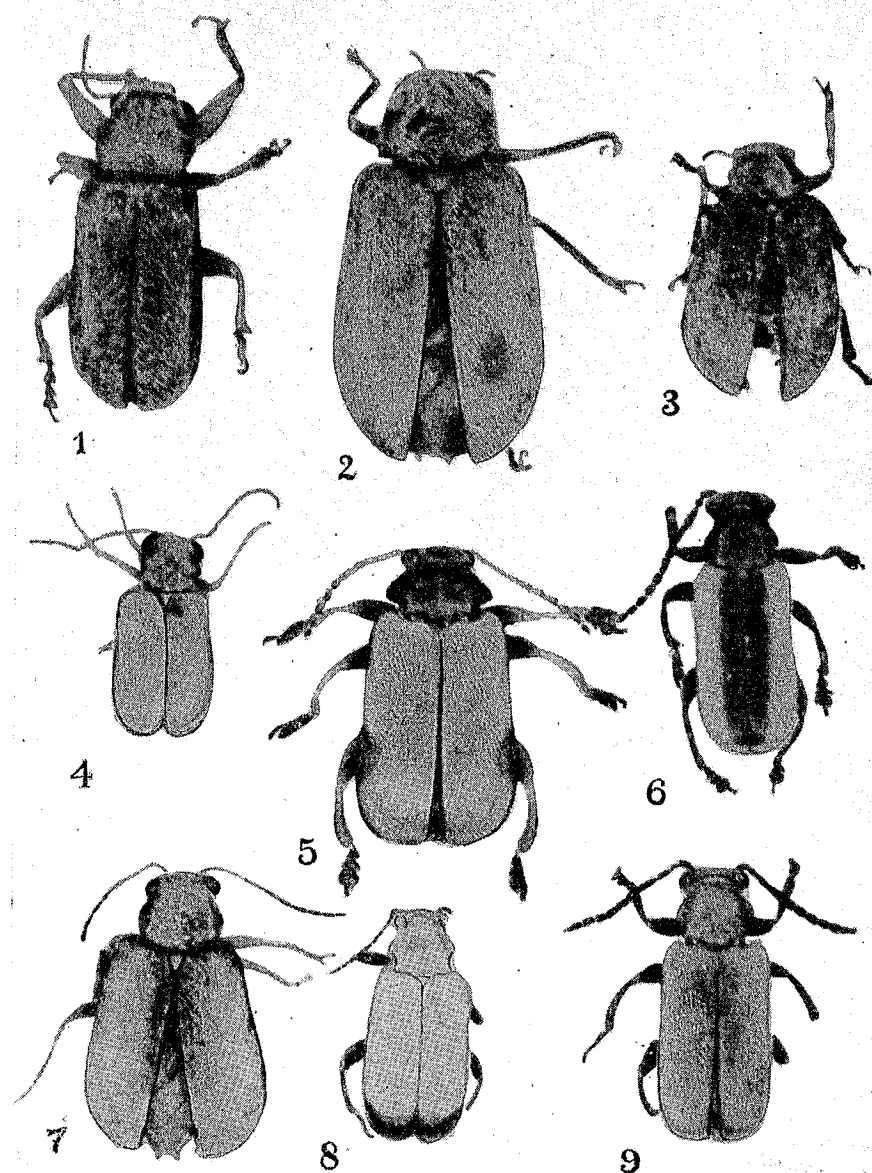
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Explanation of Plate
(Magnified $\times 7.6$)

- Fig. 1. *Orthaulexis philippina* Gressitt, n. sp.; holotype.
2. *Nephrella elongata* Baly; Ceylon.
3. *Aulexis obscura* Gressitt, n. sp.; holotype.
4. *Xanthophorus fuscipennis* Jacoby, male; Ceylon.
5. *Zeugophora ornata* (Achard), n. comb.; SE. China.
6. *Zeugophora dimorpha* Gressitt, n. sp.; holotype, male.
7. *Xanthophorus fuscipennis* Jacoby, female; Ceylon.
8. *Zeugophora murrayi* (Clark), n. comb.; Ceylon.
9. *Zeugophora dimorpha* Gressitt, n. sp.; allotype, female.



A NEW TORTOISE-BEETLE NAME (Col.: Chrys.: Cassid.)

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Since Spaeth has shown (1938, Ent. Tidskr. 59: 236) that *Taiwania* Spaeth, 1913 (type, *sauteri* Spaeth), should be considered a synonym of *Cassida* Linnaeus, 1758, the following correction must be made:

***Cassida spaethiana* Gressitt, new name**

Taiwania spaethi Gressitt, 1942, Spec. Publ. Lingnan Nat. Hist. Surv. and Mus. 5: 2, fig. 2 (Kau-lin San, Lien-ping Distr., N. Kwangtung, S. China); (nec Weise, 1900).

Spaeth in the paper cited also stated that his *Taiwania Achardi*, of Indo-China, is a synonym of *sauteri* Spaeth, of Formosa. Though *spaethiana* thus falls within the possible range of *sauteri*, it appears to be quite distinct, aside from coloration, on the basis of the body being broader before the middle, the fifth and sixth puncture-rows of the elytra being deeply grooved behind the middle, etc.

SUPPLEMENT

The following Special Publications of the Lingnan Natural History Survey and Museum were printed in Canton in 1942. Since conditions permitted only limited distribution at that time, and since the supply of publications could not be brought from China, we are reproducing these papers without change of pagination. Other Special Publications (see list inside back cover) will be similarly reproduced as soon as possible.

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NEW LONGICORN BEETLES FROM CHINA, VIII (COLEOPTERA: CERAMBYCIDAE)¹

By J. Linsley Gressitt

Lingnan Natural History Survey and Museum.

This paper² concerns six new species of Chinese Cerambycidae, from Tibet and Fukien. The specimens are from part of a collection of Chinese longicorns belonging to the American Museum of Natural History in New York, which was submitted to the writer for study through the kindness of Dr. F. E. Lutz. The types have been deposited in the above museum, with the exception of the last, which is to be so deposited. The illustrations were prepared by Mr. Jose Gomez.

Subfamily Cerambycinae

1. *Plocaederus bicolor* Gressitt, n. sp. (fig. 1)

Female.—Body entirely shiny black; antennae deep red, except for second antennal segment, base of third, and extreme bases of tibiae, which are pitchy black. Dorsal surfaces practically glabrous; thoracic sterna with sparse oblique tawny hairs; abdomen subglabrous; tibiae and tarsi with golden bristle-like hairs.

Head feebly punctured; neck granulose; occiput with a raised area between upper eye-lobes; vertex rounded-concave; frons deeply impressed on each side of a broad subtriangular convex area across its middle. Antennae barely as long as body; scape swollen, finely punctured, nearly as long as third segment; fourth shorter than scape; fifth to seventh each about as long as third; fifth to tenth acute ectoapically. Prothorax broader than

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2. For part VII, see *Lingnan Sci. Journ.* 18 (2): 209-216, pl. 8, 1939.

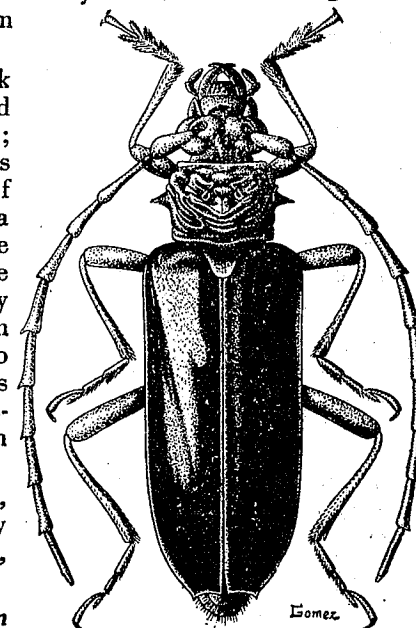


Fig. 1. *Plocaederus bicolor*, n. sp. X 2.25.

(1)

long, strongly and acutely spined at middle of each side; disc deeply vermiculate, mostly in a transverse direction, with some irregularities on each side of midline just before middle. Elytra smooth with only extremely minute punctures; apices narrowly truncate with each angle briefly toothed. Ventral surfaces hardly punctured. Femora slender and compressed; first hind tarsal segment a little longer than following two united. Length 33 mm.; breadth 9.

Holotype, female (American Museum of Nat. Hist.), "Tibet Prov., China, F. 4722".

Differs from *pedestris* (White) in being shiny black and entirely glabrous above and in having the elytra practically impunctate, the antennae no longer than the body (female), etc.

2. *Pseudaeolesthes chrysothrix tibetanus* Gressitt, n. subsp.

Female.—Body pale reddish brown, somewhat ochraceous; protuberances on head and prothorax pitchy. Surfaces clothed with rich golden orange pubescence above and golden yellow beneath, lying in different directions so as to give a highly varying pattern.

Head narrower than prothorax; eyes prominent but not very large, their inferior lobes subtriangular and deeper than wide; vertex narrowly concave and frons with a transverse hexagonal depressed area. Antennae barely longer than body; first five segments swollen apically; scape a little longer than third segment; third longer than fourth and subequal to fifth; sixth to tenth much longer and toothed ectoapically. Prothorax about as long as broad, slightly longer than breadth at base, and nearly twice as wide at tubercles as at apex; tubercles broad at bases and suddenly narrowed, subacuminate; disc strongly rugose and bounded near apex and base by zig-zag depressions; center of disc with six rugae forming a hexagon surrounding a pair of subsinuate longitudinal ridges. Scutellum rounded-triangular. Elytra long, subparallel, narrowly and obliquely truncate at apices; surface of each with a median slightly oblique raised stripe and two or three parallel depressions. Length 34 mm.; breadth 8.5.

Holotype, female (American Museum of Nat. Hist.), "Tibet Prov., China, F. 4722".

Differs from *chrysothrix* (Bates) in being slightly broader, a little darker; and in having the occiput more distinctly ridged anteriorly between superior eye-lobes, the fifth to tenth antennal segments broader and more acutely produced ectoapically, the prothorax more strongly tuberculate laterally, the pronotal disc with a strongly raised hexagonal vermiculate area around center, and the elytra less distinctly punctured and with apices less obliquely truncate and with less acute angles, the sutural projections being much shorter.

3. *Merionoeda (Ocytasia) caldwelli* Gressitt, n. sp. (fig. 2)

Male.—Body testaceous to pitchy black; head pitchy brown on clypeus, labrum, neck and undersides, pitchy black on remainder; palpi testaceous; antennae dark reddish brown on first four segments, pitchy brown on rest; prothorax shiny orange testaceous, paler at apex and beneath; elytra castaneous brown, slightly pitchy just behind middle; ventral surfaces testaceous on pro- and mesosterna and posterior coxae, slightly pitchy testaceous on metasternum, reddish brown on metepisterna and dark pitchy brown to nearly black on abdomen; legs testaceous with femoral clubs dark pitchy brown and posterior tibiae and tarsi slightly reddish brown. Ventral surfaces thinly clothed with silvery pubescence.

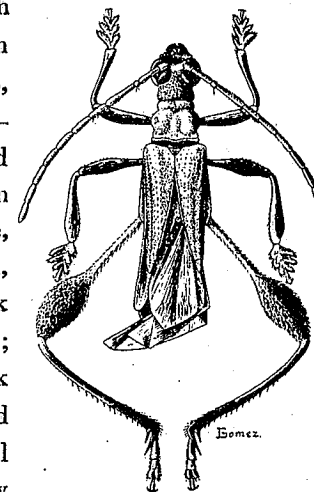


Fig. 2. *Merionoeda caldwelli*, n. sp., X 4.5.

Head a little broader than prothorax, suddenly constricted behind eyes, transversely and longitudinally grooved on frons, finely punctured on occiput, sides of neck, and middle and sides of frons. Antennae reaching to a point about half way between apices of elytra and apex of abdomen; scape arched, slender basally, longer than any following segment; third and fourth subequal, slender; fifth to last each a little longer, subequal, flattened and broadest distally. Prothorax about as long as broad, constricted before apex, with five smooth longitudinal swellings, median one posterior to ones on each side of it, which are largest. Elytra cuneiform, acute apically, subcarinate postmedially and subseriate-punctate. Metathorax closely punctured at sides; anterior and middle tarsi broadly expanded externally; posterior femora with clubs occupying nearly distal half of each. Length 8.8 mm.; breadth 1.7.

Holotype, female (American Museum of Nat. Hist.), Yen-ping, NC. Fukien Prov., SE. China, June 14, 1917, probably collected by the Rev. Harry Caldwell (Ac. 5148).

Differs from *formosana* Heller in having the head testaceous instead of black beneath, the antennae paler basally, the prothorax shorter, less punctate and more nearly carinate postmedially, the elytra shorter and more lineate-punctate, and the body darker.

4. *Dere reticulata* Gressitt, n. sp. (fig. 3)

Female.—Body black; prothorax orange red except on dorsal half of apex, basal portion of pronotal disc, coxal cavities and posterior margin of sternum; elytra dark blackish blue. Head, antennae and ventral surfaces clothed with thin silvery pubescence; legs with scattered pale hairs.

Head a little narrower than prothorax, oblique and plane in front; vertex concave in middle; frons a little longer than broad, shallowly grooved medially; inferior eye-lobes a little longer than broad. Antennae two-thirds as long as body, slightly thickened towards apex; scape slightly compressed, second segment as long as broad, two-thirds as long as third segment; fourth and sixth subequal, each a

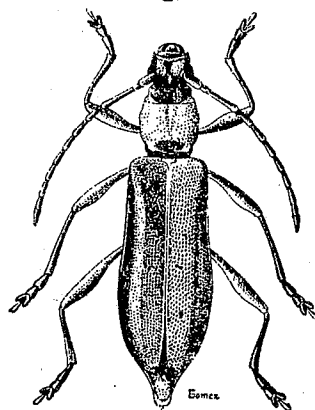


Fig. 3. *Dere reticulata*, n. sp., X 4.5.

little shorter than fifth, which is not quite as long as scape. Prothorax barely longer than broad, slightly convex at sides, a little narrower at apex than at base; disc slightly convex on each side, depressed near apex and base, its surface finely vermiculose and in part shallowly punctured; sides reticulate-punctate. Elytra broadened behind middle, obliquely emarginate at apices with angles briefly toothed; surfaces reticulate-punctate but with most of punctures only enclosed for about two-thirds their periphery and not completely round. First hind tarsal segment nearly as long as remaining united. Length 10.5 mm.; breadth 2.6.

Holotype, female (American Museum of Nat. Hist.), "Tibet Prov., China, F. 4722".

Differs from *thoracica* White in having the elytra blue instead of green, with reticulate punctures which are indistinct posteriorly and with the elytral apices less emarginate, and from *affinis* Gahan in having the pronotum partly black, the elytra longer, reticulate instead of asperate and much less deeply emarginate and unspined at apices.

Subfamily Lamiinae

5. *Pterolophia cylindricollis* Gressitt, n. sp. (fig. 4)

Female.—Body largely blackish brown above and dark reddish brown beneath and on appendages, clothed with dark brown to pale buff pubescence as follows: head with blackish brown, mixed with

rusty, particularly on vertex, occiput and around eyes; antennae with dull tawny brown, spotted on scape with blackish, ringed on bases of third and following segments with grayish white, and fourth segment whitish on central portion; prothorax clothed with dull grayish brown, marked with tawny buff near middle of basal and apical borders and on lower parts of sides; elytra clothed with dark brown hairs, mixed with rusty pubescence on posterior parts of sides and marked with tawny buff on each side of scutellum and irregularly along suture, obliquely and indistinctly with grayish white behind subbasal tubercles; tubercles capped with tufts of blackish suberect hairs, a small extra tuft on each side just before apex, and a large pale area covering most of posterior declivity; ventral surfaces with whitish buff on thoracic sternites and first abdominal sternite and with tawny to dull brownish on remainder; legs with sparse rusty to tawny pubescence broken by subglabrous areas on femora.

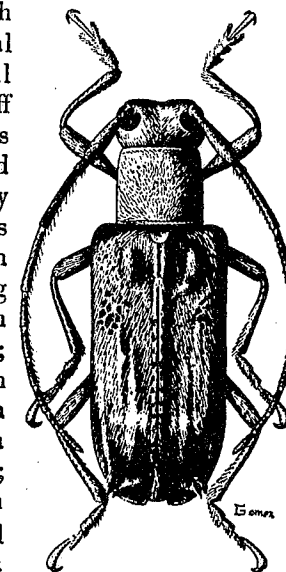


Fig. 4. *Pterolophia cylindricollis*, n. sp., 4.5.

Head not quite as wide as prothorax, sparsely punctured; inferior eye-lobes about as wide as deep, shallower than portions of genae below them. Antennae not quite as long as body; scape distinctly shorter than third segment; fourth slightly arched, equal in length to third and slightly longer than fourth and fifth combined. Prothorax five-sixths as long as broad, cylindrical, slightly depressed along median line of disc, coarsely rugulose-punctate. Elytra broad, slightly narrowed to beginning of apical quarter; steeply declivitous posteriorly; apices conjointly rounded; disc of each with a strong swelling near base, three parallel dorsal carinae just behind middle, innermost enlarged to form a tubercle at top of apical declivity, outermost terminating in a small preapical tubercle; surfaces moderately punctured as far as apical declivity. Length 12 mm.; breadth 4.3.

Holotype, female (American Museum of Nat. Hist.), Tibet (F. 4722); paratype, female (Lingnan Nat. Hist. Museum), same data.

Differs from *brunnea* Breuning in having the prothorax cylindrical, the elytral discs each with three costae and two tubercles behind middle and in being marked with areas of tawny or buff.

6. *Desisa pterolophioides* Gressitt, n. sp. (fig. 5)

Male.—Body reddish brown to blackish, clothed with rusty brown to whitish pubescence: head dark brown with rusty brown pubescence mixed with whitish on middle of frons, vertex, occiput and around

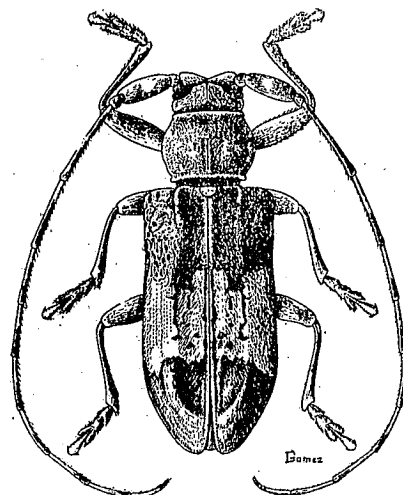


Fig. 5. *Desisa pterolophioides*, n. sp., X 3.5.

eyes; antennae dark reddish brown clothed with brown pubescence marked with grayish white at middle of scape and on bases of third to last segments; prothorax blackish brown clothed with close tawny and brownish variegated with irregular spots of grayish white; scutellum rusty brown; elytra dark reddish brown clothed with rusty mixed with pale gray, a transverse white band across middle about as wide as its distance from base and two-thirds as wide as its distance from apex; ventral surfaces blackish clothed with pale gray mixed in part with brownish, a fringe of long hairs on each side of second abdominal segment.

Head minutely punctured; vertex rounded-concave; inferior eye-lobes small, deeper than wide and occupying a space about as great as their respective distances from bases of mandibles. Antennae nearly two-thirds again as long as body, slender and tapering; scape three-fourths as long as third segment; third to fifth gradually shorter; following each subequal to fifth. Prothorax broader than long, evenly rounded at sides, constricted close to apex and base; disc smooth and evenly convex, finely and sparsely punctured. Elytra coarsely punctured to apices, but most heavily so at bases; disc of each with a subtuberculate basal carina, continued posteriorly as a feeble costa to beginning of apical declivity where it is more distinct, and a supplementary carina at side behind middle. Second abdominal segment deeply excavated at each side. Length 14 mm.; breadth 4.8.

Holotype, male (American Museum of Nat. Hist.), NC. Fukien Prov., SE. China, Aug. 12, 1917, collected by the Rev. Harry Caldwell.

Differs from *takasagoana* Matsushita in being more slender and less dorso-ventrally compressed, with the elytra strongly tuberculate-carinate basally, etc.

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male (K. O. V. Lieu coll., Szechuan Univ.), Chengtu, Szechuan, May 3, 1939, on *Citrus* trunk, Miss Lieu. Differs from *sealoni* Gress. in having the elytral apices separately obtuse and obliquely subtruncate instead of emarginate, the body darker and the elytra with 2 distant narrow transverse black bands.

12. *Miccolamia dracuncula* Gressitt, n. sp. (fig. 8)

Head black; antennae fringed with long bristles, reddish brown with scape and apices of following segments pitchy brown; prothorax black with fine silvery pubescence; elytra black, marked with testaceous brown on inner halves of discs from just behind subbasal tubercles to behind middle, and again at apices and very narrowly along posterior halves of extreme outer margins; ventral surfaces black; legs reddish brown with femoral clubs pitchy. Head swollen in front, rounded concave at vertex, finely grooved on occiput; inferior eye-lobes subrounded; antennae hardly longer than body; scape strongly swollen, hardly over twice as long as 2nd segment, shorter than 3rd; 4th as long as 3rd, 150% as long as 5th; prothorax longer than broad, stoutly tuberculate at sides and binodose on disc; elytra broadened behind middle, each rounded apically, finely lineate-punctate and with an elongate oval tubercle near base. Length 3.75 mm.; breadth 1.1. Type (Lingnan N. H. Mus.), Lungtze (Dragon Lake), below Mt. Omei, Szechuan, Aug. 13, 1940, Gressitt. Differs from *binodosa* Pic in having the prothorax black and the elytra largely black, marked with pale before middle and at apices.

13. *Nupserha cephalotes* Gressitt, n. sp.

Head reddish testaceous, finely and sparsely punctured, almost as wide as elytra; vertex nearly plane between antennal insertions; antennae black tinged with brown, slender, slightly longer than body; scape 70% as long as 3rd segment; 4th shorter than 3rd; prothorax reddish testaceous above and brownish black below middle of sides, subcylindrical, raised anteriorly, 1/6 broader than long, sparsely punctured; scutellum ochraceous; elytra pale yellowish testaceous, each finely punctured in 7 subregular rows in central portion, narrowed posteriorly and subacute apically; ventral surfaces of body black, largely impunctate; legs slender, black tinged with brown, anterior femora and inner faces of anterior tibiae partly testaceous and trochanters testaceous; hind femora reaching to apex of 3rd abdominal segment. Length 11.5 mm.; breadth 2.5. Type, female (Lingnan N. H. Mus.), Ta-o-sze, Mt. Omei, Szechuan, July 1940, C. C. Liu; others in W. China U. Univ. Differs from *pallidipennis* (Redt.) in being more slender, with head pale and much larger, prothorax more cylindrical, elytral apices subacute, etc.

14. *Nupserha rufopubens* Gressitt, n. sp.

Red above and black beneath: head reddish, tinged with black on mandibles and sides of neck, deeply but not closely punctured; vertex slightly concave; antennae black, 1/3 longer than body; scape 2/3 as long as 3rd segment; 4th shorter than 3rd; prothorax red above middle of sides, 1/4 broader than long, slightly swollen on center of disc and middle of each side, irregularly punctured on disc; scutellum and elytra pinkish red; elytra slightly narrowed in middle, each subacuminate apically and punctured in 8 or 9 rows, the outer rows confused; ventral surfaces black, tinged with brown on middle of thoracic sterna and apex of abdomen, finely punctured at sides; legs black with trochanters, bases of femora and apices of coxae dull testaceous; posterior femora extending beyond apex of 3rd abdominal segment; body with close reddish pubescence above and silvery pubescence beneath. Length 9.8 mm.; breadth 2.1. Type (Lingnan N. H. Mus.), Shin-kai-sze, Mt. Omei, Szechuan, Aug. 9, 1940, Gressitt. Differs from *ventralis* Gah. in being slenderer, with the head smaller, the prothorax longer, the elytra less distinctly carinate, etc.

also *Pachsin*, *Sikang* VII-22-39, D.S. Pen

15. *Linda major* Gressitt, n. sp.

Orange testaceous to reddish ochraceous with labrum, eyes, antennae, elytra (except bases bordering scutellum), tarsi and distal 2/3 of tibiae black, largely clothed with pale golden buff pubescence. Head coarsely and densely rugose-punctate; antennae stout, 80% as long as body; scape not quite as long as 3rd segment; 3rd a little longer than 4th; prothorax 135% as broad as long, heavily and closely punctured, sides broadly and bluntly swollen, disc evenly convex except for an upward prolongation of each lateral swelling near posterior margin; elytra slightly constricted in middle, deeply impressed with subrounded punctures in 10 irregular rows, obliquely subemarginate-truncate apically; sides of metathorax and 1st abdominal segment heavily punctured. Length 22.4 mm.; breadth 4.8. Type, female (Univ. of Nanking), Hwang Shan, S. Anhwei, Aug. 10, 1936, K. F. Chen; paratype in Lingnan N. H. Mus. Differs from *atricornis* Pic in being larger and stouter, with the head and the pronotum more densely punctured, the elytra less regularly punctured and with round instead of square punctures, etc.

EXPLANATION OF PLATE—Fig. 1, *Ceresium sculpticolle* n. sp., X 3.3; Fig. 2, *Chloridolum thoracicum* n. sp., X 1.8; Fig. 3, *Chelidonium citri* n. sp., X 1.9; Fig. 4, *Xylotrechus sikangensis* n. sp., X 4.1; Fig. 5, *Rhodopis tuberculicollis* n. sp., X 3.3; Fig. 6, *Aulaconotus varius* n. sp., X 1.8; Fig. 7, *Rondibilis chengtzensis* n. sp., X 4.2; Fig. 8, *Miccolamia dracuncula* n. sp., X 9; Fig. 9, *Anaesthetobrium lieuae* n. sp., X 6.

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NEW LONGICORN BEETLES FROM CHINA, IX (COLEOPTERA: CERAMBYCIDAE)¹

By J. Linsley Gressitt

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This installment² concerns fifteen new species from Szechuan, Sikang and Anhwei. Seven are from the Biology Dept. of West China Union University and the remainder from the collections of Miss K. O. Victoria Lieu, the University of Nanking College of Agriculture and the Lingnan Natural History Survey and Museum. I am indebted to Dr. Chang Min-cheun, Dr. C. C. Liu, Miss D. S. Pen, Miss Lieu and Prof. B. A. Slocum for the privilege of studying their material.

Subfamily Cerambycinae

1. *Ceresium sculpticolle* Gressitt, n. sp. (fig. 1)

Head dark brownish red, paler on palpi, with dense whitish buff pubescence around upper eye-lobes, transversely grooved across middle of frons, medially grooved and rugose at vertex and between upper eye-lobes; antennae pale reddish brown with sparse buff pubescence, slightly longer than body; scape barely as long as 3rd segment; 3rd 140% as long as 4th and not quite as long as 5th; prothorax dark brownish red with buff pubescence, denser on dorsum, coarsely rugose-punctate with an irregular raised glabrous area on each side of midline just before center, a longer less glabrous raised area along each side behind middle and a long median glabrous stripe medially grooved behind; scutellum densely clothed with pale buff; elytra reddish brown, sparsely clothed with pale buff, densely punctured, coarsely so basally; ventral surfaces punctured and with gray pubescence except for a deep groove along middle of metasternum. Length 12.5 mm.; breadth 3. Type (K. O. V. Lieu coll., Szechuan Univ.), Chengtu, Szechuan, June 22, 1939, on *Citrus*, Miss Lieu. Differs from *sinicum* Wh. by the prothorax broader and with more extensive impunctate and glabrous areas on disc.

2. *Chloridolum thoracicum* Gressitt, n. sp. (fig. 2)

Head golden green; clypeus and palpi pitchy to testaceous; antennae purplish blue, brownish purple distally; prothorax bright red, tinged with purplish on higher parts of disc and with orange on sternum, extreme apical and basal borders and distal portions of lateral

1. Special publication No. 3, Lingnan Natural History Survey and Museum, Lingnan University, Canton, China.

2. For part VIII, see Lingnan Nat. Hist. Surv. & Mus., spec. publ. No. 2, 1942.

tubercles bluish green; scutellum green; elytra frosted green, more shiny at humeri; ventral surfaces of hind thorax and abdomen metallic green with dull golden pubescence; thoracic sutures and coxae partly reddish brown; legs purplish blue, brownish at bases of femora, greenish on swollen portions of anterior 2 pairs, nearly black on tarsi. Head medially grooved; frons transversely ridged at bottom and longitudinally so, with punctures, at sides; occiput variously corrugated and punctured; antennae 150% as long as body; scape 1/2 as long as 3rd segment, subacute apically; 3rd a bit longer than 4th, equal to 5th; prothorax shorter than breadth at anterior swellings, subacutely toothed at middle of each side, in large part transversely or obliquely plicate, sublongitudinally so just before center; disc slightly raised at each side near base; scutellum subcordiform, concave, minutely punctured; elytra microrugulose-punctate; apices gradually narrowed and rounded externally; posterior femora slightly exceeding elytral apices; 1st hind tarsal segment not quite as long as remainder combined. Length 25 mm.; breadth 5.8. Type, female (W. China U. Univ.), Lushan, Sikang, July 17, 1938, Miss D. S. Pen. Differs from *cyaneonotatum* Pic in having the prothorax red and completely plicate and with less nipple-like tubercles, and the antennal segments less produced ectoapically but more distinctly carinate.

3. *Chelidonium citri* Gressitt, n. sp. (fig. 3)

Dark green above, golden green on head, extremities and sides of prothorax and ventral surfaces; antennae largely violet to purplish black; legs bluish green to violet; thin silvery pubescence on ventral surfaces. Head finely punctured on clypeus and labrum, rugose on lower portions of frons; vertex closely punctured; occiput smoothish in center, punctured behind; antennae 130% as long as body; scape blunt apically; 3rd segment 140% as long as 4th; 5th to 10th subacutely toothed apically; prothorax about as long as width at base, sides transversely or obliquely vermiculate with a large blunt tubercle at middle of each, disc more finely and irregularly vermiculate, apex and base each with a ridge parallel to border; scutellum longer than broad, subacute apically, finely punctured; elytra closely and finely vermiculate-punctate; posterior tibiae broad and sinuate. Length 23 mm.; breadth 5.4. Type, male (Lingnan N. H. Mus.), Chengtu, Szechuan, June 17, 1940, reared from *Citrus* by Miss K. O. V. Lieu; paratypes in coll. of Miss Lieu, Szechuan Univ. and U. S. Nat. Mus. Differs from *argentatum* (Dalm.) in having the 5th to 10th antennal segments less acutely produced apically, the scutellum rough and punctate, and the pronotal disc largely dull and very slightly different along median line.

4. *Polyzonus auroviridis* Gressitt, n. sp.

Head brilliant dark green; palpi and apices of mandibles black; antennae purplish black, pitchy distally; prothorax brilliant green, goldish at sides; scutellum bright golden green; elytra paler bronzy golden green, more greenish along suture; ventral surfaces paler golden green with silvery pubescence; legs violet black to greenish, purplish on tarsi and apices of tibiae, with purplish brown hairs. Head vermiculate, subtransversely grooved on middle of frons and longitudinally so on upper portions of frons and on vertex; occiput medially ridged anteriorly; antennae as long as body, slightly thickened distally; scape heavily punctured, 2/5 as long as 3rd segment, 4th slightly longer than scape, not quite as long as 5th, 6th or 7th; prothorax a little longer than broad, bluntly tuberculate at middle of each side; densely rugulose above, vertically or obliquely vermiculate-striolate at sides; scutellum longitudinal, subacute at apex, grooved medially; elytra densely and finely vermiculate-punctate, subrugulose basally; hind femora not quite reaching elytral apices; hind tarsi with 1st segment nearly as long as remainder. Length 19 mm.; breadth 3.4. Type, female (W. China U. Univ.), Paohsin, Sikang, July 23, 1939, D. S. Pen. Differs from *prasinus* (Wh.) in having the distal antennal segments subacutely produced ectoapically and the pronotal disc completely and finely vermiculate-rugulose and the base transversely sulcate.

5. *Xylotrechus sikangensis* Gressitt, n. sp. (fig. 4)

Head black, reddish at mouthparts, with dense yellow pubescence at lateral portions of frons and sides of head; antennae dull reddish ochraceous, pitchy on scape and dulled on apices of following segments, sparsely clothed with yellowish gray hairs; prothorax black, slightly brownish along borders, thinly clothed with yellow pubescence except for 3 rounded glabrous areas forming an inverted triangle on disc; scutellum dark brown, clothed with sulphur yellow at apex; elytra pitchy black, ochraceous on extreme bases, under 3 following discal bands and very narrowly along outer margins, each with sulphur yellow pubescence as follows: (1) a transverse band across extreme base, (2) a narrow free subtransverse band on disc just behind base, (3) a narrow stripe along suture starting behind scutellum, curved outward to middle of disc just before middle, then curving forward and ending close to external margin at end of basal third, (4) a subtransverse band at end of 2nd third, broadened at suture and produced somewhat along it both forward and backward, and (5) apical portion obliquely pubescent, extending along suture and nearly meeting 4th band; ventral surfaces brownish black with irregular yellow pubescence; legs reddish brown, darker on femoral swellings. Head asperate-punctate on occiput, swollen, subrugose and

slightly ridged on frons, but without distinct median carinae; antennae nearly 50% as long as body, 3rd segment as long as scape, longer than 4th; prothorax obtusely angulate behind middle, granulose on disc; elytra subsinuate apically with outer angles slightly toothed. Length 10.3 mm.; breadth 3. Type, male (Lingnan N. H. Mus.), Ling-kuan, Sikang, July 18, 1939, D. S. Pen; another in W. China U. Univ. Differs from *buqueti* (L. & G.) in having the subbasal bar of the elytra more transverse, the sutural stripe more arcuate and curved forward externally and the postmedian band less produced forward along suture.

Subfamily Lamiinae

6. *Rhodopis tuberculicollis* Gressitt, n. sp. (fig. 5)

Dark chocolate brown, paler and somewhat reddish at bases of 3rd and following antennal segments and on tibiae and tarsi; surfaces in part clothed with grayish white pubescence: sparsely on head and sides of prothorax; pronotum with 3 narrow longitudinal stripes, median one interrupted before center; antennae clothed on basal 2/3 each of 3rd and following segments; scutellum and ventral surfaces uniformly clothed; elytra with an incomplete band before, and another behind, middle, with small irregular scattered spots on remainder. Head moderately punctured, finely grooved medially; antennae 150% as long as body; scape moderately thickened preapically, considerably shorter than 3rd segment; 4th slightly shorter than 3rd; prothorax broader than long, strongly tuberculate laterally; disc sparsely punctured, with 3 blunt tubercles forming an inverted triangle on center; elytra finely and subseriately punctured, subasperately so basally. Length 15 mm.; breadth 4.85. Type, female (W. China U. Univ.), Tubaokou, Sikang, Aug. 13, 1939, D. S. Pen. Differs from *strandi* Br. and *blairi* Gress. in having the antennae shorter and the prothorax much more strongly tuberculate.

7. *Olenocamptus montanus* Gressitt, n. sp.

Pitchy black, largely clothed with gray to yellowish pubescence; antennae pale reddish brown with first 2 segments pitchy black; tibiae duller reddish brown; tarsi and bases of femora pitchy; head with sparse grayish pubescence at sides and dense tawny yellow behind vertex; prothorax sparsely clothed with grayish, an irregular pale yellowish stripe along each side of disc forming a dark circle on center which is open anteriorly and posteriorly; scutellum and elytra uniformly clothed with grayish; ventral surfaces and legs sparsely clothed with grayish, some tawny along parts of sides of body. Head granulose on frons; antennae 245% as long as body; scape swollen and asperate; 3rd to 9th segments finely toothed, at least beneath; prothorax 140% as long as broad, slightly swollen at sides behind middle; disc depressed and with feebly

transverse wrinkles; elytra finely punctured, apices subobliquely truncate with sutural angles subrounded. Length 13.7 mm.; breadth 2.6. Type, male (W. China U. Univ.), Paohsin, Sikang, Aug. 15, 1939, Miss Pen. Differs from *biocellatus* Schw. in being slenderer, in having yellowish markings on each side of the pronotum, and the elytra unspotted.

8. *Aulaconotus varius* Gressitt, n. sp. (fig. 6)

Head black, with scattered black bristles and a few pale hairs before and behind eyes; antennae black with white pubescence at bases of 4th and following segments and long black hairs on undersides of first 6 or 7 segments; prothorax black, densely clothed with white at sides; scutellum black; elytra reddish brown with dense white pubescence on basal portions and along suture to apices, black on outer portions from center to apices and with 3 narrow black lines on each along basal grooves; ventral surfaces pitchy black with tawny white pubescence: dense on thorax and scattered on abdomen. Head coarsely rugose; antennae 190% as long as body; 3rd segment longer than scape; prothorax as broad as long, coarsely and irregularly rugose on disc with some incomplete and irregular rows of fine tubercles at sides; elytra with a few longitudinal rows of irregular tubercles at bases, finely punctured posteriorly; apices narrowly subtruncate. Length 24 mm.; breadth 7.3. Type (Lingnan N. H. Mus.), Ta-o-sze, Mt. Omei, Szechuan, Aug. 16, 1940, C. C. Liu; paratypes in W. China U. Univ. Differs from *pachypezoides* Th. in being black and white instead of brown, in having the pronotum very rough and the elytral bases with rows of small tubercles.

9. *Anaesthetobrium lieuae* Gressitt, n. sp. (fig. 9)

Head pitchy brown; clypeus and palpi paler; antennae dull testaceous on 3rd to 6th segments, darker distally and on scape, bearing short oblique hairs; prothorax pale reddish brown; elytra pale testaceous; abdomen and legs testaceous; thoracic sternites dull brown; body with oblique hairs corresponding to ground color. Head finely but distinctly punctured, hardly concave between antennal insertions; eyes moderately separated above, inferior lobes large, deeper than wide; antennae slightly longer than body; scape nearly as long as 4th segment; 4th twice as long as 3rd; 4th to 6th subequal, remainder slightly shorter; prothorax broader than long, feebly tuberculate at middle of each side; disc distinctly punctured, with 3 small subconvex smooth areas forming an inverted triangle on central portion; elytra slightly broadened to behind middle, rounded apically; surfaces finely, somewhat closely, and in part seriatly, punctured; sides of metathorax

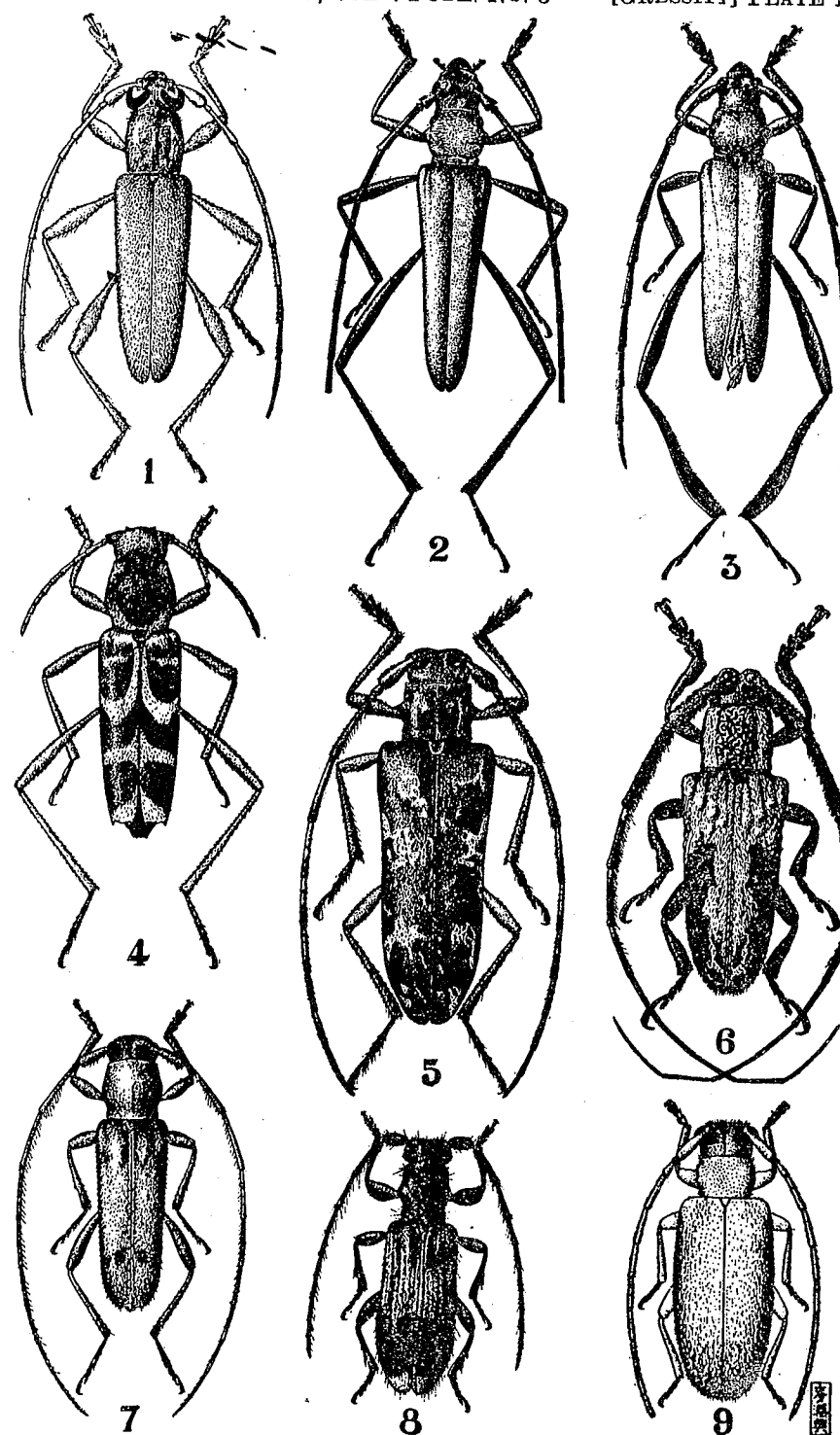
closely punctured. Length 6.2 mm.; breadth 1.8. Type (K. O. V. Lieu coll., Szechuan Univ.), Chengtu, Szechuan, May 3, 1939, taken on *Citrus* trunk by Miss K. O. Victoria Lieu, for whom the species is named. Differs from *luteipenne* Pic in being broader at humeri, with the elytra less regularly punctured and the head, antennae and prothorax brownish instead of black.

10. *Eryssamena slocumi* Gressitt, n. sp.

Head dark red-brown, sparsely punctured on frons and vertex; antennae pale red-brown, darker distally and paler at bases of 2nd and following segments, slightly longer than body; scape barely longer than 3rd segment; 3rd shorter than 4th, subequal to 5th; prothorax dark brown, reddish near apex and base, about as long as broad, briefly and bluntly tuberculate above middle of each side, sparsely punctured, disc swollen in center, with a rounded glabrous tubercle on each side; elytra pitchy black on basal 3/5 of disc beyond extreme base, reddish brown on extreme base, sides and apical portion of disc, densely punctured basally, each acuminate apically and with a subbasal crest; ventral surfaces pitchy; legs dark brown, reddish on tarsi and apices of femora; body largely clothed with long erect bristles and pale golden buff pubescence, silvery gray on second quarter of elytra and with brown dots behind a subglabrous oblique band at middle. Length 8.7 mm.; breadth 2.7. Type, female (Univ. of Nanking), Mou-pin, Sikang, July 24, 1939, S. N. Hsia. Differs from *bispinosa* Pic in having the 3rd antennal segment no longer than the 1st and shorter than the 4th.

11. *Rondibilis chengtuenensis* Gressitt, n. sp. (fig. 7)

Head brownish black; antennae reddish brown, darker distally, with oblique dark brown hairs beneath; prothorax pitchy black, reddish at apex and base; scutellum dark brown with pale hairs; elytra reddish brown with extreme bases, suture near scutellum, subbasal spines, a lateral spot on each near end of basal quarter and two spots on each, obliquely placed, near beginning of last quarter, black; ventral surfaces brownish black; legs brownish black with bases of femora and tibiae reddish; body largely clothed with buff pubescence, a few oblique black bristles on top of head and many on elytra. Head finely and closely punctured; frons feebly carinate medially; vertex barely concave; inferior eye-lobes about as wide as deep; antennae 175% as long as body; scape 4/5 as long as 3rd segment; 3rd and following gradually shorter; prothorax a little longer than broad, rounded at sides, finely granulose; elytra gradually narrowed, subseriate-punctate, swollen on bases near suture, each with a spined tubercle at end of basal fifth, apices separately subobtuse. Length 7.4 mm.; breadth 1.6. Type,



NEW TORTOISE BEETLES FROM CHINA
(CHRYSEMELIDAE: CASSIDINAE) ¹

By J. Linsley Gressitt

Lingnan Natural History Survey and Museum.

Four new species of tortoise beetles from South, East and West China are herein described. The specimens are from the collections of the Lingnan Natural History Survey and Museum, Musee Heude and West China Union University and the types are to be placed in the respective institutions. I am grateful to Father B. Becquart and Miss D. S. Pen in this connection.

1. *Hoplionota marginalis* Gressitt, n. sp. (fig. 1)

Broad, suboblong-ovate, widest near middle. Dorsal surfaces of body dull reddish brown to pitchy on pronotal disc, scutellum and elytral discs, paler pinkish red on lateral expansions with extreme margins testaceous; ventral surfaces of body pitchy brown, black on meso- and metasterna; antennae reddish ochraceous, the clubs clothed with golden pubescence.

Head small, with interocular prolongation concave, slightly broader apically than basally, emarginate in middle and rounded at corners; antennae not reaching basal angles of prothorax, last 5 segments broadened and compressed; scape longer than following 2 segments united; third to sixth subequal; seventh broadened distally; last 4 much broader, subequal in length; prothorax $2\frac{1}{2}$ times as broad as long; basal margin convex in middle, feebly emarginate at sides of disc; anteriolateral margins evenly rounded; anterior emargination trapezoidal; disc unevenly convex, slightly raised posteriorly along middle, opaque, almost granulose at sides; explanate margins somewhat shiny, with large oval or subrounded punctures and a single row of small round punctures near borders; scutellum broadly rounded posteriorly, finely punctulate; elytra broad, evenly rounded laterally and posteriorly, just as broad at extreme base as prothorax; disc of each with small swellings on extreme base, humerus, third inter-punctural area near base and before middle, the same carinate at beginning of apical declivity and feebly so before apex, an obliquely transverse ridge curving outward to middle of lateral margin from anterior end of postmedian longitudinal carina; surface

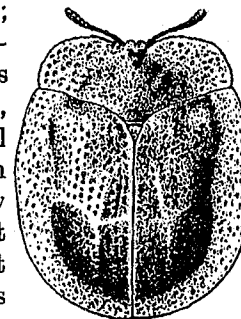


Fig. 1. *Hoplionota marginalis*, n. sp., X 8.

1. Special publication No. 5, Lingnan Natural History Survey and Museum, Lingnan University, Canton, China.

seriate-punctate; explanate margins sparsely and irregularly impressed with coarse rounded or oblong punctures; ventral surfaces micropunctulate; frons concave with a narrow median carina. Length 4.7-4.8 mm.; breadth 4.1-4.2.

Holotype (Lingnan N. H. Mus.), Kau-lin San (Chiu-lien Shan), alt. 700-900 meters, Lien-ping Distr., N. Kwangtung, S. China, Apr. 18, 1940, J. L. Gressitt and F. K. To, collectors; paratopotype (U. S. Nat. Mus.), Apr. 20.

Differs from *H. fumida* Spaeth in having the elytral ridges and tubercles less distinct, the anterior cephalic process narrowed apically, and the explanate margins reddish, lacking large pale hyaline areas.

2. **Taiwania spaethi** Gressitt, n. sp. (fig. 2)

Rounded oblong-ovate, longer than broad. Body dull ochraceous to testaceous brown with some indistinct pitchy markings; explanate margins of prothorax and elytra transparent, of very pale golden amber color with fine amber reticulation; head pale ochraceous, redder on clypeus; antennae ochraceous, pale reddish brown on distal segments; pronotal disc pale

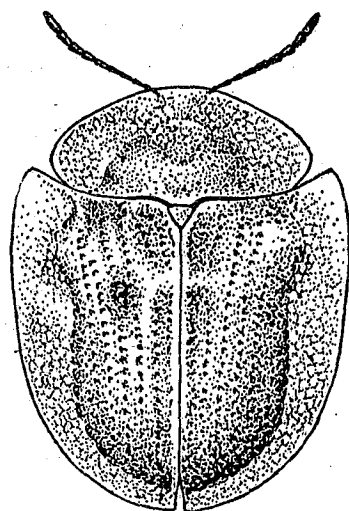


Fig. 2. *Taiwania spaethi*, n. sp., X 8.

orange ochraceous.

Head with frons trapeziform, as wide as high, convex and impunctate; antennae reaching to slightly beyond humeral angles, slender, feebly thickened and subacute distally; prothorax not quite twice as broad as long, symmetrical except for posterior median

disc pale ochraceous, subtransparent, showing testaceous or dull ochraceous blotches beneath, the latter behind and at each side of head; scutellum pale ochraceous, slightly pitchy red along borders, as are basal margins of thorax and elytra; elytral discs largely reddish or yellowish ochraceous, each paler to testaceous amber on inner 3/5 of basal half and yellowish testaceous along outermost interpunctural stripe, and on next to outermost at extreme base, middle of side and apical margin of disc, nearly pitchy pale ochraceous or subtestaceous on inner portions of posterior half; ventral surfaces of body largely dirty ochraceous, partly transparent, showing through pitchy ochraceous; legs

process, broadly rounded at sides; scutellum triangular, rounded posteriorly; elytra distinctly broader than prothorax, with humeri projecting, explanate margins broad and moderately declivitous; disc of each with 10 rows of fairly small punctures, a transverse swelling at suture behind scutellum and a concave area anterior to and another external to this, fifth and sixth puncture-rows more deeply concave behind middle. Length 6.85 mm.; breadth 5.65.

Holotype (Lingnan N. H. Mus.), Kau-lin San (Chiu-lien Shan), alt. 900 meters, Lien-p'ing, Distr., N. Kwangtung Prov., April 16, 1940, Gressitt and To, collectors; paratopotype, same data.

Differs from *T. achardi* Spaeth in being broader posteriorly, in having the frons as broad as long and the prothorax symmetrical before and behind and widest at middle; and from *sauteri* Spaeth in being broadest before the middle, in having the frons as broad as long, the elytra largely paler red without contrasted markings except for pale external border of disc, and the explanate margins more declivitous.

3. **Glyphocassis tetrasticta** Gressitt, n. sp. (fig. 3)

Rounded oval, somewhat strongly and evenly convex. Orange ochraceous, black and pale testaceous: head testaceous, with mouthparts pitchy red and eyes black; antennae testaceous, slightly duller distally; pronotum with disc pinkish ochraceous and explanate portion pale testaceous and subtransparent, except for posteriolateral angles, basal margin and 3 antierad stripes on basal portion of disc, black; scutellum pitchy ochraceous, black along margins; elytra orange ochraceous, narrowly black along sutural borders to apices, each with a squarish spot on posteriolateral portion of explanate margin, and 2 smaller spots on side of disc, obliquely placed; ventral surfaces pitchy black with margins of abdomen ochraceous.

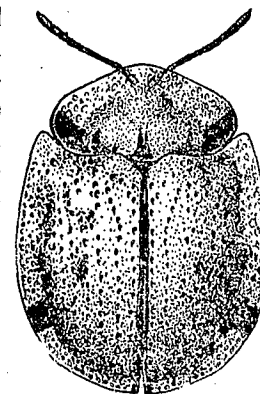


Fig. 3. *Glyphocassis tetrasticta*, n. sp., X 8.

Head hardly 1/4 as broad as prothorax; frons convex, coarsely punctured, as broad as high; occiput medially grooved; eyes narrowly ovate; antennae reaching to just beyond humeri; scape ovate, as long as second and third segments combined; third segment as long as fifth, shorter than fourth; sixth shorter; seventh to tenth very slightly thicker, each about as long as fifth; last longer, subacuminate; prothorax about 1/6 narrower than elytra at base, 3/5 as long as broad; disc minutely and sparsely punctured, unevenly convex; scutellum smooth, subequilaterally triangular; elytra with 10 subregular rows of moderate punctures, in part unequally spaced,

some broad interspaces on basal portions, a slight swelling at suture behind scutellum, with a pair of branched low ridges extending externally; explanate margins reticulate; meso- and metathoracic pleura closely punctulate; abdomen wrinkled, last segment punctured. Length 5.4 mm.; breadth 4.25.

Holotype (W. China U. Univ.), Lingkuang, Sikang Prov., W. China, July 24, 1939, Miss D. S. Pen, collector.

Differs from *G. trilineata* (Hope) in being more rounded in outline, more convex, with the prothorax narrower in relation to the elytra and the coloration largely pale orange with only a few small black markings.

4. *Cassida juglans* Gressitt, n. sp. (fig. 4)

Broadly oval, wider anteriorly, strongly convex and somewhat irregular. Dorsal surfaces pale testaceous, somewhat ochraceous on scutellum, basal margins of prothorax and elytra, elytral suture and sides of elytral discs; antennae testaceous with last 4 segments slightly pitchy; ventral surfaces black with outer borders of abdomen testaceous; legs pale brownish testaceous with coxae, trochanters and extreme bases of femora blackish.

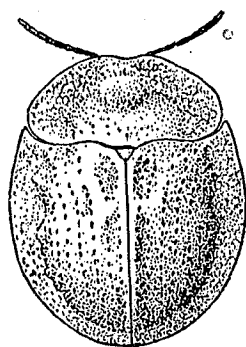


Fig. 4. *Cassida juglans*, n. sp., X 8.

Head as broad as long, feebly punctured; eyes broadly oval; antennae reaching slightly beyond outer angles of prothorax, feebly thickened distally; prothorax nearly $\frac{3}{5}$ as long as broad, evenly rounded anteriorly, obtusely rounded laterally and somewhat sinuate posteriorly; disc evenly convex, distinctly though finely punctured; explanate margins not distinctly punctured; scutellum subequilateral, impunctate; elytra slightly broader than prothorax at base, widened toward middle, strongly convex; suture distinctly raised; disc subregularly and rather finely punctured, highest portion with a short low transverse ridge connecting suture with an externally open low arcuate ridge; explanate margins strongly declivitous anteriorly, less so posteriorly, distinctly punctured, anteriorly with a few swellings extending from disc; ventral surfaces minutely punctured. Length 4.8-5 mm.; breadth 3.95.

Holotype (Musée Heude, Shanghai), Mogan Shan, Chekiang Prov., E. China, May 6, 1936, O. Piel; paratopotype, May 25.

Differs from *C. nigroventris* Boh. in being less circular in outline, in having the prothorax less than twice as broad as long and the head lacking a pale spot.

Date of publication: September 25th, 1942.

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 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.

- No. 9. New Genera and Species of Bambusaceae from Eastern Asia by F. A. McCLURE. Three new genera are erected: *Indosasa*, *Lingnania* and *Sinocalamus*. Fifty-six species and six varieties are described as new. These are distributed in fourteen genera, as follows: *Arundinaria*, three species; *Bambusa*, thirteen species and six varieties; *Chimonobambusa*, one species; *Dinochloa*, three species; *Indocalamus*, six species; *Indosasa*, four species; *Lingnania*, four species and two transfers from *Bambusa*; *Oxytenanthera*, one species; *Phyllostachys*, four species; *Sasa*, one species; *Semiarundinaria*, nine species; *Shibataea*, one species; *Sinobambusa*, six species; *Sinocalamus*, two transfers from *Dendrocalamus*, and two from *Bambusa*. The material was drawn from the following provinces of China—Shensi, Honan, Hupeh, Anhwei, Fukien, Kweichow, Yunnan, Kwangsi, Kwangtung and Hainan Island; Hong Kong and New Territories; and Tonkin, Indo-China. Issued in 1940. 67 pages. Price \$1.50 U. S. currency.

- No. 10. Catalogue of the Reduviidae of China by WILLIAM E. HOFFMANN. Eleven subfamilies, seventy genera, 161 species, two subspecies, and three varieties are treated. Generic references are included only for those genera not included by Wu, 1935: *Catalogus Insectorum Sinensium*, vol. 2. The references include full synonymy and are annotated as to pertinent data including distribution although the latter frequently includes only localities not listed in preceding references for a given species. Following the references localities, mostly not previously published, are indicated for the Collections of the Lingnan Natural History Survey and Museum, the British Museum, the United States National Museum, and the Baker Collection (also in U.S.N.M.). The distribution is further indicated by provinces for China, and alphabetically by countries. There is an index. Issued February 24, 1944. iv and 80 pages. Price \$.75 U.S. currency.

SPECIAL PUBLICATIONS

LINGNAN NATURAL HISTORY SURVEY AND MUSEUM

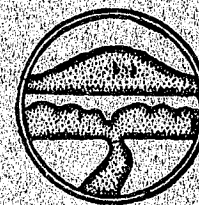
- No. 1. Destructive Long-Horned Beetle Borers at Canton, China by J. L. GRESSITT. Issued January 21, 1942. 60 pages, 41 text figures. \$60 Hong Kong currency.
- No. 2. New Longicorn Beetles from China, VIII (Coleoptera: Cerambycidae) by J. L. GRESSITT. Issued February 17, 1942. 6 pages, 5 text figures. \$20 Hong Kong currency.
- No. 3. New Longicorn Beetles from China, IX (Coleoptera: Cerambycidae) by J. L. GRESSITT. Issued March 28, 1942. 8 pages, 1 plate. \$25 Hong Kong currency.
- No. 4. A Provisional Synopsis of the Longicorn Beetles of China—Subfamily Cerambycinae by J. L. GRESSITT. Issued September 24, 1942. 34 pages. \$30 Hong Kong currency.
- No. 5. New Tortoise Beetles from China (Chrysomelidae: Cassidinae) by J. L. GRESSITT. Issued September 25, 1942. 4 pages, 4 text figures. \$20 Hong Kong currency.
- No. 6. Notes on Beetles of the Genus *Sagra* (Coleoptera: Sagraidae) by WILLIAM E. HOFFMANN. Issued October 12, 1942. 8 pages, 2 plates. \$30 Hong Kong currency.
- No. 7. New Longicorn Beetles from China, X (Coleoptera: Cerambycidae) by J. L. GRESSITT. Issued October 31, 1942. 10 pages, 1 plate, 2 text figures. \$30 Hong Kong currency.
- No. 8. A Provisional Synopsis of the Longicorn Beetles of China, II—Subfamily Lamiinae by J. L. GRESSITT. Issued November 1, 1942. 44 pages. \$40 Hong Kong currency.
- No. 9. Bugs or Homoptera: The Cicadas, Plant Hoppers, Plant Lice, Scale Insects, and Others by WILLIAM E. HOFFMANN. Issued November 28, 1942. 20 pages, 30 plates. \$60 Hong Kong currency.
- No. 10. A Provisional Bird Calendar for Canton, China by MARGARET K. GRESSITT and J. L. GRESSITT. Issued December 4, 1942. 10 pages. \$20 Hong Kong currency.
- No. 11. Lingnan Trees, a List of Trees Growing on Lingnan University Campus by WILLIAM E. HOFFMANN. Issued December 28, 1942. 15 pages. \$20 Hong Kong currency.

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FISHES OF KWEIYANG, WITH DESCRIPTIONS OF TWO NEW GENERA AND FIVE NEW SPECIES

By D. S. TANG (TANG DO-SIN, 湯獨新)

*Division of Biology,
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The fish-fauna of Kweichow Province is very rich but little known. About twenty species have been reported by Lin (1932, 1933-35), based on material collected by the Sun-yat-sen University from Yinkiang, southeastern part of Kweichow at the west border of Kwangsi, during the Yao-shan expedition (1931). Another paper on Kweichow fishes was published by the Academia Sinica, based on material collected by the Metropolitan Museum of Natural History, Academia Sinica (1930).

Beginning in April 1938, for a period of more than two years, the writer has been spending time in collecting and investigating the fish fauna of Kweiyang, the capital of Kweichow Province. Fishes were collected either from the market or directly from the fishermen. Local ponds, pools and streams were also fairly extensively surveyed. Up to the present, more than fifty different species have already been obtained. In this paper descriptions of thirty species will be given. Among them two genera and five species are described as new to science.

Family Cyprinidae

1. *Cyprinus carpio* Linn.
2. *Procypris rabaudi* (Tchang)
3. *Carassius auratus* Linn.
4. *Spinibarbus sinensis* (Bleeker)
5. *Spinibarbus nigrodorsalis* Oshima
6. *Labeobarbus brevifilis* Peters
7. *Labeobarbus longirostrum* (Kimura)
8. *Semilabeo notabilis* Peters
9. *Hemibarbus maculatus* Bleeker
10. *Varicorhinus laticeps* (Guenther)
11. *Varicorhinus gerlachi* (Peters)
12. *Varicorhinus rarus* Lin

13. *Varicorhinus rhomboides* Tang, sp. nov.
14. *Osteochilus tungting* (Nichols)
15. *Lissochilus erythropterus* Tang, sp. nov.
16. *Masticarbus pentafasciatus* Tang, gen. and sp. nov.
17. *Rhodeus ocellatus* (Kner)
18. *Rhodeus sinensis* (Guenther)
19. *Chanodichthys wui* Rendahl
20. *Hemiculter kweichowensis* Tang, sp. nov.
21. *Aphyocypris chinensis* Guenther
22. *Aphyocyprionides typus* Tang, gen. and sp. nov.
23. *Opsariichthys bidens* Guenther
24. *Pseudorasbora parva* (Schlegel)
25. *Pseudogobio rivularis* (Basilewsky)

Family Siluridae

26. *Parasilurus asotus* (Linn.)

Family Flutidae

27. *Fluta alba* (Zuiew)

Family Ophiocephalidae

28. *Channa asiaticus* (Linn.)

Family Cobitidae

29. *Misgurnus anguillicaudatus* (Canter)

Family Cyprinodontidae

30. *Aplocheilichthys latipes* (T. and S.)

Family Cyprinidae

1. *Cyprinus carpio* Linn.

Cyprinus carpio Linn., 1758, Syst. Nat., ed. 10, 1: 320 (China).

Described from a specimen P. No. 0022, Kweiyang market.

D. III, 19; A. III, 5; Lt. 1. 35; Lt. tr. 5/4½; depth of body 3.2 in length without caudal, head 3.0; predorsal space 52 per cent, postdorsal space 52 per cent; eye 4.8 in head, snout 3.0, maxillary 3.5; postorbital 2.2, interorbital 3.0, thickness of head 1.75, that of body 2.0, depth of head 1.2, width of mouth 4.1. Last dorsal spine 2.7 in head, longest branched ray 2.1, pectoral 1.65, ventral 1.8, last anal spine 2.3, longest anal ray 2.3, depth of least caudal peduncle 2.8, length of peduncle 2.3, caudal fin 1.08; depth of peduncle 2.1 in its length; barbels 4; maxillary ones as long as eye-diameter; dorsal origin about midway between tip of snout and base of caudal; anal spine serrated behind.

Common food fish.

2. *Procypris rabaudi* (Tchang)

Cyprinus rabaudi Tchang, 1930, Bull. Soc. Zool. France 55(1): 47 (Suifu, Chungking).

Described from a specimen P. No. 0035, Kweiyang market, 11/38, 270 mm in length without caudal.

D. IV, 18; A. III, 5; P. 1, 16; V. 1, 8; Lt. 1. 43; Lt. tr. 7/5; predorsal 17, 16 scales around least height of caudal peduncle. Depth 3.2 in length, without caudal, head 4; eye 3.6 in head, snout 2.7, maxillary 3.7, postorbital 2.4, interorbital 2.7, thickness of head 1.8, that of body 1.6, depth of head 1.2, width of mouth 6.1. Last dorsal spine 1.6 in head, pectoral 1.15, ventral 1.23, last anal spine 1.5, depth of least caudal peduncle 2.0, length of peduncle 1.3, caudal fin 0.98; depth of peduncle 1.4 in its length.

Body rhomboid, compressed, highest at dorsal origin; head moderate, nape concave, top slightly convex, snout greatly produced, with a depression before nostrils; nostrils close together, nearer orbit than tip of snout; eye moderate, superior and slightly anterior; mouth terminal, small and arched; lips thick, continuous at corner of mouth, separate from jaws, densely covered with small fleshy papillae; rostral folds present; postlabial grooves interrupted at middle; maxillary to nostrils; barbels 4, rostral ones 1½ in snout, reaching posterior margin of nostril, maxillary ones slightly shorter, reaching posterior margin of orbit; gill raker 20, 1.8 in gill filament; pseudobranchiae present; scale large, lateral line running to middle of tail. Origin of dorsal nearer tip of snout than base of caudal; pectoral 8/9 reaching to ventral; ventral origin below last dorsal spine, not reaching to anal; last anal spine strong and serrated behind, not reaching to base of caudal; caudal deeply forked; vent immediately before anal.

Pharyngeal teeth 3-rowed 4, 3, 2-2, 3, 4; tip slightly hooked.

Color in formalin dark, base of scales black; belly pale.

Remarks.—*Cyprinus rabaudi* Tchang (Bull. Soc. Zool. France 55(1): 47, 1930) from Suifu, Chungking, *Procypris merus* Lin (Lingnan Sci. Jour. 12(2): 193, 1933) from West River, Kwangsi, and *Procypris niger* Herre and Lin (Lingnan Sci. Jour. 13(2): 311, 1934), from Wuchow, are closely related and identical in every respect except the number of rays in dorsal fin and it seems to me there is no specific value to distinguish them as separate species in the subfamily Cyprininae. Other minor points in difference may be due to age of the specimen, e.g. *P. merus* possesses a much larger eye than *P. niger* and *C. rabaudi*. Below is shown the similarity of the three:

Description	<i>C. rabaudi</i> ¹	<i>P. merus</i>	<i>P. niger</i>	Kweiyang Sp.
Depth (mm) length	130-400 (total)	106	262	270
Depth in length	3-3 1/3	3	2.9	3.2
Head in length	3 2/3-4 1/4	3.5	3.8	4.0
Snout in head	2 4/7-3 1/3	2.7	2.2	2.7
Eye in head	3 3/8-3 3/4	3.1	4.6	4.6
Interorbital	2 1/3-3 1/3	3.7	2.7	2.7
Postorbital	2 1/3-2 7/10	2.7	2.4	2.4
Dorsal	1 1/7-1 1/2	1.2	1.1	1.6
Anal	1 1/2	?	1.2	1.5
Dorsal	IV, 20-22	III, 16	IV, 16	IV, 18
Pectoral	1, 17	1, 18	?	1, 16

¹ This description is after S. Kimura, 1934, Jour. Shanghai Sci. Inst., Sect. III, vol. 1, p. 143, specimens from Chungking (the type locality) and from Howchwan.

Ventral	1, 18(?) ²	1, 9	2, 9	1, 8
Anal	III, 6	III, 5	III, 6	III, 5
Lt. l.	43-44	42	41+3	43
Lt. tr.	8/5	8½/5	8½/5½	7/5
Pharyngeal teeth	4,3,2	5 or 4,3,2	4,3,2	4,3,2
G. rakers	20	?	20	20

3. *Carassius auratus* Linn.

Carassius auratus Linn., 1758, Syst. Nat., ed. 10, 1: 322 (China and Japan).

Described from a specimen P. No. 0020, Kweiyang market, 9/'38. D. III, 16; A. III, 5; Lt. 1. 27; Lt. tr. 6/5; predorsal scale 12, 12 scales around least height of caudal peduncle; depth of body 2.7 in length without caudal; head 3.1, predorsal space 51 per cent, postdorsal space 14.3 per cent; eye 5 in head, snout 3.6; maxillary 4, postorbital 1.85, interorbital 2.5, thickness of head 5.03, that of body 5.2, depth of head 1.00, width of mouth 3.4, last dorsal spine 1.8 in head, longest branched ray 2, pectoral 1.6, ventral 1.5, last anal spine 2.00; longest anal ray 2.06, depth of least caudal peduncle 2.25, length of peduncle 2.3, caudal fin 1.2; depth of peduncle 0.90 in its length; barbels none; dorsal origin midway between tip of snout and base of caudal, anal spine serrated behind; pharyngeal teeth 1-rowed, 4-4.

Common food fish.

4. *Spinibarbus sinensis* (Bleeker)

Puntius (Barbodes) sinensis Bleeker, 1871, Verh. Akad. Wet. Amst., Nat. 12: 17, pl. III, fig. 2 (Yangtze-Kiang?).

Described from a specimen P. No. 0054, 19/11/'38, Kweiyang market; 180 mm in length without caudal.

D. III, 9; A. 3, 5; P. 18; V. 1, 9; Lt. 1. 31; Lt. tr. 5/3-v; predorsal scale 13; 14 scales around least height of caudal peduncle. Depth of body 3.7 in length without caudal; head 4.08, predorsal space 50 per cent, postdorsal space 40 per cent; eye 4.5 in head, snout 3.2, maxillary 3.5, postorbital 1.9, interorbital 2.5, thickness of head 1.9, that of body 1.8, depth of head 1.1, width of mouth 3.8. Last dorsal spine 1.3 in head, longest dorsal branched ray 1.3, pectoral 1.2, ventral 1.2, last anal simple ray 1.5, longest anal ray 1.5, depth of least caudal peduncle 2, length of peduncle 1.7, caudal fin 0.8. Depth of peduncle 1.2 in its length.

Body oblong, compressed, predorsal elevated. Head rather small, conical, top arched; snout obtusely pointed, nostrils close together, above, in front of eye, which is moderate in size, superior and anterior; mouth subterminal, small and arched, lips thin and smooth; rostral folds present, postlabial grooves interrupted at middle; barbels 4, rostral one short, equal to eye-diameter, maxillary one as long as snout. Gill membrane joined with isthmus behind orbit; gill rakers 13, short, about ¼ of gill filament; branchiostegal rays 3, pseudobranchiae present. Lateral line complete, slightly curved, running to middle of tail. Dorsal origin in-

² Probably a misprint for "1, 8."

served nearer to the snout than base of caudal, third dorsal spine serrated behind, a sharp pointed recumbent spine before root of dorsal; pectoral reaching ¼ to ventral; ventral below second branched dorsal ray with an auxiliary scale at its root, reaching beyond half way to anal; anal not to caudal base; caudal well forked; vent immediately before anal; peritoneum black; air bladder 2-chambered.

Pharyngeal teeth 3-rowed 5, 3, 2-2, 3, 5, tips hooked.

Color in formalin reddish gray, out margins of scale and membrane of fins blackish gray, except ventral and anal fins black.

Common food fish, local name *Tsin-yu*.

5. *Spinibarbus nigrodorsalis* Oshima

Spinibarbus nigrodorsalis Oshima, 1926, Annot. Zool. Japan 11, 10 (Kachek, Hainan).

Described from a specimen P. No. 0069, 19/3/'39, Kweiyang market, 215 mm in length without caudal.

D. 3, 9; A. 3, 5; P. 18; V. 1, 8; Lt. 1. 26; Lt. tr. 4½/2½. Predorsal scale 8; 10 scales around least height of caudal peduncle. Depth of body 4.15 in length without caudal, head 4.05, predorsal space 45 per cent, postdorsal space 35 per cent; eye 5 in head, snout 3.1, maxillary 3.1, postorbital 2.08, interorbital 2.4, thickness of head 1.8, that of body 1.9, depth of head 1.3, width of mouth 3.4. Last dorsal simple ray 1.45 in head, pectoral 1.3, ventral 1.3, last simple anal ray 1.5, depth of least caudal peduncle 2.25, length of peduncle 2.25, caudal fin 0.99. Depth of peduncle 1 in its length.

Body elongate, slightly compressed. Head conical, gradually elevated to dorsal origin, snout pointed; interorbital space broad and flat; nostrils close together, in front of orbit. Eye anterior and superior; mouth low and oblique, lower jaw included, lips thin; maxillary reaching to nostrils; rostral folds present, postlabial grooves broadly interrupted at middle; barbels 4, rostral ones reaching beyond maxillary bone and the maxillary barbels reaching to posterior margin of orbit. Gill rakers 11, short and stout; branchiostegal rays 3, pseudobranchiae present. Scales large, those on the breast smaller, a recumbent spine before the dorsal; lateral line curved anteriorly, running to the middle of tail. Dorsal origin nearer to tip of snout than base of caudal, last simple ray not ossified; pectoral reaching half way beyond to the ventral; ventral reaching ¾ to anal; anal reaching to caudal base, caudal elongate, deeply forked; vent immediately before the anal; peritoneum gray; air-bladder 2-chambered.

Pharyngeal teeth 3-rowed, 5, 3, 2-2, 3, 5, tip hooked.

Color in formalin reddish gray, upper portion of body darker, pectoral and caudal gray, outer margin of the dorsal fin black, other fins pale.

Food fish, not commonly seen at market of Kweiyang, its local name is also called *Tsin-yu*.

6. *Labeobarbus brevifilis* Peters

Barbus (Labeobarbus) brevifilis Peters, 1880, Monatb. Akad. Wiss. Berlin, p. 1033, fig. 4 (Hongkong?).

Described from a specimen P. No. 0051, 11/'38, Kweiyang market, 150 mm in length without caudal.

D. III, 8; A. 2, 5; P. II, 16; V. 2, 8; Lt. 1.45; Lt. tr. 7/4-v. Predorsal scale 12; 16 scales around least height of caudal peduncle. Depth of body 4 in length without caudal, head 3.47, predorsal space 50 per cent, postdorsal space 50 per cent; eye 4.9 in head, snout 2.3, maxillary 2.6, postorbital 2.3, interorbital 3.7, thickness of head 2.35, that of body 2.3, depth of head 1.55. Last dorsal spine 1.26, pectoral 1.6, ventral 1.8, last simple anal ray 1.8; depth of least caudal peduncle 2.9, length of peduncle 2.15; caudal fin 1.00. Depth of peduncle 1.2 in its length.

Body elongate, laterally compressed; head moderately long, snout pointed, about equal to postorbital part of head; nostrils close together, in front of orbit, which is superior, situated about middle of head; mouth inferior, lower jaw included, lips thick, lower one with a rectangular lobe at center; rostral folds present, postlabial grooves across the chin; barbels 4, rostral one minute, maxillary ones half of eye-diameter; gill rakers 20+6, longest one 3 in gill filament; branchiostegal rays 3, pseudobranchiae present; scales moderate in size, smaller in the breast, lateral line complete, running to the middle of tail. Dorsal origin midway between tip of snout and base of caudal, third spine strong and serrated behind; pectoral reaching $\frac{2}{3}$ to ventral; ventral reaching beyond $\frac{2}{3}$ to anal, inserted below second dorsal branched ray; anal not reaching to base of caudal; caudal long, deeply forked; vent immediately before anal fin.

Pharyngeal teeth 3-rowed, 5, 3, 2-2, 3, 5, slender, tips hooked.

Color in formalin dark above, pale below, fins pale, tip of dorsal fin black.

Food fish.

7. *Labeobarbus longirostrum* (Kimura)

Barbus (*Labeobarbus*) *longirostrum* Kimura, 1934, Jour. Shanghai Sci. Inst. Sect. III, Vol. -, p. 114, Pl. 4, fig. 2 (Chungking).

Described from a specimen P. No. 0085, 27/3/'39, Kweiyang market, 175 mm in length without caudal.

D. IV, 8; A. 3, 5; P. 2, 16; V. 2, 8; Lt. 1.46; Lt. tr. 7/4; predorsal scale 13, 16 scales around least height of caudal peduncle. Depth of body 4.7 in length without caudal, head 3.15, predorsal space 48 per cent, postdorsal space 40 per cent; eye 5.6 in head, snout 2.2, maxillary 2.7, postorbital 2.7, interorbital 4, thickness of head 2.3, that of body 2.6, depth of head 1.8; width of mouth 4.7. Last dorsal spine 1.7, pectoral 1.7, ventral 1.9, last simple anal ray 1.75, depth of least caudal peduncle 3.9, length of peduncle 2.15, caudal fin 1.05. Depth of peduncle 1.95 in its length.

Body slender, laterally compressed; head moderate, pointed anteriorly, snout greatly produced, longer than postorbital part of head, with a depression at the top; nostrils close together, before orbit, anterior one with a flap; eye moderate, superior and posterior; mouth inferior arched, lower jaw included, with a rectangular lobe at the center; rostral folds present; lips thick, smooth; postlabial grooves continued across the chin; barbels 4, rostral ones minute, maxillary ones 2 in eye-diameter;

gill raker 22-7, longest one 2.2 in gill filament; branchiostegal rays 3, pseudobranchiae present; scales small, lateral line complete, running to the middle of tail. Dorsal origin midway between snout and base of caudal, its spine strong and serrated behind; pectoral $\frac{2}{3}$ to ventral; ventral origin below third dorsal branched ray; anal shorter than dorsal, reaching beyond half way to caudal base; caudal forked; vent immediately before anal; peritoneum gray.

Pharyngeal teeth 3-rowed 2, 3, 5-5, 3, 2, slender and hooked.

Color in formalin bluish green above, pale below, fins pale.

8. *Semilabeo notabilis* Peters

Semilabeo notabilis Peters, 1880, Monatb. Akad. Wiss. Berlin, p. 1032 (Hongkong?).

Described from a specimen P. No. 0057, 26/11/'38, Kweiyang market, 285 mm in length without caudal.

D. 3, 8; A. 2, 5; P. 2, 16; V. 1, 8; scales in Lt. 1.47; Lt. tr. $6\frac{1}{2}/4\frac{1}{2}$ -v; predorsal scale about 16; 20 scales around least height of peduncle. Depth of body 4.58 in length without caudal, head 4, predorsal space 48 per cent, postdorsal space 38 per cent; eye 7 in head, snout 1.8, postorbital 3.0, interorbital 2.3, thickness of head 1.5, that of body 1.4, depth of head 1.5, width of mouth 2.3, longest dorsal ray 1.00, pectoral 1.2, ventral 1.3, anal 1.5, depth of caudal peduncle 2.1, length of peduncle 1.6, caudal fin 0.8; depth of peduncle 1.5 in its length.

Body elongate, highest at dorsal origin, more compressed at tail region; head heavy, moderate in size, top flat; snout blunt, elevated at orbit region, covered with small warts; nostrils close together, high, at posterior third of snout; eye high, posterior, small, 4 in snout and 2.5 in postorbital part of the head; mouth inferior, twice eye-diameter; upper lip broad, covered with small papillae, continued with the lower lip by lateral folds; lower lip comparatively less broad, without posterior margin, covered with small papillae; rostral folds present, postlabial grooves deep, interrupted at middle; barbels 4, rostral ones slightly longer than eye-diameter, maxillary ones minute; gill rakers close set, short and pointed; pseudobranchiae present; scales large, lateral line continuous, running to middle of tail. Dorsal origin nearer tip of snout than base of caudal, without ossified spine; pectoral nearly horizontal, $\frac{2}{3}$ to ventral; ventral not reaching to anal, its origin below middle of dorsal fin; anal not reaching to base of caudal; caudal long, deeply forked; vent about midway between root of ventral and origin of anal.

Pharyngeal bone weak, teeth 3-rowed, 5, 4, 2-2, 4, 5.

Color in formalin dark brown, fins dark, longitudinal lines between scales darker.

9. *Hemibarbus maculatus* Bleeker

Hemibarbus maculatus Bleeker, 1871, Verh. Akad. Nat. 12: 19 (Yangtze-Kiang).

Described from a specimen P. No. 0041, Kweiyang market, 11/'38, 105 mm in length without caudal.

D. III, 7; A. III, 5; P. 1, 16; V. 1, 8; Lt. 1. 47; Lt. tr. $6\frac{1}{2}/4\frac{1}{2}$ -v; predorsal scale 14; 16 scales around least height of caudal peduncle. Depth of body 4.6 in length without caudal, head 3.4; predorsal space 50 per cent, postdorsal space 34 per cent; eye 3.8 in head, snout 2.5, maxillary 3.2, postorbital 2.5, interorbital 3.5, thickness of head 2.3, that of body 2.3, depth of head 1.8, width of mouth 4.2. Last dorsal spine 1.35, pectoral 1.35, ventral 1.75, longest anal ray 1.45, depth of least caudal peduncle 3.4, length of peduncle 2.3, caudal fin 1.05; depth of peduncle 1.7 in its length.

Body elongate, moderately compressed; head moderate, with mucous cavities about eyes and edge of preoperculum; snout long, bluntly pointed, with a shallow depression before nostrils which are situated close together, before orbit; eye large, superior; mouth arched, inferior, horizontal, lower jaw included; lips moderately thick, lower one three-lobed, middle one small; postlabial grooves short; barbels 2, maxillary in position, 1.5 in eye-diameter; gill rakers 6+1, short and pointed; branchiostegal rays 3; pseudobranchiae present; scales moderate in size, lateral line continuous, running to middle of tail; smooth dorsal spine strong, its origin midway between tip of snout and base of caudal; pectoral reaching $\frac{4}{5}$ to ventral; ventral $\frac{3}{4}$ to anal; anal nearly to base of caudal; caudal forked; vent immediately before anal.

Pharyngeal teeth 3-rowed, 5, 3, 1-1, 3, 5, slender and hooked.

Color in formalin reddish brown, a row of faint specks on sides of body above lateral line, dorsal and caudal fins with small dark spots.

10. *Varicorhinus laticeps* (Guenther)

Onychostoma laticeps Guenther, 1896, Ann. Mus. Zool. St. Petersburg, part I, p. 211, pl. 1, fig. B (Hui-Hsien Kansu).

Described from a specimen P. No. 0052, Kweiyang market.

D. III, 8; A. 2, 5; P. 1, 17; V. 1, 8; Lt. 1. 49; Lt. tr. $8\frac{1}{2}/5$; predorsal scale 15; 16 scales around least height of caudal peduncle. Depth of body 3.5 in length without caudal, head 4.4, predorsal space 45.5 per cent, postdorsal space 38.4 per cent; eye 4 in head, snout 2.7, postorbital 2.5, thickness of head 1.7, that of body 1.7, depth of head 1.02, width of mouth 2.2. Last dorsal spine 1.02 in head, pectoral 1.02, ventral 1.2, longest anal ray 1.25, depth of least caudal peduncle 2, length of peduncle 1.35, caudal fin 0.6; depth of peduncle 1.3 in its length.

Body oblong, compressed, dorsal and ventral profiles round; head small, top convex; snout roundly produced, shorter than postorbital, with row of tubercles; eye moderate, slightly anterior; mouth inferior, transverse, arched at corners, lower jaw with sharp horny sheath; lips thin; rostral folds present, postlabial grooves at corners of mouth; barbels none; maxillary reaching to anterior margin of orbit; gill rakers short, close set; pseudobranchiae present; lateral line complete, running to the middle of tail. Dorsal origin much nearer to tip of snout than base of caudal, last spine serrated behind; pectoral 1.5 reaching to ventral; ventral not to anal, its origin below third branched dorsal ray, anal not to base of caudal; caudal fin deeply forked; vent immediately before anal fin.

Pharyngeal teeth 3-rowed, 5, 3, 2.

Color in formalin uniform, slightly darker on the upper part of body. Very common at this region, used as food.

11. *Varicorhinus gerlachi* (Peters)

Barbus gerlachi Peters, 1880, Monatsb. Akad. Wiss. Berlin, p. 1034, fig. 5 (Hongkong?).

Described from a specimen P. No. 0003, 6/38, Nan-ming River, Kweiyang, 140 mm in length without caudal.

D. IV, 8; A. 2, 5; P. 2, 15; V. 1, 8; Lt. 1. 48; Lt. tr. $8/4$; predorsal scale 13; 16 scales around least height of caudal peduncle. Depth of body 3.3 in length without caudal, predorsal space 45.5 per cent, postdorsal space 37.5 per cent, eye 4.5 in head, snout 3, maxillary 2.7, postorbital 2.2, interorbital 2.2, thickness of head 1.7, that of body 1.8, depth of head 1, width of mouth 2.2. Last dorsal simple ray 0.9 in head, pectoral 1.1, ventral 1.2, last anal simple ray 1.3, depth of least caudal peduncle 2, length of peduncle 1.3, caudal fin 0.7; depth of peduncle 1.5 in its length.

Body oblong and compressed, dorsal profile sharp before dorsal; head small, snout conical, projecting, with five pores; nostrils close together, nearer to eye than tip of snout; eye moderate, superior and anterior; mouth inferior, transverse, rostral fold present, lower jaw with sharp horny substance; labial grooves at corner of mouth; barbels none; maxillary reaching to orbit; gill membrane narrowly joined with isthmus; gill rakers short, pointed, close-set; lateral line complete, running to middle of tail, dorsal with last osseous spine serrated behind, its origin much nearer to tip of snout than base of caudal; pectoral $\frac{1}{4}$ to ventral; ventral $\frac{3}{4}$ to anal; anal not to caudal base, caudal forked; vent immediately before anal.

Color in formalin uniform.

12. *Varicorhinus rarus* Lin

Varicorhinus rarus Lin, 1933, Lingnan Sci. Jour. 12(2): 204, fig. 1 (Yunkiang).

Described from a specimen P. No. 0079, Kweiyang market, 27/3/39, 145 mm in length without caudal.

D. III, 8; A. 3, 5; P. 1, 15; V. 1, 7; Lt. 1. 45; Lt. tr. $7\frac{1}{2}/5$ -v; predorsal scale 12, 16 scales around least height of caudal peduncle. Depth of body 3.3 in length without caudal, head 4.36; predorsal space 45 per cent, postdorsal space 41 per cent; eye 4.0 in head, snout 2.8, postorbital 2.3, interorbital 2.3, thickness of head 1.6, that of body 1.6, depth of head 1.05, width of mouth 2.8. Last dorsal spine 1.1 in head, longest dorsal branched ray 1.0, pectoral 1.05, ventral 1.08, longest anal ray 1.25; depth of least height of caudal peduncle 2.05, length of peduncle 1.36, caudal fin 0.6. Depth of peduncle 1.6 in its length.

Body oblong, compressed, dorsal profile sharp to dorsal origin, ventral profile round; head small, top convex; snout bluntly pointed; nostrils close together, nearer to eye than tip of snout; eye large, supralateral; mouth inferior, transverse, corners bent backwards, upper lip fleshy and thin, lower lip sharp and covered with horny edge; rostral folds prominent,

postlabial grooves only at corners of mouth; barbels 4, rostral ones minute, maxillary ones $\frac{2}{3}$ of eye-diameter; gill rakers short, in close set; branchiostegal rays 2, pseudobranchiae present; scales moderate in size, lateral line straight, running to middle of tail. Dorsal origin nearer tip of snout than base of caudal, third spine strong and serrated behind; pectoral 2/7 to ventral; ventral origin below second branched ray, reaching to vent; anal not to base of caudal; caudal deeply forked, vent immediately before anal.

Pharyngeal teeth 3-rowed, 4, 4, 2, tip hooked.

Color in formalin dark above, fins with gray membrane.

13. *Varicorhinus rhomboides* Tang, sp. nov. (Fig. 1)

Described from the type P. No. 0032, Kweiyang market, 10/'38, 260 mm in length without caudal.

D. IV, 8; A. 2, 5; P. 1, 16; V. 2, 8; Lt. 1.44; Lt. tr. 7/5-v; predorsal scale 14; 16 scales around least height of caudal peduncle. Depth of body

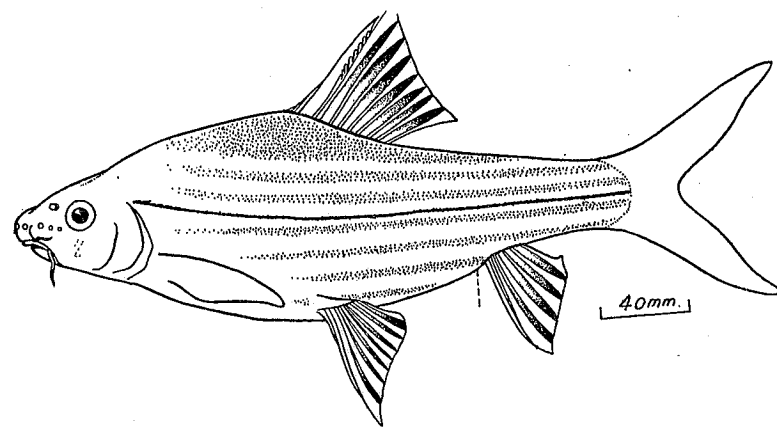


Fig. 1. *Varicorhinus rhomboides* Tang, sp. nov., P. no. 0032.

2.8 in length without caudal, head 4.5, predorsal space 50 per cent, postdorsal space 31 per cent; eye 4.9 in head, snout 2.7, postorbital 2.14, interorbital 2.3, thickness of head 1.7, that of body 1.7, depth of head 1.0, width of mouth 3.1. Last dorsal spine 0.9 in head, longest branched ray 1.0, pectoral 0.92, ventral 1.09, longest anal ray 1.3, depth of least caudal peduncle 2.0, length of peduncle 1.35, caudal fin 0.6. Depth of peduncle 1.3 in its length.

Body deep, more or less rhomboid; head moderate, triangular; top slightly convex; snout obtusely pointed, with large tubercles in pores; nostrils close together, anterior one tubular, with a flap covering the posterior nostril; eye large, supralateral, nearer tip of snout than posterior margin of the operculum; mouth inferior, transverse, corners bent backward; upper lip fleshy and thin, lower lip sharp covered with horny edge;

rostral folds prominent; postlabial grooves only at corners of mouth; barbels 4, rostral ones short, half of eye-diameter, maxillary ones as long as diameter of orbit; gill membrane joined with isthmus behind orbit; gill rakers short and sharp, in close set; pseudobranchiae present; scales large, lateral line straight, running to middle of tail. Dorsal origin midway between tip of snout and base of caudal, first spine minute, second spine short, third spine about $\frac{1}{2}$ of the fourth, which is thick, strong and serrated behind; pectoral 5/7 to ventral; ventral commencing under third dorsal spine; anal not to base of caudal; caudal deeply forked; vent immediately before anal; peritoneum gray.

Pharyngeal teeth 3-rowed, 4, 3, 2-2, 3, 4, tips hooked.

Color in formalin dark above with longitudinal faint lines, pale below membrane of dorsal, anal, and ventral with black stripes.

Food fish, rather common, its local name is *Sha-yu*.

Remark.—This species differs from all other Chinese species of this genus by its deep body, small head and coloration.

14. *Osteochilus tungting* (Nichols)

Varicorhinus tungting Nichols, 1925, Amer. Mus. Novit., No. 182, p. 3 (Tungting Lake).

Described from a specimen P. No. 0062, Kweiyang market, 11/'38, 140 mm in length without caudal.

D. 3, 10; A. 2, 5; P. 17; V. 10; Lt. 1.44; Lt. tr. 7/6; 24 scales around least height of caudal peduncle. Depth of body 4.3 in length without caudal, head 4.15, predorsal space 48 per cent, postdorsal space 33 per cent, eye 5.3 in head, snout 2.4, postorbital 2.4, interorbital 2.05, thickness of head 1.75, that of body 1.5, depth 1.3, width of mouth 2.7, height of dorsal 1.3 in head, pectoral 1.18, ventral 1.3, height of anal fin 1.5, depth of least caudal peduncle 1.45, depth of peduncle 1.11 in its length.

Body oblong, moderately compressed; head small; snout slightly swollen, broadly rounded, with horny warts; nostrils close together, nearer orbit than tip of snout; eye small, superior at middle of head; mouth inferior, slightly arched, lower jaw with sharp horny covering; lips smooth, overhung by fringed skin; rostral folds present; postlabial grooves short, at corners of mouth; maxillary reaching to nostrils, with two barbels, 1.5 in eye-diameter; gill rakers short, close set; scales moderate and thin, those on the breast and before the dorsal fin imbedded in skin. Dorsal origin nearer tip of snout than base of caudal; tip of pectoral round, $\frac{2}{3}$ to ventral; ventral $\frac{2}{3}$ to anal; anal $\frac{2}{3}$ to base of caudal; caudal forked; vent immediately before anal. Lateral line straight, running to middle of tail.

Pharyngeal teeth 3-rowed, 5, 3, 3.

Color in formalin greenish above, pale below.

Food fish, rather common.

15. *Lissochilus erythropterus* Tang, sp. nov.

Described from the type P. No. 0095, from Nan-ming River of Kweiyang, 125 mm in length without caudal.

D. III, 8; A. 3, 5; P. 1, 16; V. 1, 8; Lt. 1. 47; Lt. tr. 8/5; predorsal scale 15; 16 scales around least height of caudal peduncle. Depth of body 3.95 in length without caudal, head 3.95, predorsal space 58 per cent, postdorsal space 35.5 per cent; eye 4.15 in head, snout 3, maxillary 3, postorbital 2.2, interorbital 3, thickness of head 2, that of body 1.85, depth of head 1.2, width of mouth 5.1. Last dorsal spine 1.25 in head, pectoral 1.3, ventral 1.45, longest anal ray 1.6, depth of least caudal peduncle 2.4, length of peduncle 1.75, depth of peduncle 1.4 in its length, caudal fin 0.95.

Body oblong, slightly compressed, head moderate, slightly shorter than height of body, snout bluntly rounded, without tubercles, nostrils close together, nearer to orbit than tip of snout; eye anterior and lateral, with a free rim; mouth inferior, horse-shoe shaped, lower jaw included; lips thin, upper lip completely covering the upper jaw, lower lip with a notch at center and the leathery lower jaw thus exposed; maxillary not reaching to anterior margin of orbit; rostral folds present, postorbital grooves parallel to lower lip, interrupted at middle; barbels 4, maxillary ones equal to eye diameter, rostral ones a little shorter; gill rakers 10 + 5 on first arch, slender and pointed; scales moderate, lateral line complete, running to middle of tail. Dorsal origin slightly nearer to base of caudal than tip of snout, first spine short, second spine shorter than half of the third which is ossified and serrated behind; pectoral $\frac{3}{4}$ to ventral; ventral $\frac{3}{4}$ to anal, its origin opposite to that of dorsal fin; anal not to base of caudal; caudal fin deeply forked; vent immediately before anal.

Pharyngeal teeth 3-rowed, 4, 3, 1, tips hooked.

Color in formalin uniform, darker above, paler below, dorsal membrane with black stripes parallel to the rays; caudal, anal, ventral fins red when alive.

Food fish, its local name is called *Hung Wei Pa* (red tail), common in Nan-ming River.

Remarks.—This species is closely related to *L. rendahli* Lin (Lingnan Sci. Jour. 12(2): 210, 1933) from Shiu-kwan, Kwangtung, but differs from the latter in longer rostral barbel, more posterior dorsal fin, longer head and so on.

Masticbarbus Tang, gen. nov.

Derivation of name: *masti* = whip, *barbus* = name of group of the fish.

Similar to *Lissochilus* of Weber and Beaufort, but the upper lip separate from the jaw and the male fishes with a long filament prolonged from last dorsal spine.

Kweichow.

Type.—*Masticbarbus pentafasciatus* Tang, sp. nov.

16. *Masticbarbus pentafasciatus* Tang, sp. nov. (Fig. 2)

Described from the type, P. No. 0080, Kweiyang market, 27/3/'39, 180 mm in length without caudal.

D. IV, 8; A. 3/5; P. 1, 16; V. 1, 8; Lt. 1. 43; Lt. tr. 7/4 $\frac{1}{2}$ -v; predorsal scale 13; 16 scales around least height of peduncle. Depth of body 3.05 in length without caudal, head 3.8, predorsal space 50 per cent, postdorsal

space 33 per cent; eye 5 in head, snout 2.45, maxillary 3.1, postorbital 2.3, interorbital 3.0, thickness of head 2.1, that of body 2.15, depth of head 1.3, width of mouth 6.4. Longest dorsal branched ray 1, pectoral 1.35, ventral 1.35, longest anal ray 1.5, depth of caudal peduncle 2.5, length of peduncle 1.8, caudal 0.75. Depth of caudal peduncle 1.25 in its length.

Body oblong, compressed, dorsal profile highest at dorsal origin and somewhat sharpened; head moderate, top convex, nape slightly concave; snout bluntly pointed, with a depression before nostrils; tubercles present on snout, preoperculum and operculum (but not in female fish); nostrils close together, nearer to orbit than tip of snout; mouth inferior, horseshoe shaped, jaws leathery, lips rather thick, separate from both jaws, with a

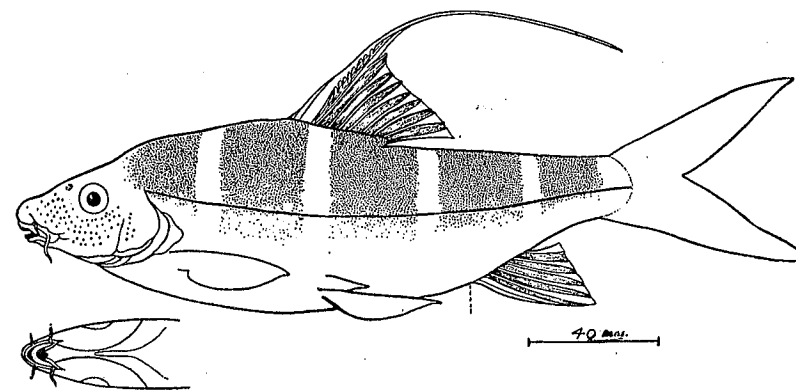


Fig. 2. *Masticbarbus pentafasciatus* Tang, sp. nov., type P. no. 0080.

notch in middle of lower lip, lower jaw included; rostral folds present, postlabial grooves interrupted at middle; barbels 4, rostral ones $\frac{1}{3}$ of, maxillary ones $\frac{2}{3}$ of, eye-diameter; maxillary bone not to nostrils; gill rakers 3 + 6 on first arch, widely set, short and pointed; scales moderate in size, lateral line to middle of tail. Dorsal origin midway between tip of snout and base of caudal fin, its last dorsal spine strong and serrated behind with its tip produced as a long filamentous ray extending beyond caudal base (it is not produced as a ray in females); pectoral $\frac{3}{4}$ to ventral; ventral $\frac{3}{4}$ to anal, its origin below third dorsal branched ray; anal scarcely to base of caudal; caudal forked; vent immediately before anal.

Pharyngeal teeth 3-rowed, 5, 3, 2, one tooth molar-like in the main row, others hooked at their tips.

Color in formalin darker above and paler below, sides of body with five vertical black bands.

Derivation of name: *penta* = five, *fasc* = band.

MEASUREMENTS OF *Masticarbus pentafasciatus*

Nos.	Depth in length	Head in length	Eye in head	Snout	Postorbital scale		Sex
Type 0080	3.05	3.8	5.0	2.45	2.3	43-7/4 $\frac{1}{2}$	M.
Cotype 0081	3.2	3.6	5.8	2.6	2.15	43-7/4	M.
Cotype 0082	3.15	3.8	5.7	2.6	2.2	44-7/4 $\frac{1}{2}$	M.
Cotype 0083	3.2	3.7	5.0	2.5	2.35	43-7/4	F.
Cotype 0066	3.25	3.8	5.2	2.5	2.25	44-7/4	F.

17. *Rhodeus ocellatus* (Kner)

Pseudoperilampus (?) *ocellatus* Kner, 1897, Novara Fische, p. 365, pl. 15, fig. 6 (Shanghai).

Described from a specimen P. No. 0129, Kweiyang, 58 mm in length without caudal.

D. II, 10; A. II, 10; Lt. 1. 33; 11 scales from dorsal origin to base of ventral. Depth of body 2.2 in length without caudal, head 4.2, predorsal space 53 per cent, postdorsal space 28.6 per cent; eye 3.7 in head, snout 3, postorbital 2, interorbital 2.7. Last dorsal simple ray 1.35, ventral 1.35, pectoral 1.25, last anal simple ray 1.4; depth of least caudal peduncle 2, length of peduncle 1.15, caudal fin 0.8; depth of peduncle 1.5 in its length.

The rhomboid body deep oval, nape notched; head small, conical, snout broadly pointed, provided with rows of horny warts before nostrils which are close together, near anterior margin of orbit, eye large, lateral; mouth small, terminal, slightly oblique; lower jaw included; lips thin; barbels none; lateral line incomplete, only anterior four scales; dorsal origin nearer tip of snout than base of caudal; anal origin below fourth dorsal branched ray; vent midway between pectoral axilla and anal origin.

Pharyngeal teeth single row, 5-5, bevelled surface smooth.

Color in formalin uniform with a black band in middle of tail, oval spots in dorsal distinct.

Common in the Nan-ming River.

18. *Rhodeus sinensis* Guenther

Rhodeus sinensis Guenther, 1868, Cat. Fish Brit. Mus. 7: 280 (China).

Described from a specimen P. No. 0130, 7/39; 53 mm in length without caudal.

D. II, 10; A. 11, 9; Lt. 1. 34; Lt. tr. 9 from dorsal origin to base of ventral. Depth of body 2.5 in length without caudal; head 4.0; predorsal space 54 per cent, postdorsal 25 per cent; eye 3.85 in head, snout 3.85, postlabial 2.15, interorbital 2.9. Last dorsal simple ray 1.35, pectoral 1.25, ventral 1.5, last simple anal ray 1.25, length of peduncle 1.9.

Body not as deep as in *Rh. ocellatus* and with a lesser convex dorsal profile; lateral line incomplete, 3-5 scales only; dorsal origin slightly nearer base of caudal than tip of snout; anal origin below fifth dorsal branched ray.

Pharyngeal teeth 1-rowed, 5-5, bevelled surface smooth.

Color in formalin uniform, dark in middle of tail, pale spots on dorsal; anal with intense black edge.

Less common than *Rh. ocellatus* in Nan-ming River.

19. *Chanodichthys wui* Rendahl

Chanodichthys wui Rendahl, 1932, Arkiv. Zool. 24A (1b): 105.

Described from a specimen P. No. 0013, Kweiyang market, 7/38, 165 mm in length without caudal.

D. II, 7; A. 3, 25; P. 1, 15; V. 1, 8; Lt. 1. 59; Lt. tr. 12 $\frac{1}{2}$ /5-v; 20 scales around least height of peduncle. Depth of body 3.25 in length without caudal, head 4.08; eye 3.25 in head, snout 3.9, postorbital 2.3, interorbital 3.5, thickness of head 2.0, that of body 2.2, depth of head 1.2, width of mouth 3.5. Last dorsal simple ray 1.25, pectoral 1.25, ventral 1.65; longest anal ray 2.3, depth of least caudal peduncle 2.3, length of peduncle 2.05, caudal fin 0.85. Depth of peduncle 1.2 in its length.

Body more or less rhomboid, compressed; head small, nape concave, abdominal keel distinctly behind ventrals; snout bluntly pointed; nostrils close together, slightly nearer to orbit; eye large, superior and anterior; mouth terminal, oblique, maxillary reaching below to nostrils; lips thin, not separate from jaws; postlabial grooves interrupted at middle; barbels none; gill rakers 3+10, 2.5 in gill filament; lateral line normally curved, running to middle of tail. Dorsal origin about midway between tip of snout and base of caudal; last spine strong and smooth, first spine about $\frac{2}{3}$ of the second; pectoral almost to ventral, ventral origin before dorsal fin; anal long, commencing a little behind last dorsal ray; caudal forked; vent immediately before anal; air bladder in two divisions.

Pharyngeal teeth 3-rowed, 4, 4, 2, slender and hooked.

Color in formalin uniform.

Food fish, not commonly seen on market.

20. *Hemiculter kweichowensis* Tang, sp. nov.

Described from the type P. No. 0042, Kweiyang market, 11/38, 110 mm in length without caudal.

D. III, 7; A. 3, 12; P. 1, 14; V. 1, 8; Lt. 1. 60; Lt. tr. 10/3-v. Depth of body 4.2 in length without caudal, head 3.9; space between origin of ventral and anal 4.2, predorsal space 52 per cent; eye 3.45 in head, snout 3.45, maxillary 3.4, postorbital 2.15, interorbital 3.4, space between tip of pectoral and origin of ventral 2.8. Last dorsal spine 1.5 in head, pectoral 1.36, ventral 1.6, longest anal ray 2.25. Length of peduncle 1.5, caudal fin 0.95, depth of peduncle 1.9 in its length.

Body elongate and compressed, the dorsal profile straight, the abdominal keel confined to belly behind ventrals; head moderate, pointed; snout short, bluntly pointed; eye large, superior and anterior, equal to snout or slightly shorter than interorbital which is broad and convex; mouth terminal, oblique, lower jaw with a low symphyseal knob; lips thin and smooth; barbels none; gill rakers 9 on first lower arch, short and pointed; scale thin, moderate in size; lateral line continuous, bending downward over the pectoral, running low to base of anal, then running

upward and backward to middle of tail. Dorsal origin slightly nearer to base of caudal than tip of snout or midway between nostrils and base of caudal, postdorsal space 1.5 in predorsal space, first spine short, second spine half of third which is strong and smooth; pectoral pointed, reaching $\frac{2}{3}$ to ventral; ventral $\frac{2}{3}$ to anal; anal origin below tip of dorsal fin when depressed; caudal forked; vent immediately before anal origin; peritoneum dark gray; air-bladder bipartite.

Pharyngeal teeth 3-rowed, 5, 4, 2, slender and tip hooked.

Color in formalin dark above, pale below, irregular black specks above lateral line; fins pale.

Remarks.—This species is closely related to *H. dispar* Peters but with a larger eye and more scales on lateral line.

21. *Aphyocypris chinensis* Guenther

Aphyocypris chinensis Guenther, 1868, Cat. Fish. Brit. Mus. 7: 201 (Chekiang).

Described from a specimen P. No. 0078, from Tai-I-Tsin, by Mr. T. H. Chin, 30 mm in length without caudal.

D. 3/6; A. 3/7; Lt. 1. 32; Lt. tr. 9-v; predorsal scale 17; 16 scales around least height of caudal peduncle. Depth 4.1 in length without caudal, head 3.7, predorsal space 58.8 per cent, postdorsal space 35.3 per cent; eye 3.3 in head, snout 4.0; postorbital 2.15, interorbital 2.15, thickness of head 2.0, that of body 2.2, depth of head 1.4. Longest branched dorsal ray 1.2, pectoral 1.35, ventral 1.8, longest anal ray 1.5, depth of least peduncle 2.1, length of peduncle 1.2, caudal fin 0.8, depth of peduncle 1.5 in its length.

Body oblong, moderately compressed, abdominal keel confined to the belly behind the ventrals; head moderate, interorbital broad, slightly convex; snout short, pointed; eye moderate in size, anterior and superior mouth large, oblique; lips thin; barbels none; gill rakers short, close set; lateral line incomplete, only first two scales. Dorsal without osseous spine, its origin much nearer base of caudal than tip of snout; pectoral reaching to ventral; ventral not to anal; anal not to base of caudal; caudal forked; vent immediately before anal origin.

Pharyngeal teeth 2-rowed, 4, 3, tip hooked.

Color in formalin dark above, pale below, with a blackish streak from occiput to middle of tail and another similar band from nape to caudal.

Genus *Aphyocyprionides* Tang, gen. nov.

Derivation of name: *oides* = like.

Similar to *Aphyocypris* Guenther, but with a less compressed body and more teeth on pharyngeal bone.

Body oblong, compressed. Eye normal. Mouth small, terminal. Barbel none. Dorsal inserted at interspace between ventral and anal, not overlapping, without osseous spine and with less than 7 branched rays. Anal short, with 7 branched rays. Lateral line incomplete. Abdominal keel before vent. Vent immediately before anal origin. Pharyngeal bone strong, teeth 3-rowed, 5, 4, 1-1, 4 or 3, 5 or 4, slender and hooked.

Distribution.—Kweichow.

Type.—*Aphyocyprionides typus* Tang, sp. nov. (Kweiyang, Kweichow Prov.).

22. *Aphyocyprionides typus* Tang, sp. nov. (Fig. 3)

Described from the type P. No. 0101, 33 mm in length without caudal from a small pool, Kweiyang, 7/38, by Mr. P. N. Yu, biology teacher of Provincial Senior Middle School of Kweichow.

D. 3/6; A. 2/7; Lt. 1. 33; Lt. tr. 10; depth of body 3.9 in length without caudal, head 3.2, predorsal space 58.8 per cent, postdorsal space 33.1 per cent; eye 3.8 in head, snout 4.5, postorbital 1.8, interorbital 2.5, thickness of head 1.8, that of body 1.8, depth of head 1.4, width of mouth 3.1; longest dorsal branched ray 1.5, pectoral 1.5, ventral 1.8, longest anal branched ray 1.55, depth of least caudal peduncle 2.1, length of peduncle 1.8, depth of peduncle 1.2 in its length; caudal 1.00 in head.

Body oblong, compressed, dorsal and ventral profiles round, only keeled behind ventrals, highest at dorsal origin; head conical, top flattened, snout short, obtusely round, nostrils close together; eye moderate in size, superior and anterior; mouth terminal, oblique, maxillary reaching to nostrils, lip thin, barbels none; gill rakers short, close set; scales thin, lateral line incomplete, only first five scales. Dorsal small and short, without osseous spines, its origin much nearer to base of caudal than tip of snout; pectoral not to ventral; ventral not to anal; anal not to caudal base; caudal forked; vent immediately before anal origin.

Pharyngeal teeth 3-rowed, 5, 4, 1-1, 4 or 3, 5 or 4, slender and hooked at tips.

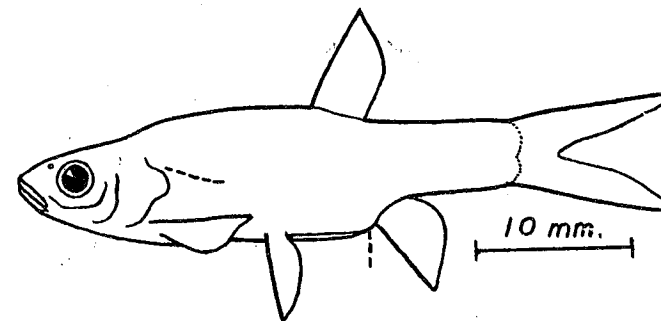


Fig. 3. *Aphyocyprionides typus* Tang, sp. nov., type P. no. 0101.

Color in formalin darker above, pale below, a brownish black streak from the nape to base of caudal fin; fins pale.

Remarks.—This small fish is closely related to *Aphyocypris chinensis* but with a less compressed and stouter body, 3 rows of pharyngeal teeth instead of two, without a dark band from operculum to base of caudal fin at sides of body, and other minor points.

23. *Opsariichthys bidens* Guenther

Opsariichthys bidens Guenther, 1873, Ann. Mag. Nat. Hist. 4, 12: 249 (Shanghai).

Described from a specimen P. No. 0002, 150 mm in length without caudal, from Nan-ming River.

D. 3/7; A. 3/9; P. 1, 13; V. 1, 8; Lt. 1. 46; Lt. tr. 8/2½; predorsal scale 18. Depth of body 4.3 in length without caudal, head 3.3, predorsal space 48 per cent, postdorsal space 39.4 per cent; eye 5.7 in head, snout 3.0, maxillary 2.1, postorbital 2.0, interorbital 3.25, thickness of head 2.1, that of body 2.0, depth of head 2.4, width of mouth 4.0. Last dorsal simple ray 1.8, pectoral 1.5, ventral 2.0, longest anal ray 0.98, depth of least caudal peduncle 3.6, length of peduncle 2.2, caudal fin 1.2. Depth of peduncle 1.5 in its length. Mouth terminal and oblique, maxillary arched, mandible with a prominent symphyseal knob; gill rakers 9+2, short and pointed; dorsal origin nearer to base of caudal than tip of snout.

Very common in Nan-ming River, used as food fish; its local name is *Pai-tiao-yu*.

24. *Pseudorasbora parva* (Schlegel)

Leuciscus parvus Schlegel, 1847, Fauna Japonica, Pisces, p. 215, pl. 102, fig. 3 (Japan).

Described from a specimen P. No. 0025, 79 mm in length without caudal.

D. 3/7; A. 3/6; Lt. 1. 36; Lt. tr. 5/3. Depth of body 3.9 in length without caudal, head 4.0; eye 5.0 in head, snout 3.2, postorbital 2.0, interorbital 2.5, thickness of head 1.8, that of body 1.8, width of mouth 3.5. Last dorsal simple ray 1.25, pectoral 1.45, ventral 1.45, longest anal ray 2.0, depth of caudal peduncle 1.8, length of peduncle 2.15, caudal fin 1.05, depth of peduncle 1.5 in its length.

Body oblong and compressed, head moderate in size, snout pointed with horny warts in males; nostrils close together, in front of orbit; eye moderate, rather high; mouth small, oblique, directed upward, lips thin, postlabial grooves interrupted at middle, barbels none; gill rakers rudimentary; branchiostegal rays 3, pseudobranchiae present; lateral line complete, running in the middle of tail; dorsal origin slightly nearer to base of caudal than tip of snout; pectoral 2/5 to ventral; ventral 2/5 to anal, its origin slightly before that of dorsal, anal short, caudal forked, vent immediately before anal.

Pharyngeal teeth 1-rowed, 5-5, weak.

Coloration uniform.

Common in Nan-ming River.

25. *Pseudogobio rivularis* (Basilewsky)

Gobio rivularis Basilewsky, 1855, Novu, Mem. Soc. Nat. Musco 10: 231 (North China).

Described from a specimen P. No. 0024, Kweiyang Market, 68 mm in length without caudal.

D. 5, 7; A. 2, 5; Lt. 1. 35; Lt. tr. 6/3½; predorsal scale 10; depth 4.5

in length without caudal, head 3.8, predorsal space 47.7 per cent, postdorsal space 40 per cent; eye 5 in head, snout 2.2, interorbital 4, thickness of head 1.8, height of head 1.6, longest dorsal ray 1.3, pectoral 1.2, ventral and anal 1.6, caudal 1, least height of caudal peduncle 2.5.

Body oblong, slightly compressed, head large, with a depression before eye, mouth subterminal, lips thick, slightly striated, confluent at corners, lower lip 4-lobed, median ones small; two maxillary barbels, 2/3 of eye-diameter; dorsal origin nearer tip of snout than base of caudal fin, pectoral not to ventral, anal to base of caudal fin. Scales thin, lateral line complete, to middle of tail, breast naked.

Color in formalin spotted dorsally, dorsal and caudal fins with rows of specks.

Common in Nan-ming River.

Family Siluridae

26. *Parasilurus asotus* (Linn.)

Silurus asotus Linn., 1758, Syst. Nat., ed. 10, p. 501 (Asia).

Described from a specimen P. No. 0016, Kweiyang market.

D. 5; A. 77; P. 1. 12; standard length 183 mm, depth of body 5.7 in length, head 4.5; eye 8.7 in head, snout 3.0; postorbital 1.7, interorbital 2.0; longest dorsal ray 2.7, pectoral 1.8, ventral 2.5, longest anal ray 3.2; barbels 4, maxillary one reaching to base of ventral, mandibular ones 2.2 in head.

Common food fish.

Family Flutidae

27. *Fluta alba* (Zuiew)

One specimen P. No. 0017, Kweiyang market, total length 400 mm. Food fish.

Family Ophiocephalidae

28. *Channa asiaticus* (Linn.)

Gymnotus asiaticus Linn., 1758, Syst. Nat., ed. 10 (China).

Described from a specimen P. No. 0015, Kweiyang market.

D. 47; A. 30; P. 15; Lt. 1. 57; Lt. tr. 6½/13½. Standard length 140 mm. Depth of body 6.2 in length; head 3.7; eye 5.7 in head, snout 4.8; maxillary 2.4, postorbital 1.7, interorbital 3.7, thickness of head 1.75, that of body 2.5, depth of head 2, width of mouth 2.9, longest dorsal ray 3, pectoral 1.6, longest anal ray 2.4, depth of least caudal peduncle 3, caudal fin 1.3; ventral fin absent; color dark above and pale below; two transverse bands on head, about 10 v-shaped markings on body and one large round spot on caudal fin, black.

Food fish, rather common.

Family Cobitidae

29. *Misgurnus anguillicaudatus* (Cantor)

Cobitis anguillicaudatus Cantor, 1842, Ann. Mag. Nat. Hist. 9: 485 (Chusan).

Described from a specimen P. No. 0027, Kweiyang market.
D. 9; A. 7; P. 1, 7; V. 1, 5. Standard length 118 mm. Depth of body 7.5 in length, head 6; eye 7.8 in head, snout 2.65, postorbital 1.7, interorbital 5.2, longest dorsal ray 1.35, pectoral 1.6, ventral 2.3, longest anal ray 1.8, depth of caudal peduncle 1.7, length of peduncle 1.00.
Food fish.

Family Cyprinodontidae

30. *Aplocheilus latipes* (Temm. and Schlegel)

Poecilia latipes Temm. and Schlegel, 1847, Fauna Jap. Pisces., p. 224.

Described from a specimen P. No. 0103, 18 mm in length without caudal.

D. 6; A. 18; P. 10; V. 6. 31 scales in median lateral series. Depth of body 3.8 in length without caudal, head 3.5. Anal fin long, dorsal fin far back, its origin behind middle of anal fin; head and body scaly, no lateral line; tip of head flat, eye large, mouth superior and transverse.
Common in rice field.

THREE NEW SPECIES OF PALPICORNIA FROM YUNNAN
(ORDER COLEOPTERA, FAMILY HYDRAENIDAE)

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Hydraena (s. str.) *yunnanensis* sp. nov. (Fig. 1, 2)

Size.—1.96 × 0.66 mm.

General Form and General Color.—Elongated, dorsal surface less arched; black, with brownish background.

Head.—Black, narrowed anteriorly; vertex-front little arched, with sparse moderately large and irregular punctate points, intervals of which are glabrous; the surface of the head capsule is provided with fine ridges and fine furrows which are arranged obliquely and longitudinally and are concentrated at each side of the vertex-front; near the inner side of each compound eye there is a shallow longitudinal furrow and between these furrows there is a very shallow depression; the occipital suture is indistinct, the occiput is represented by a transverse shining sclerite behind the vertex-front, its surface provided with very minute ridges. Clypeus narrow anteriorly, slightly elevated longitudinally along the middle, with a few sparse and irregular punctate points, intervals of which are shining; the lateral sides provided with minute ridges; anterior margin of clypeus truncated; lateral margins nearly straight. Labrum coarse; anterior margin bilobed. Maxillary palpi brown, longer than the head and the pronotum taken together; second joint slender and long, curved inward, thickened distally, being the longest joint of maxillary palpi; third joint shorter than the second one, peg-like in form; fourth joint longer than the third joint, club-shaped, distal end black. Compound eyes brown.

Pronotum.—Disk black, lateral sides brown, moderately arched, with rather big and deep elliptical punctate points which are larger on each side of the disk; some of the points are arranged into irregular rows, intervals of points shining and appearing as narrow ridges; there is a longitudinal depression on each side near the margin; anterior margin broadly emarginated, being broader than the base of head capsule together with the eyes; lateral margin arched; posterior margin slightly arched, narrower than the base of elytra and almost as broad as the anterior margin; anterior angles rounded; posterior angles nearly rectangular.

Scutellum.—Small, triangular, shining black.

Elytra.—Broad, arched, provided with fifteen longitudinal punctate series and sparse short indistinct setae; the series end before the distal end of the elytra; the points of series black, deeper and larger than those of the pronotum, gradually smaller and irregular toward the posterior end;

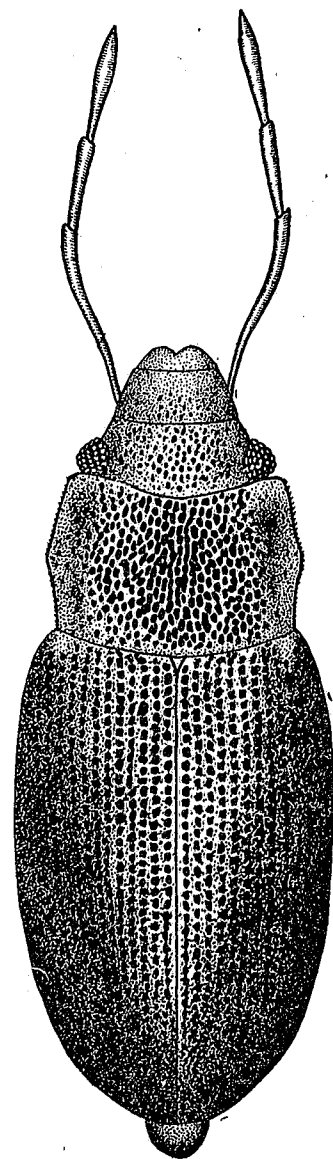


Fig. 1. *Hydraena* (s. str.)
yunnanensis sp. nov.

interstices glabrous, generally narrower than the points and the spaces among the points of one series generally narrower than the interstices or nearly equal in size; the inner margin of each elytrum raised into fine border; anterior angles rounded; posterior angles broadly rounded; there is a large lateral channel near the outer margin, the portion exterior to the lateral channel extends slightly upward; pseudoepipleuron of each elytrum extends from anterior end backward to end at the posterior fifth of the elytrum; outer margin slightly arched with very minute and very indistinct teeth; part of last abdominal tergite is behind the posterior tip of the elytra.

Leg.—Brown; anterior coxae globular, brown black, with dense white hairs; anterior femora brown, basal part black, middle part slightly enlarged; anterior tibiae nearly straight, slightly shorter than the femora,

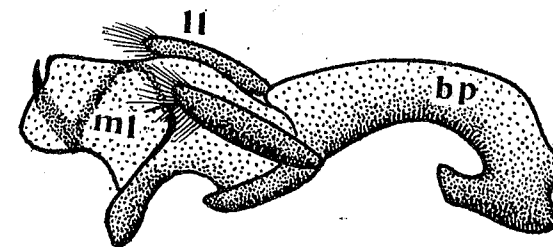


Fig. 2. Lateral view of phallus of *H. yunnanensis* sp. nov.
bp, basal piece; ll, lateral lobe; ml, medial lobe.

thickened distally, without apparent spines; middle coxae brown, globular, coarse; middle femora brown, enlarged at middle, with a few punctate points on the ventral side; middle tibiae almost as long as the femora, straight, armed with short spines; hind femora similar to the middle femora in shape, with sparse points on the ventral surface and with very sparse hairs; hind tibiae almost as long as the hind femora, straight, with distinct spines at the distal end; all tarsi shorter than their respective femora, with distal joint longer than the preceding joints taken together; ventral side of each tarsal joint armed with minute and sparse spines.

Ventral Surface.—Mentum black, narrow anteriorly; anterior margin rounded; lateral margins nearly straight; surface of mentum provided with small ridges and small depressions. Prosternum transverse, coarse, dull black; anterior margin provided with sparse and indistinct hairs, a low carina is present along the middle line. Mesosternum coarse, dull black, with minute indistinct hairs and with five longitudinal small ridges before the middle coxae and one transverse ridge in front of these longitudinal ridges; this transverse ridge arranged in form of four small arches; there is a small transverse ridge between the median coxae. Metasternum coarse, dull black, pubescent, with a posterior median shallow depression; a small ridge is present on each side of this depression. Abdomen with seven visible sternites; four basal sternites dull, coarse, each one with hairs on the lateral sides of the posterior margin; anterior margin of the fifth

abdominal segment coarse and dull, posterior part brown and shining; there are some moderately long hairs on this segment; sixth and seventh segments brown and shining, the former provided with short hairs on the posterior margin, the latter semicircular in outline and slightly emarginated posteriorly, median part with longitudinal lighter colored portion.

Phallus.—Basal piece curved, provided with a single distal elongation on one side; lateral lobes short, provided with numerous distal hairs; median lobe broad, unsymmetrical, with a single lateral elongation and distal curved spinous outgrowth.

Holotype.—One male from Chengkiang district of Yunnan Province; altitude about 1800 meters, October 20, 1939, collected by the writer from a stagnant pond. In the collection of C. L. Pu.

Allotype.—One female with same locality and date as the holotype. In the collection of C. L. Pu.

Paratypes.—Five specimens from Chengkiang, April 20, 1939, collected by the writer. Fifty-seven specimens with the same locality and date as the holotype. Ten paratypes in the insect collection of the College of Agriculture, Sun Yatsen University; the others in the collection of C. L. Pu.

The allotype can be distinguished from the holotype by the presence of short bristles along the posterior margin of the last abdominal tergite and the absence of distal emargination on the median posterior margin of the seventh abdominal sternite.

This species resembles *Hydraena fontana* Orchym. from India and *Hydraena formula* Orchym. from Indochina, but can be distinguished from them by the deeper emargination of labrum, the larger punctate points on the mentum and the different shape of phallus.

***Ochthebius (Bothocius) verrucosus* sp. nov. (Fig. 3, 4)**

Size.—2.62 × 0.85 mm.

General Form and General Color.—Elongated, deeply black; dorsal surface with rather long hairs which appear blue green when observed under certain directions of light.

Head.—Black, with metallic shining; vertico-front with rather sparse, irregular and more or less elongated punctate points, intervals of which are larger than the points and the intervals near the anterior margin shagreened; the points at the anterior part are not so evident and the ground shows granulated appearance; a depression is present on each side of the posterior part of the vertico-front near each compound eye and upon each depression there is an ocellus; a median smaller depression is present on the posterior end of the vertico-front. Epistomal suture v-shaped; there is an indistinct median suture extending lengthwise on the vertico-front, being composed of punctate points. Clypeus with metallic shining green; anterior portion elevated; lateral margins nearly straight and provided with minute elevated borders; the posterior part of clypeus finely granulated, anterior part with irregular minute points, the intervals of which are shining. Labrum large; anterior margin slightly emarginate; lateral margins nearly straight; whole margin of labrum with fine elevated

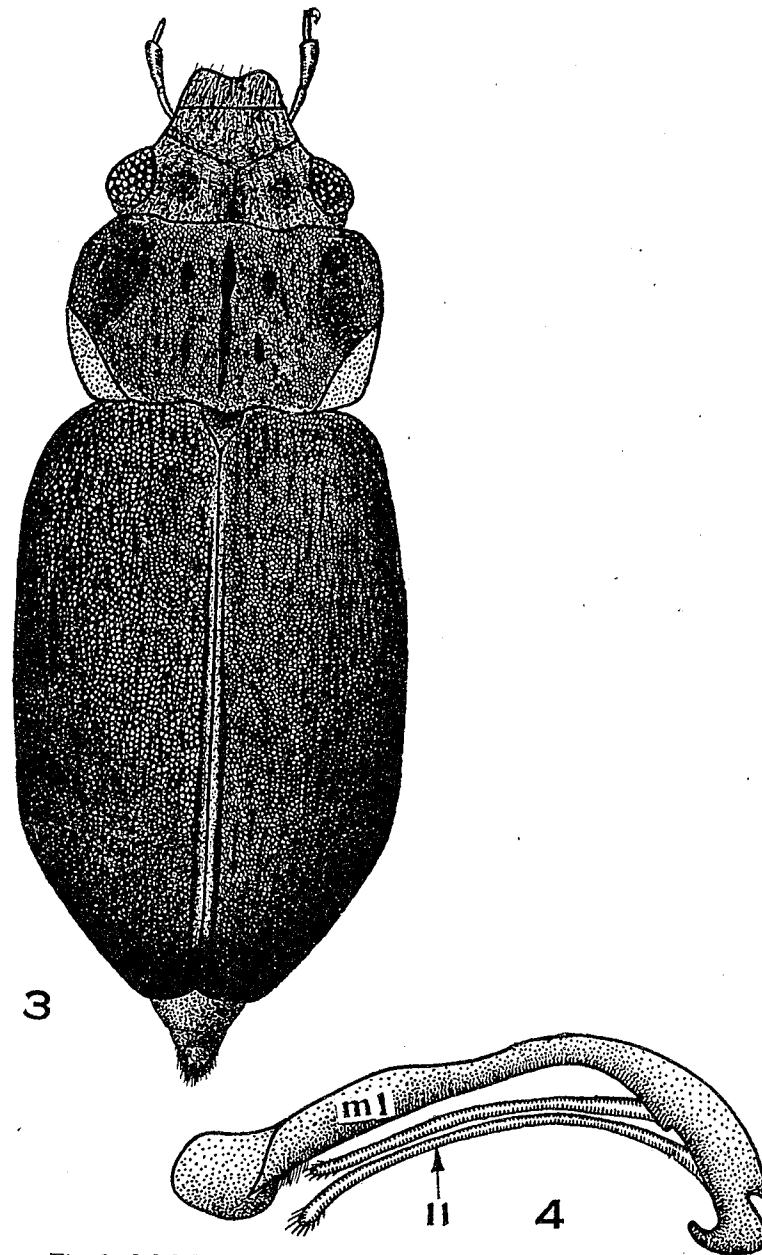


Fig. 3. *Ochthebius (Bothocius) verrucosus* sp. nov.; Fig. 4, lateral view of phallus. ll, lateral lobe; ml, median lobe.

border; a small area of median part of labrum finely and densely granulated, other area shining. Compound eyes brown, prominent. Maxillary palpi brown; the third joint of each maxillary palpus being the longest and biggest joint, thickened toward the tip; fourth joint being the shortest and smallest joint, tapering at the tip. Antennae brown; joints of club gradually large and rather truncate at the distal tip.

Pronotum.—More or less hexagonal, black, slightly transverse; median furrow rather deep, slightly narrow at middle, tapering at the two extremities; anterior and posterior discal impressions small; exterior impressions elongated and large; surface of pronotum finely and densely granulated and provided with very sparse and shallow punctate points; anterior margin slightly sinuate, with minute elevated border, and along the anterior margin there is a transverse row of minute granules; lateral margins with anterior parts nearly straight, medio-posterior part retracted; posterior margin strongly sinuate, with median part pointed posteriorly; retracted parts of lateral margins with rather large membranes which continue to the posterior margin; anterior angles rounded; posterior angles broadly rounded.

Scutellum.—Black, transverse; width of base slightly larger than the whole length; lateral sides nearly straight; basal portion finely and densely granulated, hind portion glabrous.

Elytra.—Black, distal tip brown; rather arched; sutural series short, more distinct at distal part and gradually effaced proximally; humeral calli rather prominent; lateral margin arched; anterior angles rounded; posterior angles broadly rounded; lateral channel rather distinct; whole surface provided with fine and dense granules and provided with rather distinct rows of punctate points on the disk. The elytra shortened behind the distal end of the abdomen and usually three distal abdominal tergites exposed.

Leg.—Brown; front legs with hairy, slightly elongated, large and finely granulated coxae, with slightly curved femora which are pubescent proximally and with minute and indistinct reticulation; each front tibia nearly straight with rather short external spines and minute internal spines arranged in rows, a rather long seta present near the distal end; each front tarsus with distal joint longer than the preceding joints taken together, basal joint with white hairs on the ventral side. Middle legs with pubescent, globular, and finely granulated smaller coxae and with nearly straight femora provided with minute and sparse points and sparse short setae; each middle tibia somewhat like those of front legs in form but the spines much larger and longer; each middle tarsus with distal joint nearly as long as the preceding joints taken together, basal joint without pubescence. Hind legs with nearly straight femora provided with rather distinct reticulation and sparse points; each hind tibia like those of middle legs in form but with still longer and sparser spines; each hind tarsus with distal joint slightly shorter than the preceding joints taken together. All tibiae longer than their respective femora. Three basal joints of tarsi with two setae each on the distal end of the ventral side; all tarsi shorter than their respective femora.

Ventral Surface.—Mentum trapezoid in outline; black; with several rather large and deep points, intervals of points smooth or coarse; anterior margin broadly emarginate and with minute elevated border; lateral margin straight. Prosternum muddy black; granulated; with longitudinal low carina. Mesosternum muddy black; granulated; extending posteriorly between middle coxae. Metasternum muddy black; granulated; with white pubescence; hind margin with a small triangular notch on the median line. Abdomen with seven sternites; five basal sternites granulated; apical part of each sternite pubescent; two disternites, glittering; the sixth sternite with small scale-like structure formed by minute lines, this sternite bearing several points and rather long hairs at the distal part; the seventh sternite slightly coarse, with distal hairs and with median small distal depressions.

Phallus.—Median lobe curved, constricted at middle, expanded at the distal portion, with hairs near the distal tip; lateral lobes slender and long with distal hairs.

Holotype.—One male, from Chengkiang district of Yunnan Province, altitude about 1800 meters, October 29, 1939, collected by the writer from an affluent of Fu-hsien Lake. In the collection of C. L. Pu.

Allotype.—One female with same locality and date as the holotype. In the collection of C. L. Pu.

Paratypes.—Four specimens with same locality and date as the holotype. Two hundred twenty specimens from Lou Fong Tsouen of Yunnan, altitude about 1300 meters, March 25, 1940, collected by the writer from a stream on the mountain. Twenty paratypes are deposited in the insect collection of College of Agriculture, Sun Yatsen University; the others in the collection of C. L. Pu.

The allotype can be distinguished from the holotype by the denser punctate points on the middle part of vertex-front and on the clypeus and by the absence of a depression on the hind margin of the last abdominal sternite.

This species resembles *Ochthebius turkestanus* Kuwert but can be distinguished from it by the shorter elytral series.

There are two forms of the elytral punctures in the specimens from Lou Fong Tsouen; one group is identical to the holotype from Chengkiang, having faint punctate points, some of which are arranged in irregular rows, while the other group has deeper punctate points, some of which are also arranged in irregular rows. This morphological difference appeared at first to the writer to be a specific or subspecific character, but as examination of the phallus showed no evidence for differentiation into two species they are identified under the same specific name.

Limnebius (Bilimneus) wui sp. nov. (Fig. 5, 6)

Size.—1.1 × 0.63 mm.

Head.—Pitch black, glittering, slightly arched, provided with microscopic irregular uneven punctate points, intervals of points shining; anterior margin of head semicircular. Clypeus large, more or less trapezoid. Labrum narrow, transverse; anterior margin slightly emarginate. Com-

pound eyes moderately prominent, more or less wedge-shaped in outline. Maxillary palpi rather long, brown; second joint of each palpus slender, thickened at the distal end; penultimate joint large, also thickened at the

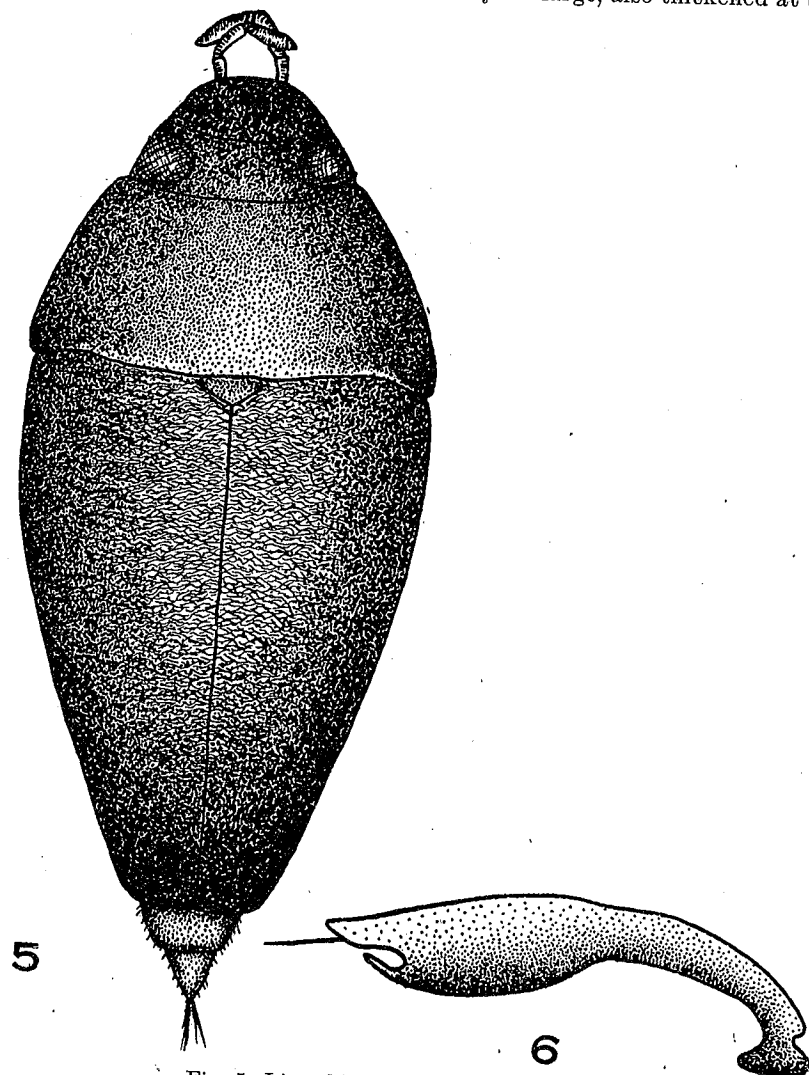


Fig. 5. *Limnebius (Bilimneus) wui* sp. nov.
Fig. 6. Lateral view of phallus of *L. wui*.

distal end; the ultimate joint being the longest one with the distal end pointed and dark in color.

Pronotum.—Dark brown, glittering, arched, transverse, narrow an-

teriorly, provided with microscopic, irregular, sparse, punctate points, some points at the antero-lateral corners and lateral and posterior parts of the pronotum slightly large, intervals of points shining; anterior margin as wide as the posterior margin of the head together with compound eyes, moderately sinuate; a very faint line is present along the anterior margin; anterior angles rounded; lateral margins arched; posterior margin slightly sinuate, broader than the anterior margin; posterior angles rounded; an indistinct elevated border present along each lateral margin and anterior angle.

Elytra.—Dark brown, posterior part much lighter in color; the surface arched, narrow behind, provided with distinct crowded transverse short lines which appear as reticulation and scattered with sparse and minute hairs without distinct punctate points; each elytrum provided with elevated margin along the elytral suture; this elevated margin being very distinct at the middle and posterior part; there is also an elevated margin along the outer margin of each elytrum; posterior margin subtruncate, exposing the last two abdominal tergites; outer angles of the posterior margin rounded; inner angles obtuse.

Legs.—Brown; front coxae peg-like in form, densely punctate, lie closely; front trochanters provided with dense whitish hairs at the basal part; middle coxae much smaller than the front coxae, black, moderately widely separated; middle and posterior femora with fine reticulation; tibiae with rather dense spines at the outer margins, spines on the middle tibiae being more dense; each tarsus with three visible joints, first joint always with a few spines on the inner margin.

Ventral Surface.—Black, lateral sides of ventral surface of prothorax brown. Mentum semicircular with irregular points and short lines. Prosternum prolonged posteriorly into a ventral lamella between front coxae. Median elevated part of metasternum thinly pubescent and finely granulated, provided with minute punctate points. Abdomen with seven complete sternites; five basal sternites dull black, coarse, thinly pubescent; sixth sternite much larger, shining, brown black, very thinly pubescent and very indistinctly reticulated; seventh sternite spade-like in form, brown black, very thinly pubescent, with indistinct sculpture; behind the seventh sternite there is a minute retractile segment which bears several long and pointed terminal bristles.

Phallus.—More or less club-shaped; distal end of the club pincer-shaped and with a rather long terminal seta.

Holotype.—One male, from Chengkiang district of Yunnan Province, altitude about 1800 meters, April 21, 1939, collected by the writer from a stagnant pond. In the collection of C. L. Pu.

Allotype.—One female with same locality and date as the holotype. In the collection of C. L. Pu.

Paratypes.—Twenty specimens collected by the writer with same locality and date as the holotype; ninety specimens from Chengkiang, July 14, 1939, collected by the writer; two specimens from Kunming, October 29, 1939, collected by the writer. Ten paratypes deposited in the insect collection of College of Agriculture, Sun Yatsen University; the others in the collection of C. L. Pu.

The allotype can be distinguished from the holotype by the rounded distal tip of elytra and by the smaller seventh abdominal sternite.

This species resembles *Limnebius kwangtungensis* Pu, but can be distinguished from it by the less thickened spines on the middle tibiae and by the presence of transverse reticulation on the elytra.

This species is named in honor of Professor C. F. Wu.

STUDIES ON THE TIPULIDAE OF CHINA (DIPTERA) V. NEW CRANE-FLIES FROM YUNNAN AND KWANGTUNG

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The preceding part under this general title was published in the Lingnan Science Journal, 19: 121-132, April 1940. In the present installment I wish to discuss a few new species that were taken in Yunnan by Mr. Ernest R. Tinkham and in Kwangtung by Mr. F. K. To. The types of these novelties will be returned to the Lingnan Natural History Survey and Museum. I am greatly indebted to the collectors, and to Professor William E. Hoffman and Mr. J. Linsley Gressitt, for the opportunity of studying this interesting series of Tipulidae.

Tipulinae

1. *Dolichopeza (Nesopeza) tinkhamiana* n. sp. (Fig. 1, 6)

General coloration almost uniform reddish brown; halteres with stem yellow, knob dark brown; femora and tibiae brown, the tips of the latter, with the tarsi, snowy white; wings subhyaline, stigma oval, dark brown; *m-cu* more than one-third its length before fork of *M*; abdominal tergites yellow, their apices broadly brownish black; subterminal segments more uniformly blackened; male hypopygium with the outer dististyle flattened, dusky, at apex with three or four long fasciculate setae; inner dististyle large and complex, its beak very slender.

Male.—Length, about 9.5 mm; wing, 10 mm; antenna, about 4.5 mm.

Female.—Length, about 10 mm; wing, 9.5 mm.

Frontal prolongation of head light brown; palpi darker brown. Antennae of male relatively long, as shown by the measurements; scape, pedicel and extreme base of first flagellar segment yellow, the remainder of organ brown; flagellar segments long-cylindrical, with a short dense pubescence and scattered verticils of moderate length, somewhat longer on the outer segments. Head light reddish brown; anterior vertex wide.

Pronotum and mesonotum almost uniform reddish brown, the scutellum, but not the parascutella, slightly more buffy; praescutum with a very narrow and ill-defined median brown stripe. Pleura yellow, the mesepisternum more darkened. Halteres elongate, stem yellow, knob dark brown. Legs with the coxae and trochanters yellow; femora and tibiae brown, the tips of the latter broadly whitened; tarsi snowy white; legs detached and association difficult but one pair shows the proximal portions of tarsi a trifle more infuscated than are the outer segments. Wings (Fig. 1) subhyaline or with the cells beyond cord a trifle darkened; stigma oval, dark brown; veins brownish black. Venation: *Rs* longer than *R*₂₊₃;

m-cu more than one-half its length before fork of *M*; medial forks of moderate depth; cell *2nd A* relatively narrow.

Abdominal tergites brownish yellow to pale brown, the apices of the segments broadly brownish black; subterminal segments forming a blackened ring, most evident in male; sternites somewhat more uniformly pale; hypopygium yellow, the tergite and dististyles darkened. Male hypo-

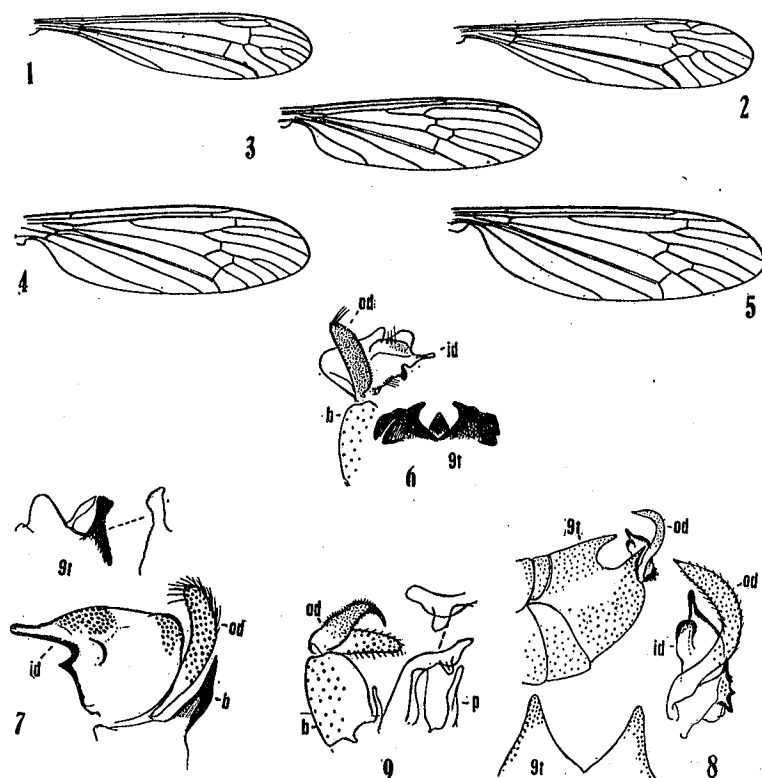


Fig. 1. *Dolichocheza (Nesopeza) tinkhamiana* n. sp., venation; Fig. 2, *Tipula palesoides* n. sp., venation; Fig. 3, *Dicranoptycha kwangtungensis* n. sp., venation; Fig. 4, *Hexatoma (Eriocera) sincera* n. sp., venation; Fig. 5, *Hexatoma (Eriocera) licens* n. sp., venation; Fig. 6, *Dolichocheza (Nesopeza) tinkhamiana* n. sp., male hypopygium; Fig. 7, *Tipula (Vestiplex) yunnanensis* n. sp., male hypopygium; Fig. 8, *Tipula palesoides* n. sp., male hypopygium; Fig. 9, *Dicranoptycha kwangtungensis* n. sp., male hypopygium. (Symbols: b, basistyle; id, inner dististyle; od, outer dististyle; p, phallosome; s, sternite; t, tergite.)

pygium (Fig. 6) with the tergite, *gt*, heavily blackened, the lateral lobes narrow, incurved; median lobe narrowed distally. Region of sternite and

basistyle with long conspicuous yellow setae (not shown in figure). Outer dististyle, *od*, a flattened dusky lobe set with dense short curved setae; at apex with three or four elongate subfasciculate bristles. Inner dististyle, *id*, large and complex in structure, as illustrated; beak very slender.

Hab.—China (Yunnan).

Holotype, ♀, Yunnan-fu, Temple of the 500 Genii, September 3, 1934 (E. R. Tinkham). *Allotopotype*, ♂, in poor condition.

Dolichocheza (Nesopeza) tinkhamiana is named in honor of the collector, Mr. Ernest R. Tinkham. The species is very distinct from generally similar regional forms, especially in the structure of the male hypopygium. Among these regional species it is most similar to *D. (N.) francki* Alexander, yet entirely distinct.

2. *Tipula (Vestiplex) yunnanensis* n. sp. (Fig. 7)

Allied to *divisotergata*; general coloration of mesonotum yellowish brown to yellow, the praescutum with four conspicuous brown stripes that are narrowly bordered by darker brown; antennae 12-segmented, flagellum brown; femora brown, the tips blackened; wings medium brown, restrictedly variegated with whitish subhyaline and darker brown; *Rs* nearly twice the length of *m-cu*; basal abdominal tergites yellow, heavily striped with dark brown; male hypopygium with the tergite divided by pale membrane, each half of the saucer produced into a slender black lobe or rod that is microscopically roughened; basistyle produced into an apical spine; inner dististyle a compressed blade, the apical beak slender.

Male.—Length, about 15 mm; wing, 21 mm; antenna, about 2.8 mm.

Frontal prolongation of head brownish yellow, darker beneath; nasus distinct, dark brown; palpi dark brown. Antennae short; scape yellow, pedicel very pale yellow, flagellum brown; antennae with 12 segments, the terminal one reduced; longest verticils exceeding the segments in length. Head yellowish brown, the vertical tubercle low, light yellow; vertex with three extensive brown areas, two lateral and one median.

Mesonotal praescutum with the ground color obscure brown or yellowish brown, with four conspicuous brown stripes that are narrowly bordered by darker brown; lateral borders of praescutum broadly yellow pollinose; scutum brownish yellow, each lobe with two separated brown areas; scutellum and mediotergite yellow pollinose, with a capillary brown median vitta. Pleura chiefly yellow pollinose, with extensive more grayish areas on the ventral sternopleurite and ventral anepisternum. Halteres with stem brown, the extreme base narrowly yellow, the knob dark brown, a trifle paler at apex. Legs with the coxae yellow to grayish yellow; trochanters yellow; femora brown, the tips blackened; tibiae and tarsi brown; claws (male) with a small erect tooth near base. Wings with the ground color medium brown, only restrictedly variegated with whitish subhyaline and darker brown; prearcular region and cell *Sc* more yellowish; stigma darker brown; the paler areas occur before and beyond the stigma, across

the base of cell 1st M_2 and at near two-thirds the length of cell M ; more yellowish areas across cells R and M at the basal fourth and at bases of anal cells; veins brown. Venation: R_s nearly twice as long as $m-cu$; outer end of cell 1st M_2 pointed.

Abdominal tergites with the ground color yellow, becoming more obscure on the third and outer segments, with three conspicuous dark brown stripes that become wider on the outer segments and finally include all outer segments and hypopygium; basal sternites more brownish yellow to yellow, the outer segments darkened. Male hypopygium (Fig. 7) with the tergite, $9t$, divided medially by pale membrane, on either side of the midline produced into a slender black lobe that is weakly capitate or dilated at apex, the margin serrulate or roughened (only one-half of tergal saucer shown in figure). Basistyle, b , produced apically into a strong black spine. Outer dististyle, od , a dusky clavate lobe. Inner dististyle, id , compressed; apical beak long and slender, blackened; inner edge of style below the beak with a triangular blackened lobe or flange.

Hab.—China (Yunnan).

Holotype, ♂, Yunnan-fu, West Hills, altitude 7,000–8,000 feet, August 22, 1934 (E. R. Tinkham).

Tipula (Vestiplex) yunnanensis is allied to *T. (V.) divisotergata* Alexander, differing in the structure of the antennae and male hypopygium, and in the pattern of the wings.

3. *Tipula palesoides* n. sp. (Fig. 2, 8)

General coloration orange, the praescutum with three dark gray stripes that are conspicuously bordered by velvety black; head orange, the anterior vertex with a nearly complete velvety black crossband, interrupted at median line; halteres and legs darkened, the tips of femora black; wings with a weak brown tinge, the stigma dark brown, conspicuous; cell M_1 short-petiolate; cell 2nd A long and narrow; basal abdominal segments yellow, those beyond fourth with caudal borders conspicuously blackened; male hypopygium with the tergite produced into slender lateral lobes; basistyle produced at apex into a spine; outer dististyle very conspicuous, appearing as a sickle-shaped cylindrical rod, the tip an acute spine.

Male.—Length, about 10 mm; wing, 12.5 mm; antenna, about 4.8 mm.

Frontal prolongation of head short, obscure yellow; nasus conspicuous; palpi pale brown throughout. Antennae with scape and pedicel yellow; flagellum black, the first segment slightly brightened at base; flagellar segments with weak basal enlargements; terminal segment reduced to a short thimble. Head orange, with a very conspicuous velvety black spot on either side of anterior vertex, not quite crossing the midline, leaving the summit of vertical tubercle orange.

Pronotum orange. Mesonotal praescutum yellow, with three conspicuous dark gray stripes that are bordered by velvety black; median stripe with the borders very broad, in front subequal to the diameter of

the stripe itself, behind more narrowed but still wide and conspicuous; lateral stripes more narrowly bordered by brownish black; extreme lateral humeral border darkened; scutum yellow, each lobe with two confluent gray areas that are encircled by brown borders; posterior sclerites of notum orange. Pleura orange, clear yellow on pteropleurite and dorsal pleurotergite. Halteres dark brown, the extreme base of stem pale. Legs with coxae orange; trochanters brownish orange; femora brown, the tips passing into black; tibiae brown, the tips more narrowly brownish black; tarsi passing through dark brown to black. Wings (Fig. 2) with a weak brownish tinge, cell Sc a trifle darker; stigma conspicuous, oval, dark brown; cord and the longitudinal veins beyond it narrowly seamed with brown; veins dark brown. Venation: Sc_2 ending opposite three-fourths the length of the moderately long, feebly angulated R_s ; cell M_1 very short-petiolate, the petiole less than one-half m ; $m-cu$ at near midlength of cell 1st M_2 ; cell 2nd A long and narrow.

Basal abdominal segments yellow, the outer ones from the caudal border of the fifth tergite and the fourth sternite blackened. Male hypopygium (Fig. 8) with the tergite, $9t$, closely fused with the sternite. Ninth tergite, $9t$, dark basally, the distal half pale, produced into slender lateral lobes that are separated by a broad U-shaped emargination. Basistyle produced apically into a slender, spinous lobe, the tip subacute, the surface with numerous setae. Outer dististyle, od , a very conspicuous, sickle-shaped, yellow rod, the tip suddenly narrowed to an acute chitinated point, the surface of style with numerous setae. Inner dististyle, id , small and compact; apical beak slender, blackened; base of style on outer face with a spinous blackened plate. Eighth sternite, $8s$, short, simple.

Hab.—China (Yunnan).

Holotype, ♂, Yunnan-fu, Temple of the 500 Genii, September 3, 1934 (E. R. Tinkham).

Tipula palesoides is different from all known species of the genus. Superficially it much resembles species of the genus *Nephrotoma* Meigen, but is a true *Tipula*.

Limoniinae

4. *Dicranoptycha kwangtungensis* n. sp. (Fig. 3, 9)

General coloration of mesonotum brownish black, sparsely pruinose; pleura obscure brownish yellow, with a conspicuous black longitudinal stripe; legs yellow, the outer tarsal segments blackened; wings with a strong brownish yellow tinge; costal fringe of male short; $m-cu$ lying far distad, beyond midlength of the small cell 1st M_2 ; abdomen brownish yellow, in male with a blackened subterminal ring; male hypopygium with the apical spine of the outer dististyle long and blackened, the lower margin of style with microscopic spines; phallosome complex.

Male.—Length, about 9 mm; wing, 9.5 mm.

Female.—Length, about 10 mm; wing, 10 mm.

Rostrum and palpi black. Antennae with scape pale brown, pedicel yellow; basal flagellar segments weakly bicolored, yellow basally, the

apices more infuscated, the intermediate and outer segments uniformly darkened; flagellar segments long-oval to elongate. Head clear light gray; anterior vertex of male relatively wide, a little less than twice the diameter of scape.

Pronotum and mesonotum almost uniformly brownish black, the sides of the pronotum and the lateral pretergites more reddish; praescutal stripes not differentiated from the ground; mediotergite more pruinose. Pleura obscure brownish yellow, with a conspicuous black longitudinal stripe extending from the cervical region and propleura across the ventral anepisternum, including almost all of the pteropleurite and pleurotergite; ventral pleurites obscure brownish yellow, the ventral sternopleurite a little darker. Halteres obscure yellow. Legs with the coxae pale brown; trochanters brownish yellow; femora yellow, the extreme tips very narrowly and insensibly darkened; tibiae and basitarsi yellow; remainder of tarsi brownish black. Wings (Fig. 3) with a strong brownish yellow tinge, cells *C* and *Sc* clearer yellow; a linear darkening in the stigmal area; veins dark yellow. Costal fringe (male) short and dense. Venation: Anterior branch of *Rs* arcuated at origin, running close to *R*₁ so cell *R*₁ is very narrow; cell 1st *M*₂ small, its inner end arcuated to weakly angulated and spurred; *m-cu* unusually far distad, at or beyond midlength of cell 1st *M*₂; all veins issuing from cell 1st *M*₂ elongate.

Abdomen brownish yellow, the sternites a little clearer yellow; a subterminal dark ring in male, lacking in female; male hypopygium yellow. Male hypopygium (Fig. 9) with the apical spine of outer dististyle, *od*, long and blackened, the lower or concave face of style with microscopic spines, the outer surface with abundant dense erect setulae. Phallosome, *p*, complex, as shown; longest element a powerful sinuous arm, before apex on lower face with a flattened flange.

Hab.—China (Kwangtung).

Holotype, ♀, Lung Ping Hui, Lin District, May 16–17, 1934 (F. K. To). *Allotopotype*, ♂, in poor condition.

Dicranoptycha kwangtungensis is entirely different from allied regional species. It is allied to *D. phallosomica* Alexander, yet differs conspicuously in coloration, venation, and in the structure of the male hypopygium.

5. *Hexatoma (Eriocera) sincera* n. sp. (Fig. 4)

Belongs to the *plumbeicincta* group; general coloration opaque black, including the entire head and thorax; legs dark brown; wings dark brown, the prearcular field, costal border and discal area light yellow; wing-tip in cells *R*₃ and *R*₄ very restrictedly whitened; vein *R*₁₊₂ slightly exceeding twice the length of *R*₂₊₃₊₄; cell *M*₁ present, exceeding its petiole in length; *m-cu* at outer end of cell 1st *M*₂; abdomen opaque black, the basal rings glabrous, on tergites two to five heavily light gray pruinose; hypopygium orange.

Male.—Length, about 14 mm; wing, 12.5 mm; antenna, about 3.5 mm.

Rostrum and palpi black. Antennae (male) 7-segmented; scape and pedicel black, flagellum brownish black; flagellar segments gradually decreasing in length outwardly. Head velvety black; vertical tubercle low, bilobed.

Thorax uniformly opaque velvet-black; vestiture of praescutal interspaces short and sparse. Halteres with stem dark brown, knob black. Legs with coxae and trochanters black; remainder of legs dark brown. Wings (Fig. 4) with the ground color dark brown; prearcular field broadly yellow, connected in cells *C* and *Sc* with a similarly colored discal area before cord, this latter area extending from vein *R*₁ to *Cu*₁; extreme wing-tip in cells *R*₃ and *R*₄ restrictedly more whitish; extreme wing-base darkened; veins brown, yellow in the flavous areas. Costal fringe dense but short; sparse macrotrichia on longitudinal veins beyond cord. Venation: *R*₂₊₃₊₄ a little longer than *R*₂₊₃; *R*₁₊₂ slightly exceeding twice the length of *R*₂₊₃₊₄; cell *M*₁ present, longer than its petiole; *m-cu* opposite fork of *M*₃₊₄, at outer end of cell 1st *M*₂.

Abdomen opaque black; segments two to five, inclusive, with basal rings heavily light gray pruinose, especially heavy on distal portion, the pruinose area including not more than one-half the total length of the segment; sternites with basal rings more plumbeous and glabrous rather than pruinose; hypopygium and preceding segment orange.

Hab.—China (Yunnan).

Holotype, ♂, Yunnan-fu, Shin Tang, altitude 7,000–8,000 feet, in pine-clad mountains, August 28, 1934 (E. R. Tinkham).

Allied to *Hexatoma (Eriocera) chrysomela* (Edwards), likewise from southeastern China (Fukien-Kwangtung), differing conspicuously in the pattern of the wings.

6. *Hexatoma (Eriocera) licens* n. sp. (Fig. 5)

General coloration opaque black; antennae black throughout; halteres and legs black throughout; claws of male toothed; wings with a strong blackish suffusion; radial veins beyond cord with numerous macrotrichia; *R*₂₊₃₊₄ a trifle longer than the basal section of *R*₅; cell *M*₁ lacking; *m-cu* at near two-thirds the length of lower face of cell 1st *M*₂; abdomen black, the basal rings of tergites two to four more nacreous.

Male.—Length, about 13 mm; wing, 12.5 mm; antenna, about 4 mm.

Rostrum and palpi black. Antennae (male) 8-segmented, black throughout; flagellar segments cylindrical, gradually decreasing in length outwardly, the third and fourth subequal in length. Head dull black.

Thorax opaque black, without evident pattern. Halteres and legs black throughout; claws (male) with a conspicuous tooth. Wings (Fig. 5) strongly and uniformly suffused with blackish; veins black. Radial veins beyond cord with abundant macrotrichia; outer medial veins with trichia sparse or lacking. Venation: *Sc*₁ ending shortly before fork of *R*₂₊₃₊₄, *Sc*₁ alone shorter than *R*₂; *Rs* approximately one-half longer than *R*; *R*₂₊₃₊₄ a trifle longer than the basal section of *R*₅; *R*₂₊₃ about one-third longer than *R*₂; cell *M*₁ lacking; cell 1st *M*₂ long, exceeding vein

M_4 beyond it; $m-cu$ at near two-thirds the length of lower face of cell 1st M_2 and a little exceeding the distal section of Cu_1 .

Abdomen, including hypopygium, black, the basal rings of tergites two to four more glabrous and nacreous.

Hab.—China (Yunnan).

Holotype, ♂, Yunnan-fu, Temple of the 500 Genii, September 3, 1934 (E. R. Tinkham).

By Edward's key to the Old World species of *Eriocera* (Ann. Mag. Nat. Hist., (9) 8: 70-78; 1921), the present fly runs to couplet 37, where it disagrees with all species beyond this point by the combination of uniformly black abdomen and loss of cell M_1 of the wings. There is no species since described with which it can be confused.

FOUR NEW SPECIES OF ARDISIA (MYRSINACEAE) FROM INDO-CHINA¹

By EGBERT H. WALKER

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The following new species were recognized during a study of the Myrsinaceae in the excellent collections from northern Indo-China made by Professor A. Petelot. Recently the Arnold Arboretum has obtained a valuable collection of duplicate specimens, photographs, and fragments of the types and of critical specimens of the Myrsinaceae in the Paris herbarium, which were used by J. Pitard in preparing the treatment of this family for H. Lecomte's "Flore Générale de l'Indo-Chine" (1930). This special collection has kindly been made available to the author for these studies, as well as a valuable collection of Myrsinaceae from Indo-China at the New York Botanical Garden.

Ardisia (Sect. *Acrardisia* Mez) *Petelotii* Walker, sp. nov. (Fig. 1)

Frutex 1-1.5 m altus; folia alterna vel subverticillata, petiolata elliptico-lanceolata, basi acuta, apice graciliter acuta, falcata, 18-24 cm longa, 2.5-4 cm lata, intergra vel subcrenolata, praesertim subtus minute et dense atro-punctata, nervis lateralibus circa 13-jugis, late divergentibus, in nervum lateralem non confluentibus; inflorescentia terminalis, paniculata, ad 17 cm longa, floribus dispersis, non subumbellatis, circa 5 mm longis, pedicellis circa 1 cm longis; sepala anguste ovata vel lanceolata, acuta, circa 1.5 mm longa, minute ciliata, punctata, punctulis parvis; tubus corollae nonnihil ovarium amplexans, lobis ovatis, dense punctatis, punctulis parvis; antherae late ovatae, apice rotundatae, dorso non punctatae; pistillum petalis aequale; fructus ignotus.

A shrub 1 to 1.5 meters high, the stems rather slender, smooth; leaves petiolate (0.5 to 1 cm), alternate or subverticillate, the blade thin-chartaceous to membranous, elliptic-lanceolate, falcate, acute to broadly acute at base, slenderly acute at apex, 18 to 24 cm long, 2.5 to 4 cm wide, entire to subcrenulate, about equally green on both sides, minutely and densely black-punctate especially beneath, the midrib raised beneath, the lateral nerves about 13 pairs, diverging at a wide angle from the midrib, not uniting in a definite marginal nerve, the ends sometimes inarching, thus forming an irregular and undulate marginal nerve, the veinlets very obscure, reticulate; inflorescence terminal, glabrous, paniculate, up to 17 cm long, the rose-colored flowers scattered along the secondary branches, not subumbellate as in most species of *Ardisia*, the peduncle and axis slender, green, the bracts subulate, minute, the pedicels

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Fig. 1. *Ardisia Petelotii* Walker, n. sp. End of stem with inflorescence and leaves, $\times \frac{1}{2}$. Drawn from the type, Petelot no. 4293.

very slender, about 1 cm long; sepals shortly united at base, narrowly ovate to lanceolate, acute, about 1.5 mm long, punctate with small glands especially near the apex, minutely ciliate; petals shortly united at base and apparently somewhat clasping the ovary, the lobes ovate, somewhat acute, 5 mm long, densely punctate with small glands especially on the upper half, not papillose within; stamens half the length of the petals, the filaments very short or nearly wanting, the anthers broadly ovate, rounded at apex, not punctate on back; pistil equaling the petals, the ovary globose, the style not distinctly slender, the stigma apiculate; fruit unknown.

Type in the United States National Herbarium, no. 1,550,886, collected at 1200 meters altitude on the "massif du Tam-dao, Province de Vinh-Yên," Tonkin, May, 1931, by A. Petelot, no. 4293. Additional specimens seen are A. Petelot, no. 2413, collected in an open forest on Mount Bavi, Province of Santay, Tonkin, May 26, 1940, in the U. S. National Herbarium and the Arnold Arboretum.

Ardisia (Sect. *Akosmos* Mez) *prionota* Walker, sp. nov. (Fig. 2)

Frutex gracilis, 0.5-1 m altus; folia alterna, petiolata, elliptica vel oblongo-lanceolata, basi cuneata, apice graciliter acuta vel acuminata, 10-15 cm longa, 2.5-3.5 cm lata, irregulariter serrata vel subintegra, uberrime glanduloso-punctata, punctulis parvis, costis et nervis subtus elevatis, nervis lateralibus 15-25-jugis, late divergentibus, incurvato-ascendentibus, in nervum lateralem non confluentibus; inflorescentia lateralis vel axillaris, paniculato-cymosa, 6-8 cm longa, pedicellis gracilibus, subumbellatis, in ramulis secundariis terminalibus; flores rosei; sepala ovata, acuta, 1 mm longa, plus minusve punctata; petala late ovata, 4 mm longa, sparse vel non punctata; antherae ovatae, acutae, apiculatae, dorso non punctatae; fructus globosus, circa 6 mm longus, non punctatus, rubescens vel ater.

A slender branching forest shrub 0.5 to 1 meter high, the branches grayish, more or less wrinkled; leaves with channeled petiole up to 1 cm long, the blade chartaceous, elliptic to oblong-lanceolate, rarely elliptic-ovate, cuneate at base, slenderly acute to acuminate at apex, 10 to 15 cm long, 2.5 to 3.5 cm wide, irregularly serrate to subentire, olive green or brownish, slightly paler beneath, glabrous, abundantly glandular-punctate with small not prominent glands, the midrib and lateral nerves somewhat impressed above, raised beneath, the latter 15 to 25 pairs, diverging at a wide angle from the midrib, curved-ascending, not uniting in a definite marginal nerve; inflorescence lateral or axillary, paniculate-cymose, 6 to 8 cm long, the pedicels subumbellate, very slender, 1 to 1.5 cm long, the flowers rose-colored; sepals shortly united at base, ovate, acute, 1 mm long, more or less punctate, subciliate or glabrous on margin; petals broadly ovate, broadly acute or acuminate, 4 mm long, very sparingly or not at all punctate, sparingly papillose within near base; stamens about three-fourths the length of the petals, the filaments short, the anthers ovate, acute, apiculate, not punctate on back; pistil shorter than the petals, the style slender, the stigma apiculate; fruit globose, about 6 mm in diameter, not punctate, reddish or black.



Fig. 2. *Ardisia prionota* Walker, n. sp. Branch with leaves and inflorescence, $\times \frac{1}{2}$. Drawn from the type, Petelot no. 6471.

Occurs in open moist forests at 1500 to 1600 meters altitude.

Type in the United States National Herbarium, no. 1,754,900, collected at 1500 meters altitude in Chapa, Tonkin, July, 1936, by A. Petelot, no. 6471; duplicate in the herbarium of the Arnold Arboretum. Additional specimens seen are A. Petelot, nos. 4291 and 4380, both from Chapa, Tonkin, collected July, 1931, and April, 1925, respectively, both deposited in the United States National Herbarium.



Fig. 3. *Ardisia botryosa* Walker, n. sp. Whole plant with fruiting inflorescence, $\times \frac{1}{2}$. Drawn from the type, Petelot no. 4298.

Ardisia (Sect. *Bladhia* (Thunb.) Mez) *botryosa* Walker, sp. nov. (Fig. 3)

Suffrutex, rhizomate repente; caules erecti non ramosi, ad 8 cm alti; folia alterna vel subverticillata, petiolata, petiolis late alatis, minute

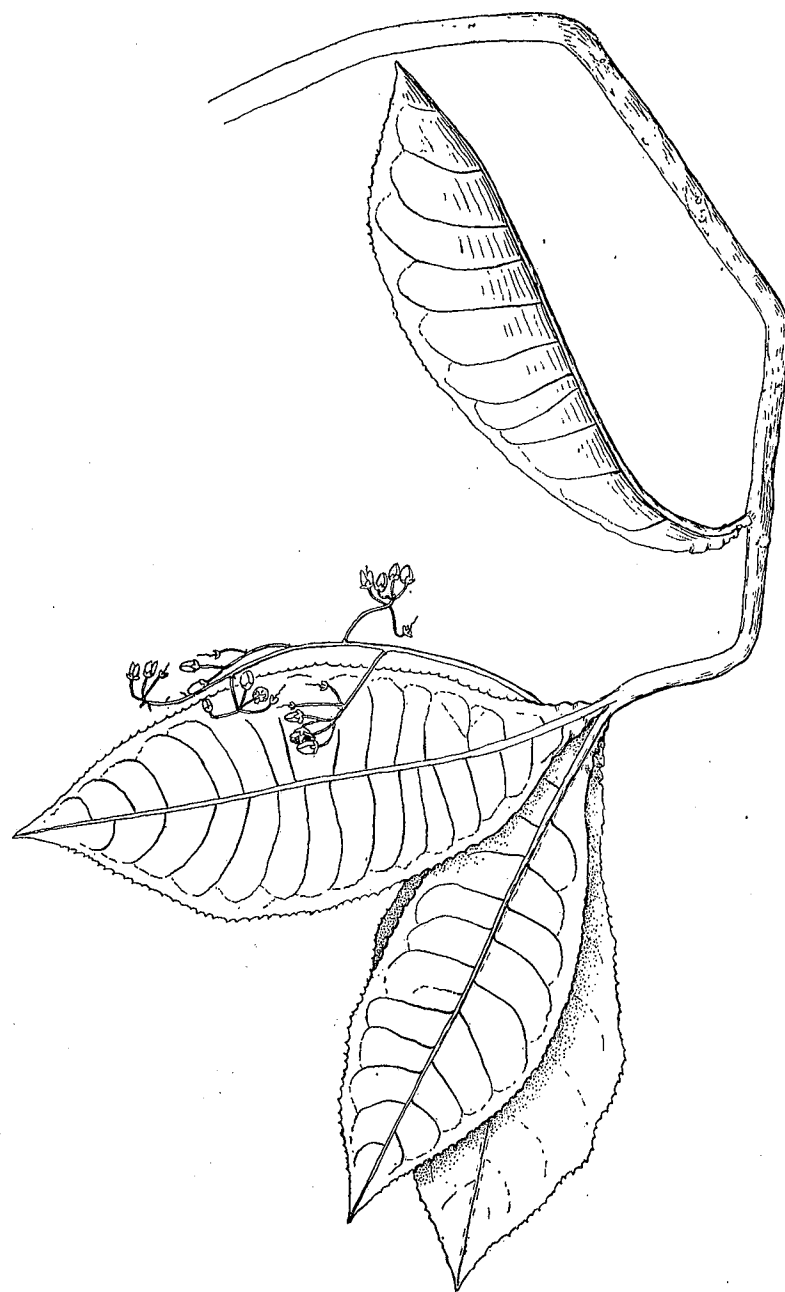


Fig. 4. *Ardisia perpendicularis* Walker, n. sp. Whole plant with inflorescence, $\times \frac{1}{2}$. Drawn from the type, Petelot no. 5090.

puberulis, late elliptico-ovata, basi acuta, decurrentia, crispata, apice obtusa vel late acuta, 8-9 cm longa, 4-5 cm lata, eroso-dentata, dentibus apiculatis, subtus pallidiora, praesertim in nervulis minute puberula vel lepidota, non punctata, nervis lateralibus circa 8-jugis, supra impressis, subtus elevatis, incurvato-ascendentibus, in nervum lateralem non confluentibus; inflorescentia axillaris, racemosa, 6-8 cm longa, pedicellis ad 1 cm longis; sepala ovata, obtusa, 1.5 mm longa, punctata, plus minusve ciliata; flores alioqui ignoti; fructus globosus, 4 mm longus, rubescens, bene punctatus.

A suffrutescent undershrub with thick creeping rhizome, the erect stems about 8 cm high, glabrous; leaves alternate or subverticillate, mostly near apex of stem, the petioles 1 to 2 cm long, puberulent, broadly crisped-wing-margined, the blade chartaceous, broadly elliptic-ovate, acute and decurrent at base, obtuse to broadly acute at apex, 8 to 9 cm long, 4 to 5 cm wide, erose-dentate with apiculate teeth, dark green above, paler beneath, not punctate, minutely puberulent or lepidote beneath especially on nerves, the midrib and about 8 pairs of lateral nerves somewhat impressed above, prominently raised beneath, the latter curved-ascending, not uniting in a definite marginal nerve, the veinlets reticulate, rather obscure; inflorescence axillary, racemose, 6 to 8 cm long, the terminal internodes shorter, the bracts subulate or narrowly lanceolate, 2 to 3 mm long, the pedicels up to 1 cm long; sepals ovate, obtuse, 1.5 mm long, punctate, more or less minutely ciliate; flowers otherwise unknown; fruit globose, 4 mm in diameter, reddish, abundantly punctate.

Type in the United States National Herbarium, no. 1,550,891, collected at 1800 meters altitude in the "forêt le long de la route de la Garderie forestière de Lo-qui-Ho à Ta-Phinh, environs de Chapa, Tonkin," Sept. 1929, by A. Petelot, no. 4298. Additional specimens seen are A. Petelot, no. 2362, collected in an open forest along the same route in April, 1936, in the U. S. National Museum and the Arnold Arboretum.

This species is similar to *A. pubivenula* Walker, from which it is distinguished by its simple racemose inflorescences.

***Ardisia* (Sect. *Bladhia* (Thunb.) Mez) *perpendicularis* Walker, sp. nov. (Fig. 4)**

Suffrutex, rhizomate repente, caules erectos non ramosos, 10-15 cm altos, fusco-pubescentes proferente; folia subverticillata, sessilia, obovata, basi cuneata crispata, apice acuta vel late acuta, 15 cm longa, 5-7 cm lata, eroso-dentata, dentibus apiculatis, non punctata, nervis lateralibus 15-18-jugis, plerumque late divergentibus, in nervum lateralem undulatum confluentibus, venulis reticulatis, subtus in nervis appresso-fusco-puberula; inflorescentia axillaris, racemoso-paniculata, circa 11 cm longa, pedicellis 5-8 mm longis, subumbellatis, in ramulis secundariis terminalibus, pedunculo fusco-puberulo; sepala ovata, acuta, 1.5-2 mm longa, punctata, minute puberula; petala late ovata, obtusa, 4 mm longa, punctata; antherae lanceolatae, minute apiculatae, dorso non punctatae; pistillum petalis brevius, ovario puberulo; fructus ignotus.

A suffrutescent undershrub with a long thick creeping rhizome, the erect stem 10 to 15 cm high; leaves subverticillate near apex of stem, sessile, chartaceous, obovate, cuneate and crisped at base, acute to broadly acute at apex, about 15 cm long, 5 to 7 cm wide, erose-dentate with apiculate teeth, dark green and glabrous above, brownish beneath, not punctate, the midrib prominent beneath, the lateral nerves 15 to 18 pairs, mostly diverging at nearly a right angle, uniting in an irregular marginal nerve, the veinlets reticulate, all the nerves appressed-fuscous-puberulent beneath; inflorescence axillary, racemose-paniculate, about 11 cm long, the slender pedicels 5 to 8 mm long, subumbellate on ends of secondary branches, the peduncle fuscous-puberulent, the bracts subulate, 1.5 mm long; sepals shortly united at base, ovate, acute, 1.5 to 2 mm long, punctate, minutely puberulent, ciliate; petals broadly ovate, obtuse, 4 mm long, punctate, sparingly papillose within near base; stamens about three-fourths the length of the petals, the anthers subsessile, lanceolate, minutely apiculate, not punctate on back; pistil shorter than the petals, the ovary puberulent, the style slender, the stigma apiculate; fruit unknown.

Type in the United States National Herbarium, no. 1,550,908, collected in a very moist ravine at 1500 meters altitude in Chapa, Tonkin, August, 1927, by A. Petelot, no. 5090.

This species is similar to *Ardisia replicata* Walker, especially in the divergence of the lateral veins at nearly a right angle from the midrib, but differs in the smaller, not replicate marginal teeth and in the sessile leaves.

NOVELTIES IN CHINESE PHYLLANTHUS

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Of the three species involved in the present treatment, two, namely *P. kiangsiensis* and *P. chekiangensis*, belong to a taxonomic aggregate which has repeatedly been treated as generic. Hasskarl advanced it as *Eriococcus* in allusion to the peculiar and characteristic indument of the capsule; Wight called it *Reidia*. Mueller Argovienensis, however, reduced it to a mere section of *Phyllanthus* and as such it is being considered by Pax & Hoffmann in their most recent work. Gamble is one of the modern authors who has maintained the old rank of this group as a genus, unfortunately using for it the later name *Reidia*.

We are of the opinion that the characters which set this entity apart from the other subgenera and lesser aggregates of *Phyllanthus* are in themselves not less outstanding than those which suggested to Hooker to rescue *Glochidion* from the sectional rank to which it had been confined by Mueller Argovienensis. We refrain from accepting *Eriococcus* as a full-fledged genus, however, considering that its species are but 3 per cent of the total number of species generally treated as *Phyllanthus*. We believe that the breaking up of the largest euphorbiaceous genera in small units is not desirable, not at least until all related genera have been thoroughly studied in view of determining their phyletic units and of establishing thus their classification on a thoroughly sound and broad basis. For the present we deem it that the best interests of classification are served in treating *Eriococcus* as a subgenus under *Phyllanthus*, as follows:

Phyllanthus subg. *Eriococcus* (Hassk.) Croiz. & Metc. comb. nov.
Eriococcus Hassk. in Hov. & Devr. Tijdschr., 10: 143 (1843).
Reidia Wight Icon. 5(2): 27, t. 1903-4 (1852); Gamble, Fl. Pres. Madras 7: 1291 (1925).
Phyllanthus sect. *Eriococcus* (Hassk.) Muell. Arg. in Linnaea 32: 3 (1863); Pax & Hoffmann, Naturl. Pflanzenf. 19(c): 65 (1931).

It may be interesting to notice that the so-called branches of species of *Phyllanthus* of this and of the related species are in reality deciduous floriferous axes, the leaves of which are basically bracteal in nature. These floriferous axes are borne in the axil of stipules, which replace the true leaves. These last are restricted to 2-6 that grow on the main stem of

the seedling, but disappear as the plant grows. The ♂ flowers are borne often if not certainly always in the axils of bracteoles which are closely crowded upon diminutive secondary floriferous axes. The characters that distinguish *Eriococcus* at sight are the dull purplish color of the flower, the peculiarly lacinate erose lobes of the perianth; and the indument of the capsule; and the prevailing tetramerous pattern of the ♂ flower.

1. *Phyllanthus Wilfordii* Croiz. & Metc., nom. nov.

P. anceps Benth. Fl. HK. 311 (1861), non Vahl [Symb. 2: 95 (1791)], non Willdenow [Sp. Pl. 4: 574 (1805)]; Forbes & Hemsley in Jour. Linn. Soc. 26: 420 (1894); Dunn & Tutchner, Flora Kwangtung & Hongkong 224 (1912).

P. simplex var. *chinensis* Muell.-Arg. in Linnaea 32: 33 (1863), and in DC. Prodr. 15(2): 33 (1866).

Phyllanthus anceps of Vahl (1791) and of Willdenow (1805) is a synonym of *P. simplex* of Retzius (1789). *Phyllanthus Wilfordii* is distinguished from *P. simplex* Retzius by the distinctly pedicelled ♀ flowers with obovate, reflexed sepals, and by the leaves without a ciliolate margin.

HONG KONG: *Wilford 66*, type (AA. Bentham l.c., Muell.-Arg. l.c., F/H l.c. and D/T l.c.); Wright (Bentham l.c.) and *Wright 432* (AA); Happy Valley and Deepwater Bay (D/T l.c.); *Hance 1223*, in Berlin (Muell. Arg. l.c.).

KWANGTUNG: Canton, *Park 57* (Muell.-Arg. l.c.).

The new name commemorates the collector of the type of Bentham's binomial. *Phyllanthus Wilfordii* is very nearly related to *P. myrtifolius* Moon (Ceylon), *P. Miquelianus* Muell.-Arg. (Southern India), *P. Roeperianus* Muell.-Arg. (N.E. India, Yunnan). It also has affinity with *P. cochinchinensis* Muell.-Arg. (N.E. Indochina).

2. *Phyllanthus chekiangensis* Croiz. & Metc., sp. nov. (Pl. 6)

P. leptoclados Metcalf in Ling. Sci. Jour. 10: 453 (1931), in last paragraph sub *P. glabrocapsulus* Metcalf, non *P. leptoclados* Benth.

Fruticulus ad 1 m altus, lignosus, caulibus erecti. Ramulis fasciculatim aggregatis glabris, gracilibus, hinc inde asperato-granulosis, stric-tiusculis, ad 15 cm longis; foliis (bracteis floralibus) elliptico-lanceolatis ad 1.5 cm longis 0.7 latis, basi more subgeneris anisomeris alternis, ad 25, subsessilibus, petiolo vix 0.5-1 mm longo, tenuiter chartaceis, glabris, margine integro, subrevoluto, venis utrinque 3-4; stipulis setaceo-lanceo-latis scariosis, minutis. Floribus ♂ 3 mm latis, pedicellis capilliformibus 5-6 mm longis, lobis perianthii 4, hyalinis 1.25 mm longis, 0.75 mm latis, triangulari-ovatis, lacerato-erosis; disco carnosulo vix 1 mm lato; antheris 4, connatis, thecis vix 0.33 mm magnis. Floribus ♀ 4-4.5 mm latis, pedicellis subcapilliformibus apice longe incrassatis 9-10 mm longis; lobis 5-6 ovato-lanceolatis hyalinis lacerato-denticulatis, 1.5 mm longis, 1 mm latis; disco carnosulo, evoluti, integro, margine incrassato sublobulato; ovario valde depresso-globoso, 3-loculari, processibus fungoso-laceris more subgeneris subasperato, 1-1.5 mm lato, 0.75-1 mm longo; stylis 3, apice simplicibus bipartitis; capsula epicarpio tenui secedibili, 5

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mm longa, 7 mm lata; seminibus trigonis lunatis levibus 2.5 mm longis, 1.75 mm latis.

A lignescens strict shrublet, with erect or suberect more or less granulose stems. Branches (correctly: axes of the inflorescence) up to 10 cm long, terete to subcompressed, not winged, glabrous but here and there strigose-asperate, borne in crowded fascicles in the axils of more or less setaceous bracts on the main stems; leaves (correctly: floral bracts with function of leaves) up to 25, alternate glabrous, pale green, thinly chartaceous, elliptic-lanceolate, subsessile (petiole less than 1 mm long) broadly acuminate at the apex, rotundate at the base with thin, revolute margins and 4-5 rather irregular pairs of veins, pale grayish or yellowish green; stipules setaceous, denticulate-erose at the somewhat enlarged base, 1 mm long or less. Male flowers (? always) in the axils of secondary floriferous axes bearing close imbricate scales and not over 3 mm long; flower about 3 mm broad, borne upon hair-like pedicels 5-6 mm long; lobes of the perianth 4, lanceolate-ovate, hyaline, in dried specimens dark red, 1.25 mm long, 0.75 mm broad, denticulate-erose at the margin; disc barely 1 mm broad, carnosule, with 4 connate stamens, the anthers barely 0.33 mm large. Female flowers on the primary floriferous axes about 4-4.5 mm broad, the 5-6 perianth lobes as in the male flowers 1.5 mm long, 1 mm broad; disc fleshy, evolute, shallowly lobulate at the margin; ovary ochraceous, definitely depressed globose, 3-locular, each loculus deeply grooved on the keel and thus appearing 2-celled from the exterior, 1-1.5 mm broad, 0.75-1 mm long, the thin testa more or less verruculose, covered by spongy minute processes; styles 3 each, spreading horn-wise to form two entire stigmas, about 1-1.25 mm long; capsule like the ovary, 5 mm long, 7 mm broad; seeds trigonous-lunate, smoothish, the thin brownish arillode here and there exposing the underlying yellowish testa in bands.

CHEKIANG: Tsing-tien, *G. L. Keng 121*, holotype, July 25, 1926, "growing by hillside, low shrub, about ½ m, pubescent on young stem, leaves oblong, entire, alternate, with persistent stipules, fruit globose hairy, 3-sided, subtended with 6 purple perianth lobes"; Chuhsien, *Y. L. Keng 864*, paratype, July 18, 1927, "400 ft., waste place by roads, low shrub or suffrutescent plant, flower purple, on axillary pendulous pedicels, fruit young, globose, villous, 3-lobed."

KIANGSI: Shang Yau-hsien, *H. H. Hu 1353*, paratype, July 27, 1921, "open hillside, 2800 ft., 2-3 ft. high, flower dark purple."

Phyllanthus chekiangensis is near *P. leptoclados* Benth. (*P. liukiuensis* Mats., *P. glabrocapsulus* Metc., from the types) but differs in the more robust habit; in the prevailing larger size of all its parts, the capsule and seed especially; in the longer leaves; in the fairly abundant indument of the ovary and of the fruit.

3. *Phyllanthus kiangsiensis* Croiz. & Metc., sp. nov. (Pl. 7)

P. leptoclados Merrill in Herb., non Bentham.

Fruticulus ad 1 m altus, caulibus cortice laete brunneo laeviusculo vel hinc inde granuloso; ramulis florigeris ad 15 cm longis, in axillis soli-

tariis vel paucis, fasciculatis, foliis (rectius: bracteis floriferis) glabris in ramulo quove ad 30, distichis alternatis, ellipticis vel obovato ellipticis, utrinque late acutatis, basi subanisomeris, siccis grisei, ad 12 mm longis, 4 mm latis, venis irregularibus obscuris, stipulis minutis setaceis. Flores ♂: 2.5 mm lato, lobis 4, hyalinis, in sicco saturate nigro-rubris, ad 1.5 mm longis, 1 mm basi latis, margine tenuissime eroso-denticulatis, pedicello tenuissimo ad 3.5–4 mm longo; staminibus 4, sessilibus, disco staminigero vix 0.5 mm lato. Flores ♀: 3 mm lato, lobis hyalinis (5)–6, caetera ut in flore ♂, disco carnosulo bene evoluto, lobulato; pedicello ad 6 mm longo tenui. Fructus (dissitus) coccis 4–4.5 mm longis, 2 mm latis, pericarpio tenui secedibili processibus subspongiosis nempe asperato-ruguloso, seminibus levibus, lunato-trigonis, totis pallide luteo-brunneis, 2 mm longis, 1.25 mm latis.

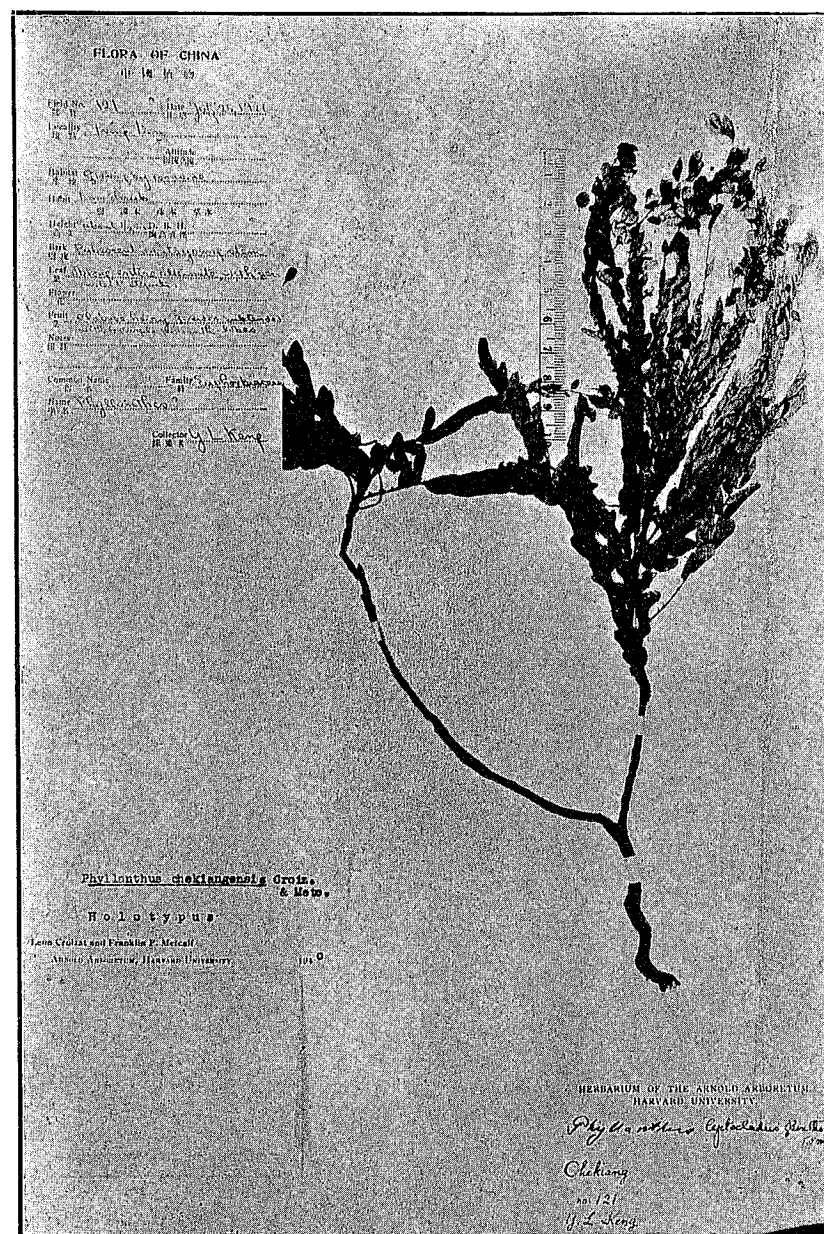
A shrublet, with long rather strict floriferous axes (leafy branches) up to 1 m tall, the stems having a brown-red bark, smoothish or granular in spots; floriferous branchlets up to 15 cm long, single or few in the axils, with up to 30 distichous alternate floral bracts (leaves of authors) subtended by minute stipules; floral bracts gray to slaty-green in the specimens seen, elliptic to obovate elliptic, sessile, glabrous, subsessile (petiole very minute, not over 0.5 mm long), with 4–6 pairs of broadly furcating, obscure and somewhat irregular veins. Flower ♂ minute, deep red up to 2.5 mm broad, with 4 hyaline lobes, denticulate-erose at margin up to 1.5 mm long, 1 mm wide; stamens 4 sessile on a disc barely 0.5 mm broad, pedicel very slender 3–4 mm long. Flower ♀ with (5)–6 lobes quite similar to those of the ♂, pedicel slender not over 6 mm long, subterete. Fruit (dehiscent) with cells about 4 mm long, 2 mm broad, on a pedicel up to 7 mm long, slightly clavate at apex; pericarp thin, brown ochraceous, not adherent, with minute rugulose-spongy processes, seeds smooth, lunate-trigonal, pale yellow-brown throughout, 2 mm long, 1.25 mm thick.

KIANGSI: On Chi-Shan, near Lam Uk Village, Lungnan district, S. K. Lau 4694, holotype, October 1–25, 1934 (1st Kiangsi Expedition, Lingnan University), "fairly common; dry gentle slope; forest; woody, erect, height 1 m"; Sai Hang Cheung near Tung Lei Village, Kiennan district, S. K. Lau 4024, paratype, August 1–29, 1934 (1st Kiangsi Expedition, Lingnan University), "rare, dry gentle slope; forest, woody, erect; fruit red."

In proposing this as a species distinct from *P. chekiangensis* we knowingly accept a concept of taxonomic limits that is narrow rather than otherwise. It is very likely that this and the other species here announced are mutations from a common ancestor, *P. chekiangensis* being distinct from *P. kiangsiensis* especially in the shape of the leaf, which is more definitely obovate; in the size of the capsule, the coccus of which is about 7 mm long and 3 mm broad as against the coccus of *P. kiangsiensis* which is not over 4–4.5 mm long, and about 2 mm broad; in the seed which is smaller than that of *P. chekiangensis* (2 mm long, 1.25 mm broad as against 2.5 mm long, 1.75 mm broad) and less acuminate, the difference being more apparent to the eye than the description and

the measurements here given indicate. The pedicel of the ripe capsule, moreover, is 10 mm long in *P. chekiangensis*, 7 mm long in *P. kiangsiensis*, so that the latter might almost be described as a microcarpous variety of the former. *Phyllanthus leptoclados* Benth is a more delicate plant than either *P. chekiangensis* or *P. kiangsiensis*. *Phyllanthus insulensis* Beille from Indo-China, which also belongs in this affinity, has a characteristically large ♀ calyx.

It is our understanding that the ends of classifications are better served by our granting separate recognition to all the forms of this complex than by reducing them to one overextensive unit, covering numerous varieties. A problem similar to the one which we have faced in analyzing the two new species here published was met with by Prokhanoff when working out the *Euphorbia* ssp. of Central Asia, especially the so-called *Esula* complex. Prokhanoff found it necessary to break up this group into a number of distinct species, giving specific significance to characters that in themselves are not very strong [Consp. Syst. Tithym. Asiae Med., 8 (1933)]. After a careful study of the specimens used by Prokhanoff in his work, the senior author has reached the conclusion that the narrow concept checked by Prokhanoff has in certain cases very definite advantages. There is no greater amount of essential truth to be had in treating the forms of a broad complex as varieties rather than as species. If *P. chekiangensis* and *P. kiangsiensis* were subordinated within one unit it should be necessary to bring within this same unit at least *P. leptoclados* Benth, *P. Bodinieri* Léveillé, and *P. Forrestii* W. W. Smith, which would unduly extend the conceptual limit of the species and tend to assimilate it to that of a subsection. The probability that intermediates occur among all the five mentioned species is freely accepted by us, but that still leaves unaffected the basic reason why we have chosen to treat them as distinct entities: authors who indulge in involved and extensive subordinations are liable to interpret the facts of nature in altogether too personal a manner.



Phyllanthus chekiangensis Croizat & Metcalf, sp. nov. Photograph of holotype, G. L. Keng 121 from Tsing-tien, Chekiang.



Phyllanthus kiangsiensis Croizat & Metcalf, sp. nov. Photograph of holotype, S. K. Lau 4694, from Lungnan, Kiangsi.

SOME ASIATIC SPECIES OF LESPEDEZA

By P. L. RICKER

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A study over a several years period of a considerable number of specimens of the genus *Lespedeza*, together with the growth of many introduced numbers at the Arlington Experiment Farm, Arlington, Va., by the Office of Forage Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture, has given the writer an opportunity to get a much better idea of the variations in their growth than can usually be obtained by the study of herbarium material alone.

Included in the material studied from several herbaria, were nine apparently new species and all without very close resemblance to any species previously described. Unfortunately, in most cases, only a single collection of the species was available for study though often from material distributed to two or three herbaria, yet the characters are such that it is practically impossible for them to be variations in species already described. Also a very few of the new species readily distinguished from all others by leaf characters alone, lack both mature flowers and fruit. Later it is hoped to publish a synopsis of the species with synonyms, keys and notes on their variations.

It is probable that more ample or living specimens will necessitate future changes in the descriptions of the size and habits of some of the species.

In addition to the type material cited, fine detailed photographs in five by seven inch size of the whole herbarium sheet of the type and a portion of the foliage and inflorescence in natural size, if the original specimen is not in the respective herbaria, have been deposited at the New York Botanical Garden, Arnold Arboretum and Lingnan University. Copies of these photographs are also available by exchange for other herbaria where special studies of the Asiatic flora are being made.

***Lespedeza (Eulespedeza) hedysarioides* (Pallas) Ricker, comb. nov.**

Trifolium cytisoides Pallas, Reise Russ. 3: 266. 1776. nom. nud.

Trifolium hedysarioides Pallas, Reise Russ. 3: 751. pl. Dd. f. 3, A. 1776.

Trifolium cystoides Pallas, sphalm. Nakai, Lesp. Jap. Korea 94. 1927.

Lespedeza cystoides Nakai, sphalm. l.c. not *L. cytisoides* Bertol 1850.

***Lespedeza (Eulespedeza) aitchisoni* Richer, sp. nov.**

Shrubby, stems erect, 7-8 dm tall; branches virgate, appressed pubescent; stipules subulate 3-4 mm long. Leaflets oblanceolate, mucronate, up to 5 × 15 mm appressed pubescent above and below, petiole up to 7 mm long. Flowers axillary 2-4, peduncles slender up to 15 mm long; calyx appressed pubescent, 5-6 mm long; teeth linear lanceolate 4-5 mm

long; corolla violet (?) equaling or slightly exceeding the calyx. Pods broadly obovate, mucronate, appressed pubescent, equaling or slightly exceeding the calyx.

Suffrutex erectus, caule 7-8 dm alto, ramis virgatis adpresse pubescentibus. Foliola oblanceolata, apice mucronata, usque ad 5×15 mm superne et subtus adpresse pubescentia; petiolo usque ad 7 mm longo. Flores axillares 2-4, pedunculo usque ad 15 mm longo; calyx 5-6 mm longus, laciniis lineari-lanceolatis, 4-5 mm longis. Legumen late obovatum calycem aequans vel paullum superans.

Type No. 661 Dr. J. E. T. Aitchison, Dec. 1879, Kerrum Valley, Afghanistan in Gray Herbarium.

Nearest to *L. variegata* but distinguished from all other species in the *L. cuneata* group by its long slender flower peduncles and the linear lanceolate calyx teeth.

Basal habit of the plant unknown but probably stems cespitose or branching from near the base.

Lespedeza (Eulespedeza) canescens Ricker, sp. nov.

Shrubby, stems erect 4-6 dm tall, woody at the base, branched, lenticellate below, pubescence somewhat spreading. Leaves minutely puberulent or glabrous above, densely grayish villose below; stipules linear-subulate 2-5 mm long; petioles hispid 7-15 mm long; leaflets oblong-elliptic to oblanceolate, 5-11×10-30 mm mucronate, the terminal leaflet often truncate at the apex, wider at the middle and narrowing to an acute base. Flowers 2-4 subsessile; calyx 4-5 mm long, teeth 3-4 mm long, narrowly-lanceolate; corolla 5-6 mm long; probably violet; pod broadly elliptic, acute, canescent, mucronate, 4-7 mm long.

Suffrutex, caule erecto 4-6 dm alto. Foliola oblonga-elliptica ad oblanceolata 5-11×10-30 mm superne subglaberrima, subtus dense cinereo-villosa. Flores 2-4, subsessiles; calyx 4-5 mm longus, laciniis 3-4 mm longis, anguste-lanceolatis. Legumen late ellipticum acutum, mucrone 4-7 mm longo.

Type No. 2746, Dr. A. Henry, Hupeh, China 1885-88, in Gray Herbarium of Harvard University.

Most nearly resembling the few flowered forms of *Lespedeza daurica* (Laxm.) Schindl. or of its subspecies *shimadae*, but calyx teeth shorter than the pods which are much exceeded by the calyx teeth in that species. Also somewhat resembles the larger leaved forms of *L. hedysarioides* (Pallas) Ricker, but the calyx teeth not prominently ribbed as in that species.

Lespedeza (Macrolespedeza) anhweiensis Ricker, sp. nov.

Shrubby, stems erect, slender, flexuous, appressed pubescent; stipules lanceolate-subulate 1×3-4 mm, 5-7-nerved; petioles about 1.5 cm long; leaflets broadly to oblong elliptic, up to 2×5 cm, glabrous above, pubescent below, apex mucronate. Racemes axillary, few flowered, up to 2.5 cm long; pedicels nearly as long as the calyx; calyx pubescent, about 4 mm long, teeth acuminate about 3 times the length of the tube; corolla

purple, 7-8 mm long. Pod obovate-oblong, puberulent, about 5×13 mm.

Suffrutex, caule erecto, gracili, flexuoso, adpresse pubescente. Foliola late elliptica ad oblongo-elliptica, usque ad 2×5 cm superne glabra, subtus adpresse pubescentia. Racemi axillares, sparsiflori, usque ad 2.5 cm longi; calyx ca 4 mm longus, laciniis tubo 2-3-plo longioribus; corolla purpurea, 7-8 mm longa.

Type No. 8997 R. C. Ching, Sept. 4, 1925, Wu Yuan, Anhwei, China, in U. S. National Herbarium.

Most nearly resembling *L. nipponica* Nakai but differs in having leaflets glabrous above, obtuse instead of acute at both ends and flowers 2-3 mm shorter.

Lespedeza (Macrolespedeza) bracteolata Ricker, sp. nov.

Erect shrubs, up to 6 dm tall; branches many angled, appressed pilose; stipules linear-lanceolate, pubescent, 4-5 mm long and .5 mm wide; petiole up to 1 cm long; leaflets elliptic-lanceolate, glabrous above, appressed pilose beneath up to 1.5×4 cm. Racemes axillary 1.5 cm long, dense flowered; bracteoles ovate, 7-9-ribbed; calyx 3-3.5 mm long, teeth 2-2.5 mm long, lanceolate; corolla purplish white, 4-5 times longer than the calyx; banner white, unguiculate, 9-10 mm long, wings purplish white 8-9 mm long. Pod unknown.

Frutex erectus, usque ad 6 dm altus; ramis multi-angulatis, adpresse pilosis. Stipulae lineari-lanceolatae, 4-5 mm longae; foliola elliptico-lanceolata, superne glabra, subtus adpresse pilosa, usque ad 1.5×4 cm. Racemi axillares 1.5 cm longi, densiflori; bracteolae ovatae 7-9 striatae; calyx 3-3.5 mm longus, laciniis lanceolatis 2-2.5 mm longis; corolla albo-purpurea quam calyx 4-5-plo longior.

Type in the herbarium of L. H. Bailey at Cornell University, collected on the Letts place (now destroyed) at Hollywood, Cal., by E. P. Bradbury, July 15, 1916.

Not resembling any known species. It has prominently ribbed bracteoles like those found only in *L. buergeri* and *L. maximowiczii*. It most certainly must have come from China or Korea.

Lespedeza (Macrolespedeza) chekiangensis Ricker, sp. nov.

Erect shrubs, stems many-angled, appressed pubescent. Stipules linear-lanceolate, 3-4 mm long; petioles up to 2 cm long; leaflets obovate, up to 2.7×4.5 dm, dark coriaceous, sparingly puberulent to glabrous above, densely puberulent below, apex obtuse or mucronate. Racemes terminal and axillary up to 2 cm long, few flowered; bracteoles lanceolate, 1.5 mm long, calyx densely pubescent, 4-5 mm long, teeth acuminate, equaling or longer than the tube, dorsal tooth bifid, corolla twice longer than the calyx, purple, keel and banner equal, wings much shorter. Pod unknown.

Frutex erectus, caule multiangulo, adpresse pubescente. Stipulae lineari-lanceolatae 3-4 mm longae; petiolus ad 1.5 cm longus; foliola obovata usque ad 2.7×4.5 cm, nitida, coriacea, superne sparse pubescente, demum glabra, subtus dense adpresse puberulenta. Racemi axillares et

terminales, ad 2 cm longi; calyx usque ad 4.5 mm longus, laciniis acuminate, tubo subaequalibus; corolla calycem duplo superans, purpurea.

Type No. 4170 K. K. Tsoong, Chekiang, China, September 23, 1910, in herbarium of New York Botanical Garden, from Herbarium, Bureau of Science, Manila.

Most nearly related to *L. formosa* but distinguished by its much shorter peduncles and petioles and leaflets obtuse to broadly acute instead of retuse at the apex.

Lespedeza (Macrolespedeza) hupehensis Ricker, sp. nov.

Erect shrubs up to 1 meter tall; stems few, virgate, branches few angular, velutinous. Stipules linear-lanceolate, about 4 mm long; petioles very short; leaflets obovate up to 2.5 cm long and 1.5 cm wide, pubescent above and below, becoming glabrate above with age, apex obtuse, mucronate. Racemes axillary, up to 5 cm long, the longer arcuate, closely few flowered above; bracteoles lanceolate, 1 mm long. Calyx about 4 mm long, densely pubescent, teeth acuminate, somewhat longer than the tube, dorsal tooth bifid. Corolla purple about 9 mm long, banner nearly equaling the keel, wings much shorter. Pod broadly elliptic densely pubescent, about 5 mm long and 4 mm wide, apex mucronate.

Frutex erectus usque 1 m altus, caulibus paucis, virgatis, ramis sparsis, angulatis, velutinis. Stipulae lineari-lanceolatae; petiolus brevissimus; foliola obovata, usque ad 1.5 × 2.5 cm, superne et subtus pubescentia, demum glabrescentia. Racemi axillares, usque ad 5 cm longi, densiflori; calyx ca 4 mm longus, laciniis acuminatis; corolla purpurea ca 9 mm longa.

Type No. 9169 H. H. Chung, Wuchang, Hupeh, China, September 6, 1932, in herbarium of New York Botanical Garden.

The inflorescence suggests somewhat forms of *L. thunbergii* with short panicle branches, but the leaflets are obovate instead of the usual elliptic lanceolate of that species, the stem pubescence is densely spreading instead of appressed and is of a type rarely found in *Lespedeza*. In this respect and somewhat in leaf shape the species approaches *L. kawachiana* Nakai, from which it is at once distinguished by its much longer dense flowered peduncles.

Lespedeza (Macrolespedeza) merrilli Ricker, sp. nov.

Shrubby, erect, stems 1-1.5 m high, branches angular, sparingly appressed pubescent. Stipules linear-acuminate, 7-9 mm long; petioles up to 6 cm long; leaflets thin elliptic to broadly ovate, the terminal 3.5-6.5 × 6-9 cm, much larger than the lateral; sparingly pubescent on both sides. Racemes many flowered, up to 4 cm long, in the axils of small leaves and on branches up to 9 cm long forming terminal racemes up to 2.5 dm long; flowers sessile or very short pediceled; calyx 7-8 mm long appressed pubescent, teeth acuminate, 3 times longer than the tube; corolla purplish, twice the length of the calyx; keel nearly equaling the standard, wings shorter. Pod unknown.

Suffrutex erectus, caule 1-1.5 m alto, ramis angulatis sparse adpresse

pubescentibus. Stipulae lineari-acuminatae 7-9 mm longae; petiolus usque ad 6 cm longus; foliola elliptica ad late ovata, 3.5-6.5 × 6-9 cm. Racemi usque ad 2.5 dm longi, multiflori, floribus subsessilibus; calyx 7-8 mm longus, laciniis tubo 3-plo longioribus; corolla purpurea, quam calyx 2-plo longior.

Type in U. S. National Herbarium and duplicate in herbarium of the New York Botanical Garden, No. 14377 C. Y. Chiao, Yen Tang Shan, Province of Chekiang, China, 2700 ft. altitude, July 21, 1927, distributed from Herbarium of the University of Nanking.

Nearest to *L. davidii* Franch. but at once distinguished from it by the sparingly appressed, instead of velvety, pubescence of the stems and longer calyx teeth.

Lespedeza (Macrolespedeza) veitchii Ricker, sp. nov.

Erect shrubs, up to 15 dm, much branched; branches virgate, angular with spreading hairs. Leaf stipules subulate, up to 5 mm long; petioles up to 4 cm long. Leaflets elliptic, up to 5 cm long and 2.5 cm wide, above cinereous, below appressed pilose, apex mucronate. Racemes axillary and terminal, up to 20 cm long; bracts lanceolate, 2.5 mm long, persistent; pedicels 1-2 mm long; bracteoles broadly lanceolate, acute 1.5 mm long. Calyx 4.5-5 mm long, densely pilose, tube and teeth equal in length, teeth lanceolate, acuminate. Corolla 2-2.5 times longer than the calyx, purple or violet, standard 9-10 mm long, wings about 7 mm long, keel 10-11 mm long. Pod unknown.

Frutex erectus usque ad 15 dm altus ramosissimus ramis virgatis, villosis. Folia stipulis subulatis usque ad 5 mm longis et petiolo usque ad 4 cm longo; foliola elliptica usque ad 5 × 2.5 cm superne cinerea, subtus adpresse pilosa. Racemi usque ad 20 cm longam; pedicelli 1-2 mm longi; calyx 4.5-5 mm longus dense pilosus, tubo et laciniis subaequalibus, laciniis lanceolatis acuminatis; corolla calyce 2-2.5-plo longior purpurea vel violacea.

Type No. 1391, E. H. Wilson, W. Hupeh, China, July, 1900, in herbarium of the New York Botanical Garden. Nearest to *Lespedeza elliptica* Benth. from India, but readily distinguished by the spreading pubescence of the stems and petioles and the somewhat larger leaves and flowers.

Lespedeza (Macrolespedeza) wilfordi Ricker, sp. nov.

Shrubby, erect, angular, puberulent, 1-2 m tall; leaves dark coriaceous, glabrous to finely puberulent above, finely puberulent below, petioles pubescent, about equaling the leaflets; stipules linear lanceolate 2-3 mm long, leaflets elliptic, the terminal larger, up to 2.5 × 5 cm, racemes terminal or axillary, short; pedicel about equaling the calyx tube; calyx about 5 mm long, teeth lanceolate, equaling or slightly exceeding the tube; corolla unknown; pods about 1 cm long, pilose, elliptic, apex acute.

Suffrutex, caule erecto puberulo, angulato, 1-2 m alto. Folia nigrescentia, coriacea, superne glabra ad puberulenta, subtus puberulenta;

foliola elliptica usque ad 2.5×5 cm. Racemi brevi, terminales et axillares; calyx ca 5 mm longus, laciniis tubo subaequalibus. Legumen ca 1 cm longum, pilosum ellipticum apice acutum.

Type in Gray Herbarium collected by Wilford at Hong Kong, China, and distributed as *L. viatorum* Champ. which it in no way resembles.

SECOND SUPPLEMENT TO "A STUDY OF THE LONGICORN
BEETLES OF KWANGTUNG PROVINCE,¹ S. CHINA"
(COLEOPTERA: CERAMBYCIDAE)²

By J. LINSLEY GRESSITT

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This second supplement to the writer's paper entitled "A study of the longicorn beetles of Kwangtung Province, S. China,"³ is based entirely on material in the Lingnan Natural History Museum, and largely concerns specimens collected by the writer or by F. K. To, with some additional ones kindly made available by Prof. C. T. Cheng of the Biology Department of Lingnan University and Mr. Konyil Chan of Hong Kong. Three tribes, six genera and eleven species are added to the fauna of the province, and seven of these species are described as new to science. In addition, a few new locality records of previously recorded species are presented at the end of the paper. Of the four species newly recorded from the province, three were known previously from parts of China to the north, and the fourth from Hainan Island. Of the six genera added, two were known previously only from Hainan, Formosa or the Philippines, three are more or less widely distributed in China and neighboring areas, and the sixth is almost cosmopolitan. References are given only to tribes, genera or species which are new to Kwangtung Province. The types of the new species are deposited in the Lingnan Natural History Museum. The drawings were prepared by Mr. Mak Yuen-hing. The writer is indebted to Prof. C. T. Cheng and Mr. Konyil Chan for their cooperation, and also to Dr. H. T. Chen, head of the Biology Department of Lingnan University, for research facilities extended during stays in Hong Kong.

Subfamily Lepturinae
Tribe Lepturini

168. *Strangalia meridionalis* Gressitt, n. sp.

Male.—Body black; elytra and appendages partly pale: labrum pitchy; labial palpi and basal segments of maxillary palpi testaceous; antennae black with sixth and seventh segments pitchy, last four pale brown and extreme bases of fourth and following pale reddish; elytra pale ochraceous, narrowly bordered along suture with black, marked with a narrow, submedian, longitudinal black stripe from base to apex, which becomes broader and meets external margin behind middle and suture

¹ Exclusive of Hainan Island.

² Contribution from the Lingnan Natural History Survey and Museum.

³ *Lingnan Science Journal* 18(1): 1-122, pls. 1-3, 1939. First supplement: *Lingnan Science Journal* 19(1): 1-20, pl. 1, 1940.

just before apex, and also marked with a small humeral spot and two fairly large lateral spots, at ends of first and second fifths, respectively; legs with femora pale orange testaceous, tibiae pitchy brown to pitchy black and tarsi nearly black with pale claws. Ventral surfaces of body and pronotum moderately clothed with greenish golden pubescence, particularly dense at middle and each corner of base of pronotal disc; antennae clothed with very thin pale pubescence; head and elytra with sparse goldish hairs.

Head as broad as long, slightly broader than prothorax, not quite as broad as elytra, strongly and suddenly constricted behind eyes; clypeus punctured near postero-lateral corners; frons closely and minutely punctured, grooved medially. Antennae slender, slightly longer than body; scape two-thirds as long as third segment, not quite as long as fourth; fifth equal to third, longer than each of remaining segments. Prothorax slightly longer than breadth at extreme base, strongly narrowed anterior to base and in third quarter; apex forming a distinct cylindrical collar; disc minutely punctulate, with a smooth median longitudinal line behind center. Scutellum longer than broad, narrowly rounded apically. Elytra strongly narrowed to beginning of apical third, slightly dehiscent and obliquely truncate apically; surfaces densely punctured, somewhat coarsely so on basal halves and finely so posteriorly. Abdomen reaching beyond elytral apices; posterior femora reaching to between elytral and abdominal apices; first posterior tarsal segment longer than remaining combined. Length 8 mm (elytra 4.6); breadth 1.55.

Holotype, male (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), alt. 850 meters, Lien-p'ing Distr., N. Kwangtung Prov., S. China, Apr. 24, 1940, J. L. Gressitt, collector.

Differs from *S. crebrepunctata* Gressitt in being smaller, more pubescent and less shiny, and in having the preapical antennal segments duller and the apical segments paler, the pronotum with a shorter impunctate stripe, and the elytra more coarsely punctured basally and more dehiscent apically, with the median dark stipe broader and closer to the median line.

Distribution.—South China (Kwangtung).

Subfamily Cerambycinae
Tribe Achrysonini

Achrysonides Lacordaire, 1869, Gen. Col. 8: 231.
Achrysonini Aurivillius, 1912, Col. Cat. 39: 39.

Genus *Nortia* Thomson

Nortia Thomson, 1864, Syst. Ceramb.: 252 (type: *N. cavicollis* Thoms.); Lacordaire, 1869, Gen. Col. 8: 234; Gressitt, 1940, Philippine Journ. Sci. 72: 37.

169. *Nortia planicollis* Gressitt, n. sp. (Pl. 8, Fig. 2)

Male.—Body reddish testaceous brown, paler testaceous towards elytral apices; mouthparts reddish; mandibles pitchy black distally; antennae dull reddish brown on third segment, paler on other segments;

extreme apices of femora pitchy black; tibiae dull reddish brown; tarsi paler, ochraceous distally. Body surfaces thinly clothed with short suberect golden buff hairs; antennae with a loose fringe of longer hairs beneath.

Head as broad as prothorax, abbreviated anteriorly, finely granulose above, sparsely punctured on sides of neck; clypeus concave apically; frons broader than deep, convex, finely grooved medially; vertex slightly concave, grooved along middle; occiput fairly even, feebly grooved medially; inferior eye-lobes rounded-triangular, coarsely faceted, almost as broad as long. Antennae about one-half again as long as body; scape swollen, granulose, three-fifths as long as third segment; fourth subequal to third; fifth and following gradually shorter. Prothorax about as long as broad, moderately rounded laterally, with a slight swelling at middle of each side; disc flattened in center, slightly swollen at each side; surfaces finely granulose. Scutellum longer than broad, rounded behind, concave, minutely punctulate. Elytra long, gradually narrowed posteriorly; apices separately narrowed and briefly rounded; surfaces finely and in part serially punctured, sparsely and indistinctly so towards apices and somewhat densely so near base, each with three sublongitudinal raised lines. Ventral surfaces finely granulose on thorax, finely and sparsely punctured on abdomen. Legs with femora broad and strongly compressed, posterior pair not quite reaching elytral apices; tibiae very slightly broadened distally, anterior pair strongly arched; tarsi slender, first segment of hind pair as long as remaining segments combined. Length 11.5 mm; breadth 2.85.

Holotype, male (Lingnan Natural History Museum) New Territories, Hong Kong, spring 1940.

Differs from all of the three known species of *Nortia* in having the prothoracic disc smooth and lacking cavities, ridges or grooves, and from *N. geniculata* Gressitt in being smaller and much paler, with only the extreme apices of the femora darkened.

Distribution.—Hong Kong (New Territories).

Tribe Cerambycini

170. *Margites fulvidus* (Pascoe).

Cerambyx fulvidus Pascoe, 1858, Trans. Ent. Soc. London (2) 4: 236 (N. China).

Margites fulvidus Gahan, 1891, Ann. Mag. Nat. Hist. (6) 7: 26.

One specimen (Lingnan Natural History Museum) was collected across the river on the north side of Ho-yün, Ho-yuen Distr., central Kwangtung Prov., S. China, Apr. 7, 1940, J. L. Gressitt. The specimen was taken on a thorny bush in the daytime. New to South China.

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

Tribe Oribini

Genus *Obrium* Curtis

Obrium Curtis, 1825, Brit. Ent. 2: pl. 91 (type: *Cerambyx cantharinus* Linn.); Lacordaire, 1869, Gen. Col. 8: 361; Gressitt, 1935, Insecta Matsumurana 9: 145.

171. *Obrium complanatum* Gressitt, n. sp. (Pl. 8, Fig. 1).

Male.—Body reddish castaneous, paler on palpi, antennae and elytra; parts of head and pronotum pitchy red; elytra pale ochraceous. Head, legs and abdomen partly clothed with fine golden buff hairs; antennae clothed with very thin golden buff pubescence.

Head distinctly broader than prothorax, not quite as broad as elytra; clypeus smooth, concave in center; frons with a deep transverse groove; vertex and occiput plane, minutely punctured except along median line; eyes large, about as widely separated on dorsal surface as on ventral surface of head. Antennae one-fourth again as long as body, very slender; scape about as long as second and third segments combined; fourth equal to third, three-fourths as long as fifth; fifth to last subequal. Prothorax longer than breadth at tubercles, fully one-half again as long as breadth at base, broader at apex than at base, strongly but bluntly tuberculate at middle of each side; disc minutely and sparsely punctured, with a longitudinal swelling along central portion of median line, a feeble transverse swelling before middle, connecting at each end with an incomplete arcuate ridge on each side above lateral tubercles, which extends posteriorly to a bend in the sinuous transverse groove between base and middle. Scutellum small and short, rounded apically. Elytra slightly broadened posteriorly to beginning of apical third, subrounded apically; discs distinctly, but not very densely, punctured on basal three-quarters, subseriately so on outer portion of dorsal surface, sparsely and minutely punctured on apical quarter. Ventral surfaces of body apparently impunctate; metasternum deeply grooved. Legs slender; first hind tarsal segment as long as following two combined. Length 5.5 mm; breadth 1.35.

Holotype, male (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), alt. 800 meters, Lien-p'ing Distr., N. Kwangtung Prov., S. China, Apr. 19, 1940, J. L. Gressitt and F. K. To, collectors.

Differs from *O. rufograndum* Gressitt in being much smaller, narrower and more compressed, in having the prothorax more strongly tuberculate, more sparsely punctured and lacking a pair of distinct swellings on each side before middle, and the elytra more sparsely punctured.

Distribution.—South China (Kwangtung).

Tribe *Cleomenini*

Cleomenides Lacordaire, 1869, Gen. Col. 9: 97.

Cleomeninae Pascoe, 1869, Trans. Ent. Soc. London (3) 3: 645.

Cleomenini Gahan, 1906, Fauna Brit. India Col. 1: 313; Gressitt, 1940, Philippine Journ. Sci. 72: 86.

Genus *Dere* White

Dere White, 1855, Cat. Col. Brit. Mus. 8: 248; Lacordaire, 1869, Gen. Col. 9: 100; Gahan, 1906, Fauna Brit. India Col. 1: 315.

172. *Dere macilentata* Gressitt.

Dere macilentata Gressitt, 1940, Philippine Journ. Sci. 72: 87 (Hainan Island).

One specimen (Lingnan Natural History Museum) was taken at Nan Shan, Ho-yuen Distr., central Kwangtung Prov., May 2, 1938, by W. T. Tsang. New to the mainland of China.

Distribution.—Hainan; Kwangtung; Tonkin.

Subfamily *Lamiinae*Tribe *Monochamini*Genus *Uraecha* Thomson

Uraecha Thomson, 1864, Syst. Ceramb.: 84, 383; Lacordaire, 1869, Gen. Col. 9: 302, 335.

173. *Uraecha angusta* (Pascoe).

Monohammus? angustus Pascoe, 1856, Trans. Ent. Soc. London (2) 4: 49 (N. China).

Uraecha angusta Aurivillius, 1912, Col. Cat. 73: 113; Matsushita, 1933, Journ. Fac. Agr. Hokkaido Imp. Univ. 34: 334; Gressitt, 1938, Lingnan Sci. Journ. 17: 157 (Szechuan).

One specimen (Lingnan Natural History Museum) was taken at Kau-lin San (Chiu-lin Shan), Lien-p'ing Distr., N. Kwangtung, Apr. 18, 1940, J. L. Gressitt and F. K. To. New to Kwangtung.

Distribution.—N. China; Szechuan; Kwangtung; Formosa.

Genus *Arisania* Gressitt

Arisania Gressitt, 1936, Philippine Journ. Sci. 61: 106 (type: *A. submarmorata* Gress.).

174. *Arisania acutipennis* Gressitt, n. sp. (Pl. 8, Fig. 6)

Male.—Body reddish brown to blackish brown, irregularly clothed with pale grayish to orange tawny pubescence: head blackish brown, largely clothed with dull tawny pubescence, darker on antennal supports; antennae dark reddish brown, nearly blackish brown on scape, sparsely clothed with tawny hairs on basal halves of third and following segments, with dark brown hairs on remainder and a few isolated suberect hairs on under sides; prothorax dull reddish brown, densely clothed above with pale tawny pubescence except for some glabrous puncture-spots, moderately pubescent at sides; scutellum dark reddish brown, nearly covered with tawny pubescence; elytra bright reddish brown basally, darker at middle, becoming blackish brown apically, with some irregular spots of tawny pubescence on basal fifth, sparse and irregular pale gray pubescence on following two-fifths, and the apical two-fifths extensively mottled with orange tawny pubescence; ventral surfaces of body brownish black, slightly reddish on mesopleurae and posterior abdominal segments, metathorax clothed with gray pubescence except for a tawny spot on each side near posterior margin; abdomen partly clothed with tawny pubescence, arranged somewhat in four longitudinal stripes or rows of spots, the remainder with gray pubescence; legs reddish brown with central portions of femora and distal portions of tibiae partly blackish, clothed with grayish tawny pubescence.

Form very narrow and elongate, subcylindrical. Head no broader

than prothorax, minutely punctulate, with scattered larger punctures; frons convex; vertex deeply and angularly concave between antennal supports; inferior eye-lobes one-half again as deep as broad. Antennae not quite twice as long as body, slender; scape not quite as long as third segment; fourth longer than third and not quite as long as fifth; sixth and following shorter. Prothorax slightly longer than breadth at base, subcylindrical, briefly but sharply toothed at middle of each side; disc slightly raised just behind center and on each side anterior to middle, depressed areas coarsely punctured. Scutellum as broad as long, rounded posteriorly. Elytra subparallel; apices narrowed and obliquely truncate, with external angles acutely produced; discs deeply and rather closely punctured almost to apices, subseriately so in part. Ventral surfaces of body even, microscopically punctulate. Legs short; first hind tarsal segment nearly as long as following two combined. Length 10 mm; breadth 2.25.

Holotype, male (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), alt. 800 meters, Lien-p'ing Distr., N. Kwangtung Prov., S. China, Apr. 20, 1940, J. L. Gressitt and F. K. To, collectors.

Differs from *A. submarmorata* Gressitt, of Formosa, in having the elytra separately acute apically, instead of being rounded, the antennae much darker, with the scape more slender distally, and the prothorax more cylindrical, much more strongly toothed laterally, and less even on disc.

Distribution.—South China (Kwangtung).

Tribe Nipponini

175. *Pterolophia carinipennis* Gressitt, n. sp. (Pl. 8, Fig. 5)

Female.—Broad; elytra strongly carinate on basal two-thirds, broadened posteriorly and somewhat flattened near margins. Body dark reddish brown, paler reddish on labrum, antennae, tibiae and tarsi; clothed with pubescence as follows: head clothed with variable tawny brown, with paler hairs forming an irregular spot on each side of frons and a transverse band on vertex and another on occiput; antennae with bands of pale pubescence on base and apex of scape, on second segment, two or three on third, two on fourth, and one on apex of each of following; pronotum with dark brown on middle and sides of basal half, with pale tawny on remainder, extending posteriorly with two oblique lines to base near middle; scutellum clothed with pale apically; elytra largely clothed with dark brown pubescence, vaguely mottled with dull tawny or rusty brown, paler behind scutellum, with several tawny bands on outer half from behind humerus to behind middle; ventral surfaces of body clothed with dark grayish brown mixed on abdomen with tawny hairs; legs irregularly clothed with pale tawny.

Head narrower than prothorax, finely and not very closely punctured; frons slightly broader than deep; vertex broadly rounded-concave; inferior eye-lobes rounded-triangular, about as deep as portions of genae below them. Antennae three-fourths as long as body, fairly stout; scape two-thirds as long as third segment, subequal to fourth; following much

shorter. Prothorax one-third broader than long, closely and finely punctured, with a pair of small tubercles at center of disc. Scutellum short and rounded posteriorly. Elytra broadened posteriorly to behind middle; each broadly rounded apically with margins almost flattened; disc coarsely punctured and with a slightly sinuous strongly raised ridge extending from base to beginning of apical third, not far from suture. Sides of metasternum heavily punctured; abdomen indistinctly punctured. Length 4.6 mm; breadth 2.

Holotype, female (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), alt. 1050 meters, Lien-p'ing Distr., N. Kwangtung Prov., S. China, Apr. 21, 1940, J. L. Gressitt, collector.

Differs from *P. camela* Pic in being much shorter, with the antennae stouter, and the elytra much broader and more strongly carinate, with the apices greatly broadened and flattened.

Distribution.—South China (Kwangtung).

176. *Pterolophia hongkongensis* Gressitt, n. sp. (Pl. 8, Fig. 3)

Female.—Moderately stout, narrowed posteriorly; carinate-tuberculate on elytra. Body dark reddish brown to pinkish brown, clothed with blackish brown to pale buff pubescence: head dark brown with clypeus and labrum paler, clothed with grayish brown pubescence in front, black across vertex, and with a pair of blackish brown spots on occiput; antennae dark brown, reddish at apices of basal segments, clothed with rings of pale buff pubescence at apex of each segment, with narrower, less distinct rings at intervals between; prothorax dark brown, largely clothed with pale buff pubescence, darker on each side of disc, dull reddish brown along most of borders, except at middle of basal margin; scutellum clothed with pale buff; elytra pinkish brown to dark brown, each clothed with buff to dark brown pubescence: pale near scutellum, two irregular oblique dark brown bands on basal half, alternating with pale, an incomplete transverse band just behind middle, and most of sides and apical third moderately pale, with a few darkened areas; ventral surfaces of body pinkish brown, darker on last abdominal sternite, clothed with pale golden buff pubescence with black hairs at apex of abdomen; legs reddish brown to darker brown, mottled with pale buff and dark brown pubescence.

Head distinctly narrower than prothorax, minutely punctured: densely so on frons and sparsely so on occiput; frons convex, nearly as high as wide; vertex shallowly concave; occiput swollen posteriorly; inferior eye-lobes rounded-triangular, broader than deep, not quite as deep as parts of genae below them. Antennae five-sixths as long as body, tapering; scape shorter than third segment; third and fourth subequal; fifth and following much shorter. Prothorax nearly one-half again as broad as long, strongly convex before middle of each side; disc with a pair of small tubercles near center, minutely punctured, more heavily so on middle of anterior portion. Scutellum almost semicircular. Elytra slightly broadened to behind middle, narrowed posteriorly; apices subrounded; disc of each deeply punctured on basal half, more finely so posteriorly, bearing two irregularly raised costae extending to top of pos-

terior declivity, first with a strong tubercle near base and a lesser one at posterior end, second without any distinct tubercles. Thorax heavily punctured at sides; abdomen much less distinctly so. Length 6.7 mm; breadth 2.6.

Holotype, female (Lingnan Natural History Museum), Hong Kong, October 18, 1939, Konyil Chan, collector.

Differs from *P. kalea* Bates in being larger, in having the prothorax more swollen at sides and lacking dark markings on disc, and the elytra less contrastingly marked, with stronger subbasal tubercles and coarser puncturation.

Distribution.—Hong Kong.

Tribe Estolini

Estolides Lacordaire, 1872, Gen. Col. 9: 416, 636.

Estolini Aurivillius, 1922, Col. Cat. 73: 317; Gressitt, 1940, Philippine Journ. Sci. 72: 177.

Genus *Donyisia* Gressitt

Donyisia Gressitt, 1940, Philippine Journ. Sci. 72: 179 (type: *Sydonia costata* Matsushita).

177. *Donyisia ciliata* Gressitt, n. sp.

Body reddish brown to blackish brown, densely clothed with pale buff to tawny or dark brown pubescence: head dark brown, reddish on labrum, clothed with pale buff pubescence, crossed by indefinite dark bands on frons and with a brownish black triangle behind each superior eye-lobe; antennae dark brown on basal segments, nearly black on middle segments, except for their bases, which are pale reddish brown, as are last three segments; basal segments densely clothed with tawny pubescence, spotted with dark brown; distal segments more thinly clothed; prothorax dark brown, completely covered with dense pale pubescence: nearly white at sides and on a posterior median longitudinal stripe, tawny buff on remainder; scutellum dark brown covered with whitish buff pubescence; elytra blackish brown to reddish brown, almost entirely covered with dense pale brown pubescence, blackish brown on tubercles, ridges and some short subapical longitudinal lines, whitish buff on most of apical third; ventral surfaces of body dark reddish brown, clothed with dense pale buff pubescence in part finely spotted with reddish brown; last abdominal sternite largely clothed with black pubescence; legs dark reddish brown, mottled with buff and reddish brown pubescence. Head and prothorax with a few long erect setae.

Head narrower than prothorax, deeper than wide, sparsely but deeply punctured; vertex narrowly concave between antennal supports; occiput with a pair of posterior swellings and a small deep cavity between superior eye-lobes; inferior eye-lobes obliquely triangular, nearly as broad as deep. Antennae slender, tapering, as long as body; scape strongly swollen, one-half as long as third segment; fourth shorter than third, much longer than fifth; following diminishing in length. Prothorax cylindrical, slightly longer than broad, convex anteriorly, longitudi-

nally corrugated on disc and with rugose punctures. Scutellum as long as broad, concave medially, rounded posteriorly. Elytra subparallel basally, distinctly narrowed in posterior two-fifths, obliquely truncate apically with external angles somewhat prominent; disc of each with about five incomplete longitudinal rows of small tubercles or short ridges scattered at greater or lesser intervals, with the remaining area sparsely and subseriately punctured. Length 10.5 mm; breadth 3.

Holotype (Lingnan Natural History Museum), Honan Island, Canton, Kwangtung Prov., S. China, July 9, 1935, Prof. Wm. E. Hoffmann, collector.

Differs from *D. costata* (Matsush.) in having the eyes smaller and more angular, the antennal supports much more closely approximated and more acutely produced internally, the pronotum less completely ridged, and the elytra with more numerous and more distinct tubercles and short ridges.

Distribution.—South China (Kwangtung).

Tribe Phytoeciini

178. *Nupserha subvelutina* Gressitt.

Nupserha subvelutina Gressitt, 1937, Lingnan Sci. Journ. 16: 619 (S. Kiangsi); 1939, Notes d'Ent. Chinoise 6: 122 (Chekiang).

A male (Lingnan Natural History Museum) was collected between Kau-lin San and Tsung-sun, Lien-p'ing Distr., N. Kwangtung, Apr. 22, 1940, J. L. Gressitt. New to Kwangtung.

Additional Records on Previously Recorded Species

144. *Philus antennatus* (Gyllenhal).

Two specimens (Lingnan Natural History Museum) were taken in the New Territories, Hong Kong: one in the spring of 1940 by members of the Lingnan University Biology Department, the other at Hong-lok-yuen, near Tai-po, Apr. 22, 1941, by Y. H. Mak. New to Hong Kong mainland.

17. *Molorchus insularis* (White). (Pl. 8, Fig. 4)

A specimen (Lingnan Natural History Museum) was taken at Kau-lin San, alt. 800 meters, Lien-p'ing Distr., N. Kwangtung, Apr. 16, 1940, J. L. Gressitt. New to mainland of China; previously known only by the type material in the British Museum from Hong Kong.

27. *Chelidonium argentatum* (Dalman).

A specimen (Lingnan Natural History Museum) was taken on *Citrus* at Hong-lok-yuen, near Tai-po, New Territories, Hong Kong, May 22, 1941, by Y. H. Mak.

47. *Demonax bowringii* (Pascoc).

One example (Lingnan Natural History Museum) was taken at Kau-lin San, alt. 1050 meters, Lien-p'ing Distr., N. Kwangtung, Apr. 21, 1940, by the writer.

49. *Chlorophorus annularis* (Fabricius).

Several specimens (Lingnan Natural History Museum) were taken at Hong-lok-yuen, near Tai-po, New Territories, Hong Kong, May 18, 1941, by Y. H. Mak.

65. *Melanauster chinensis* (Förster).

Several specimens (Lingnan Natural History Museum) were collected on *Citrus* at Hong-lok-yuen, near Tai-po, New Territories, Hong Kong, May 1941, by Y. H. Mak.

118. *Oberea distinctipennis lateriventris* Gressitt.

One specimen (Lingnan Natural History Museum) was taken between Sin-fung and Lung-kai, near border of Sin-fung and Lien-p'ing Districts, NC. Kwangtung, Apr. 12, 1940, J. L. Gressitt and F. K. To.

129. *Linda fraterna* (Chevrolat).

Several specimens (Lingnan Natural History Museum) were collected on *Rubus* at Waichow, Hwei-yang Distr., SC. Kwangtung, Apr. 4, 1940, by the writer.

130. *Phytoecia rufiventris ventralis* Bates.

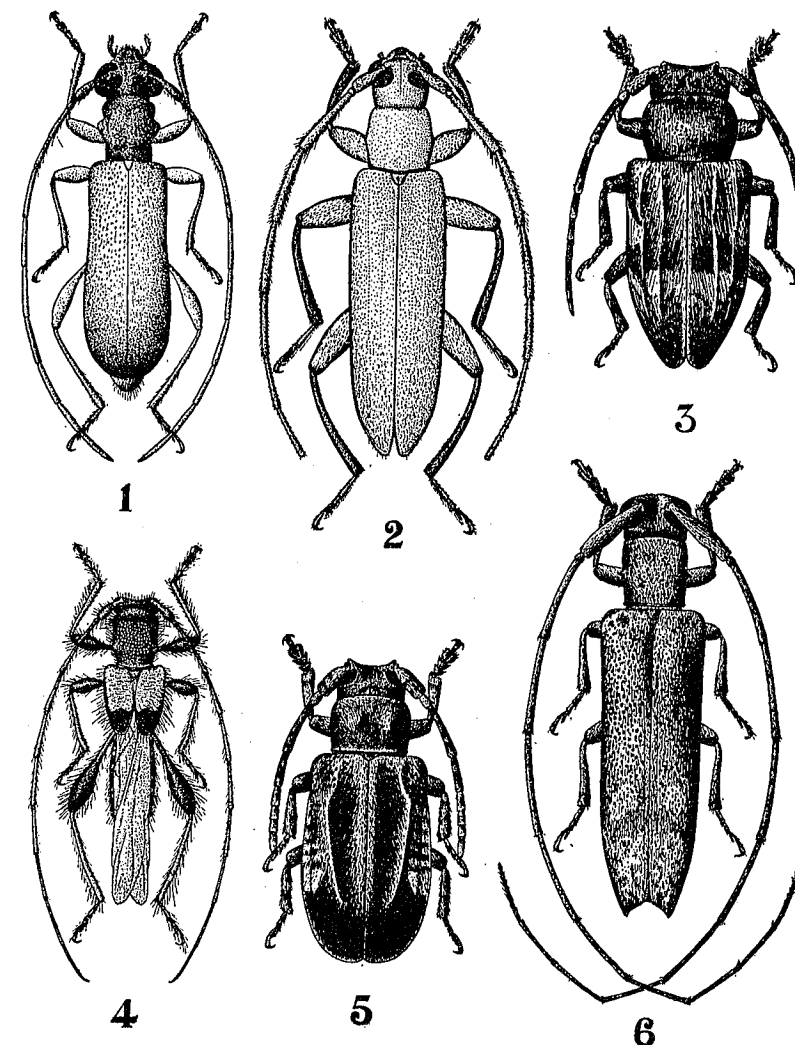
One specimen (Lingnan Natural History Museum) was collected on *Chrysanthemum* between Tung-pa and Ho-yün, Ho-yuen Distr., C. Kwangtung, Apr. 27, 1940, by the writer.

133. *Chreonoma basalis* Gahan.

A specimen (Lingnan Natural History Museum) was taken on Cheung-chau Island, near Hong Kong, May 9-13, 1940, by F. K. To.

Explanation of Plate

- Fig. 1. *Obrium complanatum* Gressitt, n. sp. (Mag. $\times 7.6$).
 2. *Nortia planicollis* Gressitt, n. sp. (Mag. $\times 4.6$).
 3. *Pterolophia hongkongensis* Gressitt, n. sp. (Mag. $\times 6.1$).
 4. *Molorchus insularis* (White). (Mag. $\times 4.3$).
 5. *Pterolophia carinipennis* Gressitt, n. sp. (Mag. $\times 7.3$).
 6. *Arisania acutipennis* Gressitt, n. sp. (Mag. $\times 5.8$).



NOTES ON CHLORANTHUS, BETULA, LITHOCARPUS,
AND QUERCUS

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In making the final revision for the first fascicle of the Flora of Fukien, just before its publication, a number of new species were found, both in the province of Fukien and in Southeastern China. Those from Fukien were included in the Flora but without a Latin description; those from Southeastern China were simply referred to very briefly, usually only with a few descriptive lines, and with citation of specimens.

Lack of space made it impossible to insert full descriptions of the new species in the first fascicle of the Flora. Some of those referred to in the Flora are described in this paper.

The writer wishes at this time to thank the John Simon Guggenheim Memorial Foundation, as these notes were mostly prepared during the tenure of a fellowship from that foundation, and to thank Dr. E. D. Merrill, Director of the Arnold Arboretum, Harvard University, for the excellent facilities made available during this same period.

CHLORANTHACEAE

Chloranthus Swartz

Chloranthus kiangsiensis Metcalf, sp. nov. (Fig. 1)

C. sp. No. 7, Metcalf, Flora Fukien, p. 39 (1942).

Herba perennis, caulibus erectis, simplicibus, ad 60 cm altis, obscure striatis, minute puberulentibus, apice 4-foliis; foliis petiolatis, membranaceis, oblanceolatis vel late ellipticis, ad 30 cm longis et 12 cm latis, gradatim acutis vel subacuminatis, basi cuneatis vel anguste acutis, margine prominenter ciliato-dentatis, nervis numerosis, conspicuis, utrinque circiter 15, supra glabris, subtus nervis exceptis glabris, nervis minute pubescentibus; petiolo 2.5-3 cm longo, subglabro vel minute pubescente. Flores ignoti. Inflorescentiis incompletis. Bracteis 5-lobis, lobis lanceolatis ad 1.5 mm longis et 1 mm latis, acuminatis, ciliolatis, reflexis; fructibus glabris, ovoideis ad 5 mm longis et 4 mm latis, minute scalariformibus et striatis; stylis persistentibus, ad 4 mm longis, filiformibus, ad 0.5 mm supra basim nodulosis; pedicellis filiformibus, 12-15 mm longis, minute pubescentibus.

Kiangsi: Sai Heng Cheung, Kiennan district, *S. K. Lau 4193*, August 1-29, 1934.

Even though no flowers and no complete inflorescences are available we do not hesitate in proposing this as a new species. It is easily characterized by the prominent ciliate dentate margins to the leaves, the ciliate margins of the lanceolate lobes of the bract, and the persistent

elongate style with a small swollen knob about one half a millimeter above the attachment to the ovary.

BETULACEAE

Betula Linn.

Betula kwangsiensis Metcalf, sp. nov. (Fig. 2, c)

B. sp. No. 1 in Metcalf, Flora Fukien p. 49 (1942).

Arbor ad 20 m, trunco 60 cm diametro; ramulis glabris, cinereo-brunneis, ramulis glabris, opaco-brunneis vel nigris, ultimis 2-2.5 mm

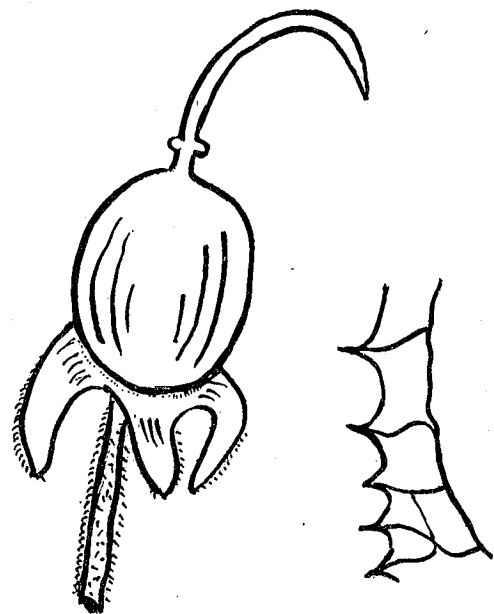


Fig. 1. *Chloranthus kwangsiensis* Metcalf. S. K. Lau 4193. Fruit and portion of the margin of the leaf. $\times 8$.

diametro, lenticellis numerosis, ellipticis, albis; foliis ovatis vel lanceolato-ovatis, 8-13 cm longis et ad 6 cm latis, gradatim acuminatis, basi rotundatis vel subcordatis, margine regulariter, prominenter et simpliciter curvato-serratis, supra olivaceis vel viridi-olivaceis, glabris, subtus pallidioribus, viride brunneis vel brunneis, nervis exceptis subglabris, nervis appresso-strigosis; nervis primariis prominentibus, utrinque 11-13; petiolo 15-22 mm longo. Amentis fructiferis subcylindricis ad 4.5 cm longis et 1.5-2 cm latis; pedicello 5-6 mm longo pubescente; bracteis breviter lobatis, supra pubescentibus, subtus subglabris, 7 mm longis et 6 mm latis, lobo mediano obovato rotundato, lobis lateralibus oblanceolatis vel breviter spathulatis; nucula ovali vel elliptica, 2.5 mm longa et 1.5 mm lata, ala prominente, utrinque 1 mm lata.

Kwangsi: Dar Yeung Kiang, Luchen, border of Kweichow, 3900 ft., R. C. Ching 6279. Type, June 27, 1928. "Tree 40 ft., 1.2 diam."; Tzu Yuen, Z. S. Chung (T. S. Tsoong) 83494, August 3, 1937, "in woods along stream, tree."

Kweichow: Ta Ha Yen, Feng Hsiang Ping, 1200 m A. N. Steward, C. Y. Chiao, and H. C. Cheo 735, "tree 20 m, 60 cm diam."

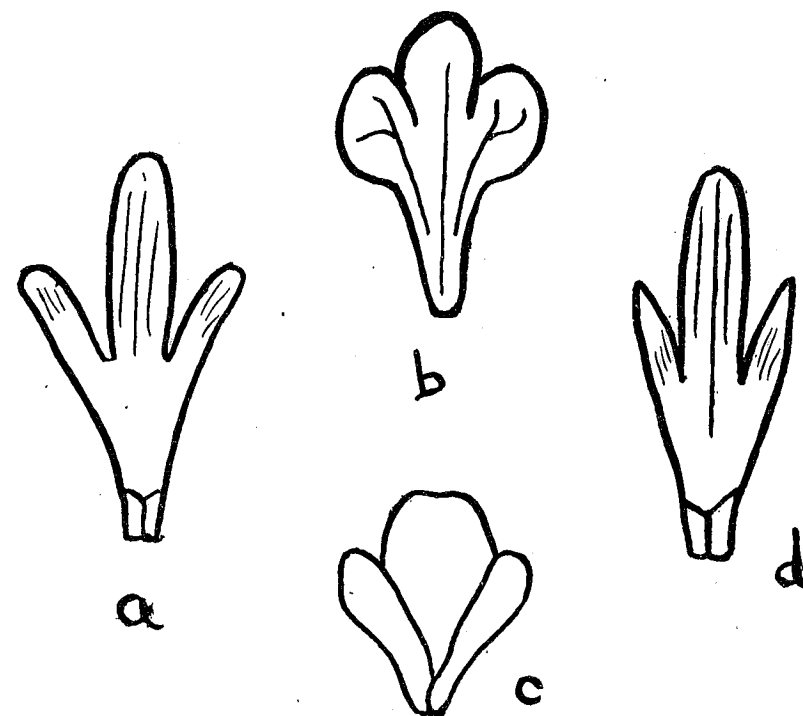


Fig. 2. Bracts of related species of *Betula*. a. *B. kweichowensis*; b. *B. utilis*; c. *B. kwangsiensis*; d. *B. insignis*.

This species is readily recognized by the large ovate leaves, the thick pistillate catkins and the oblanceolate, short, lateral wings of the bracts. It simulates in its large pistillate aments *B. kweichowensis* Hu, *B. insignis* Franchet, and *B. utilis* D. Don. The first two mentioned have, however, very prominently elongate spatulate lobed bracts, and *B. kweichowensis* Hu also has the leaves and bracts black punctate. *B. utilis* D. Don has much smaller aments, a marked difference in the marginal serration of the leaves, and bracts that simulate in shape a 3-leaf clover, with all three lobes somewhat similar, spherical to obovate in outline, not obtuse, oblanceolate or spatulate as in my proposed new species.

Lithocarpus Blume

Lithocarpus elliptica Metcalf, Flora Fukien p. 64 (1942).

A brief Latin description is here added:

Frutex ad 15 m altus; ramis et ramulis puberulentibus, cinereis vel flavidis; foliis ellipticis vel lanceolatis, 8-12 cm longis, 2.5-4 cm latis, foliis juvenilibus longioribus ad 20 cm latis et 6.5 cm latis, leviter oblanceolatis, coriaceis, integris, acutis vel acuminatis, supra glabris, olivaceis, subtus pallioribus, cinereis vel castaneis, dense tomentosis; nervis utrinque 12-15, supra obscureis subtus prominenter elevatis, reticulatis; petiolo 1-2 cm longo, ramulis juvenilibus 3-4 cm longo. Cupula et glans Lithocarpi corneae Rehder similis.

Fukien: Yenping, Cha-ping, *Chung* 2905 (type), and Buong-kang, *Chung* 3559 and 3640.

Kwangtung: Fan Shiu Shan, Wung-yuen, *Lau* 2628, Sin-fung, *Taam* 716 and 959; Sam Kok Shan, Tsungfa, *Tsang* 25207, North River, *Wang* and *Ling* 7347, Cheng-kou, *Chun* 5858.

Closely related to *Lithocarpus cornea* (Lour.) Rehder from which species it is readily separated by the more numerous veins, thicker leaves, more densely pubescent beneath; *Lithocarpus uvariifolia* (Hance) Rehder has larger consistently broader oval oblong leaves with rounder or broadly acute, rarely acuminate apices. *Lithocarpus Fordiana* (Hemsl.) Chun has leaves with distinctly serrate margins.

Lithocarpus elliptica Metcalf var. **glabrata** Metcalf, Flora Fukien p. 64 (1942).

Foliis glabris paucis pilis costa media subtus exceptis.

Kwangtung: Naam Kwan Shan, near Sheung Ping Village, Lungman district, W. T. Tsang 25339 (type), June 1-19, 1935.

Quercus Linnaeus

Quercus macrocalyx Hockel and Camus var. **tomentosa** Metcalf, Flora Fukien p. 80 (1942).

A specie foliis subtus distinctis tomentosis differt.

Hainan: Po-ting, H. C. How 73518 (type), Aug. 27, 1935.

ADDITIONAL NOTES ON ACER¹

By FRANKLIN P. METCALF

Formerly Curator of Herbarium, Botanical Survey, Lingnan University.

In revising the manuscript of this genus for the Flora of Fukien, a number of new facts were brought to light, which it was thought best to publish before the Flora. This included one new species, three new varieties, a few extensions of range of known species and a brief discussion of the variable and difficult group to which *Acer Tutcheri* Duthrie belongs.

I wish to thank Dr. E. D. Merrill, Administrator of Botanical Collections, Harvard University, and Director of the Arnold Arboretum, for the facilities made available to me during the preparation of this short paper.

1. **Acer Buergerianum** Miquel var. **horizontalis** Metc., var. nov. (Fig. 1, 2).

A specie differt alis carpellorum patentibus, subhorizontalibus; a varietate ningpoense inflorescentiis et ramulis juvenilibus glabris, non cinereo-pubescentibus.

Chekiang: Chu Ka Ping, 3500 ft., 50 li north of S. C., R. C. Ching 1620, type (CCC. AA) May 23, 1924, "on partly wooded rocky cliff, shrub 15 ft. high, 6 in. diam., breast high; fruit young, greenish tinged

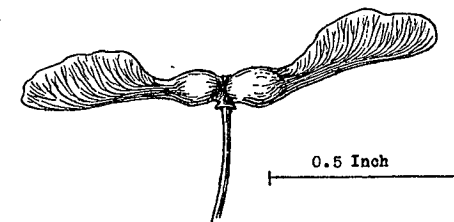


Fig. 1. Fruit of *A. Buergerianum* var. *horizontalis*.

with purplish along the inner margin, a rare shrub of dainty habit." (ex Herb. National Southeastern Univ. Nanking).

¹ Literature:

Metcalf, F. P. *Acer* (section *Integrifolia* Pax) for Southeastern China. *Ling. Sci. Jour.* 11(2): 193-210, tab. 3, fig. 1-5 (1932).

Metcalf, F. P. Notes on Fang's Chinese Aceraceae. *Ling. Sci. Jour.* 12(1): 135-136 (1933).

Metcalf, F. P. Geographical Distribution of *Acer* (section *Integrifolia* Pax) in China. *Ling. Sci. Jour.* 17(4): 609-614, t. 27 (1938).

Metcalf, F. P. *Acer oblongum* Wallich var. *concolor* Pax. *Jour. Arn. Arb.* 22 (1941).

A rather unusual shrub, tentatively placed as a variety of *A. Buergerianum* Miquel from which it can be separated by its widely divergent, almost horizontal, wings to the fruit and the smaller leaves glaucous beneath. From the var. *ningpoense* (Hance) Rehder it can be readily distinguished by the glabrous, not cinerous-pubescent, inflorescence and young branchlets, and the smaller less lobed leaves.

2. *Acer cappodocicum* Gleditsch in Schrift. Gesell. Naturf. Freunde Berlin 6: 116, t. 2 (1785); Rehder & Wilson in Sarg. Pl. Wils. 1: 84 (1911).

Asia Minor.

2a. var. *sinicum* Rehder in Sarg. Pl. Wils. 1: 85 (1911); and in Jour. Arn. Arb. 8: 162 (1927), *specim. cit. e Anhwei excl., non* Rehder (1911); Fang

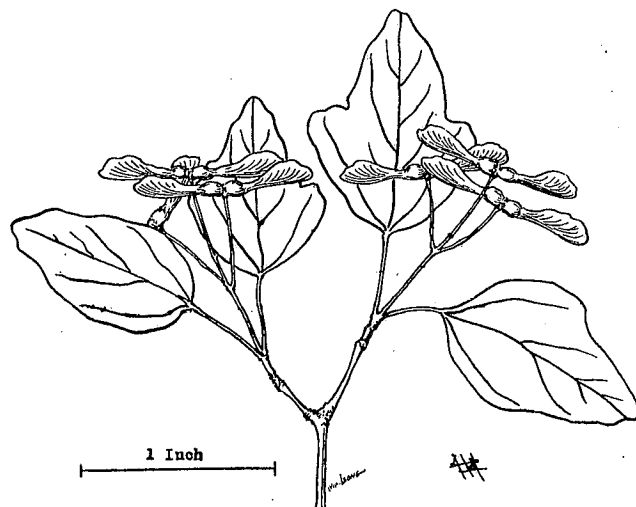


Fig. 2. Leaves and fruit of *A. Buergerianum* var. *horizontalis*.

in Contrib. Biol. Lab. Sci. Soc. China, Bot. 7: 147 (1932), *pro parte, specim. cit. Ching 3228 e Chekiang excl.*

Kwangsi: Shap Man Taai Shan, Yao Shan, and Tzu Yuen, W. T. Tsang 24316, Sept. 21, 1934 (CCC. AA), C. Wang, June 19, 1926 and T. S. Tsoong 83465, July 26, 1937 (AA).

First records for Kwangsi. Formerly only known from Hupeh and Szechuan (*types*), Yunnan (Rehder l.c.), Chekiang (Fang l.c.) [this last not seen by writer], and Sikang and Tibet (Fang l.c.)

2b. var. *serrulatum* Metcalf, var. nov.

A specie differt, foliis magnis, margine pauci-serratis.

Kwangsi: Without additional locality or data, C. Wang 39538 (AA).

In fruit and other features this seems to agree with the Chinese var. *sinicum* Rehder, but the larger leaves and serrate margin seem sufficient

to designate it as a new variety. The variety *sinicum* Rehder, all four syntypes of which, as well as considerable material are available at the Arnold Arboretum, all seem to consistently be with entire margins.

3. *Acer decandium* Merr. in Ling. Sci. Jour. 11: 47 (1932); Merr. & Chun in Sunyatsenia 2: 269 (1935); Merr. in Jour. Arn. Arb. 19: 44 (1938). — *A. oblongum* Wall. var. *concolor* Merrill in Jour. Arn. Arb. 19: 45 (1938), *quoad specim. cit. e Indo-Chine, non* Pax.

Kwangsi: Sup Man Ta Shan [on Kwangtung border]; H. Y. Liang 69812, July 21, 1937 (ex Bot. Inst. Sun Yatsen University).

First record for Kwangsi, and for Kwangtung proper, formerly known only from Hainan and Tonkin, Indo-China. The leaves may be either glaucous or pale brown beneath.

4. *Acer flabellatum* Rehder in Sarg. Trees & Shrubs 1: 161, t. 81 (1905); in Sarg. Pl. Wils. 1: 91 (1911); Fang in Contrib. Biol. Lab. Sci. Soc. China, Bot. 8: 167 (1932).

Kiangsi: Lushan Mts., H. H. Chung and S. C. Sun 363, July 5, 1934 (AA). A fairly good match of the type material from Hupeh, Henry 1232, but with fewer pilose hairs on the veins beneath.

Kwangsi: Yao-shan, Tseung-yuen, C. Wang 39571, June 29, 1936 (AA).

New both to Kiangsi and Kwangsi. Formerly only known from Hupeh and Szechuan (Rehder l.c.).

5. *Acer Johnedwardianum* Metcalf, sp. nov. (Fig. 3, 4, 5)

A. Wilsoni Rehder var. *serrulata* Dunn in Jour. Linn. Soc. 38: 358 (1908).

A. Oliverianum Pax var. *serrulatum* Rehder in Sarg. Pl. Wils. 1: 90 (1911), *syn. nov.*

Arbor ad 3 m alta, ramis et ramulis cinereo-brunneis; foliis trilobatis 2.5–4 cm longis et 3.5–5.5 cm latis, ad basim subtruncatis vel cordatis, lobis breviter ovatis, apice breviter et obtuse acutis, margine appressoserrulatis, utrinque glabris et reticulatis; petiolo glabro, delicato, circiter 1.5 cm longo; inflorescentiis in corymbis parvis et paucifloris; fructibus rubris, nuculis subglabris vel parce pilosis, alis glabris 2.5 cm longis, pedicellis delicatis subglabris.

Inghok: Tributary Gorge of Yuen Fu River, Dunn 291-HH 2545, Dunn's Expedition to Central Fokien, April to June 1905, type "small tree, 5'" (Arnold Arboretum, two sheets, and Hong Kong, type of *Acer Wilsoni* Rehder var. *serrulata* Dunn); Fang-Quang-Yen [Huang-Guang-Nang] H. H. Chung 2636, April 22, 1924, "growing near rocks, small tree 3 m" ex Herb. Univ. Amoy (Lingnan University and Arnold Arboretum). [This collection of Chung's may actually represent a collection from the same detail locality as the type.]

This was originally described by Dunn as a variety, the complete description being "folia serrulata." Rehder (l.c.), in 1911, transferred this variety to *Acer Oliverianum* Pax, stating that it seemed less closely related to *A. Wilsoni* than to *A. Oliverianum* Pax. Rehder stated that it

differed from the type of *A. Wilsoni* Rehder "in its smaller 3-lobed leaves with short ovate, appressed serrulate lobes, narrowed to a short obtusish acumine glabrous on both sides, reticulate beneath, 2.5-4 cm long and 3.5-5.5 cm broad; corymb small and few flowered." Rehder also stated that *A. Wilsoni* differed very noticeably from this in its "paniculate inflorescence and in the entire or nearly entire lobes of the thinner leaves." I agree with Rehder but feel that it is also not very closely related to *A. Oliverianum* Pax and that it would probably be better treated as a species. Ten years ago, when working on this genus at the

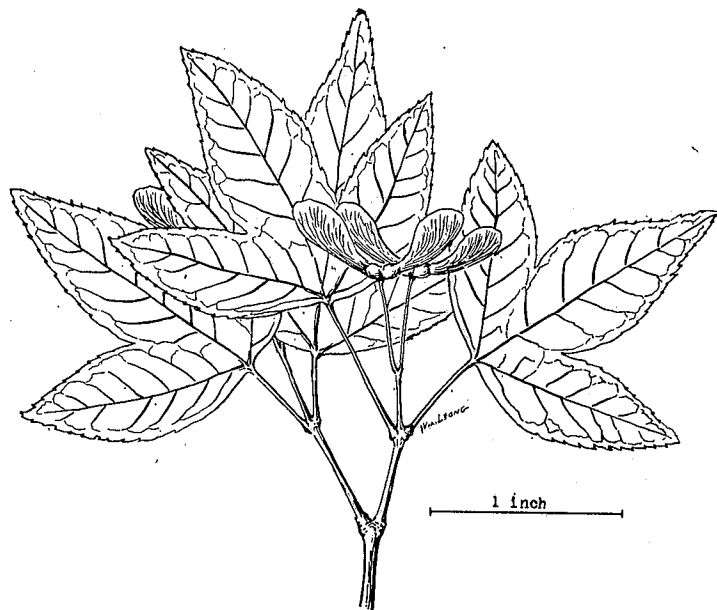


Fig. 3. Leaves and fruits of *A. Johnedwardianum*.

Arnold Arboretum, I named it in my Flora of Fukien manuscript, but did not publish it at that time, which is just as well, as that name I now find is preoccupied.

This species is actually more closely related to *A. confertifolium* Merr. & Metc. [Ling. Sci. Jour. 16: 167 (1937)] than to either *A. Wilsoni* Rehder or *A. Oliverianum* Pax, but can easily be distinguished from *A. confertifolium* Merr. & Metc. by the blunt shortly and obtusely acute apices of the three lobes, and the fewer and more distant serrulations. *A. confertifolium* Merr. & Metc. has acute to shortly acuminate apices, also the petioles apparently are longer, being 2-2.8 cm long.

This species has been named for my son, John Edward Metcalf.

6. *Acer lucidum* Metcalf in Ling. Sci. Jour. 11: 197 (1932).

Kwangsi: Lung-mu-an, and San-min, Kweilin, W. T. Tsang 27781 and 27988, July 8-12, and August 5-23, 1937, "fairly common, in thicket on sandy steep slope, woody, 7 to 10 ft. high, fruit brown or red." (5th Lingnan Kwangsi Expedition).

First record for Kwangsi, formerly only known from the type locality Shuichow (Metcalf l.c.), and Lohfaushan, Kwangtung.

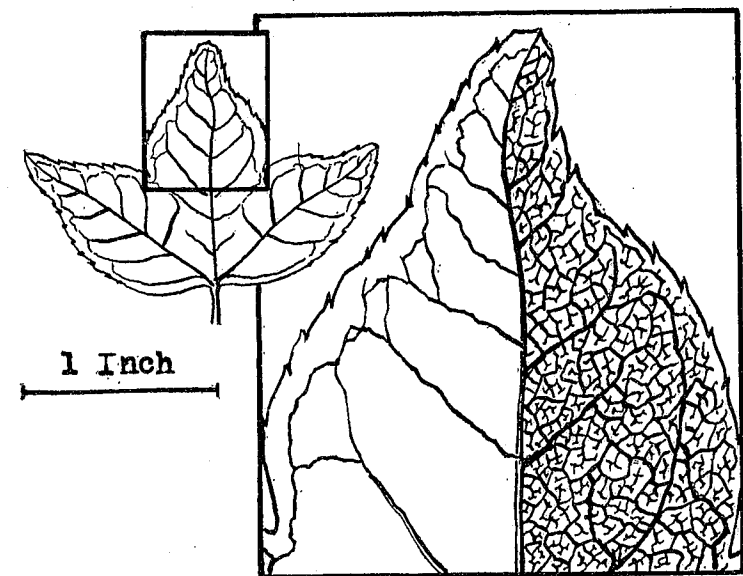


Fig. 4. Venation of leaf of *A. Johnedwardianum*.

7. *Acer sinense* Pax var. *microcarpum* Metcalf, var. nov.

Foliis, utrinque viridibus, 5-lobis, subglabris; fructibus quam speciei paullo minoribus, alis 2 cm longis, ascendentibus nec horizontalibus.

Kwangsi: Yao Mar Shan, N. Lin Yen, R. C. Ching 7170, August 27, 1928, "4000 ft., in wood; tree; 60 ft., 1.8 ft. diam. at breast height; bark grey; leaf light green on both sides." (CCC; photograph and leaves and fruit, AA).

This number was named and distributed but not published by H. H. Hu as a new species, but was subsequently determined by Rehder as *A. sinense* Pax var. *concolor* Pax; it was distributed to the herbarium of the Botanical Survey, Lingnan University, as *A. erianthum* Schw. The fruit, however, is much smaller and the wings are not almost horizontal as described by Pax. It does not belong to the species as it has the leaves green beneath, or to the pubescent variety *pubinerve*. It is, I believe, of

varietal rank, and is here described. The fruit is much smaller than in the species and the wings ascending, not horizontal.

8. *Acer Tutcheri* Duthrie in Kew Bull. Misc. Inform. 21: 16 (1908); Dunn & Tutcher, Fl. Kw. & HK. in Bull. Misc. Inform. Kew, Add. ser. 10: 87 (1912); Fang in Contrib. Biol. Lab. Sci. Soc. China 7: 155 (1932). —*A. Wilsonii*¹ Fang in Contrib. Biol. Lab. Sci. Soc. China, Bot. 7: 153 (1932), *pro parte, quoad Ching 2464 e* Chekiang, *non* Rehder.

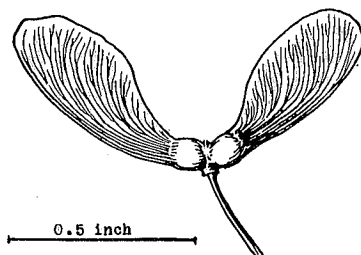


Fig. 5. Fruit of *A. Johnedwardianum*.

There has been a great deal of confusion about this and related species. I am not sure that my present interpretation is a correct one, but at the Arnold Arboretum I have the great advantage of having available for study the following classic specimens and types in this difficult group, including both entire and serrulate forms.

Classical specimens:

- A. *Tutcheri* Duthrie:—Lantau Island, March 16, 1909, Tutcher, Herb. Hongk. 7158, *topotype* and possibly even an *isotype* (AA). [Duthrie did not cite any number.] Tutcher, *HH 588*, *type* (seen Kew).
- A. *Wilsonii* Rehder:—Hupeh, *Wilson 303*, *type* (AA).
- A. *Oliverianum* Pax:—Hupeh, *Henry 6512*, *isotype* (AA).
- A. *confertifolium* Merrill & Metcalf:—Kwangtung, *Tsang 21407*, *type* (AA).
- A. *Johnedwardianum* Metcalf (*A. Wilsonii* Rehder var. *serrulata* Dunn):—Fukien, *Dunn 291-HH 2545*, *type* (AA) [*isotype* of variety], and *Chung 2636*, *paratypes* (CCC. AA).

Specimens have variously been determined as *A. Wilsonii* Rehder, *A. Oliverianum* Pax or its var. *serrulatum* (Dunn) Rehder or var. (?). Those which I now consider to belong to *Acer Tutcheri* Duthrie are cited below:

Chung-an Hsien, N. Fukien near Chekiang Border, 4700', July 27, 1921, *Hu 1342* (CCC. AA).

Chekiang: Lung-chuan, *Ching 2464* (AA).

Kwangtung: Lantau Island, *Tutcher HH 588*, *type* (K); same local-

¹ Error for *Wilsonii*.

ity, *HH 7158*, *topotype*, March 16, 1909 (AA); Lung-tau Shan, *LU 12516* (To & Tsang) (CCC. AA); Sha Lo Shan and Hau Tong Shan, *Taam 743* and *933* (CCC. AA); Naam Kwan Shan, *Tsang 20174* and *20239* (CCC. AA); Yu-yuen, *Ko 52959* (AA). An extreme form, *Taam 573* from Ah Po Kai Shan, Sun-fung district may belong here.

Kwangsi: *Wang 39382*, *39611*, and *Tsoong 81982* (AA).

Duthrie lists only as Kwangtung, Lantau Island, W. J. Tutcher. Fang (l.c.) on the basis of sight determinations by Merrill has credited *LU 12517* (To & Tsang) and *McClure 1556* to this species. On the label prepared by Lingnan University (CCC 12516, CCC specimen), the following statement is printed, "Quoting Rehder in letter to Merrill of Dec. 16, 1926: 'No. 12516 may be *A. Tutcheri* Duthrie or *A. Oliverianum* var. *serrulata* Dunn and I am inclined to follow you in referring it to the former but do need more material'." On the label prepared in Washington it was named and distributed as *A. Oliverianum* Pax, but was subsequently changed at the Arnold Arboretum by Rehder to *A. Tutcheri* Duthrie.

Fang (l.c.) cited *Ching 2464* (which was originally distributed as *A. Oliverianum* Pax), from Chekiang under *A. Wilsonii* Rehder, but did not consider this typical for *A. Wilsonii* Rehder as he added, "In *Ching 2464*, the leaves have somewhat shorter lobes." The Fukien material, *Hu 1342* (2 sheets) was not cited by Fang, but was distributed as *A. Oliverianum* Pax.

The specimens from Lung-tau Shan, Kwangtung, *LU 12516* and *Wang 39382* from Yao Shan, Kwangsi, have much narrower lobes than the type and appear at first quite distinct from typical *Tutcheri*; that from Yu-yuen has larger leaves and longer lobes, approaching *A. Wilsonii* Rehder. The Naam Kwan Shan material, *Tsang 20174* and *20239* approaches much closer to the type, especially *Tsang 20239*. *Tsang 20174* has much longer lobes. *Taam 743* and *933* from Sin-fung, *Wang 39382* and *Tsoong 81982* appear to be intermediate between the Lung-tau Shan material and the type material from Lantau. *Taam 573* from Ah Po Kai Shan, Sin-fung represents the other extreme and might be a good variety. It has the large fruits, however, of *Tutcheri*, but very unusual leaves, some of which are almost without lobes, or 1-2-3-lobed, more nearly entire than typical *Tutcheri* and with only a few serrations at the tip; in leaf shape it approaches *A. confertifolia* Merrill & Metcalf. However, the material cited seems to include a good series showing much variation within limits, approaching in *Ko 52929* *A. Wilsonii* Rehder, and in *Taam 573* *A. confertifolia* Merr. & Metc. Some of this intermediate material, constantly 3-lobed, has the general appearance of the typical 5-lobed *A. Oliverianum* Pax but with decidedly less marginal serrulation.

¹ The two different labels on each specimen formerly used on the Lingnan University set and the exchange material sent out by Lingnan University were quite different from the label prepared and used in Washington for this material, which stated in part, "Geographic Society Central China Expedition under direction of F. R. Wulsin in collaboration with Canton Christian College," etc.

All this material appears, however, to have a rather definite range, being restricted to the high mountains of Hong Kong, Kwangtung, Kwangsi, and Fukien, and probably is conspecific.

A. Wilsoni Rehder has a more western distribution, centering in Hupeh and extending southward into Hunan and westward into Kweichow, Szechuan, and probably includes *Wang 39265* (AA) from Yao Shan, Kwangsi; the leaves in this species are less coriaceous, with longer caudate acuminate lobes and subentire margins.

A. confertifolia Merrill & Metcalf represented only by the type collected from Yam-na-shan (Yit-Nga Shan), Mei District (Kaying), Kwangtung is distinguished by the smaller samaras, the wing and the nutlet being less than 2 cm long, the peculiar dwarf habit and with a crenate-serrate type of leaf margin; the leaves, however, are in some aspects very close to some forms of *A. Tutcheri* Duthrie.

A. Oliverianum Pax is constantly 5-lobed, with serrate margin and a noticeably truncate, and less commonly a subcordate base, and rather even, subequal, narrowly lanceolate lobes. It is at present known from Hupeh, Szechuan, Kansu, Hunan, Anhwei, and Chekiang, a more northern distribution than all the others.

A. Johnedwardianum Metcalf is always 3-lobed with a distinct and prominent serrulate margin and also is readily distinguished by the blunt, shortly, and obtusely acute apices of the 3 shortly ovate lobes. It is at present restricted to Fukien.

THE GENUS *PHILAGRA* AS IT IS REPRESENTED IN CHINA (CERCOPIDAE, HOM.)

By GAINES KAN-CHIH LIU

National Tea Station, Meitan, Kweichow.

The genus *Philagra* was established by Stål in 1862 from Walker's *hastata* (Trans. Ent. Soc. Lond., 1862, p. 593). In 1908 Distant characterized it as follows:

Head narrowed and strongly produced in front of the eyes, centrally and laterally carinate above, longer than or as long as pronotum; ocelli a little nearer to eyes than to each other, more or less upwardly directed; face more or less transversely striated, centrally longitudinally carinated; clypeus short, posteriorly rounded; rostrum almost reaching the posterior coxae; posterior tibiae armed with two spines; pronotum sex-angular, anteriorly convexly rounded, posteriorly angularly emarginate before scutellum; tegmina apically subacute, their costal margins strongly convex, costal and radial areas broad, the latter dilated near base.—Distant, Fauna Brit. India, Rhyn. 4, 1908, p. 107.

As pointed out by this English author, the chief character of this genus is the strong anterior prolongation of the head, technically known as the cephalic process. But Distant's definition has been more or less modified by later students of this group.

The genus is a fairly large one with its members distributed over the Austro-Oriental region; mainly, however, Oriental. In 1912 Lallemand reported nine species (Lallemand, Gen. Ins., fasc. 143, 1912, p. 71). By 1934 Metcalf and Horton listed 22 for China (Ling. Sci. Jour., 1934, p. 399). These American authors' "China," however, is used in a much broader sense, including all the neighboring countries of Indo-China, Formosa, and Japan.

The present paper contains 11 species with one of them described for the first time. They are known from various parts of China, including Tibet, and may be separated from one another by the following table:

Key to the Chinese Species

1. Body beneath decorated with an inverted V-shaped fascia extending backward from the apex of the face. 2
Body beneath without such a fascia. 5
2. Tegmina both fasciate and maculate; cephalic process non-carinate.
Tegmina fasciate only. 3
3. Pronotum bimaculate; tegmina with a broad transverse fascia behind the middle and two smaller ones in the claval areas. 4
Pronotum uniformly colored. 4
4. Cephalic process uniformly dark brown; legs uniformly yellowish brown.
..... semivittata

- Cephalic process ferruginous, brighter at the apex, with the lateral carinae blackish fuscous; legs with the anterior 4 ferruginous and the hind 2 testaceous yellow. *vittata*
5. Tegmina with 4 distinct spots; pronotum longitudinally sulcate. *quadrinaculata*
- Tegmina not so colored. 6
6. Face carinate. 7
- Face non-carinate. 9
7. Tegmina not spotted and with the costal margin distinctly arched; face with its median carina subobsolete on basal half. *tongoides*
- Tegmina irregularly marked with the costal margin normally convex but not distinctly arched. 8
8. Head strongly tricarinate above and with the cephalic process only slightly upwardly curved. *fusiformis*
- Cephalic process more upwardly curved and with the median carina reaching only the base of the tylus; in general appearance resembling the last one. *major*
9. Head including cephalic process only slightly longer than the pronotum; tegmina yellow with three dark fasciae; head and pronotum dark brown with the lateral margins yellow. *recta*
- Head including cephalic process much longer than the pronotum. 10
10. Tegmina with a conspicuous fasciate spot on costal margin; head including cephalic process as long as pronotum and scutellum combined. *grahami*
- Tegmina without such a fasciate spot but with some indistinct fasciae formed by numerous grayish yellow spots; head including cephalic process one and one-half as long as pronotum. *subrecta*

The ten old species were described by three Americans, two Englishmen, one Austrian, one German, and one Russian. Fortunately the descriptions appear in only two languages, English and German. But not only has each author his own way of presentation but the articles are found in different periodicals, which are not necessarily always available in China. In the present paper, the species is either redescribed or given with its original description.

1. *Philagra albinotata* Uhler

Uhler, Proc. U. S. Nat. Mus. 19, 1896, p. 286.
Mats., Jour. Sappora Agr. Coll. 2, 1903, p. 22, f. 3.
Metcalf, Ling. Sci. Jour. 13, 1934, p. 401.

This species was originally reported from Japan and hitherto has not been known to occur in China. The following description is based upon specimens from Tienmushan, Chekiang, in the Heude Museum, Shanghai.

Dark fuscous. Easily recognized by the inverted V-shaped fascia beneath the body and the oblique fascia behind the middle of the costal margin. Head about as long as pronotum and scutellum united.

Body above long pilose. Head including eyes a little wider than the anterior margin of pronotum, more or less suddenly narrowed toward the front with the process pointed forward and upward. Crown longitudinally convex, uniformly dark fuscous, covered with long prostrated gray

hairs and with the apex shining smooth. Ocelli twice as far from each other as from the eyes. Eyes elliptical and slightly projected beyond the anterior margin of the pronotum.

Pronotum longitudinally convex, wider than long, a little produced between the eyes, and concave behind. Antero-lateral margins slightly convex; the postero-lateral ones slightly concave. Disc uniformly dark fuscous, punctate and pilose with two slightly curved and oblique slender elongate spots on each of the antero-lateral areas. Scutellum punctate and pilose, dark fuscous with the apex ochraceous. Abdomen above reddish ochraceous.

Tegmina dark fuscous, thickly setigerous, and with a broad ochraceous oblique fascia behind the middle, two transverse but less distinct ones about the middle of the claval area (the posterior one shorter). Apex pointed; costal margin strongly convex; posterior margin straight after the basal third of the clavus. Wings hyaline, yellowish, and with the venation ochraceous.

Body beneath paler and less pilose. A bright yellow inverted V-shaped fascia extending backward from the apex of the face to the mesopleura. Face fairly convex with the lateral areas faintly obliquely striated. Clypeus, legs, rostrum, pro- and mesosternum, and abdomen beneath pale testaceous. Apical segment of rostrum and the anterior four tarsi darker. Metasternum, metacoxae, lateral and transverse segmental margins of abdomen beneath reddish ochraceous. Rostrum passing intermediate coxae. Posterior tibia with two prominent spines of unequal size.

Genital plates contiguous, abruptly narrowed and curved back in a hook-form at the apices. Anal style long, penultimate segment shorter than the preceding one.

Body length 11.5 mm; pronotum width 2.5 mm.

Tegmina expansion 7 mm; tegmina width $2\frac{3}{4}$ mm.

Twelve specimens (6 ♂, 6 ♀) from Tienmushan.

The two transverse fasciae on the claval area are more often missing, or very obscure; and when present, they are distinctly formed by different spots.

2. *Philagra fusiformis* Walker

Walker, List Hom. Suppl., 1858, p. 47 (Cyrene).

Dist., F. B. I. R. 4, 1908, p. 108, f. 83.

Metcalf, Ling. Sci. Jour. 1934, p. 402, f. 23, 34, 41, 118, 123.

This species was reported by Distant to occur in "North China" which was used ordinarily in a much broader sense than it is today. Schmidt's record is Canton and that of Metcalf, Mungpha. The two male specimens the present writer examined are from Hoabinh, Tonkin. The following description is from Distant's *Rhynchota*:

Body and legs ochraceous; head, pronotum, and scutellum thickly shortly palely pilose; abdomen shining ochraceous; tegmina ochraceous with pale irregular scattered fuscous markings; wings subhyaline with a pale ochraceous tint; head above strongly tricarinate, about half as long again as pronotum,

its apex slightly upwardly curved; face strongly centrally carinate, its posterior area transversely striate; rostrum almost reaching the posterior coxae.

Var. Darker and more brownish ochraceous in hue, the fuscous markings to the tegmina darker and more numerous.

Body length 10-14 mm; tegmina expansion 18-27 mm.

Hab. Sikkim, Assam, Burma, N. China.

Tonkin is a new record of distribution for this species. In these specimens, the general color is clayish and the apical half of the scutellum is distinctly ochraceous.

3. *Philagra grahami* M. and H.

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 403, figs. 30, 37, 53.

The present writer has not seen any specimen of this species. The following is the original description of its authors as it appears in the Lingnan Science Journal:

In general coloration and markings of the tegmina, the species resembles *P. albinotata* very closely; but it is somewhat larger, lacks the pale lateral vittae on the face and propleurae. The cephalic process is more elongate and less erect.

The cephalic process as long as the pronotum and scutellum combined, conspicuously constricted in front of the eyes, median carina wanting; lateral carinae inconspicuous; antennal ledge conspicuous; ocelli separated from each other by one and a half times their distance from the eyes; face flat, median carina wanting, lateral ridges inconspicuous. Pronotum broad and flat, with a distinct groove on the median line; anterior margins rather long, about one-third as long as the posterior laterals which are broadly sinuate; posterior margin shallowly incised; scutellum broad and short. Tegmina elongate; venation conspicuous. Legs short and stout; hind tibia rather elongate, with the 2 lateral spines conspicuous.

General color testaceous-brown; the disc of crown, antero-lateral margins of pronotum, disc of scutellum, irregular markings on the tegmina, anterior and intermediate legs, largely pitchy brown or pitchy black. Tegmina with a conspicuous fasciate yellow spot on the costal margin, and irregular yellow spots on the middle of the claval suture and near the apex of the clavus. The apex of the scutellum is marked with a conspicuous yellow spot. There is a dull yellow spot between the eyes and ocelli and the pronotal foveae are dull yellow also. The cephalic process dorsally and the face are reddish testaceous.

Length from the apex of cephalic process to the apex of tegmina 4.5 mm.

Holotype: female, Yao Gi, China.

Paratype: female, Vrianatong, Tibet.

4. *Philagra major* M. and H.

Metc. and Hort., Ling. Sci. Jour., 1934, p. 404, figs. 27, 38, 57, 108, 113.

This species was described from male specimen collected in Tibet. The following is the authors' original description:

This species bears a general resemblance to *P. fusciformis* Walker but the cephalic process is more robust and more curved. The median dorsal carina runs only to the base of the tylus and its genitalia are distinctly different.

Cephalic process broad and stout, median carina and lateral carinae conspicuous, extending from the apex of the cephalic process to the base of the

tylus; antennal ledge elongate, not especially conspicuous; face with a conspicuous pereurrent median carina, lateral ridges not conspicuous. Pronotum broad and flat, whole surface very minutely and inconspicuously punctate, with a few coarse punctures, especially on the posterior field; anterior margin broadly curved; antero-lateral margin about a fourth as long as postero-lateral which are shallowly sinuate; posterior margin shallowly incised. Scutellum half as long as the pronotum. Tegmina coarsely punctate, venation obscure. Legs rather slender, tibial spines stout.

General color clay yellow, marbled with fuscous, especially on the tegmina. The apex of the scutellum is bright yellow and the apex of the cephalic process yellowish. The apical segment of the beak, anterior and intermediate tarsi, and spines on the posterior tibiae and tarsi are blackish fuscous.

Length to apex of tegmina: male 19-20 mm; female 23-25 mm.

Holotype: male, Vrianatong, Tibet.

5. *Philagra memoranta* sp. n.

Dark castaneous. Cephalic process non-carinate, curved upwardly, glabrous on apical third, and almost as long as pronotum and scutellum united; ocelli nearer to eyes than to each other; pronotum rugose, convexly rounded in front, sulcate behind, with a distinct longitudinal sulcation and six foveae (four elongate and two circular) on the anterior region which is much darker near the sulcation; scutellum acutely triangular, transversely wrinkled, and black with the lateral margins narrowly castaneous and the apex ochraceous. Head and pronotum pilose.

Tegmina pale castaneous with a bright oblique ochraceous fascia just a little after the middle and two paler but distinct spots on the claval area (one after the middle and the other near the apex). The region around the oblique fascia piceous. Costal margin strongly convex, inner margin straight, apex pointed. Wings brownish hyaline. Abdomen above ochraceous with the central region orange.

Body beneath with an inverted V-shaped fascia extending backward from the apex of face to the mesopleura. Face and thorax castaneous. Rostrum castaneous with the apical segment piceous, and reaching the intermediate coxae. The anterior four legs and the posterior femora pale castaneous. Posterior tibiae and tarsi paler. Posterior tibia with two stout spines. Metasternum and metacoxae ochraceous.

Holotype.—Male, body length (excluding tegmen) 7 mm; tegmina expansion 14 mm.

Hab.—Omei Mt., Kingfu Mt., Tsingchen Mt. (Szechuan); Taiping (Anhwei).

This species is close to Uhler's *albinotata* but can be easily separated therefrom by the presence of a sulcation on the pronotum, the different markings on the tegmina, and the absence of stripes in front of ocelli.

6. *Philagra quadrimaculata* Schmidt

Schmidt, Arch. f. Naturg., 85, A(7), 1919, p. 125.

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 402, figs. 29, 35, 40, 107, 112.

Female: Tegmina brown with brown veins; on each of the tegmina there are 2 yellowish white spots which are surrounded by dark brown; the smaller

spot is located on the middle of the claval suture and extends through the first cell to the first longitudinal vein in clavus and to media in corium; the second spot is located on the costal margin and extends in the corium slightly obliquely toward the apex until reaching the Radius 2; within these spots the veins are yellowish white; apical part darkened. Wings hyaline, transparent in basal third, with the base and the venation ochraceous; the apical part slightly smoky with the veins smoky brown. Abdomen, meso- and metathorax, and legs ochraceous; meso- and metatarsi and the last metatarsal(?) segment piceous brown; thorax and the anterior four legs slightly brownish; scutellum, pronotum, and head brown; cephalic process pitchy brown. Eyes spotted with gray and brown; ocelli shining with yellow outline. Antennae yellowish brown with the arista darker.

Tegmina 3 times as long as wide at the widest point, widest in the middle, convex with strongly arched costal margin, and more slender than Walker's *fusiformis*. Wing with its form and structure typical. Head with the process longer than abdomen. Cephalic process pointed forward and upward, abruptly rounded at the apex which is lightly depressed, with the dorsal lateral margins convergent for the basal half and then parallel to the apex.

Pronotum one and a half as long as the scutellum with lateral transverse foveae behind the anterior margin and a longitudinal sulcation in the middle (the sulcation obsolete both behind and in front). Rostrum with the apical segment longer than the basal one. Posterior tibia with 2 strong spines.

Body length from the apex of the head to the apex of abdomen 13 mm, head with the process 5 mm, abdomen 4 mm. Tegmina expansion 21 mm, tegmen 9 mm with its greatest width 3 mm.

China. Tscha-jiu-san. Male unknown.

This is a translation from the original description, which is in German. There are four specimens from Tienmushan in the Heude Museum, Shanghai. In these specimens, the form of the genital plates is the same as that in *albinotata* but the penultimate segment equals the preceding one in length. Tienmushan is a new record for this species.

7. *Philagra recta* Jacobi

Jacobi, Archiv f. Naturg., 87, A(12), 1921, p. 31.

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 403, figs. 25, 26, 59, 109, 114.

This species evidently enjoys a wide distribution in China. Originally it was described from specimens obtained in Kiauchow (Shantung). Later its occurrence in Yunnan was reported by Metcalf and Horton while the large number of specimens the present writer examined are from Tienmushan (Chekiang). The following is a translation of the original German description:

Castaneous brown to pitchy brown and covered with golden hairs. Tegmina yellow with scattered black spots which form an oblique fascia and 2 convergent ones after the middle. Lateral margins of head and pronotum yellow.

Cephalic process a little longer than pronotum, truncate, broad, and a little curved; carina hardly distinguishable and entirely absent on the face. Tegmina as described for *insularis*.

Length 12 mm. Hab. China, Kiautschou.

In those specimens from Tienmushan, which is a new record for this species, the lateral margins of head and pronotum, as a rule, are of uniform color with the disc. Tegmina also vary in shade but the apical third of the costal margin always darker than the rest. For *insularis*, see the end of this paper.

8. *Philagra semivittata* Melichar

Melichar, Verh. Zool. Bot. Ges. Wien, 69, 1915, p. 5.

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 402, figs. 13, 24, 44, 116, 121.

The present writer has not seen any specimen of this species. The following is a translation of the original German description:

Yellowish brown, thickly finely punctate, and covered with fine golden hairs which become pitchy brown on the slightly upwardly curved cephalic process. Body beneath with an inverted V-shaped slender fascia extending backward from the apex of the face to the thorax. Tegmina with a slender oblique white fascia which extends from the costal margin after middle to the corium. Body beneath and legs yellowish brown. Posterior tibia with 2 spines.

Body length 10 mm.

Central Asia, Szechuan, Linanfu, Chodsigoy 6000 ft.

9. *Philagra subrecta* Jacobi

Jacobi, Arch. f. Naturg., 87, A(12), 1921, p. 30.

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 400, figs. 22, 33.

This species was originally described from specimens collected in Formosa. Metcalf and Horton first reported its occurrence in Muping (Szechuan). The following is a translation of the original German description:

Leathery brown with brighter marbling and the same marking as the preceding species (i.e. *P. insularis* from Formosa).

Head with the cephalic process one and a half times as long as pronotum, feebly pointed upward but hardly curved, convex both above and below, truncated at the apex, and finely transversely striated on the dorsal surface; the dorsal lateral carinae of this process hardly distinguishable, the lateral margins (namely, before the sharp margins of the "Jochstücke") likewise weak. Face non-carinate. Tibia hardly longer than the intermediate coxae. Tegmina with the form as in *P. insularis*.

Body length 11-12 mm.

Formosa, from various localities.

var. *unipuncta*, var. n.

Differs from the typical form by the presence of a spot just before the scutellum, a character constant in the specimens examined. Scutellum with its apex ochraceous. The cephalic process can hardly be considered as longer than pronotum and scutellum united.

Seven females from Anhwei (Kihua Mt. six, Taiping one).

10. *Philagra tongoides* Kirkaldy

Kirkaldy, Ann. Soc. Ent. Belg. 53, 1909, p. 183.

The present writer has not seen any specimen of this species. The following is the original description:

Male: Yellowish-brown, suffused more or less with reddish. Tegmina yellowish brown, veins tinged with reddish. Vertex very distinctly longer than its width including eyes; nearly twice as long as the pronotum, rapidly narrowing acuminate to the apex which is a little rounded; the three dorsal keels do not reach nearly as far as the eyes.

Vertex subascendant curved in the profile, at about 45°; the lateral keel proceeds from the eye for about one-third of the length of the head, is then interrupted by the oblique striae of the face, continuing after a little to the apex; middle keel of the frons subobsolete on the basal half, then narrowing rapidly. Pronotum anteriorly gently rounded. Tegmina very closely and minutely punctured, distinctly more arched costally than in *fusiformis* or *parva*.

Length about 16 mm to apex of abdomen; length of vertex about 5 mm; expanse of tegmina 33 mm.

Hab.: Tali, Yunnan (Montandon type in my collection).

11. *Philagra vittata* Metcalf and Horton

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 405, figs. 31, 32, 52, 115, 120.

This species appears to be near *tongoides* Kirkaldy in the arrangement of the carinae of the cephalic process. It differs in being much smaller, differently colored, and in having tegmina with costal margin not arched.

Cephalic process rather broad at base, tapering gradually to a rather narrow apex; dorsal surface with a distinct median carina which fades out before the anterior margin of the eyes; lateral margins with distinct carinae which are continuous with the antennal ledges; face with an evident median carina which extends from the apex of the cephalic process and fades out about the anterior margin of the antennal ledges. Tegmina narrow and elongate; costal margin not arched; apical margin broadly rounded; venation indistinct, whole surface with numerous setigerous small punctures.

General color ferruginous, brighter at the apex of the cephalic process and at the apex of the tegmina. Marked with blackish fuscous as follows: dorsal and lateral carinae of the cephalic process; the median area of the face ventrally; the eyes; 2 indefinite fasciae across the tegmina, more conspicuous on the costal margin and enclosing a yellowish fascia, which extends from the costal to the claval margin. A pair of conspicuous yellowish vittae on the lateral margins of the face, confluent on the cephalic process, where they shade to bright ferruginous. Stern, beak, spines on the legs and claws blackish fuscous; the anterior and intermediate legs ferruginous; abdomen and posterior legs testaceous yellow.

Length male to apex of tegmina 9.5 mm, female 11.5 mm.

Holotype: male, China without definite locality.

Allotype: female, China without definite locality.

12. *Philagra insularis* Jacobi

Jacobi, Arch. f. Naturg. 87, A(12), 1921, p. 30.

This species has not been known to occur in China. But as it is frequently referred to in the present paper and since there is a possibility that it might occur in China, its original German description is translated and given here.

Pitchy brown to pitchy black, covered with yellowish-gray hairs, and with a reddish brown fascia on the side of the cephalic process. The carinae both in front and behind the eyes and the apex of the scutellum ochraceous. Tegmina with numerous grayish yellow spots which form several indistinct transverse and oblique fasciae. Wings dark grayish brown. Metasternum, sides, and posterior segmental margins of abdomen occasionally ochraceous.

Cephalic process more than twice as long as the pronotum and upwardly curved as in *P. parva*, truncate at the apex; lateral carinae very small, the dorsal pair hardly distinct, median carina absent both ventrally and dorsally; face convex, glabrous, and indistinctly transversely striated. Tibiae hardly longer than the intermediate coxae.

Costal margin strongly convex. Tegmina with the apex obtusely pointed and the apical part behind the claval apex equally keel-like narrowed.

Length: 18-19 mm.

Hab.: Formosa, Fuhosho, Koshun.

ON A NEW GENUS OF CERCOPIDAE FROM HUPEH

By GAINES KAN-CHIH LIU

National Tea Station, Meitan, Kweichow.

Among the Cercopids collected in Wuchang, Hupeh, by the writer when he was on the Parker Fellowship from Harvard University, U. S. A., in 1932, there are three males and five females which cannot be placed in any of the known genera. They are evidently allied to Distant's *Sounama* (F. B. I. R. IV, p. 205) and Metcalf and Horton's *Lepyropsis* (Ling. Sci. Jour. 1934, p. 416) by having the vertex alone carinated. On the other hand, they are slender and elongate; the general shape is unlike *Lepyronia*. The head is not narrower than the pronotum and the antennal ledge is sulcate. Furthermore, the general shape of the front is also different from the figure (Fig. 4) as given by Metcalf and Horton for their genus. Thus they cannot be classified with *Lepyropsis*. From *Sounama* they are different in having two spines on the posterior tibia, ocelli about equidistant, and the posterior margin of the pronotum deeply sulcate. In 1939, the writer also noticed five specimens, one male and four females, in the Heude Museum, Shanghai, which were collected from Chusan, Chekiang.

Eusounama, gen. n.

Genotype.—*Eusounama wuchangia*

Small, slender, elongate, rather thickly hirsute and punctate Cercopid with only the vertex sharply and longitudinally carinate in the middle for the whole length and with the pronotum deeply and longitudinally sulcate for the anterior half on the disc and deeply and obtuso-angularly sulcate on the posterior margin.

Head including eyes as broad as, or broader than, pronotum. Crown obtusely rounded in front (more angulate in the female) and more than half as long as pronotum. Ocelli about equidistant. Scutellum produced anteriorly in the middle. Tegmina nearly parallel and obtusely rounded at the apex; costal margin slightly sinuate before middle. Antennal ledge sulcate. Front moderately convex, broadly sulcate longitudinally on the middle, but not striate on the lateral areas. Rostrum short, not reaching the mesocoxae. Posterior tibia provided with two spines. Venation not prominent.

Eusounama wuchangia, sp. n.

In addition to the generic characters given above, the following specific ones may be mentioned. Crown dark brown, setigerous, margined in front, and rather depressed on the lateral areas. Pronotum with the region around the sulcation paler and with two broad depressions on each

side; antero-lateral margins very short and nearly parallel; postero-lateral ones slightly sinuate. The disc is slightly convex. Scutellum concolorous with the pronotum (in female, there is a broad darker stripe extending from pronotum to scutellum). Tegmina with two large luteous spots; one on the apical region and the other in the middle on the costal side. Veins rather obsolete, yellow but sometimes fuscous both apically and basally (in female the veins are more prominent). Inner margin fuscous. Wings hyaline with yellow veins.

Body beneath ochraceous with the mesosternum, the tarsi and the claws black. Front black at the base and provided with faint brownish oblique stripes on the lateral areas. Abdomen above ochraceous with a large black spot on the basal central region. Genitalia in male with the genital plates turning upward and backward.

Body length to the tip of tegmina 6 mm. Tegmina expansion 10 mm.

Holotype: male from Wuchang, Hupeh, in the author's collection.

Paratypes: males and females from the same locality. Other record: Chusan, Chekiang.

This species rather resembles *Sounama imprimis* Distant (F. B. I. R. IV, p. 206). But the proportion of the length of pronotum to its width makes this Chinese species a distinct genus. In those Chusan specimens, the black spot on abdomen above is absent.

BIOLOGICAL NOTES ON THE LONG-LEGGED GENERA OF CERCOPIDAE WITH DESCRIPTION OF A NEW SPECIES

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The long-legged genera of the Cercopidae include *Caloscirta*, *Abidama*, *Rhinastria*, and *Callitettix*. They all belong to the subfamily *Cercopinae* and are characterized by having the anterior legs elongate with their femora extending far beyond the lateral margins of the body. These four genera may be distinguished by the following table:

Key to the Genera

1. Anterior femora distinctly longer than the middle ones.....2
Anterior femora about as long as the median ones.....*Caloscirta*
2. Head in the male strongly produced anteriorly into a point before the eyes.
.....*Abidama*
- Head not produced into a point.....3
3. Front elongate, compressed, and about twice as long as wide; tegmina moderately broad with the costal margins convex on the basal third and narrowed toward the apex; the apical region of the tegmina reticulate.....*Rhinastria*
- Front fairly prominent but less than twice as long as wide, tegmina elongate, oblong, and slightly dilated toward the apex.....*Callitettix*

Except the Ceylonese *Rhinastria*, which hitherto has not been known to occur in China, the remaining three all have been reported from the Chinese territory.

1. *Caloscirta basi-rubra* Kato

Kato, Illustr. Ins. fasc. IV, pl. 46, fig. 3.

This genus has not been known to occur in China before. Although the writer has not been able to locate the original description, judging from the colored figure, the large number of specimens from Kwangsi and Chekiang examined appear to be Kato's *C. basi-rubra*. The following description is based upon materials from Kwangsi collected by the writer himself when he was on the Parker Fellowship from Harvard University, in 1933.

Head including eyes only a little narrower than the thorax. Eyes prominent, globular, and extending beyond the anterior angles of the pronotum. Vertex almost as long as broad, rounded in front, distinctly margined both anteriorly and posteriorly, depressed laterally, and with a distinct longitudinal median carina on the disc. Ocelli separated only by the median carina. Face visible from above.

Pronotum convex with the anterior and the posterior margin straight and the antero-lateral margin distinctly ridged. Scutellum roundly de-

pressed. Tegmina leathery, thickly punctate, elongate, and with venation rather indistinct, especially on the apical region. Front very globose and shining. Rostrum about reaching the mesocoxae. Mesosternum long and shining. Anterior and intermediate femora subequal. Posterior tibia with two prominent spines of equal size.

Vertex yellowish-red with the lateral areas between the eyes piceous. Pronotum piceous with the posterior two-thirds punctate and transversely wrinkled; the anterior third pilose and more or less smooth. Scutellum piceous, pilose, and transversely wrinkled.

Tegmina pale piceous with the basal region suffused with red, coarsely, thickly and setigerous punctate. The form is elongate, almost parallel with the costal margin slightly sinuate near the base. The apex is broadly rounded. Wings rather thickly pilose and dull hyaline. Abdomen above pale piceous with the base reddish.

Antennae black. Front yellowish-red with the lateral areas faintly striped with oblique bands. Pro- and mesosternum and the pleural pieces black. Mesosternum shining. Metasternum ochraceous. Anterior and intermediate legs (except the basal half of femora) piceous. Posterior legs and the basal half of the anterior and intermediate femora ochraceous. Abdomen beneath black with two longitudinal stripes, one on each of the lateral marginal areas.

Length to the tip of tegmina 5 mm.

Hab.—Pinglo, Kweiling.

Caloscarta basi-rubra tienmu, var. n.

Differing from the typical form in having abdomen beneath entirely black, posterior legs piceous with femora ochraceous, and the face not laterally striped with oblique bands. A large number of specimens, both males and females, from Tienmushan, Chekiang, in the Heude Museum, Shanghai.

It may be mentioned that these Chinese insects differ from Breddin's definition of *Caloscarta* on the following points: antennae with the first joint not longer than the second one, face not centrally carinate, anterior femora not widened, and the costal margin of tegmina not concavely rounded near the base.

Callitettix Stål

Stål, Öfv. Vet.-Ak. Förh., 1865, p. 152.

Members of this genus can be easily recognized by the slender elongate form, the unusual length of the anterior pair of legs, and the non-prolongation of the head in front. They are essentially Asiatic but, out of the seven species, only two have been reported from China. These two may be separated from the following table:

Key to the Chinese Species

Tegmina pale orange with the apical third black; insects living on bamboo...	<i>braconoides</i>
Tegmina black, ordinarily with six colored spots; insects living on paddy...	<i>versicolor</i>

2. *Callitettix braconoides* Walker

Walker, List Hom. Suppl. 1858, p. 185.

Distant, Fauna Brit. India Rhyn. IV, 1908, p. 111, fig. 85.

Pale brown, elongate, and of a fairly large size. Head, pronotum and scutellum pale sanguineous. Head declivous, longer than broad, more or less narrowed anteriorly, wider than the base of scutellum, and prominently margined behind. Vertex impressed transversely behind the tylus and longitudinally between the ocellus and the eye, the antero-lateral margins raised and convex. Ocelli nearer to each other than to the eyes which are fairly prominent and maculate.

Pronotum pale sanguineous, setigerous, hexagonal and sloping, with the antero-lateral margin long and straight, the postero-lateral ones slightly sinuate, and the posterior margin concave. The disc is bifoveate on the anterior half; the foveation is somewhat V-shaped and with the apex directed toward the center. Scutellum pale sanguineous, setigerous, and prominently foveate behind the base. Abdomen above reddish.

Tegmina pale orange with the apical reticulate area black; the color of the region just before the black area is much deeper.

Body beneath pale orange. Face compressed and transversely striated laterally (the lateral areas, however, are more or less convex) and suddenly bent downward beyond middle toward the clypeus. The median carination from the base to the point of turning is shining but not very distinctly separated from the surface. Rostrum reaching the middle coxae. Legs pale orange with apical two-thirds of anterior femora (only on the dorsal surface), the apices of the posterior four femora, the apical two-thirds of the anterior four tibiae, the apical third of the posterior tibiae, and all the tarsi black. The ventral plates of the male genitalia also black.

Body length including tegmina 12 mm. Tegmen length 10 mm. Tegmen width 3 mm.

Redescribed from materials in the Heude Museum.

Hab.—Sikkim, Burma (Distant); China (Jacobi); Hoa-binh, Tonkin, Meitan, Kweichow (Liu).

3. *Callitettix versicolor* Fab.

Fabricius, Ent. Syst. IV, 1794, p. 50.

Distant, Fauna Brit. India Rhyn. IV, 1908, p. 113, fig. 86.

This species was reported by Distant from Kashmir, Assam, India, Burma, Malay Peninsula, and China; and by Metcalf from Szechuan and Canton. The present writer has specimens from Chungking and Kingfooshan in Szechuan, Ichang in Hupeh, Taiping and Wuyuan in Anhwei, Tienmushan in Chekiang, Meitan in Kweichow, Hoa Binh and Laos in Indochina. The insects are fairly common in paddy fields, especially in Chungking. The following is the description given by Distant:

Shining black, finely fuscously pubescent; tegmina with a spot before the middle of the clavus, and a subtransverse spot between the middle of upper claval margin and the costal margin, white; two spots beyond the middle of

tegmen, the external large and transverse, the internal small, and the apex of clavus, sanguineous; wings dull hyaline, the veins and apical margin infuscated. Abdomen above black.

var. a—Basal spots to tegmina luteus, not white.

var. b—Basal spots to tegmina obliterated, sanguineous apical spots present.

var. c—Basal white spots to tegmina very small, only one sanguineous apical spot (*approximans* Walker).

var. d—All the spots present but luteous, none sanguineous.

Body length 9 mm. Tegmina expansion 20–22 mm.

Abidama Distant

Distant, Fauna Brit. India Rhyn. IV, 1908, p. 114.

This genus is very close to *Callitettix* but can be easily separated by the anterior prolongation of the head. The three Chinese species can be separated from the following key.

Key to the Chinese Species

1. Tegmina with six discal spots; head, pronotum, and scutellum shining black; legs with the anterior four dark castaneous, the posterior two ochraceous. *sexmaculata*
Tegmina without any discal spots. 2
2. Tegmina testaceous with the basal part of the costal margin bright red; anterior four legs black; scutellum uniformly black. *rufescens*
Tegmina sanguineous with the apical part black; scutellum with the apex red; legs sanguineous. *rufula*

4. *Abidama rufescens* Metcalf and Horton

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 376.

The following is the authors' original description of this species:

This species resembles *A. rufula* Distant in the narrowed produced crown, but is somewhat larger, with the tegmina nearly uniformly colored and the genitalia entirely different.

General color piceous black. Head, pronotum, scutellum, anterior and intermediate legs black. Tegmina and posterior legs rufotestaceous, with the costal margin basad bright red. Basal segment of abdomen of the male, especially dorsad; metapleura; metasternum, and the hind coxae, bright red.

Head as broad as the anterior margin of the pronotum. Crown in male broad, suddenly constricted in front of the eyes and then produced. Ocelli much nearer to each other than to the eyes; crown in female broad and short, obtusely triangular in front of the eyes; face in male not inflated, distinctly carinated, face in female inflated. Pronotum elongate, flattened, about half again as wide as long; anterior margin broadly curved; posterior margin nearly parallel to the anterior margin and about the same width; anterior-lateral margin straight, about one and a half times as long as the postero-lateral; the postero-lateral slightly sinuate.

Scutellum large, about half as long as pronotum. Tegmina elongate, nearly parallel-sided; costal margin reflexed; venation indistinct; the first discal cell short, only about half as long as the second. Posterior tibia with a single stout spine on the apical third.

Hab.—Yunnanfu, Suifu, Kiating, Hongya.

The present writer has a single male specimen from Kingfooshan, Szechuan, but in this specimen the face is not carinated and the venation is rather distinct.

5. *Abidama rufula* Distant

Distant, Fauna Brit. India, Rhyn. IV, 1908, p. 114.

Metcalf and Horton, Ling. Sci. Jour., 1934, p. 376.

Sanguineous with head, pronotum, scutellum and the apical region of tegmina black.

Head prominently margined behind, narrowed toward the front, longer than broad, and including eyes, wider than the base of scutellum. Vertex impressed both transversely behind the tylus and longitudinally on both sides of the ocelli. The longitudinal impression curved inward. Antero-lateral margin raised and rounded. Ocelli shining greenish yellow and nearer to each other than to the eyes. Frons conical, pointed downward, and about as long as the vertex.

Pronotum black, gray pubescent, declivous in front, and sloping laterally; antero-lateral margin long, straight, and ridged for the anterior two-thirds; postero-lateral straight; posterior margin slightly sinuate. Disc bifoveate laterally on the anterior half. Scutellum black with the apical part dark red (the red color cannot be detected unless against the light). Abdomen above sanguineous.

Tegmina sanguineous (sometimes piceous red) with the apical reticulate region black. Wings hyaline with the base and the basal part of the venation bright red.

Body beneath sanguineous with the anterior part dark castaneous. Head beneath, pro- and mesosternum dark castaneous or black. Face compressed with the central longitudinal area shining and extending backward behind the anterior coxae. Rostrum sanguineous and reaching between the intermediate coxae. Legs sanguineous with the tarsi paler (sometimes not). Apices of tibiae black. Anterior femora longer than the intermediate one. Posterior tibia with a prominent spine.

Body length to the tip of tegmina 8 mm. Pronotal width 2 mm. Tegmen width 2 mm. Tegmen length 7 mm.

Habitat.—Bengal and Burma (Distant); Suifu, Szechuan (Metcalf and Horton); Hoa Binh, Tonkin (Liu).

The above description is based upon males from Tonkin.

6. *Abidama sexmaculata* sp. n.

Head, pronotum and scutellum black suffused with red. Tegmina paler with six ochraceous spots.

Head declivous, margined behind, narrowed toward the front, longer than broad, and including eyes, broader than the base of scutellum. Vertex black with the antero-lateral margins raised and more or less angulate, impressed both transversely behind the tylus and longitudinally on both sides of the ocelli. Eyes black. Ocelli shining greenish yellow and farther from the eyes than from each other. Antennae black. Tylus conical and longer than the vertex.

Pronotum black, convex, declivous in front, and sloping laterally. Antero-lateral margin long, straight, and ridged nearly for the whole length. Posterior margin slightly curved. Disc bifoveate laterally on the anterior half and with two small pimples between the lateral foveations. Scutellum black. Abdomen above sanguineous.

Tegmina somewhat dilated toward the apices, sinuate near base on the costal margin and sinuate about the middle on the inner margin; disc piceous black, each with three ochraceous spots about the same size, one apical and two basal. The apical one sometimes a little reddish. In addition to these three, there is a small, very faint one at the apex of the clavus. Wings hyaline with the base bright red. There is a triangular projection near base on the costal margin.

Body beneath sanguineous with the anterior part black or dark castaneous. Face pointed at base, compressed, smooth, flat, and shining on the disc, obliquely striated on the lateral surface, constricted behind the middle, and reaching between the anterior coxae. Rostrum reddish with the apical part piceous except the apex which is red and reaching the intermediate coxae.

Pro- and mesosternum and the anterior four legs black or dark castaneous. Metasternum and posterior legs reddish ochraceous. Posterior legs with the apices of tibiae and tarsi piceous and with one spine on the tibia. Anterior femora longer than the middle ones.

Abdomen beneath sanguineous. Genitalia more or less paler. Genital plate piceous for the apical half. The genitalia appears to be closer to that of *rufescens*. The aedeagus looping down below the plates, which are contiguous near the apices. The genital style projecting far above the genital plates.

Body length excluding tegmina 6 mm. Pronotal width 2 mm. Tegmen length 6 mm. Tegmen width 2.5 mm.

Holotype.—Male from Chüchow, Chekiang, in the Heude Museum, Shanghai.

These insects are fairly common in the neighborhood of the National Tea Station, Meitan, Kweichow. The writer collected a large number by sweeping the grass along the mountain stream. Their markings are very similar to those of *Callitettix versicolor* but can be readily separated by the pointed head, which is produced long before the eyes. The Kweichow specimens are duller and paler.

ON A NEW LEPYRONIA FROM CHINA

By GAINES KAN-CHIH LIU

National Tea Station, Meitan, Kweichow.

Lepyronia is one of the cosmopolitan genera in the family Cercopidae (Homoptera) with about twenty species known at present. The large number of specimens in my collection, all belonging to one species, appear to be new to science and may be described as follows:

Lepyronia bifasciata sp. n.

Pale brownish to reddish, pilose, decorated above with two oblique, transverse, and fuscous fasciae on the apical region of the tegmen (the outer and smaller one curved toward the margin). Body form dilated behind.

Head and pronotum non-carinate. Head, including eyes, as broad as, or a little broader than, the posterior angles of the pronotum. Crown reddish, pilose, as long as pronotum, angularly rounded in front, and sometimes longitudinally sulcate in the middle on the basal half; ocelli closer to each other than to the eyes and located behind a line drawn across from the anterior margin of the eyes. Pronotum setigerous with the anterior third concolorous with the head and the rest much paler; disk with a median longitudinal sulcation on the anterior two-thirds and four transverse, laevigate (rather obscure) spots which are arranged in a row on the anterior third; antero-lateral margins short and nearly parallel, the postero-lateral ones slightly sinuate, and the posterior margin rather deeply angularly indented. Scutellum setigerous and concolorous with the posterior part of the pronotum.

Tegmina concolorous as the scutellum, or sometimes darker, with two fuscous transverse fasciae on the apical region; the inner one is broader and runs the whole length from the costal margin to the inner angle, the outer one much narrower and forming a semi-circle from the costal margin to the outer angle. The longitudinal veins between these fasciae are also more or less fuscous. Costal margin strongly convex; the inner margin oblique on both ends but straight in the middle. Wings hyaline with the venation fuscous. Abdomen above piceous, with the lateral margin, the posterior margin of each segment, the anal segment and its appendage more or less ochraceous.

Body beneath pilose, castaneous to piceous, with a large quadrate spot just beneath the antero-lateral margin of pronotum, an annulation on each of the intermediate and the posterior femora, the metasternum, and the metacoxa ochraceous or paler. Anterior femora darker than anterior tibiae (in castaneous specimens not so distinct). Posterior tibiae each with two very strong spines which are ochraceous but black at

apices. Abdomen beneath black with the genital segment paler; the posterior segmental margins and the lateral margins ochraceous.

Genital plates long, somewhat tongue-like, and projecting above the spindle-shaped anal process. Anal plates (the two lateral plates) wanting.

Length, excluding tegmina, 4-4.5 mm; including tegmina, 6 mm; tegmina expansion 10-11 mm.

Type.—Males from various localities.

Distribution.—Taiping, Kiuhua (Anhwei); Ihing (Kiangsu); Peiping.

The present species can be easily separated from *L. coleopterata* Linn., the only other member of this genus known to occur in China up to the present, by the following points: In the *coleopterata* the arrangement of the fuscous fasciae on the tegmina is not on the apical region but limited to the middle; the face is not flat but strongly convex and distinctly transversely furrowed (in *bifasciata* the transverse furrows are quite indistinct); the propleura under the antero-lateral margins of pronotum not maculate but piceous; the intermediate tibiae not annulate but uniformly colored. Furthermore the genital plates in *coleopterata* are more dilated on each of the external margins.

For ready consultation, especially for students in China, the German descriptions of the genus and the species *coleopterata*, as given by Melichar, are translated and included here.

Lepyronia Amyot and Serville

Vertex as long as the pronotum in the middle, more than half longer than the width between the eyes, antero-lateral margins non-sulcate, face convex. Ocelli almost the same distance from each other as from the eyes. Antennae each jointed in a deep furrow beneath the antero-lateral margin of the vertex before the eye, the basal two segments cylindrical, the third one globular. Tegmina strongly convex with hardly noticeable venation. Wings shorter, with three veins, which show much variation in their branching and anastomosing, reticulate in the apical region. The wing shows on the costal margin the characteristic membranous expansion of the family, which has three to five hook-like teeth. On the membranous expansion, there is a row of six to eight small tubercles. The apex of the wing fringed. Posterior tibiae strongly bispinose. Melichar, Cicad. M. Europa, 1898 (?), p. 117.

Melichar places great stress on the structure of the wings. The genus may be also recognized by its general form and the absence of carination on the head and the pronotum. Structurally it is very close to Stål's *Napotrepes*, which so far has only one known species, from Africa, but *Napotrepes* has the face longitudinally carinate and the tegmina oblong with feeble convexity, not oval as in *Lepyronia*. In his description of the antennae, Melichar states, "in einer Aushöhlung des zweiten Gliedes sitzend und in eine lange Borste auslaufend." The statement is not quite clear to me. There may be some typographical mistake.

Lepyronia coleopterata Linn.

Body above, in male, either bright yellow, brownish yellow, or grayish yellow. Tegmina with a blackish transverse fascia behind the middle and an

oblique one in the corium, the two meet on the costal margin. In female, the markings indistinct, more or less obscure. Body beneath and legs black with brighter spots.

Genital plates in male produced backward in tooth-like form, obliquely directed upward from the base, and with the outer margin produced into an obtuse angle which curves backward. Last abdominal segment straight behind. Anal plates wanting.

Last abdominal segment in female narrow, truncate behind, not covering the base of the ovipositor.

Length: male and female 6½-7 mm. Europe. Melichar, Cicad. M. Europa, 1898(?), p. 118, Taf. 4, figs. 40-42.

This species has been known to occur in Europe, America, and Japan. The large number of specimens in the Heude Museum, Shanghai, are from Chemo, Kiangsu. In these insects, true in both sexes, the posterior tibia is paler than the anterior four and the posterior coxa is ochraceous. But in the female the oblique fascia to the clavus is, in general, not so distinct as in the male.

var. *grossa* Uhler

There are three specimens of this variety, one male and two females, from Nanking in the Heude Museum. They differ from the typical form in being much darker and, in male, the genital plates are castaneous as is the rest except that the margins are paler.

NOTES AND DESCRIPTIONS OF EAST ASIAN LYGAEIDAE
(HEMIPTERA)

By ROBERT L. USINGER
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Two specimens of particular interest were encountered in a small collection of Lygaeids submitted for identification from the Lingnan Natural History Survey. The *Gastrodes* sheds additional light on the confused distributional picture of this conicolous genus in East Asia, while the *Clerada* is noteworthy because of recent interest in the haematophagous and frequently inquiline habits of this group.¹

Gastrodes japonicus (Stål)

A single specimen of this species is at hand, collected by F. K. To at Tai Kwong Village, Lam Mo District, Hunan Province, S. China, on July 21-22, 1934. In a previous paper² I recorded *japonicus* as restricted to Japan and identified a specimen in the Koebele collection at the United States National Museum from Hong Kong as "perfectly typical . . . *grossipes*." At the same time it was suggested that *grossipes* (Degeer) and *japonicus* (Stål) might run together although typical examples were strikingly distinct. The Hunan specimen here recorded is equally typical of *japonicus* and hence adds another bit of evidence toward the eventual solution of this problem.

Clerada hirsuta Usinger, n. sp.

A distinctly pubescent species with short head and stout antennae, clothed with erect fulvous hairs over the entire body.

Head scarcely broader than long, 23::21; smooth and impunctate or minutely, sinuately rugose above; anteocular portion at least twice as long as short, posteriorly rounded postocular portion; ocelli located laterally and nearly contiguous to eyes; eyes nearly half as long as entire head, 19::42, about five-sixths as wide as interocular space above, 14::17, and nearly three times as wide as interocular space beneath, 19::7; beset with scattered, short, erect bristles among the ommatidia. Antennae scarcely longer than distance from apex of head to apex of scutellum, 145::140; nearly as robust as tibiae; clothed with a fine, apically directed, short pubescence and with longer, more erect bristles on the first segment; first segment exceeding apex of head by less than half its length; propor-

¹ Lent, Herman. Sobre o hematofagismo da *Clerada apicicornis* e outros artropodos; sua importancia na transmissão da doença de Chagas. Mem. Inst. Oswaldo Cruz, 34: 583-606, 1939.

² Usinger, R. L. Review of the Genus *Gastrodes*. Proc. Calif. Acad. Sci., (4) 23: 289-301, 1938.

tion of segments one to four as 14:51:35:40. Rostrum attaining hind coxae, proportion of segments one to four as 28:29:56:27. Bucculae scarcely elevated and then only briefly about to level of antenniferous tubercles. Pronotum longer on median line than head, 48::42; less than twice as broad across humeral angles as long, 86::48; strongly depressed at anterior margin; broadly smooth and impunctate in region of callosities, laterally, on humeri, and even along posterior margin; coarsely, irregularly punctate near and just behind the middle at center and in sub-depressed areas sublaterally; lateral margins not at all carinate nor reflexed, the edges rounded and the sides nearly rectilinear except anteriorly and posteriorly. Scutellum scarcely broader than long, 48::45; disk quite flat, shallowly, irregularly punctate; sides slightly carinate, and apex feebly attenuated and acute. Hemelytra exceeding tip of abdomen and concealing connexiva; commissure of clavus one-third shorter than scutellum; clavus impunctate along outer third except for a single straight line of punctures; corium likewise impunctate between cubital vein and claval suture except for a single straight line of punctures; exterior to this with an impunctate area mesad to median fracture; costal margin abruptly deflected laterad to vein R+M on basal half and then briefly lamellately produced at extreme base; costal margins rounded at base, then inwardly sinuate to basal fourth beyond which they are evenly arcuate; apical margin of corium about one-twelfth shorter than length of claval suture. Under surface of thorax irregularly rugose rather than punctate, the abdomen clothed with long, scattered, erect hairs, especially posteriorly. Basal segment of posterior tarsi over half again as long as the following two segments together, 23::14.

Color fulvous brown, the head darker brown except apically, the posterior depressed and punctate half of pronotal disk, scutellum except apically, inner two-thirds of clavus except for narrow inner margin, and corium between branches of vein R+M and along apical margin laterad to this, darker brown. Eyes black, ocelli clear. Appendages somewhat paler, fulvo-testaceous. Under surface irregularly marked with fulvous and brown. Membrane whitish-hyaline basally, clear hyaline apically, immaculate. Length 7 mm.

Holotype, female, Dwa Bi, Hainan Island, July 21, 1935, J. L. Gressitt collector.

Runs to *setulosa* Horvath in Horvath's key³ but differs in its shorter, impunctate head, larger eyes, pale antennae and rostrum, pale membrane, broader pronotum anteriorly, and larger size.

³ Horvath, G. Species generis Lygaeidarum Clerada Sign. Ann. Mus. Nat. Hungarici, 7: 622-625, 1909.

A NEW SPECIES OF DRAGONFLY FROM HAINAN AND SOME NEW DISTRIBUTION RECORDS

By JAMES G. NEEDHAM

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Since publishing in this Journal, in 1931, a list of the forty species of Odonata then known from the island of Hainan, I have received from Prof. W. E. Hoffmann some further small collections among which I find one new species and several others that were not in the previous list.

Four well known species belonging to genera not hitherto reported from the island are:

1. *Ictinus rapax*; one female specimen from "near Nodda."
2. *Gomphus personatus*; a single male specimen from "Fan Ta Chuen Hung, Hainan, May 6th 1929." The specimen is more deeply pigmented than are others that I have from India (having only a vestige of the round spot that represents the upper end of the usual antehumeral pale stripe). In form of genitalia it seems to be identical with them.
3. *Paragomphus pardalinus* n. sp., described below.
4. *Rhinagrion* sp.?; a fragment of a teneral specimen, specifically undeterminable, but with a venation of the wings showing well enough for generic determination.

With this new material come also two male specimens of *Onychogomphus* (*Lamelligomphus*) *micans*, hitherto known from the Chinese mainland. I was at first inclined to consider them a distinct species because of slight color differences: both have the middorsal thoracic carina black and not yellow as in the typical mainland specimens and both had a yellow spot on each side (lateral face) of the postclypeus, but I could find no structural differences, and the two specimens were not quite in agreement with each other. One male from "Grove near Fooi In, northwest of Nodda, Hainan 26th VIII, 1929" had no vestige of the ante-humeral pale stripe on the synthorax; the other from "Lin Kao District, Hainan, July 28-29, 1932" had a minute round spot representing the upper end of that stripe.

Paragomphus pardalinus n. sp.

Length 54 mm; abdomen 39; hind wing 29.

This is a brightly colored black and yellow species, with conspicuous black crossbars on a yellow face. Labium all yellow. Labrum narrowly touched with black at the outer ends of the front margin, and with a black basal crossband that is much narrowed at both ends. Anteclypeus wholly yellow, and the postclypeus likewise, except for a black border along the concave portion of its front margin. Frons black with a pair of yellow oval spots covering about half of its upper surface. Vertex and occiput black with a touch of yellow in the middle of each.

Prothorax black above with a touch of yellow on each of the four corners of its disc. Synthorax black in front, with a very broad yellow crossband on the collar, that is divided in the middle line by the wholly black carina. A pair of elongate oval yellow spots divergent downward is not connected with the collar. The usual antehumeral pale stripe is represented only by a triangular yellow spot beneath the crest. Sides yellow, with a broad black band covering the second and third lateral sutures and most of the intervening space, but inclosing a small yellow spot near each end. This band is conjoined in front with the humeral black area both above and below; likewise in the rear with a marginal black line on the metepimeron.

Legs black, with a large yellow area on the outer side of all femora, and a narrower one on the outer face of the front tibiae. Wings subhyaline with brown veins and a very narrow yellowish line on the costa. Ante- and postnodals in fore wing 14-15 and 8-9, and in hind wing 11 and 9-10.

Abdomen black broadly marked with yellow as follows: segment 1 yellow middorsally and across the apical margin, and with a large spot of yellow covering the postero-lateral margin; 2 with an irregular mid-dorsal yellow line, a side spot similar to that on 1 but larger, a lesser spot covering only the upper side of the auricle; 3 to 6 with large basal half rings that are narrowly divided on the middorsal line by the black longitudinal carina. These dorsal bands are connected on 3 and 4 with yellow patches on the anterolateral margin of the sides. Segments 8 and 9 are black above, except for the very narrow intersegmental membranes, but broadly and diffusely yellow on the lower part of the sides and on the large leaf-like lateral expansions of these segments: these expansions are obscurely margined with blackish. Segment 10 is black with a yellow mid-dorsal spot. Appendages black, only a little paler basally and internally; of the form quite constant in this genus.

Described from a single fine male specimen from Han-ying-ts'nen, six miles southeast of Nodda, Lin Kao District, Hainan Island, South China, collected by Mr. F. K. To, "July 28-29, 1932."

This species is closely allied to *M. risi* Fraser from Burma, but it seems to differ in a considerable number of minor characters. It is larger. It lacks the black of the labium of that species, also the cross stripe on the vertex; also the lower vestige of an antehumeral pale stripe. It has fewer nodal crossveins, especially in the hind wing. It has much more yellow on the legs, all femora being broadly marked with that color.

THE LONGICORN BEETLES OF KWANGSI (COLEOPTERA: CERAMBYCIDAE)

By SHU-NAN CHIANG (蔣書楠)

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National University of Kwangsi.

The present work is primarily based upon a part of the collection deposited in the Entomological Laboratory, College of Agriculture, National University of Kwangsi. All these specimens were collected at Shatang, Liuchow (central Kwangsi), Wuchow (eastern Kwangsi), and Yao Shan, Pingnan Hsien (eastern Kwangsi), during 1934-1941. The last locality was the destination of an expedition sent by the University under the leadership of Prof. H. C. Tao in 1934. A part of the materials studied was collected by Prof. C. Y. Liu and Mr. T. T. Tsao at Jung Hsien, which is situated in the northern part of this province. This paper includes thirty-five known species scattered among twenty-six genera belonging to three subfamilies. For some species I have included notes on salient characters of recorded and unrecorded sexes. In addition to the foregoing, a new species is herewith described.

The writer is much indebted to Prof. C. Y. Liu of the Agricultural Experiment Station of Kwangsi for his suggestions in undertaking this study, constant encouragement throughout the course of work, and his kindness in putting his personal collection at his disposal. I wish to express my gratitude to Dr. M. T. Cheo, Dean of the College of Agriculture, National University of Kwangsi, and Professor of Entomology, for the privilege extended to me to make this study. Thanks are due to Mr. T. T. Tsao, Mr. T. K. Chang and to my wife for their kindness in supplying materials for study and to Mr. S. S. Li for the making of drawings.

Subfamily Prioninae Tribe Megopidini

1. *Megopis (Aegolipton) marginalis* Fabr., 1775.

Two males and one female were taken at Wuchow, one male was taken at Shatang, Liuchow, June 12, 1940, by N. H. Lee.

2. *Megopis sinicum* White, 1853.

A single specimen of female was taken at Chongon, Jung Hsien, July, 1939, by Prof. C. Y. Liu.

Tribe Prionini

3. *Paraphrus granulosus* Thomson, 1861.

Seven specimens were taken from light trap at Shatang, Liuchow, from Feb. 20 to June 5, 1940.

Subfamily Cerambycinae
Tribe Cerambycini

4. *Nadezhdiella aurea* Gressitt, 1937.

One male and two females were taken at Shatang, Liuchow, May 11, 1940, by F. S. Chang and S. N. Chiang.

The male has remained undescribed since Gressitt discovered this species. The antenna of the male is half again as long as the body, scape shorter than third, but subequal to fourth, and slightly shorter than fifth to tenth, the terminal segment twice as long as the tenth, slender and much flattened, fifth to tenth less flattened than those in female, sub-cylindrical and not prominently broadened ectoapically, the endoapical tooth extremely minute and only on fifth to eighth. Body length 55 mm; breadth 14 mm.

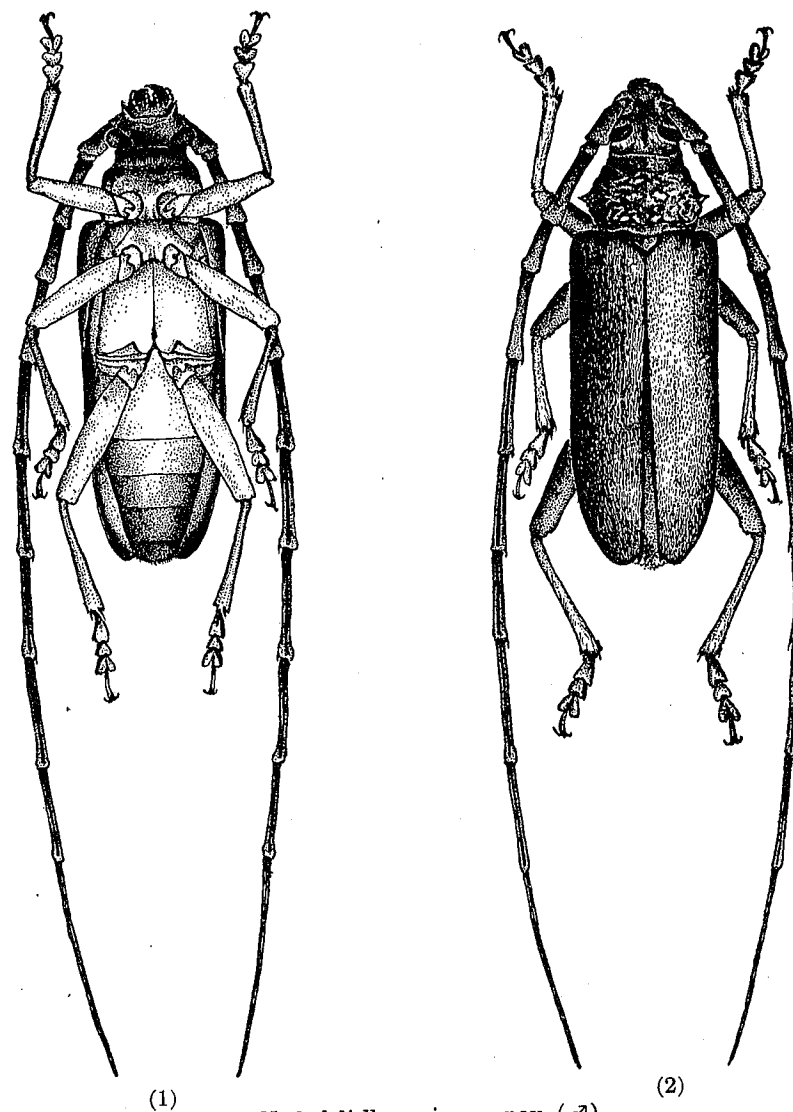
5. *Nadezhdiella cantori* (Hope), 1845.

Two females and two males were collected at Luoshiang Village, Yoa Shan, Pingnan Hsien, July 17, 1934.

6. *Nadezhdiella conica* Chiang, sp. nov. (Figs. 1, 2)

Male.—Body elongate, parallel, dark brown; light brown on underside of elytra, gradually deeper toward outer margins and reddish-brown at apical eighth; body entirely clothed with fine golden-brown pubescence, thinly on elytra and on antennal segments beyond fifth, but densely on antennal insertions and sulci, vertex, front margin of eye-lobes, depressions of pro-thoracic vermiculations, scutellum and ventral surface, especially on metasternum and hind coxae; with some long hairs on clypeus, labrum, anterior and posterior margins of prothorax below and pygidium.

Head deeply grooved on vertex, the groove broader at tip and pointed between antennal insertions; frons depressed, obliquely grooved along antennal insertions; eyes deeply emarginate, with upper lobes narrow, and lower lobes broadly triangular; genae subacute at tip; mandibles suddenly curved preapically, with a single tooth on the middle of cutting edge; antennae very long, twice as long as body, scape broad, three-fifths as long as the third segment, and subequal to fourth, third subequal to fifth, all sparsely punctulate and prominently swollen at tip, fifth and following segments increased in length, slightly swollen at apex, flattened and longitudinally sulcated above and below along external margin and hence with the edge sharpened, the last segment almost twice as long as the tenth, a minute tooth located endoapically on fifth to eighth; prothorax broader than long, slightly narrower anteriorly, swollen just behind front margin, lateral spine acute, with apex slightly recurved posteriorly, disk irregularly vermiculated, with four ante-median and two post-median tubercles in an arc leaving a post median lyre-shaped raised area; scutellum broader than long, angulate behind; elytra rounded apically with a fine spine at sutural angle; median process of mesothoracic sternum broadly concave but swollen at middle; meta-



(1) *Nadezhdiella conica* sp. nov. (♂)
Fig. 1. Ventral view. Fig. 2. Dorsal view. (Both natural size.)

thoracic sternum well-developed; abdomen conical, suddenly narrowed beyond the first segment, hence leaving the lateral part of underside of elytra visible; femora subparallel, tibia as long as femora, tarsi with first two segments combined subequal to the last. Length 62.5 mm; breadth 18 mm.

Holotype, male, in the Entomological Laboratory, College of Agriculture, National University of Kwangsi, collected at Luoshiang Village, Yao Shan, Pingnan Hsien, July 18, 1934, by Kwangsi University Expedition.

Differs from male of *N. aurea* Gressitt in having body slightly broader; antennae twice as long as the body instead of one and one-half, fifth and following segments more flattened and deeper sulcated; metasternum and abdomen forming a straight slope instead of slightly convex at middle; abdominal segments conical, suddenly narrowed beyond the first. The name of this species is derived from this character.

7. *Rhytidodera Bowringii* White, 1853.

A single specimen was taken at Wuchow,

Tribe Callichromini

8. *Embrik-Strandia bimaculata* (White), 1853.

One male was taken at Wuchow, and one male was taken at Onsui, Jung Hsien, Sept. 19, 1939, by T. T. Tsao.

9. *Embrik-Strandia unifasciata* (Ritsema), 1897.

One male was taken at Shatang, Liuchow, May 26, 1940, by T. C. Tsai.

Tribe Clytini

10. *Chlorophorus annularis* (Fabr.), 1787.

Two specimens were taken at Wuchow, May 27, 1935, one at Lou-shiang Village, Yao Shan, Pingnan Hsien, July 12, 1934, seven at Shatang, Liuchow, from April 26 to June 17, 1940, by Prof. C. Y. Liu from bamboo furniture, Mr. F. C. Chang, T. T. Hsu and the writer.

Tribe Stanaspini

11. *Euryphagus chinensis* Gressitt, 1939.

Seven females were collected at Shatang, Liuchow, on April 26, 1939, April 4, 24, and June 4, 1940, by F. S. Chang, T. T. Hsu, Miss P. C. Yang and the writer.

Color various from pale orange-red to bright red. Length 15-22 mm; breadth 5-7 mm.

Besides, a male specimen was collected at the same locality but without collecting date and collector. Whether it is the male of *E. chinensis* Gressitt or a new variety of this species is uncertain owing to the limited materials on hand.¹ It differs from the female of *E. chinensis* Gressitt in having the frons much broader (as broad as pronotum), with sides a little wider below than above, and dilated laterally downward, disk of frons glabrous, shallowly concave; gena with apex longer and hanging vertically instead of obliquely forward; mandibles long and slender, with apices bifurcate, and the apical teeth much slenderer, the two

¹ This form is undoubtedly the male of *E. chinensis*. [J. L. Gressitt].

mandibles embraced tip by tip forming a semicircle and leaving a crescent space between the mandibles and the labrum; ligula flat and wide; antennae one-seventh again as long as body, with second segment nearly black, only slightly reddish on the underside, antennal insertions more distant; elytra with sides more vertical, hence body somewhat narrow at second quarter. Length 21 mm; breadth 5.5 mm.

Subfamily Lamiinae

Tribe Phrissomini

12. *Aethalodes verrucosus* Gahan (?)

A single specimen was taken at Wuchow, June 1, 1935.

Tribe Monochamini

13. *Psacotha inarmata* Gressitt, 1940.

One female was collected at Luoshiang Village, Yao Shan, Pingnan Hsien, July 17, 1934. One male was taken at Chongon, Jung Hsien, Sept. 18, 1939, by T. T. Tsao. Length of male 13.5 mm; breadth 4.5 mm.

14. *Epepeotes tonkinensis* (Aurivillius), 1920.

One male and one female were taken at Luoshiang Village, Yao Shan, Pingnan Hsien, July 17, 1934.

15. *Monochamus filicornis* Gressitt, 1935.

One male was taken at Wuchow, 1934.

16. *Monochamus tesserula* White, 1858.

One male and two females were taken at Wuchow, 1935, and one male was taken at Shatang, Liuchow, April 26, 1940, by S. N. Chiang.

All specimens with the scape one-half as long as the third segment. Length 24-26 mm; breadth 8-9 mm.

17. *Melanauster chinensis* (Frost), 1771.

A number of specimens were taken at Wuchow, and Shatang, Liuchow; from April to August.

18. *Blepephaeus succinator* (Chevrolat), 1852.

Two males and three females were taken at Wuchow, June 4 and July 9, 1936.

Tribe Batocerini

19. *Batocera lineolata* Chevrolat, 1852.

A number of specimens were taken at Luoshiang Village, Yao Shan, Pingnan Hsien, July 24, 1934.

20. *Apriona germari* (Hope), 1831.

A number of specimens were collected at Wuchow and Liuchow from May to July.

Tribe Xylorhizini

21. *Xylohiza adusta* (Wiedemann), 1819.

Five specimens were collected at Wuchow, July 13, 1934, and Aug. 28, 1935; one specimen was taken at Shatang, Liuchow, June 7, 1940, by S. N. Chiang.

Three of the specimens are supposed to be male with hind femora extending beyond the apex of second abdominal segment, and the lateral bi-branched buff streaks on the ventral side of abdomen terminating at second segment, a pair of circular depressions densely clothed with brown pubescence is present on the third and following abdominal segments instead of the buff streaks. Length 30-37 mm; breadth 9.5-11.5 mm.

Tribe Nipponini

22. *Pterolophia annulata* (Chevrolat), 1845.

Six specimens were taken at Wuchow, Aug. 3, 1935, and July 7, 1936.

Tribe Apomecynini

23. *Apomecyna cantator excavaticeps* Pic, 1918.

Six females were taken at Chongon, Jung Hsien, Oct. 13, 1939 and Feb. 26, 1940, by T. T. Tsao on the stems of field pumpkin (*Cucurbita pepo* L.). Three females were taken at Shatang, Liuchow, June 10, 1940, by the writer.

24. *Ropica formosana dorsalis* Schwarzer, 1925.

Two specimens were taken at Shatang, Liuchow, May 24, 1940, from light trap. Length 5-7 mm, breadth 1.8-2.2 mm.

Tribe Hippopsini

25. *Pothyne obliquetruncata* Gressitt, 1939.

Two males were taken from light trap at Shatang, Liuchow, June 10, 1940. Length 10 mm.; breadth 2 mm.

Tribe Spalacopsini

26. *Tetraglenes insignis sublineatus* Gressitt, 1937.

A single specimen was taken from light trap at Shatang, Liuchow, June 9, 1940. Length 14 mm; breadth 2 mm.

Tribe Saperdini

27. *Thermistis croceocinctus* (Saunders), 1839.

A male was taken at Luoshiang Village, Yao Shan, Pingnan Hsien, July 13, 1934.

Tribe Gleneini

28. *Glenea relictata* Pascoe, 1858.

Two specimens were collected at Luoshiang Village, Yao Shan, Pingnan Hsien, July 14, 1934.

29. *Glenea* (*Stirolene*) *cantor* (Fabr.) 1787.

A single specimen was collected at Wuchow, May 6, 1935.

30. *Paraglenea fortunei* (Saunders), 1853.

Two specimens were collected at Pa Shiu, July 18, 1939, by T. T. Tsao; one was taken at Yao Shan and another one at Wuchow.

Tribe Phytoeciini

31. *Oberea nigriceps* (White), 1844.

One male and one female were collected at Luoshiang Village, Yao Shan, Pingnan Hsien, July 13, 1934.

Differs from White's original description in having the antennae brownish black, and the apical portions of mid and hind tibia black. Length 17-18.5 mm; breadth 3-3.5 mm.

32. *Oberea semiargentina* Pic, 1923.

A single specimen was taken at Luoshiang Village, Yao Shan, Pingnan Hsien, July 6, 1934.

Second abdominal segment clothed with silvery pubescence with basal angles black. Length 23.5 mm; breadth 3.5 mm.

33. *Oberea toi* Gressitt, 1939.

One male was collected at Jung Hsien, Sept. 12, 1940, by T. T. Tsao. Length 16.5 mm; breadth 2.5 mm.

34. *Oberea walkeri* Gahan, 1894.

Two females were collected at Yao Shan, Pingnan Hsien, July 12, 1934.

With last abdominal segment entirely black. Length 18.5-20.5 mm; breadth 3.5 mm.

Tribe Tetraopini

35. *Chreonoma atricornis* Pic, 1922.

One male and three females were taken at Chongon, Jung Hsien, Sept. 9 and Oct. 15, 1939, by T. T. Tsao.

36. *Chreonoma atritarsis* Pic, 1912.

Two females were taken at Wuchow, May 6, 1935. One specimen with deeper color, third antennal segment, tibia and tarsi entirely black. Length 13.5 mm; breadth 4 mm.

TWO NEW SPECIES OF WRANGELIA FROM CHINA¹

By C. K. TSENG

Department of Botany, University of Michigan.

The genus *Wrangelia* (Ceramiaceae, Rhodophyceae) as it now stands has 26 species including two questionable ones. Among these, *W. penicillata* (C. Ag.) C. Ag., originally described from the Mediterranean and the Adriatic Sea, is the only one which is known to be rather widely distributed in the warmer seas. The rest are more or less confined to certain limited regions. Two species, namely *W. Argus* (including *W. plebeja* J. Ag.) and *W. bicuspidata* Børg. are known from the West Indies and Florida; two others, *W. Tagoi* (Okam.) Okam. et Segawa and *W. ? tanegana* Harv. from Japan; *W. ? purpurifera* J. Ag. from the Cape of Good Hope; and the remaining twenty species are confined to the Australian-Tasmanian region, although *W. velutina* Harv. was reported to extend to the Malay Archipelago. To date none is reported from the China Sea region. In the present paper, two new species are to be added to the floristic list of China, both from the southern coast.

1. *Wrangelia hainanensis* sp. nov. (Figs. 1, 2, 3; Pl. 9)

Frons ca. 12 cm alta, pinnate ramosa, a basi sursum longitudinaliter corticata, in parte superiore verticillatate ramulifera, ad geniculos penicillata; ramis principalibus 0.7 mm crassis, internodiis 2-3-plo longioribus quam crassioribus; ramellis mollissimis, iteratim subdichotome divis, a basi ad apicem angustatis; cellulis in parte basali ca. 24 μ latis, supremis ca. 7 μ latis, minus quam 15-plo longioribus quam latioribus; articulo terminali plerumque bicuspidato, cuspidibus inaequalibus; tetrasporangiiis sphaericis, tetrahedraliter divis, 60-75 μ diam. metientibus, in cellulis basalibus ramulorum lateralium sessilibus, ramellis pluries dichotomis incurvis involucrentibus.

Specimen typicum: *Tseng 883* (in herbario auctoris), undis relictum, prope Sama, Hainan, China, 23 Apr. 1934.

Wrangelia hainanensis is a beautiful, elegant plant attaining a height of 12 cm. It has a percurrent axis from which the lateral branches issue alternately and pinnately. The lower lateral branches are usually very much longer than the upper ones so that the general outline of the frond is somewhat corymbose (cf. Pl. 9). The main axis has a diameter of 0.6-0.7 mm at the base, tapering gradually upwards, with internodes 2-3 diameters in length. The lower portions of the axis and the principal branches are covered with a cortical layer formed by the rhizoidal filaments issuing from the bases of the branchlets; the upper and younger portions are, however, not corticate.

¹ Papers from the Department of Botany of the University of Michigan, No. 784.

As usual in *Wrangelia*, the branchlets are verticillate and are crowded together on the upper, younger portions of the branches. Each branchlet has its origin in a basal cell which by repeated subdichotomous branching, generally 7 to 9 times, gives rise to the other cells of the branchlet or ramulus. The two daughter cells of the same forking are always very conspicuously unequal in size. At the apices of the branches, the branch-

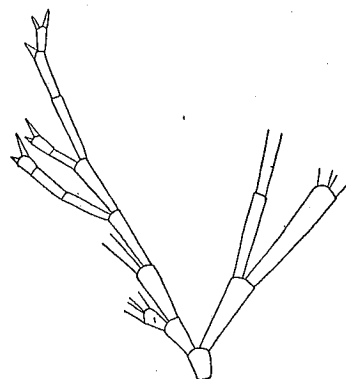


Fig. 1. *W. hainanensis* sp. nov.
A young branchlet. $\times 150$.

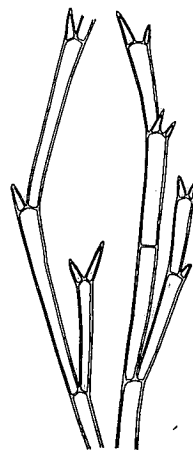


Fig. 2. *W. hainanensis* sp. nov.
Apices of mature branchlet. $\times 150$.

lets are bent upwards and more or less cover the growing point of the branch thus giving all the short branches a penicillate appearance. The apices of the filaments generally end in two short, conical cells which are always conspicuously unequal in size (cf. Fig. 1). Rarely, there may be one or three such cells at the apices. The cells of the branchlets measure from 7 to 24 μ in diameter. The basal cell is generally the broadest one in the whole branchlet, measuring about 24 μ diam.; upwards the cells become smaller until they are about 7 μ diam. at the apices. The length of the cells also varies a good deal. The basal cell is generally the shortest, only 1.5–2.0 diameters long. Upward, however, the cells increase quickly in relative length until the fourth or sometimes the third or the fifth cell may be as much as 10 to 15 diameters long. Then the cells become shorter and shorter until at the apices they are only 2 to 5 diameters long.

The tetrasporangia are terminally sessile upon the basal cell of the short lateral ramuli, borne on ecorticate branches (cf. Fig. 2). They are spherical, tetrahedrally divided, measuring 60 to 75 μ in diameter when mature. The involucre originates from the same cell which gives rise to the tetrasporangium, and is composed of two short, once or twice dichotomously branched filaments curving around the sporangium.

Wrangelia hainanensis is undoubtedly a sublittoral alga growing in rather deep water, for it was found only among those algae drifted ashore, whereas careful search on the rocks in the neighborhood did not reveal any trace of it. Very delicate and soft, it has a yellowish purple color and adheres closely to paper upon drying.

Habitat.—Drifted ashore, Sama, Hainan, China, in April 1934 (Tseng 883, tetrasporiferous, TYPE) and in January 1937 (Tseng 2299, sterile).

The present species is a member of the section, *Penicillatae*, very near to *W. penicillata* (C. Ag.) C. Ag. from which it differs distinctly in

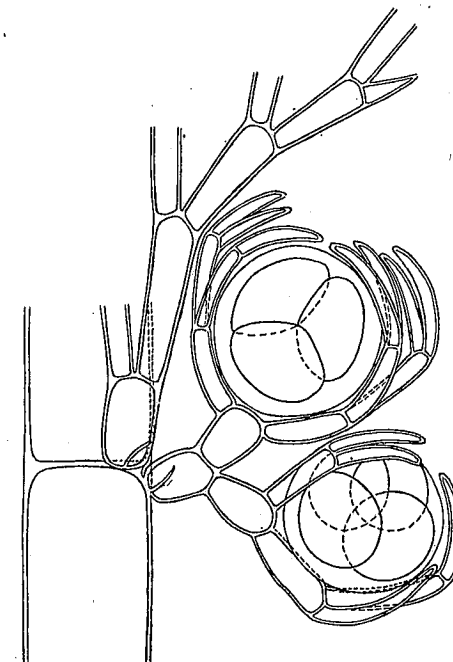


Fig. 3. *W. hainanensis* sp. nov. Tetrasporic ramuli. $\times 300$.

the branchlets terminating in two unequal cuspidal cells. Moreover, the involucre filaments of the species are dichotomous, shorter, more strongly curved and more closely applied to the sporangia than those of *W. penicillata* which are simple, longer, straighter and more loosely applied to the sporangia. The only species in the whole section which has bicuspid ends on the branchlets is *W. bicuspidata* Børg., originally described from the West Indies (Børgesen 1916, p. 118) and later reported from Florida (Taylor 1928, p. 144). In the present species, however, the two spines are always strongly unequal, whereas in the West Indian plant they are generally equal or at most sometimes very slightly unequal (cf.

Fig. 1 with Børgesen 1916, Fig. 129). The Hainan plant is also a much more elegant species, reaching a height of 12 cm and a diameter of 0.7 mm in the main axis. The West Indian plant attains only a height of 7 cm and a diameter of 225 μ . Again, the cortication in the present species is continuous, extending completely over the whole internodes in the main axis and the main branches as well. The West Indian alga, on the contrary, is practically noncorticate on the internodes and only lightly corticated at the nodes of the main axis. Last, the branchlets of the Chinese plant have much smaller basal cells, only 24 μ in diameter and comparatively much longer upper cells, as much as 15 diameters long, but the American alga has basal cells twice as large, being 50 μ in diameter, and the upper cells somewhat shorter, only up to 10 diameters long.

A remark must be made at this place on the record of *W. bicuspidata* Børg. from the Malay Archipelago by Mme. Weber-van Bosse (1921, p. 221). Undoubtedly, the identification of the Malayan alga with the West Indian plant must have been based upon the presence of two spines, as clearly shown by the following remark made by that author: "Le sommet des ramules verticillés porte deux mucros, mais ceux-ci, ou l'un deux, tombent souvent." This statement is true with both the Hainan and the West Indian plants. However, the same author noted that "vers la base l'axe est cortiqué" and moreover, "Le *Wr. bicuspidata* paraît se rapprocher beaucoup du *Wr. penicillata*." These statements are more true of the Hainan plant than the West Indian one. The present writer has examined several specimens of *W. bicuspidata* from West Indies and Florida and confirmed that the cortication in that species is incomplete and generally limited to the nodes only, as is illustrated and described by Børgesen (1916, p. 118, Fig. 128) and Taylor (1928, p. 144, Pl. 20, Fig. 14). So far as the internal structure and the general appearance are concerned, there is a much greater similarity between *W. penicillata* and the Hainan plant than the West Indian one. Moreover, the marine flora of Hainan where this alga was collected is very similar to that of the Malayan region, as the writer has previously pointed out (Tseng 1936, p. 187). Therefore, although the writer has not been able to study the specimen of Mme. Weber-van Bosse, he is very much inclined to assume that the Malayan plant is the same as the present species, rather than the West Indian *W. bicuspidata* Børg. Dr. F. Børgesen to whom the writer had sent a specimen of the present species made the following remark in his letter of April 24, 1937: "Mme. Weber has *Wr. bicuspidata* in her flora (p. 221); most probably her plant is like yours."

2. *Wrangelia Tayloriana* sp. nov. (Figs. 4-6; Pl. 10)

Frons caespitosa ca. 5 cm alta, pinnate ramosa, ad basim longitudinaliter corticata, in parte superiore verticillatata, ad geniculos penicillate ramulifera; ramis principalibus 0.5-0.6 mm latis, internodiis 1.5-4-plo longioribus quam crassioribus; ramellis mollissimis, crebre subdichotomis, a basi ad apicem attenuatis, cellulis in parte basali ca. 50 μ latis, supremis ca. 15 μ latis, 4-9-plo longioribus quam latioribus, apice acutis; tetrasporangii sphaericis, tetrahedraliter divisis, 60-70 μ diam., in cellulis

basalibus ramulorum lateralium sessilibus, ramellis simplicibus subincurvis involucratibus; acervulis spermatangialibus sphaericis, ca. 90 μ diam., in ramulo unisegmentali terminalibus cum cellulis parce arcuatis involu-

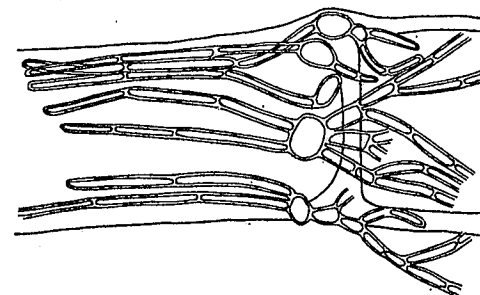


Fig. 4. *W. Tayloriana* sp. nov. Corticating filaments at younger portion of axis. $\times 300$.

cratis; cystocarpiis sphaericis, ca. 0.3 mm diam., in vertice ramulorum sitis.

Specimen typicum: Tseng 195 (in herbario auctoris; duplum in herb.

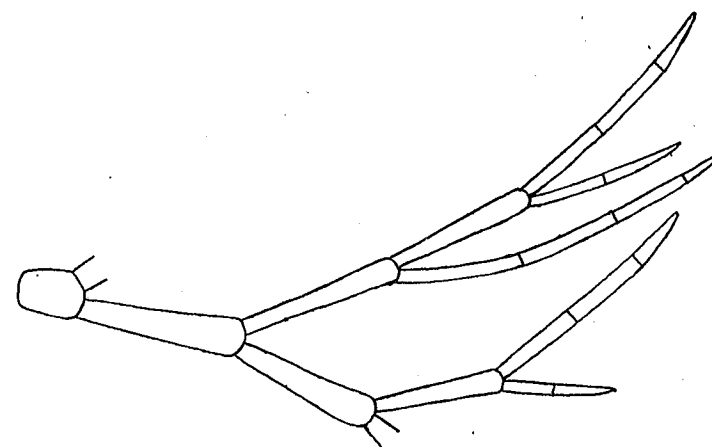


Fig. 5. *W. Tayloriana* sp. nov. A branchlet. $\times 150$.

Univ. Mich.) ad rupes arenosas zonae inferioris littoralis, prope Kukwang, Quimoy, Amoy, China, 7 Jul. 1932.

Wrangelia Tayloriana has fronds reaching a height of 4 to 5 cm. From the percurrent main axis the lateral branches issue alternately and pinnately in a paniculate manner, producing a pyramidal outline (cf. Pl. 10). Toward its base, the main axis is quite densely corticated by the decurrent rhizoidal filaments which issue from the basal cells of the

branches. The cortication, however, is not as compact and tissue-like as in *W. penicillata* or even in *W. hainanensis* (cf. Fig. 3). In the upper portions of the main axis and the principal branches, there is practically no cortication at all. Near the base, the main axis measures 0.5 to 0.6 mm in diameter, gradually tapering upwards. The lower internodes are generally one or two diameters long and the upper ones as much as four diameters long.

The verticillate penicillate branchlets are found at the nodes of the lateral branches and of the upper ecorticate parts of the main axis. They are generally three to five times subdichotomously branched with narrow

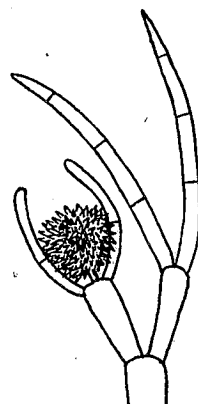


Fig. 6. *W. Tayloriana* sp. nov. Antheridial ramulus. $\times 150$.

angles, the terminating filaments above the last dichotomy having two to four (more or less) subulate cells. The basal cell of the branchlet is usually the broadest and shortest, having an average diameter of $50\ \mu$ and a length of two diameters. The cells become gradually less in diameter (up to $15\ \mu$) but comparatively longer toward the tip of the branchlet (as much as 4 to 9 diameters long). The apex of the branchlet ends with a short, acute, conical cell (cf. Fig. 4).

Tetrasporic, spermatangial and cystocarpic plants are all found. Generally speaking, there is no difference in the stature of these different plants. Tetrasporangia are spherical, tetrahedrally divided, 60 to $75\ \mu$ diam. when mature. They are sessile on the basal cells of the lateral branchlets and are involucre by two filaments ending in blunt apices (cf. Fig. 5). The involucre filaments are generally simple, somewhat incurved, rather loosely applied to the sporangia, and each with two or three cells measuring 15 to $20\ \mu$ diam. The spermatangial clusters are spherical, about $90\ \mu$ diam., each terminal on an unicellular stalk, and involucre by (generally) two slightly arcuate filaments each of which

has two cells ending in blunt apices (cf. Fig. 6). The globular cystocarps are much larger, as much as 0.3 mm in diameter, and are found on the vertices of the fertile branchlets surrounded by incurved involucre filaments.

The present species is very soft and spongy in substance and generally purplish-blue in color when alive, especially when it grows in an exposed place; upon drying, it adheres perfectly to paper.

Habitat.—On rocks covered with sand, sometimes also on the coarser algae, especially the corallines, in exposed places in the lower littoral

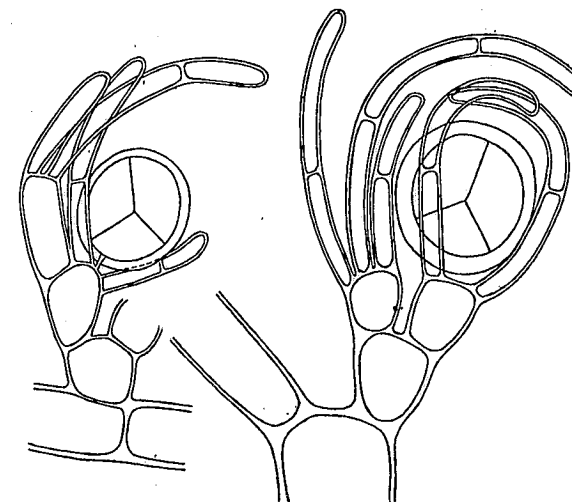


Fig. 7. *W. Tayloriana* sp. nov. Tetrasporic ramuli. $\times 300$.

region. Amoy: Kukwang, Southern Quimoy, in May 1932 (*Tseng 195*, tetrasporic, spermatangial and cystocarpic, TYPE), and in July 1937 (*Tseng 2597*, tetrasporic and cystocarpic); and Stevens I., in March 1935 (*Tseng 1326*, sterile).

The present species is a member of the section, *Penicillatae*, being undoubtedly most closely related with the West Indian *W. Argus* (Mont.) Mont. under which name it has, most probably, been reported from the Malay Archipelago by Mme. Weber-van Bosse (1921, p. 221), from Japan by Okamura (1934, p. 46), and from India by Børgeesen (1937, p. 338). Mme. Weber as well as Børgeesen pointed to the fact that their plants were much larger than the West Indian alga. Dr. Børgeesen, to whom the writer had sent a specimen of the present species, made the following remark in his letter of January 23, 1937: "A few days ago I have determined a *Wrangelia* from India to be *W. Argus* and then tried again your no. 195; it seems to be sterile, but I am inclined to consider it to be *W. Argus* even if the ramuli seem to be somewhat thicker in your plant." Having compared carefully his specimens with the illustration and de-

scription of "*W. Argus*" by Okamura (1934, p. 46, Pl. 324), the writer had very little doubt that his and Okamura's plants belong to the same species. So for the past few years, the writer had to be contented with identifying his plant with the West Indian *W. Argus* as is done by Weber, Okamura and Børgesen. However, he made that determination not entirely without doubt. Now, having studied the excellent collection of *W. Argus* (Mont.) Mont. from the West Indies and Florida in Dr. Taylor's herbarium, the writer is fully convinced that the oriental species is different from the West Indian plant.

The most striking superficial difference between these two species lies in the size. In the present species, the plant reaches a height of 4 to 5 cm and a diameter of 0.6 mm while the West Indian plant is only 1.0 to 1.5 cm high and reaches 225 μ in diameter. Microscopic examination reveals conspicuously the difference in the cortication of the main axis. In the Asiatic plant, cortication is denser and complete while the American one has very loose cortication which is incomplete and generally restricted to the nodes. Tetrasporangia of the former are somewhat larger, to 75 μ diam., and those of the latter species smaller, not more than 60 μ . Other important differences are found in the characteristics of the involucre filaments of the tetrasporangia which may be more clearly realized by the following table of comparison:

TABLE 1
Comparison between the tetrasporangial, involucre filaments of
W. Tayloriana and *W. Argus*

	<i>W. Tayloriana</i>	<i>W. Argus</i>
Number of cells in the filament	2 or 3	3 to 5
Diameter of cells	15 to 20 μ	10 to 15 μ
Habit of the filament	generally simple	generally dichotomous
Curvature of the filament around the sporangium	generally loosely applied, sometimes rather straight	generally strongly curved and closely applied

In view of these differences between the oriental and the occidental plants, the writer feels justified to treat them as separate and different species and to describe the former as new.

The next species which should be compared is the imperfectly known Capetown species, *W. purpurifera* J. Ag. (1863, p. 707), based on a specimen from W. H. Harvey who previously mentioned it, without description, under the name *Callithamnion purpuriferum*. Later, however, the same author (J. Agardh, 1876, p. 623) added a question mark to the genus and made the following remark: "Fructus hodie ignoti, nec specimina bene reviviscunt." It should be noted that in his first description of this species in 1863, J. Agardh described fully the characteristics of the spermatangia which were entirely omitted in his second description in 1876. What made him do so was not mentioned. This species was

not mentioned until more than forty years later when Yendo (1917, p. 203) reported to have studied the authentic specimens of this species and decided that his specimens from Japan "exactly accord with the type in the Agardhian Herbarium and the description given by J. Agardh in Spec. Alg., l.c." Evidently, however, Okamura later disapproved of Yendo's identification as he did not include *W. purpurifera* in his comprehensive, posthumous treatise on the Japanese marine algae (*Nippon Katsosai*, published in Japanese, 1936). Okamura also intimated in the same work that, judging from the nearby localities whence Yendo's record of "*W. purpurifera*" and his own of "*W. Argus*" came and from the descriptions given by Yendo, the two seemed to belong to the same species. A study of Yendo's rather detailed description of his plant also convinces the present writer that what that Japanese phycologist called "*W. purpurifera*" is, most probably, the same as what Okamura called "*W. Argus*" and what the writer is here proposing as a new species. There are a few differences, however, especially in the size of the axial cells which Yendo reported to be only 100 μ in diameter (this might be a mere typographic error). A comparison with the original description of *W. purpurifera* J. Ag. reveals some more important differences. According to J. Agardh (1863, p. 707), his plant has two kinds of branchlets: "Ramuli verticillati 4 pluresve duplicis generis: alii breviores obtusi; alii longiores, supra basin semel aut bis furcati, dein simplices elongati, 6-8 articulis constantes. . ." In the present species, there is only one kind of branchlet, which is 4 or 5 times subdichotomously branched and which has only 2 to 4 cells above the last dichotomy. It is evident that the present species is distinct enough from the problematic African species, *W. purpurifera* J. Ag., even if it could be proved, in the future, to be truly a species of this genus.

Summary

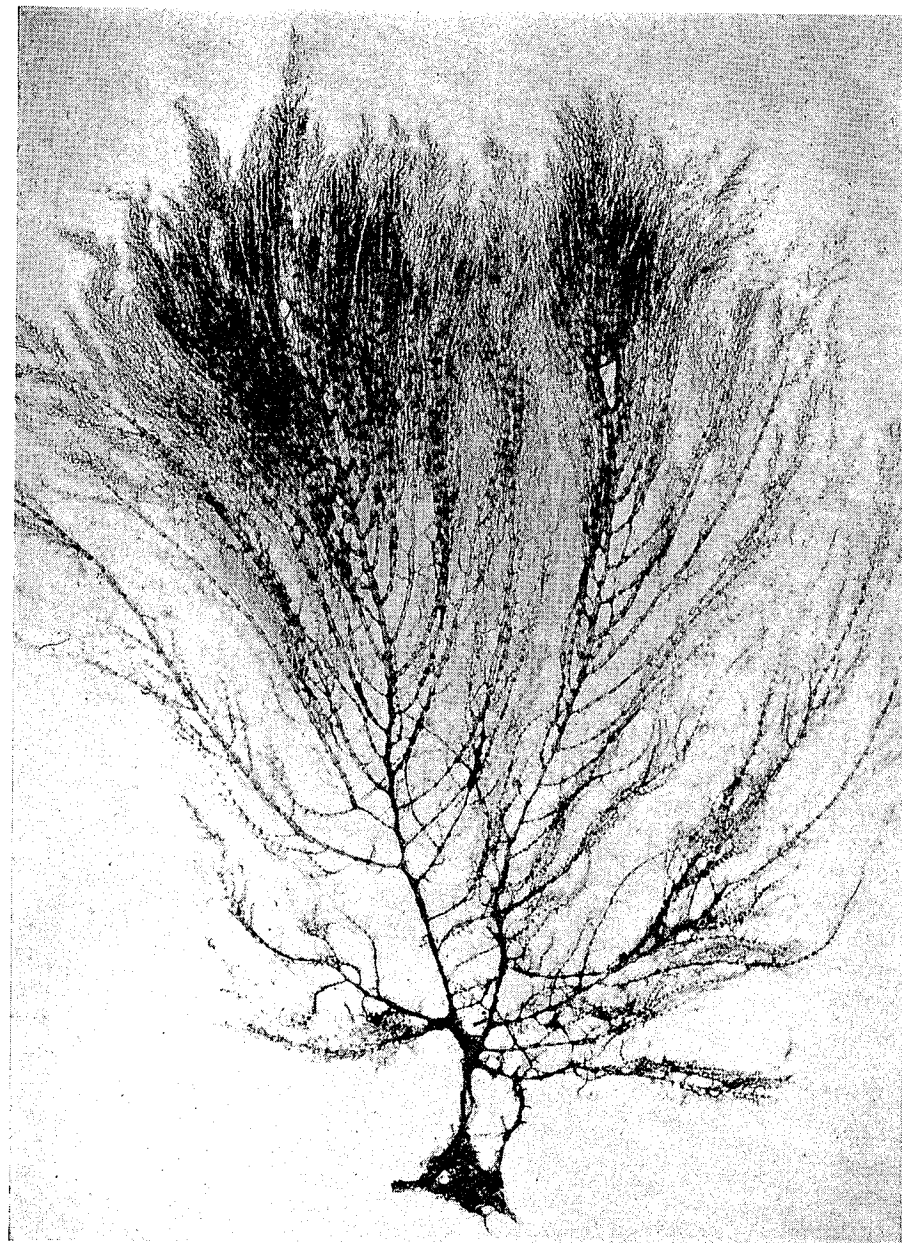
Two new species in the genus *Wrangelia* (Ceramiaceae, Rhodophyceae), namely, *W. hainanensis* and *W. Tayloriana*, spp. nov., are here described from the South China coast. Both belong to the section, *Penicillatae*, of the genus, the former nearest to the widely distributed *W. penicillata* (C. Ag.) C. Ag. on one hand and the tropical Atlantic-American *W. bicuspidata* Børg. on the other, and the latter nearest to the tropical Atlantic-American *W. Argus* (Mont.) Mont.

Thanks are due to Professor Wm. Randolph Taylor of the University of Michigan for his advice in this study and for his generosity in allowing the writer to make free use of his herbarium.

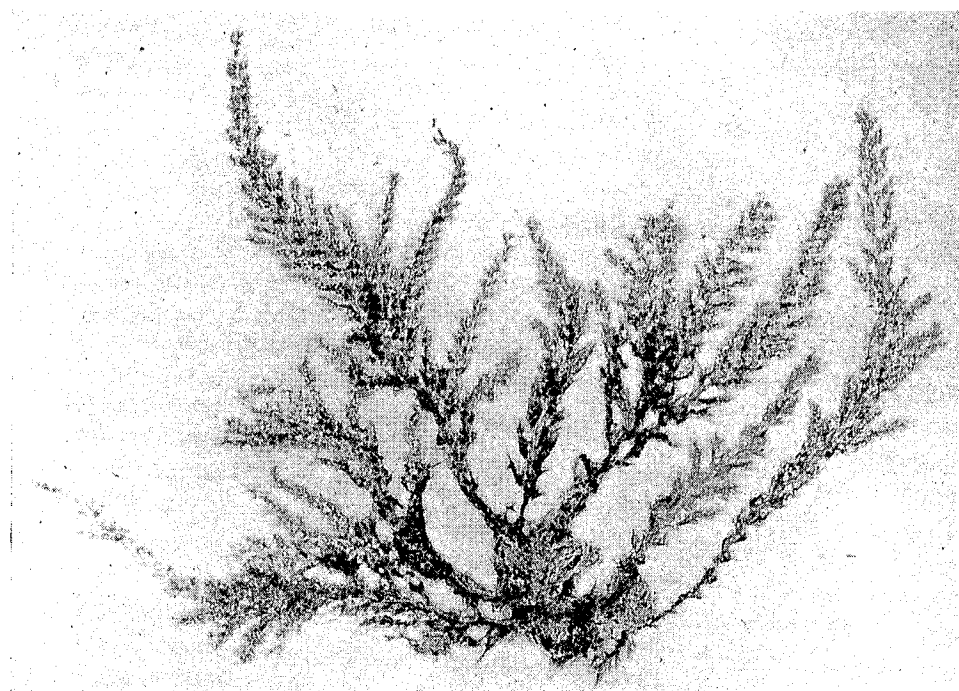
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Wrangelia hainanensis Tseng, sp. nov. $\times 1.3$.



Wrangelia Tayloriana Tseng, sp. nov. $\times 2.35$.

PLANT-BEETLES FROM SOUTH AND WEST CHINA.
I. SAGRINAE, DONACIINAE, ORSODACNINAE
AND MEGALOPODINAE (COLEOPTERA)¹

By J. LINSLEY GRESSITT

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This paper is the first of a series² on the plant-beetles or leaf-beetles (Chrysomelidae) from southern and western, as well as southwestern and southeastern China, at present available to the writer for study. These number about six hundred and fifty species, and the majority are from South China and Hainan Island. Since relatively few species have been recorded from these latter areas, a rather considerable proportion of the species appear to be new to science, or at least new to the fauna of China. Because of the fact that very little comprehensive work has been done for China in this family, keys are given to the various groupings, even though the work is by no means monographic, and concerns only the material at hand from these areas, with the occasional inclusion in the keys of other Chinese species actually seen by the writer.

The papers will appear with approximately the following order and arrangement of subfamilies:

Part I

Sagrinae, Donaciinae, Orsodacninae and Megalopodinae.

Part II

Criocerinae.

Part III

Clytrinae, Cryptocephalinae and Chlamydinae.

Part IV

Lamprosominae, Eumolpinae and Chrysomelinae.

¹ Contribution from the Lingnan Natural History Survey and Museum.

² Most of the material in the subfamilies Hispinae and Cassidinae has already been reported upon in the following papers by the writer:

Some tortoise beetles from Hainan Island, *Lingnan Sci. Jour.* 17: 185-193 (1938); Some hispine beetles from Hainan Island, l.c.: 321-336, pl. 11 (1938); Some tortoise beetles from southeastern China, l.c.: 383-388 (1938); Tortoise beetles in the collection of the Lingnan Natural History Survey and Museum, l.c.: 571-590 (1938); Hispine beetles in the collection of the Lingnan Natural History Survey and Museum, op. cit. 18: 161-186, pl. 5 (1939); Some hispine beetles from southeastern China, l.c.: 197-208, pl. 7 (1939); East Asian Hispinae and Cassidinae in the collection of the California Academy of Sciences, *Pan-Pacific Ent.* 15: 132-143 (1939); The hispine beetles of China, *Philippine Jour. Sci.*, in press (1941).

Galerucinae.	Part V
Halticinae.	Part VI
Hispidinae and Cassidinae ² .	Part VII
Index.	

The material reported upon is largely contained in the collection of the Lingnan Natural History Survey and Museum of Lingnan University, and in collections made by the writer in southeastern China (E. Kwangtung, SE. Kiangsi and SW. Fukien in 1936, and around Foochow in 1934) and on Hainan Island (1935). The material in the Lingnan Natural History Museum was largely collected in northern and eastern Kwangtung by F. K. To in 1933 and 1934; in Hainan Island by the Lingnan University Fifth Hainan Expedition in 1929, by F. K. To, O. K. Lau and Prof. Wm. E. Hoffmann in 1932, and by F. K. To in 1935; in northern Kwangtung by F. K. To and the writer in the spring of 1940; and western and southwestern China (Szechuan, Kweichow and Yunnan) by the writer in the summer of 1940; as well as at Canton and in other parts of Kwangtung or South China, and Hong Kong, at various periods by C. W. Howard, Wm. E. Hoffmann, Y. W. Djou, F. K. To, K. C. Yeung, K. C. Maack, E. R. Tinkham, R. E. Wall, P. P. Hoh, D. C. Ngu, O. K. Lau, W. T. Tsang, the writer, and others. Unfortunately, part of the Lingnan Natural History Museum material, including most of the Criocerinae, and part of the Cryptocephalinae, etc., has been lost for reasons due to the present war, and most of the writer's earlier (1934-1936) material, except for the Criocerinae, Hispidinae and Cassidinae, as well as Lingnan Nat. Hist. Museum material in certain other subfamilies, was left in the United States and is not at present available for inclusion in this series.

The remainder of the material to be reported upon is from the collection of the College of Agriculture of the University of Nanking, through the kindness of Prof. B. A. Slocum and Mr. C. S. Tsi; the Biology Department of West China Union University, through the kindness of Prof. Chang Min-chuen and Miss D. S. Pen; the Musée Heude, Université l'Aurore, Shanghai, through the coöperation of the Rev. Père Bernard Becquart; as well as a few from the collection of the California Academy of Sciences in San Francisco, through the kindness of Dr. E. C. Van Dyke.

The writer is very much indebted to the above named persons, as well as to Dr. James M. Henry, Provost of Lingnan University, and Prof. William E. Hoffmann, Director of the Lingnan Natural History Survey and Museum, for the privilege of making this study, and to Dr. Sicien Chen of the Academia Sinica for his kind coöperation.

This first installment concerns four subfamilies with twenty-three species, thirteen of which are described as new. The illustrations were prepared by Mr. Mak Yuen-hing.

Family Chrysomelidae

This family is one of the largest in the order Coleoptera (beetles), containing over 23,000 species. So far, about 1100 species have been recorded from China, but many more remain to be collected and described.

In habits, the members of the family are entirely plant-feeders in both larval and adult stages, and almost all are surface feeders on the leaves of plants, though some larvae mine between the upper and lower epidermes of leaves or bore in the stems of herbaceous or woody plants. Among the free-living surface-feeding larvae, many have the habit of at least partially covering the dorsal surfaces of the body with their own faeces as a protective measure, and some (Cassidinae) have structures to bear the faeces above the body. Members of other groups (Clytrinae and Cryptocephalinae) live in cylindrical cases during their larval existence, and at least one of the former has been recorded as living in the nests of certain ants. The pupae are often free in the soil, sometimes enclosed in cocoons of frothy material, and sometimes naked and attached to the surfaces of leaves.

The adults are of various forms, but generally flattened-oval, cylindrical or subglobose. They have the fourth tarsal segment vestigial, as do the longicorn beetles (Cerambycidae), but differ from them in having generally less elongate bodies and in having larvae which are less elongate, more varied in form, generally free-living, and very rarely actually wood-borers. The members of one subfamily, the Halticinae, all have considerable jumping capacity, with the hind femora distinctly swollen. Members of some other groups have enlarged posterior femora, but some of them are not known to jump. Dr. Sicien Chen has reported³ that *Pagria signata* Motschulsky is the only chrysomelid outside of the Halticinae that is known to jump. However, during the writer's collecting and rearing experience, members of various groups have been observed to resort to slight jumps occasionally. These include numerous species of the subfamily Eumolpinae, as well as Criocerinae, Clytrinae and Hispidinae. It is the writer's opinion that members of most of the subfamilies jump occasionally, particularly when taking to flight, though not often in the strong manner in which the halticids do. The writer has not observed members of the Sagrinae, Chrysomelinae, Galerucinae or Cassidinae to jump, though the last-named sometimes go into flight almost as suddenly as do the spiny Hispidinae.

The family Chrysomelidae consists of sixteen subfamilies, fifteen of which are represented in China. There have been various arrangements and divisions of the groups, and the first important one, establishing the modern system, was made by Chapuis in 1874 as follows:

I. EUPODES, containing the subfamilies Sagrinae, Donaciinae and Criocerinae.

II. CAMPTOSOMES: Megascelinae,⁴ Megalopinae, Clytrinae, Cryptocephalinae, Chlamydinae and Sphaerocharinae.⁵

³ *Sinensia* 6 (1935), 226-227.

⁴ Not found in China.

⁵ Later merged with the Lamprosominae; not found in China.

III. CYCLICA: Lamprosominae, Eumolpinae, Chrysomelinae and Galerucinae.

IV. CRYPTOSTOMES: Hispinae and Cassidinae.

This was modified by Jacoby in 1908 (Fauna of British India) to include five major divisions, and an additional subfamily (Halticinae), as follows:

I. EUPODES: Sagrinae, Donaciinae and Criocerinae.

II. CAMPTOSOMES: Megalopinae, Clytrinae, Cryptocephalinae and Chlamydinae.

III. CYCLICA: Lamprosominae, Eumolpinae and Chrysomelinae.

IV. TRICHOSTOMES: Galerucinae and Halticinae.

V. CRYPTOSTOMES: Hispinae and Cassidinae.

In 1935, Chen showed that the Chrysomelinae were more closely associated with the Galerucinae and Halticinae than with the Lamprosominae and Eumolpinae, and removed them from the Cyclica to the Trichostomes.

The writer, however, believes that the Megalopodinae belong more properly in the Eupodes than in the Camptosomes, and also feels that the Chrysomelinae should form still another group by itself between the Cyclica and the Trichostomes. The following tentative arrangement of the fifteen Chinese subfamilies is therefore used in this work:

EUPODES	1. Sagrinae
	2. Donaciinae
	3. Orsodacninae
	4. Criocerinae
	5. Megalopodinae
	6. Clytrinae
CAMPTOSOMES	7. Cryptocephalinae
	8. Chlamydinae
	9. Lamprosominae
CYCLICA	10. Eumolpinae
	11. Chrysomelinae
	12. Galerucinae
TRICHOSTOMES	13. Halticinae
	14. Hispinae
CRYPTOSTOMES	15. Cassidinae

Key to Subfamilies

1. Head with vertex projecting strongly forward and mouth directed posteriorly below, and often partly hidden by prosternum.....2
- Head normal, with vertex not projecting and with mouth directed forward and downward.....3
2. Pronotum and elytra with broad marginal expansions, the former often covering head.....Cassidinae

- Pronotum and elytra without broad marginal expansions, but often with spines; head never covered.....Hispinae
3. Antennae closely inserted on front of head; elytra not very rigid.....4
 - Antennae not closely inserted, separated by frons or vertex; elytra generally somewhat rigid.....5
 4. Posterior femora not greatly enlarged.....Galerucinae
 - Posterior femora strongly swollen, adapted for jumping.....Halticinae
 5. Prothorax not completely margined laterally; eyes prominent and head more or less strongly constricted behind them.....6
 - Prothorax completely margined laterally; eyes not very prominent and head not strongly constricted behind them.....10
 6. Posterior femora large and strongly swollen, often armed with teeth..7
 - Posterior femora generally not greatly enlarged, rarely armed with teeth 8
 7. Antennae long, with most segments longer than broad.....Sagrinae
 - Antennae short, barely reaching beyond humeri, distal segments generally broader than long, more or less dentate.....Megalopodinae
 8. Antennal insertions separated by width of frons.....9
 - Antennal insertions not separated by width of frons, relatively close...Donaciinae
 9. Tarsal claws generally bifid or toothed internally; prothorax frequently toothed laterally.....Orsodacninae
 - Tarsal claws simple, not toothed; prothorax never toothed laterally...Criocerinae
 10. Middle three abdominal sternites constricted in central portions; form of body subcylindrical.....11
 - Middle three abdominal sternites not constricted; form of body more or less ovate or rounded, often strongly convex and constricted anteriorly.....13
 11. Antennae relatively short and serrate.....12
 - Antennae long and slender, not serrate.....Cryptocephalinae
 12. Prothoracic pleura without antennal grooves; body surfaces smooth...Clytrinae
 - Prothoracic pleura with grooves for reception of antennae; body surfaces rough or tuberculate.....Chlamydinae
 13. Wing venation not reduced; cubital veins present; clypeus not divided into two parts.....14
 - Wing venation greatly reduced; cubital veins lacking; clypeus divided into two parts.....Chrysomelinae
 14. Prothorax as broad as elytra basally, its sides grooved for reception of antennae; abdomen grooved for reception of hind legs..Lamprosominae
 - Prothorax generally narrower than elytra basally, its sides not grooved for reception of antennae; abdomen not grooved for reception of hind legs.....Eumolpinae

EUPODES

Subfamily Sagrinae

Up to the present, eight species of the genus *Sagra* have been recorded as representing this subfamily in China. In the present material four species are at hand, one of which is new to China. However, two of the other species are placed in synonymy with another, so the total number of known Chinese species is reduced to seven for the present.

Genus *Sagra* Fabricius*Sagra* Fabricius, 1792, Ent. Syst. I(2): 51.

Key to Species

1. Pronotum very finely punctured, or impunctate; posterior femora and tibiae lacking hairy areas internally 2
Pronotum moderately or densely punctured; posterior femora and tibiae with densely hairy areas internally 3
2. Posterior femora of male each with two preapical teeth; posterior tibiae of male each with a large internal tooth before apex *femorata*
Posterior femora of male each with two or three small preapical teeth; posterior tibiae of male lacking preapical teeth *heterodera*
3. Posterior tibiae of male each with a large internal tooth before apex; pronotum moderately punctured and shiny *fulgida*
Posterior tibiae of male lacking preapical teeth; pronotum closely punctured, dull, black *mouhoti*

1. *Sagra femorata* (Drury).*Alurnus femoratus* Drury, 1773, Ill. exot. Ins. 2: 64, pl. 34, fig. 5.*Sagra femorata* Herbst, 1797, Käfer 7: 266, pl. 113, fig. 6.

Dozens of specimens (Lingnan Natural History Museum) were collected at Canton, Kwangtung Province, South China, summer of 1927, R. E. Wall, July 3, 1926, June 12, 1927, July 3, 17, 1931, June 24 and Sept. 27, 1932, Spring, 1934, Spring, 1935, July 3-11, 1935, Summer, 1936, Prof. Wm. E. Hoffmann, 1931-32, E. F. Wong, 1931-32, K. C. Maack, July 5, 21, Aug. 10, 17, 23, 1939, J. L. Gressitt; Lin-fa Ling, Hau-ying-chuen, near Nodda, Hainan I., Aug. 5, 1929, on trail, Naam-fung to Poh-shaang, Hainan, July 24-25, 1929, and Tsz-tam-ts'uen, near Hung-mo-tung, K'iung-shan Distr., Hainan, May 5, 1929, Lingnan University Fifth Hainan Expedition; Lung-ping-hui, Lin Distr., N. Kwangtung, May 18-20, Taam-yuen-tung, Lin Distr., June 10-22, Sing-tsz-chan, Lin Distr., June 24-28, Fong-tong-ping, Lin Distr., June 30-July 3, 1934, F. K. To; Loh-kong-tung, 20 miles SE. of Canton, Kwangtung, July 17, 1932, Y. W. Djou. The writer also collected a few at Hong San, near Sung-wu, SE. Kiangsi Province, June 23, 1936.

Host plants.—*Canavalia gladiata* DC. (Sword bean); *Vigna sesquipedalis* Wight (Yard-long bean).

Distribution.—India; Assam; Ceylon; S. China; Hainan I.; E. Indies.

2. *Sagra fulgida* Weber.*Sagra fulgida* Weber, 1801, Obs. Ent.: 62 (China).

Sagra petelii Lacordaire, 1845, Monogr. Phytoph. 1: 44 ("Java"), new syn.

Sagra leechi Jacoby, 1888, Proc. Zool. Soc. London: 339 (Kiukiang), new syn.

Four specimens (Lingnan Natural History Museum) were collected: three from Taam-yuen-tung, Lin Distr., N. Kwangtung Province, S. China, June 2-6, 1934, by F. K. To, and one between Tseng-yih and Tau-

chi-tsz, alt. 850 meters, N. Kweichow Province, SW. China, July 14, 1940, by the writer.

Distribution.—"China"; Kiangsi; Kwangtung; Kweichow; Burma; Siam.

3. *Sagra heterodera* Lacordaire.*Sagra heterodera* Lacordaire, 1845, Monogr. Phytoph. 1: 50 (China).

Several dozen specimens (Lingnan Natural History Museum) were collected: Canton, Kwangtung, S. China, June 24, 1932, May 23, 1933 and Spring, 1934, Wm. E. Hoffmann, July 17, 1931, 1931-1932, K. H. Tsui, Spring, 1933, P. P. Hoh; Taam-yuen-tung, Lin Distr., N. Kwangtung, June 7-22, Sing-tsz-chan, Lin Distr., June 24-28, Lung-ping-hui, Lin Distr., May 18-20, and Fong-tong-ping, Lin Distr., July 1-3, 1934, F. K. To. This form is much rarer at Canton than is *femorata*.

Distribution.—"China"; Kwangtung.

4. *Sagra mouhoti* Baly (Pl. 13, Fig. 1).

Sagra mouhoti Baly, 1862, Jour. Entom. 1: 193 (Cambodia); Jacoby, 1908, Fauna Brit. India, Chrysom. 1: 7.

One specimen (Lingnan Natural History Museum) was taken at Pi-shit-chai, alt. 4500-5500 feet, near Mengtze, Yunnan Prov., SW. China, Aug. 18, 1934, by E. R. Tinkham. New to China.

Distribution.—Cambodia; Burma; Yunnan.

Subfamily Donaciinae

Only one species, a novelty, is at present at hand for inclusion in this report.

Genus *Donacia* Fabricius*Donacia* Fabricius, 1775, Syst. Ent.: 195.5. *Donacia sikanga* Gressitt, n. sp.

Female.—Elongate-oval, flattened; elytra truncate; metallic green to brown: head bronzy green, reddish brown on mouthparts and neck; antennae reddish brown, dull bronzy green on apical portions of segments; prothorax metallic green, reddish in part beneath; scutellum reddish; elytra reddish brown with bronzy green reflections; ventral surfaces reddish brown, bronzy at sides with dense silvery pubescence; legs reddish with parts of swollen portions of femora greenish black. Legs with sparse silvery hairs.

Head narrower than prothorax, produced anteriorly, closely and minutely punctured; occiput grooved medially. Antennae reaching to about middle of elytra, slender; scape slightly longer than third segment; second segment just over one-half as long as third; fourth as long as second and third combined; following segments slightly diminishing in length. Prothorax distinctly broader than long, subrectangular, feebly projecting at each lateral angle; disc minutely rugulose at each side, feebly and incompletely grooved medially, transversely depressed near

base. Scutellum narrowed and rounded apically. Elytra long, narrowed and truncate apically; each impressed with eleven regular rows of medium-sized deep punctures before middle. Legs slender; posterior femora not quite reaching to elytral apices, spined preapically; first hind tarsal segment about as long as following two united. Length 7 mm; breadth 2.6.

Holotype, female (W. China Union Univ., Biol. Dept.), Yachow, Sikang Province, W. China, July 17, 1938, Miss D. S. Pen, collector.

Differs from *D. frontalis* Baly in having the head less tuberculate, the prothorax distinctly broader than long, slightly tuberculate at lateral angles and not constricted at middle, its disc minutely rugulose laterally and not punctured, the elytra with the interstices not transversely strigose and the posterior femora spined preapically.

Distribution.—West China.

Subfamily Orsodacninae

Up till now only three species of this group, representing the genera *Syneta*, *Zeugophora* and *Macrozeugophora*, have been recorded from China. The present collection contains six species of *Syneta*, all apparently new to science. This brings the total to nine species from China in this subfamily.

Genus *Syneta* Lacordaire

Syneta Lacordaire, 1845, Monogr. Phytoph. 1: 226.

Key to Species

1. Each side of prothorax with a group of fused teeth, or a single larger tooth at middle. 2
Each side of prothorax with two or three small, separate, more or less equal teeth; size generally small. 3
2. Each side of prothorax with a larger central tooth, and some smaller separate ones; largely black, with brown elytral discs and borders of pronotal disc; body 5–7.5 mm in length. *adamsi*
Each side of prothorax with a projecting group of three fused teeth at middle; body reddish brown except for blackish antennae and parts of legs; body 10 mm long. *hainana*
3. Each side of prothorax with three teeth at middle; length of body less than 6 mm; second antennal segment generally shorter than third; abdomen brown. 4
Each side of prothorax with two small teeth at middle; length of body 7 mm; second antennal segment as long as third; abdomen black. *ventralis*
4. Sides of elytra vertical, each with a strong ridge extending from humerus almost to apex. 5
Sides of elytra rounded, without any ridge extending posteriorly from humerus. 6
5. Antennal scape very large and strongly swollen, larger than eye; third to seventh segments strongly flattened and longer than following segments; occiput with a median swelling. *magniscapa*
Antennal scape not unusually large or swollen, much smaller than eye; third to sixth segments not compressed, more slender, and only slightly

longer than following segments; occiput without a median swelling *unicolor*

6. Eyes each about one-half as wide as space between them; antennae with second segment almost as long as fourth; pronotum irregularly and not very closely punctured; elytra with fine and moderately close punctures. *abbreviata*

Eyes each less than one-half as wide as space between them; antennae with second segment distinctly shorter than fourth; pronotum very finely and closely punctured; elytra very minutely and closely punctulate. *brevidentata*

6. *Syneta abbreviata* Gressitt, n. sp. (Pl. 11, Fig. 1).

Abbreviated, subparallel-sided, dorso-ventrally compressed. Body reddish testaceous, slightly paler on posterior portions of elytra, and abdomen, coxae and femora; eyes black; tips of mandibles pitchy. Surfaces clothed with fine suberect pale golden buff hairs.

Head narrower than prothorax, short and vertical in front; frons very short and somewhat raised above; vertex concave on each side of middle, and with a few punctures; occiput even, finely punctured and with a short shallow groove in middle between upper eye-lobes; eyes strongly convex, distant, rounded-oval, hardly emarginate behind antennal insertions. Antennae two-thirds as long as body, slender, slightly thickened in apical half; scape short, swollen and arched, less than twice as long as second segment, which is moderately swollen; third segment slender, about as long as scape; fourth to sixth each about equal to third; seventh distinctly thickened apically; eighth to tenth subequal, each a little shorter and less thickened distally; last fully as long as seventh. Prothorax not quite one-half again as broad as long, a little broader at base than at apex, armed at middle of each side with three small separate teeth; disc fairly smooth and even, finely and not very closely punctured, a slight swelling on each side of middle behind each of which is a shallow oblique depression. Scutellum narrowed and rounded behind. Elytra one-half again as long as broad, suboblong, broadly rounded-truncate apically; surfaces minutely and somewhat closely punctulate. Ventral surfaces finely and irregularly punctulate. First hind tarsal segment shorter than following two combined, but nearly as long as last segment. Length 3.7 mm; breadth 1.8.

Holotype (Lingnan Natural History Museum), Lung-ping-hui, Lien (Lin) Distr., N. Kwangtung Province, S. China, May 16–17, 1934, F. K. To; five paratopotypes, May 15–17; three paratypes, Taam-yuen-tung, Lien Distr., N. Kwangtung, May 29–30, 1934, F. K. To.

Differs from *S. adamsi* Baly in having the body much shorter and more oblong, the distal antennal segments more slender, the lateral prothoracic teeth smaller, equal, and closer, and the coloration entirely pale reddish brown above.

Distribution.—South China.

7. *Syneta brevidentata* Gressitt, n. sp. (Pl. 11, Fig. 2).

Somewhat abbreviated, broadened posteriorly. Body dark reddish

brown, slightly pitchy on pronotum, posterior portions of elytra, thoracic pleura, tibiae and tarsi. Surfaces clothed with fine, pale golden buff pubescence.

Head broader than long, distinctly narrower than prothorax, finely and closely punctured except on labrum, clypeus and median line to neck; vertex slightly raised on each side; occiput with a slight depression between superior eye-lobes. Antennae slender, not quite one-half as long as body, scape feebly thickened, longer than third segment; fourth longer than second and nearly as long as third; fifth and sixth each about as long as fourth; seventh to last stouter, each about twice as long as broad; eighth to tenth shorter than seventh and last. Prothorax considerably broader than long, narrower at apex than at base; sides rounded, each with three brief, equally spaced teeth near middle; disc closely and finely punctured, with an oblique groove on each side just behind middle. Scutellum narrowed and subrounded apically, minutely punctured. Elytra seven-tenths as broad as long, widest just behind middle, conjointly rounded apically; discs closely and minutely punctulate. Ventral surfaces minutely and irregularly punctured. Legs fairly short. Length 3.9 mm; breadth 2.

Holotype (Lingnan Natural History Museum), Nam-po-hui, Lin-kao Distr., north central Hainan Island, S. China, May 27-28, 1932, F. K. To, collector.

Differs from *S. adamsi* Baly in being shorter and broader, with shorter and more equal prothoracic teeth, more slender antennae, shorter legs and more uniform coloration.

Distribution.—Hainan Island.

8. *Syneta hainana* Gressitt, n. sp. (Pl. 12, Fig. 2).

Female.—Body reddish testaceous, paler on ventral surfaces; antennae reddish to pitchy on scape, pitchy black on next two segments, black on remainder; eyes black with silvery reflections; tibiae, tarsi and apices of femora, palpi and mandibles pitchy black. Surfaces clothed with suberect pale golden-buff hairs.

Head not quite as broad as prothorax, constricted immediately behind eyes; vertex punctured on each side of middle and raised at each edge above antennal insertions; occiput rather closely punctured except along median line, shallowly grooved between superior eye-lobes; eyes large, strongly convex, vertically oval, barely emarginate anteriorly. Antennae two-thirds as long as body, fairly slender; scape arched, thickened apically, twice as long as second segment, third barely longer than second, three-fourths as long as fourth; fifth nearly as long as scape; sixth equal to fourth; seventh nearly as long as fifth; eighth equal to sixth and subequal to following segments. Prothorax nearly one-half again as long as broad, slightly wider at base than at apex, armed at middle of each side with three short horizontal teeth projecting from a common base; disc convex with an oblique depression on each side from before middle of base to above lateral teeth; surface moderately punctured, more coarsely and densely so on each side of basal portion. Scutellum sub-

triangular, rounded posteriorly. Elytra gradually broadened to beginning of apical third, broadly and conjointly rounded apically; surfaces even and closely punctulate. Ventral surfaces less closely punctulate. Legs with femora moderately swollen and first hind tarsal segment shorter than following two segments united. Length 10.5 mm; breadth 4.7.

Holotype, female (Lingnan Natural History Museum), Tai-pin-ts'uen (Dwabi), Lam-ka-heung, Lai-mo-ling (Loi Mother Mountain), Kiung-shan Distr., central Hainan Island, S. China, Apr. 20-24, 1935, F. K. To, collector.

Differs from *S. adamsi* Baly in being larger, uniformly reddish brown above with the antennae black, and with the lateral teeth of the prothorax fused into a single toothed projection on each side.

Distribution.—Hainan Island.

9. *Syneta magniscapa* Gressitt, n. sp. (Pl. 11, Fig. 3).

Moderately narrow, feebly broadened posteriorly. Reddish brown, slightly paler on elytra, almost testaceous posteriorly; antennae dark pitchy brown except on first two segments; basal portions of tibiae pitchy black. Body surfaces clothed with sparse, pale golden buff pubescence; elytra with scattered, longer, suberect hairs as well; antennae with a few moderately long, oblique hairs.

Head deeper than broad, nearly as broad as prothorax, finely and irregularly punctured; labrum truncate apically, nearly impunctate; frons concave in middle, with ridged swellings at sides; vertex narrowed, raised and emarginate laterally, impunctate medially; occiput raised and impunctate along median line, closely punctured laterally; eyes rounded oval, small but prominent. Antennae three-fourths as long as body; scape very large and strongly swollen; second segment small, as broad as long; third to fifth segments broadened, strongly compressed in middle, subequal, each about three-fifths as broad as long; eighth to tenth segments shorter, narrower and less compressed, thickened distally, subequal; last longer, fusiform. Prothorax broader than long, about as broad at apex as at base; sides convex, each with three separate, subequal, fine teeth; disc finely but not very closely punctured, more densely so basally, strongly raised anteriorly and with an oblique depression on each side behind middle. Scutellum broadly rounded apically, finely punctured. Elytra oblongovate, broadest just behind middle, evenly rounded posteriorly; sides vertical, with a ridge extending from humerus to near apex on each; discs closely and finely punctured. Ventral surfaces minutely and irregularly punctured. Legs with femora strongly swollen, tibiae broadened and compressed and tarsi fairly narrow. Length 4.5 mm; breadth 1.75.

Paratypes.—Pronotum subglabrous and shiny. Length 4.3-4.9 mm; breadth 1.8-1.9.

Holotype (Lingnan Natural History Museum), between Kau-lin San (Chiu-lin Shan) and Tsung-sun, Lien-p'ing Distr., N. Kwangtung Province, S. China, Apr. 25, 1940, J. L. Gressitt and F. K. To, collectors; two paratopotypes, Apr. 16-18.

Differs from *S. adamsi* Baly in having the scape very much larger, the second antennal segment no longer than broad, the third to seventh segments broadened and strongly compressed and longer than eighth to tenth segments, the prothorax with three fine equal teeth at each side and the body almost entirely pale reddish brown.

Distribution.—South China.

10. *Syneta unicolor* Gressitt, n. sp. (Pl. 11, Fig. 4).

Relatively narrow, oblong-oval, dorso-ventrally compressed. Body dull reddish brown, almost pitchy on antennae, head, pronotum and parts of elytral discs, as well as bases of tibiae. Surfaces clothed with sparse, subrecumbent pale buff hairs; elytra also with scattered, longer, suberect hairs.

Head as broad as long, narrower than prothorax; labrum broadened and emarginate apically; frons raised on each side; vertex smooth in middle, with a few punctures on each side near antennal insertions; occiput finely and irregularly punctured, with a small impunctate swelling at center; eyes small, entire. Antennae slender, barely more than one-half as long as body; scape swollen distally, as long as any of following segments; second segment barely longer than broad; third to sixth slender, subequal, each not quite as long as scape; seventh longer, thickened distally; eighth to tenth subequal, each shorter than third to sixth, nearly ovate; last acuminate, as long as seventh. Prothorax slightly broader than long, nearly as broad at apex as at base; each side slightly convex, armed with three slender, acute, separate, subequal teeth on central portion; disc closely and finely punctured, strongly convex anteriorly, with a broad, deep, oblique groove on each side from middle near base to above anteriormost lateral tooth. Scutellum punctured, subrounded apically. Elytra broadest just behind middle, conjointly rounded apically, closely and finely punctured; a distinct longitudinal ridge extending posteriorly on each from humerus to near apex, forming vertical sides. Ventral surfaces of body finely and irregularly punctured. Legs rather short, femora strongly swollen. Length 5 mm; breadth 2.1.

Holotype (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), altitude 800 meters, Lien-ping Distr., N. Kwangtung Province, S. China, Apr. 19, 1940, J. L. Gressitt and F. K. To, collectors; five paratopotypes, Apr. 17–21.

Differs from *S. adamsi* Baly in being entirely pitchy reddish brown and in having each side of the prothorax with three equal slender teeth.

Distribution.—South China.

11. *Syneta ventralis* Gressitt, n. sp. (Pl. 12, Fig. 1).

Medium-sized, dorso-ventrally compressed, broadened posteriorly. Body reddish brown; abdomen, anterior tibiae and tarsi, eyes and last eight antennal segments black; third antennal segment, middle and hind tibiae and tarsi and mouthparts pitchy red. Body almost entirely clothed with suberect golden buff hairs.

Head not quite as broad as prothorax, sparsely and deeply punctured

except along occiput; frons declivitous, slightly arched transversely; vertex feebly concave between antennal insertions; longitudinally ridged on each side; occiput concave behind vertex, feebly grooved medially, slightly convex posteriorly; eyes broadly oval, subovate, slightly wider above than below. Antennae two-thirds as long as body, slightly thickened distally; scape thick, slightly arched, barely longer than second segment; third as long as scape, slightly longer than fourth and sixth, subequal to fifth, seventh, eighth and ninth; tenth shorter and last longest; fifth and following more hairy than first four. Prothorax nearly one-half broader than long, much broader at base than apex, broadly rounded laterally on basal three-fourths, with one or two small tooth-like tubercles on each side just behind middle and also on constricted anterior portion; disc transversely depressed near base, feebly so between middle and apex and obliquely grooved on each side just behind center, its surface nearly impunctate along middle, somewhat heavily punctured on each side. Scutellum long and distinctly narrowed posteriorly, truncate at apex, with scattered punctures. Elytra one-half again as wide as prothorax at base, slightly widened to behind middle, broadly and conjointly rounded apically; surfaces rather densely punctured. Ventral surfaces minutely punctured on thorax, more densely so on sides of abdomen. Legs with femora moderately thickened and distinctly punctured; first hind tarsal segment shorter than following two combined. Length 6.8 mm; breadth 2.7.

Holotype (W. China Union Univ., Biol. Dept.), Tubaokou, Sikang Province, W. China, July 20, 1939, Miss D. S. Pen, collector; paratype (Univ. of Nanking, Coll. Agric.), Mt. Omei, Szechuan Province, W. China, Aug. 2, 1938, K. F. Chen, collector.

Differs from *S. adamsi* Baly in having only two closely adjacent, minute teeth on each side of the prothorax and the dorsal surfaces uniformly pale reddish brown.

Distribution.—Sikang; Szechuan.

Subfamily Megalopodinae

Heretofore only seven members of this subfamily have been recorded from China. Six of these belong to the genus *Colobaspis* and the other one to *Clythraxeloma*. Twelve Chinese species are reported upon in this study, and eight of these are additional to the above, bringing the total for China to fifteen. Six are described as new species, and two genera are new to the Chinese fauna.

Key to Genera

1. Posterior femora armed with one or more teeth at or near apices 2
Posterior femora unarmed apically; head broader than prothorax; prothorax non-tuberculate laterally; body narrow *Poecilomorpha*
2. Prothorax non-tuberculate laterally; head generally narrower than prothorax; body often robust *Temnaspis*
Prothorax more or less tuberculate laterally near base; head generally about as broad as prothorax; body elongate-oblong *Colobaspis*

Genus *Poecilomorpha* Hope*Poecilomorpha* Hope, 1840, Coleopt. Manual 3: 178.

The genus is new to China.

Key to Species

- Elytra metallic blue; antennae and tarsi black; remainder of body testaceous with black markings on head, central portion and sides of pronotum, sides of metasternum and outsides of posterior femora; elytra heavily punctured.....*elegantula*
- Elytra reddish ochraceous basally, black on premedian portion and testaceous posteriorly; head and prothorax ochraceous spotted with black; ventral surfaces largely black; antennae pitchy; tarsi ochraceous; elytra finely punctured.....*penae*

12. *Poecilomorpha elegantula* Gressitt, n. sp. (Pl. 12, Fig. 3).

Fairly slender; body about as deep as broad. Tricolorous: testaceous, black and steel blue; head nearly ochraceous, with a fairly large round black spot on vertex and an irregular one on postocciput; antennae black with scape slightly pitchy red; prothorax orange testaceous with median portion of disc from apex to base shiny black, slightly metallic, the area broadest on central portion; each side of prothorax with a small rounded shiny black spot at middle and another irregular one on episternum; scutellum black; elytra shiny steel blue, slightly tinged with greenish basally and purplish posteriorly; ventral surfaces of body orange testaceous on thorax and pale yellowish testaceous on abdomen; parts of mesepisternum and an oblong spot on each side of metasternum pitchy black; legs pale ochraceous with tarsi, extreme apices of tibiae and a small spot on center of outer sides of middle and posterior femora pitchy black. Body somewhat heavily clothed with fairly long erect and oblique hairs, blackish on dorsal surfaces, golden buff on ventral surfaces, and partly pale and partly pitchy on legs.

Head about as long as broad, considerably broader than prothorax, almost impunctate on clypeus and frons, deeply impressed between them; vertex slightly swollen in center, closely punctured laterally; occiput feebly depressed anteriorly, moderately punctured. Antennae reaching to humeri; scape longer than third segment; fourth hardly longer than second; fifth to last moderately expanded externally; fifth practically as long as third; sixth to tenth shorter, subequal. Prothorax broader than long, narrower at apex than base, convex on central portions of each side; disc arcuately and rather deeply grooved near apex and base, finely but not very closely punctured. Scutellum narrow, subangulate apically. Elytra narrow, slightly broadened behind middle; humeri hardly projecting; discs heavily punctured basally, more finely so on apical third, basal portion slightly swollen near scutellum and feebly depressed beyond end of basal quarter. Ventral surfaces of body finely and irregularly punctured. Posterior femora one-half as broad as long, not quite reaching elytral apices; posterior tibiae arched in apical halves. Length 8 mm; breadth 2.6.

Holotype, female (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), Lien-ping Distr., N. Kwangtung Province, S. China, April 23, 1940, J. L. Gressitt and F. K. To, collectors; paratopotype, female, April 16.

Differs from *P. testaceipes* Pic in having the elytra entirely metallic blue, the head and prothorax spotted with black and the antennae almost entirely black.

Distribution.—South China.

13. *Poecilomorpha penae* Gressitt, n. sp. (Pl. 12, Fig. 4).

Narrow, subelongate, slightly broadened posteriorly; posterior femora short, unspined beneath; tricolorous. Body ochraceous or testaceous, marked with black: head reddish testaceous, black on eyes and apical portions of mandibles; antennae pitchy black, reddish on scape; prothorax reddish with three black spots, one on each side of disc and one behind center; scutellum pitchy red; elytra reddish ochraceous basally, black from end of basal quarter to behind middle, pale testaceous on remainder; ventral surfaces ochraceous marked with black anteriorly, largely black on metasternum, testaceous on borders of abdomen and pitchy black in center; legs slightly reddish ochraceous; extensively marked with black on outer surfaces of middle and hind femora. Body clothed with mixed black and golden-brown bristles above and largely with paler ones beneath.

Head broader than prothorax, narrow anteriorly; labrum and clypeus feebly punctured; frons subarcuately depressed; vertex slightly depressed in middle, occiput somewhat densely punctured, sulcate between posterior portions of eyes; eyes very large, widest a little above middle. Antennae reaching just beyond elytral bases, broadly serrate beyond fourth segment; scape longer than third segment; fourth segment a little longer than second; fifth as broad as long, fully as long as third; sixth to tenth subequal, hardly shorter than fifth; last a little longer. Prothorax a little broader than long, narrowed at apex, somewhat convex at sides; disc convex, irregularly punctured, slightly swollen at each side near base. Scutellum broadly triangular, finely punctured. Elytra feebly obtuse at sides of humeri, very slightly broadened posteriorly, separately rounded apically, closely punctured on basal two-thirds. Ventral surfaces finely and sparsely punctured. Legs with posterior femora about one-third as broad as long and last hind tarsal segment about as long as first three united. Length 10.5 mm; breadth 3.9.

Holotype (W. China Union Univ., Biol. Dept.), Tubaokou, Sikang Province, W. China, July 21, 1939, Miss D. S. Pen, collector.

Differs from *P. testaceipes* Pic in having the anterior portion of the body reddish ochraceous with some small black spots, instead of testaceous, the elytra crossed by a broad black band, the antennae largely black and the legs ochraceous marked with black.

Distribution.—West China.

Genus *Temnaspis* Lacordaire

Temnaspis Lacordaire, 1845, Mem. Soc. R. Sci. Liege 3: 716.

The genus is new to China, though species of *Colobaspis* have been described from China as *Temnaspis*.

14. *Temnaspis bidentatus* Pic (Pl. 13, Fig. 2).

Temnaspis bidentatus Pic, 1922, Mel. Exot. Ent. 36: 27 (Assam).

Large; very broad; prothorax non-tuberculate; posterior femora two-spined; bicolorous. Body yellowish testaceous, somewhat reddish ochraceous on posterior femora and hind portion of abdomen; eyes, elytra, tibiae (except basal two-thirds of hind pair), tarsi and tips of mandibles black. Body almost entirely clothed with bristles of varying length, in general corresponding in color to respective surfaces, but those on pronotum mostly pitchy.

Head not quite as broad as prothorax; labrum and clypeus convex, punctured at sides; frons transversely depressed; vertex nearly horizontal, slightly convex just behind middle; occiput largely punctured, a central concavity between posterior borders of eyes. Antennae reaching to bases of elytra, broadly expanded beyond fourth segment; scape thickest apically, a little longer than third segment; fourth shorter than third, longer than second; fifth nearly twice as wide as fourth, about as long as third; fifth to tenth about equal in width, slightly decreasing in length; last longest, nearly as broad as tenth. Prothorax nearly one-fourth broader than long, slightly narrowed anteriorly, feebly convex at sides; disc evenly convex, irregularly and deeply punctured. Scutellum broad, trapeziform, emarginate-truncate apically, feebly punctured. Elytra broad, separately rounded apically, feebly projecting on side of each humerus; surfaces sparsely and not very coarsely punctured. Ventral surfaces irregularly punctured, most heavily on sides of abdomen; last abdominal segment large; legs stout; posterior femora barely reaching to elytral apices, about one-half as broad as long, each with two subapical spines, the more proximal one nearly twice as long as second; hind tarsi with first three segments about as long as last. Length 7.5 mm; breadth 5.7.

Some specimens (Univ. of Nanking, Coll. Agric. and Lingnan Nat. Hist. Museum) were taken at Ya-an, Sikang Province, W. China, July 17, 1939, S. N. Hsia, collector. New to China.

Distribution.—Assam; West China.

Genus *Colobaspis* Fairmaire

Colobaspis Fairmaire, 1894, Ann. Soc. Ent. Belg. 38: 225.

Key to Species

1. Elytra not marked with black; head black; pronotum black or spotted with black; posterior femora pale. 2
- Elytra marked with black, at least on humeri; ventral surfaces largely black, or else pronotum and ventral surfaces entirely pale. 3
2. Prothorax testaceous with four black spots on disc, strongly tuberculate

- laterally; posterior femora each with a long distal tooth and a smaller one beyond middle. *femorata*
- Prothorax entirely black, feebly tuberculate laterally; posterior femora each with three moderate teeth below: two near apex and one beyond middle. *nankinea*
3. Prothorax entirely testaceous or ochraceous; ventral surfaces not marked with black. 4
- Prothorax black or marked with black; ventral surfaces partly black. . . . 6
4. Elytra black; legs ochraceous or testaceous. 5
- Elytra testaceous, with only anterior portions of humeri black; legs black except for pale apical portions of posterior femora; head with a round black spot covering swelling on vertex; occiput with a very shallow central depression. *pallida*
5. Antennae testaceous; vertex black at sides; elytra with moderately heavy punctures. *insignis*
- Antennae black; head lacking black markings; elytra finely asperate-punctate. *omeiensis*
6. Prothorax with a prominent tubercle at each side near base; occiput with a shallow central depression. 7
- Prothorax with a small and feeble tubercle at each side near base; occiput with a deep central fovea. 8
7. Head, antennae and thorax entirely black; legs black except for preapical portions of posterior femora; elytra testaceous with humeral and lateral black spots. *flavonigra*
- Head and pronotum pale with black markings; antennae ochraceous with last segment black; elytra pink basally, each with a large black spot before, and another behind, middle, and testaceous apically; legs largely pale with black areas on middle and hind femora. . . . *regalis*
8. Posterior tibiae strongly flattened and broadened; elytra entirely pale ochraceous except for black humeri. *kwangtungensis*
- Posterior tibiae not very strongly flattened and broadened; elytra each with a large elongate-oval discal area, as well as a humeral spot and a small spot near side behind middle, of black. *pulchra*

15. *Colobaspis femorata* Gressitt, n. sp. (Pl. 13, Fig. 4).

Male.—Large, subelongate; femora considerably exceeding elytral apices, hispinose beneath; tricolorous. Body largely reddish ochraceous, in part testaceous or black: head black, reddish pitchy beneath and on portions of mouthparts and antennal insertions; antennae black; prothorax pale testaceous with a large rounded black spot on each side of disc, centered before middle, three small black spots in a transverse row near base and a small rounded spot on each side just above middle; scutellum black, pitchy red apically; elytra reddish ochraceous, pale testaceous at apices; ventral surfaces ochraceous on metasternum, testaceous on borders of abdomen and pitchy in center; legs pitchy red to black on first two pairs and hind tibiae (except bases) and tarsi, reddish ochraceous on most of hind femora and pale testaceous on apices of hind femora and bases of hind tibiae. Surfaces clothed with sparse suberect bristles, very short on elytra, black on dorsal surfaces and mostly ochraceous on ventral surfaces and legs.

Head long, nearly as broad as prothorax; labrum densely punctured;

clypeus transversely convex, sparsely punctured; frons transversely depressed, smooth, vertex slightly convex in middle, a few punctures on each side; occiput sparsely punctured, a small depression in middle before posterior margins of eyes, convex posteriorly; eyes strongly swollen, widest near middle. Antennae reaching beyond elytral bases, moderately broadened beyond fourth segment; scape distinctly punctured, barely longer than third segment; fourth segment one-half again as long as second; fifth shorter than third, broadly expanded apically; sixth to tenth similar, successively a little shorter; last shorter than third. Prothorax much broader than long, narrowed towards apex, each side expanded into a broad flattened tubercle near base. Scutellum trapezoidal, sparsely punctured. Elytra long, slightly narrowed posteriorly, feebly obtuse at sides of humeri, separately subrounded apically; surfaces sparsely and somewhat finely punctured. Ventral surfaces finely and sparsely punctured; metasternum strongly swollen and bluntly tuberculate on each side of middle. Legs stout; posterior femora extending well beyond elytral apices, each with a stout spine just beyond middle of under side and a longer more oblique one before apex; last hind tarsal segment longer than first three combined. Length 11.5 mm; breadth 4.7.

Holotype, male (W. China Union Univ., Biol. Dept.), Lingkuang, Sikang Province, W. China, Aug. 18, 1939, Miss D. S. Pen, collector; allotype, female (Univ. Nanking, Coll. Agric.), Mou-pin, Sikang, Aug. 2, 1939, S. N. Hsia, collector.

Differs from *C. flavonigra* Fairmaire in having the pronotum testaceous marked with black, the elytra largely reddish ochraceous and without black markings, the prothoracic tubercles more blunt apically, the humeri less prominent and the femora larger.

Distribution.—West China.

16. *Colobaspis flavonigra* Fairmaire.

Colobaspis flavonigra Fairmaire, 1894, Ann. Soc. Ent. Belg. 38: 225 (Tibet).

One specimen (University of Nanking, Coll. Agric.) was taken at Mou-pin, Sikang Province, W. China, Aug. 2, 1939, by S. N. Hsia.

Distribution.—Tibet; Sikang.

17. *Colobaspis insignis* (Baly) (Pl. 14, Fig. 3).

Temnaspis insignis Baly, 1859, Ann. Mag. Nat. Hist. (3) 3: 208 (N. India).

Colobaspis insignis Jacoby and Clavareau, 1905, Gen. Ins. 33: 14; Jacoby, 1908, Fauna Brit. India, Chrys. 1: 92.

One specimen (Lingnan Natural History Museum) was taken at Chue-mo-ling, northeast of Nodao, Tan Distr., Hainan Island, Aug. 24, 1929, Lingnan University Fifth Hainan Expedition.

Distribution.—N. India; Hainan Island.

18. *Colobaspis kwangtungensis* Gressitt, n. sp. (Pl. 14, Fig. 4).

Male.—Suboblong, moderately robust, slightly broader than deep. Body testaceous and black; head black with under surfaces, genae, clypeus and anterior portion of frons testaceous to pitchy ochraceous; palpi pitchy; antennae pitchy black, shiny on first four segments and dull on remainder; prothorax testaceous with a large rounded pitchy black spot on each side of disc, nearer apex than base, a pitchy band on middle of base, a small darker spot before it and a slightly larger rounded pitchy black spot on each side just behind middle; scutellum pitchy black; elytra testaceous to nearly ochraceous, with humeri pitchy black; ventral surfaces of body pale ochraceous with sides of meso- and metathoraces, coxae and central portions of last two abdominal sternites black or pitchy black, and center of metasternum pitchy; legs largely pitchy black, anterior femora pale beneath, posterior femora nearly black with apical portions largely testaceous, and posterior tibiae orange testaceous on basal halves or more. Body sparsely clothed with moderately fine suberect pitchy or golden buff hairs.

Head (excluding neck) broader than long; frons transversely depressed, impunctate; vertex slightly swollen in center, sparsely punctured at sides; occiput with a deep fovea between posterior portions of eyes, sparsely punctured; postocciput more closely punctured. Antennae reaching to humeral angles; first four segments slender, third about as long as scape and fourth subequal to second; fifth and following broadened and flattened; sixth to tenth each slightly broader than long. Prothorax transverse, breadth at apex slightly greater than length; sides sinuate, with a short, somewhat dorsoventrally compressed tubercle on each near base; disc transversely swollen on central portion, sinuately depressed near apical border, sparsely and irregularly punctured. Scutellum truncate posteriorly, sparsely punctured. Elytra parallel-sided, with apices rounded and humeri slightly projecting; surfaces finely and not very closely punctured. Ventral surfaces of body very sparsely punctured on thorax, more densely punctured on abdomen. Posterior femora reaching end of body, strongly swollen, each with a long acute spine below apex and a much shorter one near middle of under side; posterior tibiae compressed and strongly arched. Length 10 mm; breadth 4.15.

Holotype, male (Lingnan Natural History Museum), Kau-lin San (Chiu-lin Shan), Lien-ping Distr., N. Kwangtung Province, S. China, Apr. 16, 1940, J. L. Gressitt and F. K. To.

Differs from *C. flavonigra* Fairmaire in being broader, with the head slightly narrower, the prothorax longer, broader apically and much more feebly tuberculate laterally, the scutellum broader, the elytra black only on the humeri, which are less prominent, and the posterior femora more strongly swollen and each armed with two ventral teeth.

Distribution.—South China.

19. *Colobaspis nankinea* Pic (Pl. 14, Fig. 1).

Colobaspis nankineus Pic, 1914, Mel. Exot. Ent. 10: 20 (Nanking).

Some specimens (Musée Heude, Shanghai) probably referable to this species were collected at T'ien-mu Shan, Chekiang Province, E. China, May 26, 1937, by Rev. Père Octave Piel. New to Chekiang.

Distribution.—East China.

20. *Colobaspis omeiensis* Gressitt, n. sp.

Female.—Narrow, subparallel-sided; femora strongly swollen; bicolorous. Body largely reddish ochraceous, dull ochraceous on abdomen and testaceous on tibiae; eyes, antennae, elytra and apices of mandibles black; anterior two pairs of tarsi pitchy black; posterior tarsi and apical portions of anterior two pairs of tibiae pitchy red. Elytra beset with long erect black bristles; head and prothorax with shorter black bristles; legs and ventral surfaces of body with golden buff hairs of varying length; fifth and following antennal segments with close silvery pubescence.

Head broader than prothorax; labrum and clypeus convex, former more generally punctured; frons arcuately concave; vertex nearly plane transversely, hardly punctured; occiput generally punctured, fairly plane, a small deep cavity in center before hind borders of eyes; eyes large and strongly swollen, widest just below middle. Antennae reaching well beyond elytral bases, only moderately expanded beyond fourth segment; scape with a few deep punctures, longer than third segment; fourth barely longer than second; fifth longest, nearly as long as third and fourth united, nearly as wide as tenth; sixth to last subequal, each about two-thirds as long as fifth. Prothorax a little broader than long, narrowed anteriorly, expanded and bluntly angulate at each side of base; disc convex, irregularly but distinctly punctured. Scutellum broad, trapezoidal, emarginate apically, finely punctured. Elytra parallel-sided, feebly rounded at sides of humeri, separately rounded apically; surfaces finely and somewhat regularly asperate-punctate. Ventral surfaces irregularly, but in the main finely, punctured; last abdominal sternite as long as four preceding. Legs stout, posterior femora one-half as broad as long, sparsely punctured, with a strongly perpendicular preapical spine; first three segments of posterior tarsi shorter than last. Length 10 mm; breadth 4.15.

Holotype, female (Univ. of Nanking, Coll. Agric.), Mt. Omei, Szechuan Province, W. China, Sept. 9, 1938, C. S. Tsi, collector.

Differs from *C. bicoloriceps* Pic in having the body less pale, the posterior portion of the head reddish, the tarsi partly blackish, the elytra more regularly and more heavily punctured, etc.

Distribution.—West China.

21. *Colobaspis pallida* Gressitt, n. sp. (Pl. 13, Fig. 3).

Body largely yellowish testaceous; head with distal three-quarters of mandibles, parts of labrum and a round spot on vertex pitchy black; antennae entirely pitchy black, shiny on first four segments and dull on remainder; prothorax entirely pale; scutellum pitchy black on central

portion of base; elytra pale except for pitchy black humeral borders; ventral surfaces pale except for pitchy black mesepisterna and pitchy bases and apices of metepisterna; legs black with basal portions of femora pitchy brown and apical halves or so of posterior femora testaceous. Body almost entirely clothed with suberect pitchy or golden buff hairs.

Head longer than broad, barely broader than prothorax; labrum distinctly punctured; clypeus and frons hardly punctured, latter transversely depressed; vertex sparsely punctured, slightly swollen in center; occiput with a very feeble anterior depression, sparsely punctured. Antennae reaching to humeral angles; scape slightly longer than third segment; fourth barely longer and broader than second; fifth and following moderately expanded; fifth one-half again as long as fourth, longer than each of following; sixth to tenth subequal, slightly angulate ectoapically. Prothorax transverse; breadth at apex greater than length; sides sinuate, bluntly tuberculate between middle and base; disc sparsely punctured, slightly swollen on each side before middle. Scutellum sparsely punctured, broad and slightly emarginate-truncate apically. Elytra with humeri briefly projecting, apices evenly rounded, and surfaces finely punctured. Ventral surfaces of body sparsely punctured; metasternum with a distinct blunt tubercle on each side of middle; metepisternum with an arcuate cavity anteriorly and apex slightly swollen. Legs compressed; posterior femora not quite reaching elytral apices, each arm with a sharp tooth below apex. Length 10.5 mm, breadth 4.2.

Holotype (Musée Heude, Shanghai), T'ien-mu Shan, Chekiang Province, E. China, May 24, 1937, Rev. Père Octave Piel, collector.

Differs from *C. humeralis* (Jacoby) in having the head and prothorax punctured, the occiput with a very feeble fovea, the prothorax and ventral surfaces of body entirely testaceous, the scutellum largely pale, the elytral humeri less extensively dark and the head with only a small black spot on center and the rest testaceous.

Distribution.—East China.

22. *Colobaspis pulchra* (Baly) (Pl. 14, Fig. 2).

Temnaspis pulcher Baly, 1859, Ann. Mag. Nat. Hist. (3) 3: 206 (N. China).

Colobaspis pulchra Jacoby and Clavareau, 1905, Gen. In. 33: 14 ("N. India").

Female.—Moderately small, slightly broadened posteriorly; prothorax feebly tuberculate laterally. Body pale yellowish testaceous and pitchy black: head blackish with anterior portion and ventral surfaces largely pale, labrum and clypeus pitchy brown basally and palpi ochraceous brown; antennae pitchy black; prothorax testaceous with a large rounded spot on each side of disc, a small narrow one on median line behind middle, a round one behind middle of each side, and a smaller spot on each episternum, of pitchy black; scutellum nearly black; elytra pale yellowish testaceous, each with humerus, a large elongate-oval spot on disc, and a small one at side behind middle pitchy black; hind thorax entirely pitchy black; inner parts of coxae testaceous; legs pitchy black

tinged with reddish, anterior and middle femora largely dark reddish brown and posterior femora testaceous just before apices; abdomen testaceous, pitchy black on central portions of third to fifth sternites. Body clothed with long, erect, blackish hairs above, long, pale, oblique hairs on legs, and shorter and sparser, pale, or pitchy, ones on ventral surfaces.

Head about as long as broad, distinctly broader than prothorax, finely and sparsely punctured anteriorly, with a deep transverse depression on frons; vertex impunctate and somewhat swollen in center, sparsely punctured at sides; occiput with a large fovea behind anterior swelling, finely and sparsely punctured. Antennae reaching to beyond humeri, shiny on first four segments, dull on remainder; scape longer than third segment; fourth slightly larger than second; fifth and following somewhat compressed and expanded; fifth slightly shorter than third; sixth and following shorter, subequal. Prothorax subtransverse, breadth at apex greater than length; sides slightly sinuate, each with a very feeble blunt tubercle between middle and base; disc feebly swollen anteriorly on each side of middle, sparsely and finely punctured. Scutellum broad, truncate apically, finely punctured. Elytra slightly broadened behind middle; humeri rounded and slightly projecting, discs finely and not very closely punctured. Ventral surfaces with very few punctures on thorax; abdomen moderately punctured. Posterior femora stout, not reaching to elytral apices, each armed with a moderately long slender tooth below apex; posterior tibiae slightly compressed, but feebly arched. Length 8 mm, breadth 3.

Allotype, female (Musée Heude, Shanghai), Mogan Shan, Chekiang Province, E. China, May 7, 1936, the Rev. Père Octave Piel, collector.

Distribution.—North China; Chekiang.

23. *Colobaspis regalis* Achard.

Colobaspis regalis Achard, 1920, Bull. Soc. Ent. France: 48 (Yunnan).

One specimen (Univ. Nanking, Coll. Agric.) was taken at Mou-pin, Sikang Province, West China, Aug. 22, 1939, by S. N. Hsia. New to Sikang.

Distribution.—Yunnan; Sikang.

Explanation of Plates

Plate 11

- Fig. 1. *Syneta abbreviata* n. sp.; holotype. $\times 14.3$.
 2. *Syneta brevidentata* n. sp.; holotype. $\times 14.3$.
 3. *Syneta magniscapa* n. sp.; holotype. $\times 14.3$.
 4. *Syneta unicolor* n. sp.; holotype. $\times 14.3$.

Plate 12

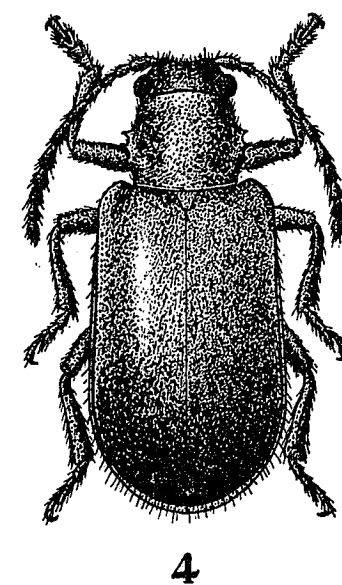
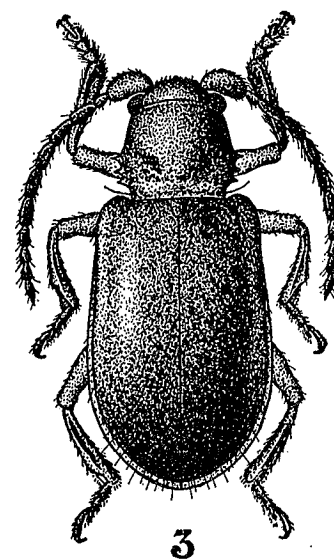
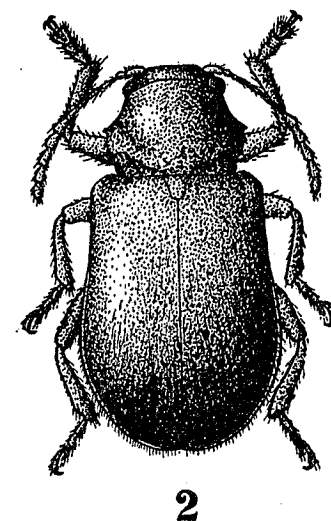
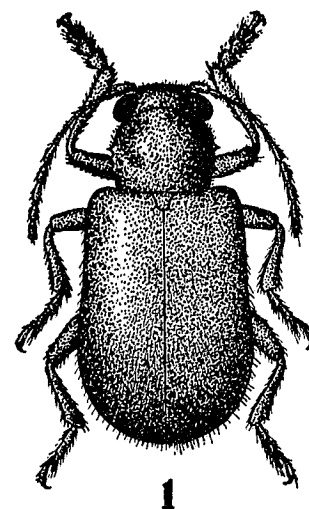
- Fig. 1. *Syneta ventralis* n. sp.; holotype. $\times 8.60$.
 2. *Syneta hainana* n. sp.; holotype. $\times 5.75$.
 3. *Poecilomorpha elegantula* n. sp.; holotype. $\times 6.87$.
 4. *Poecilomorpha penae* n. sp.; holotype. $\times 4.65$.

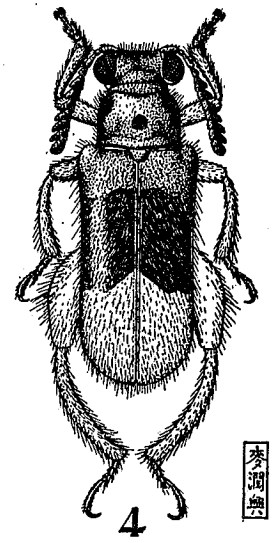
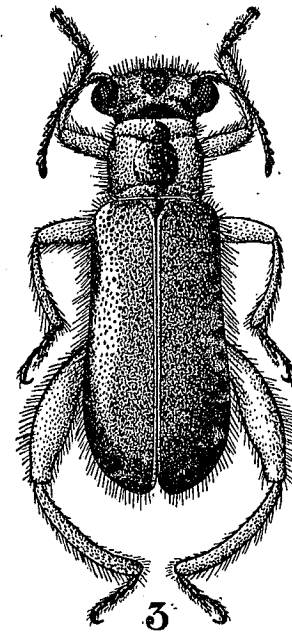
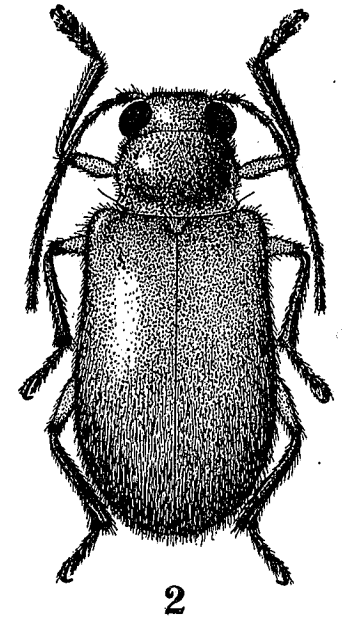
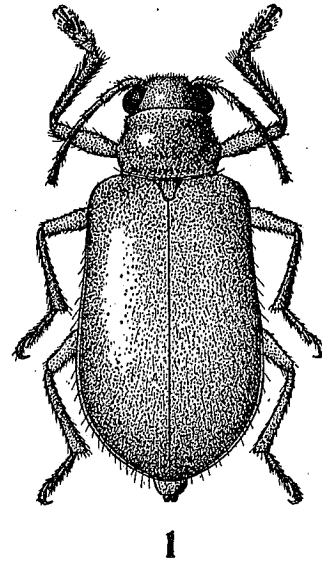
Plate 13

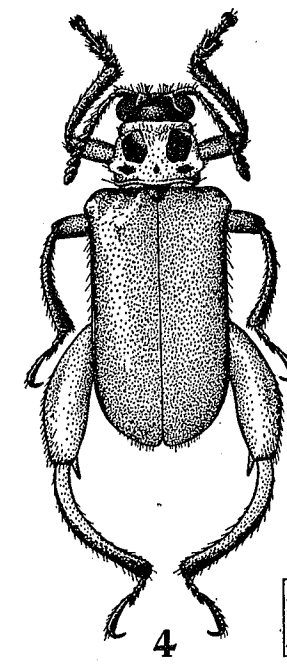
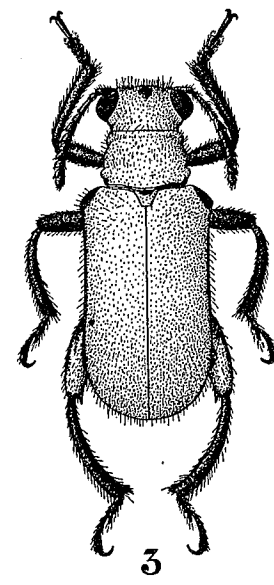
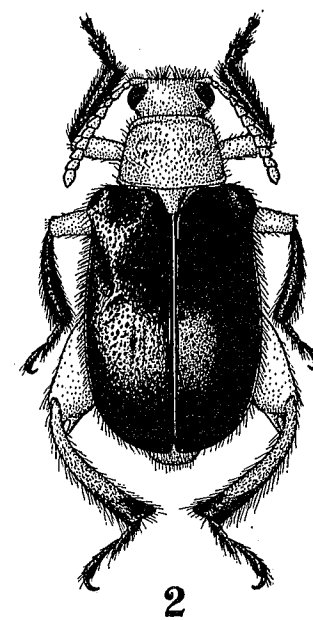
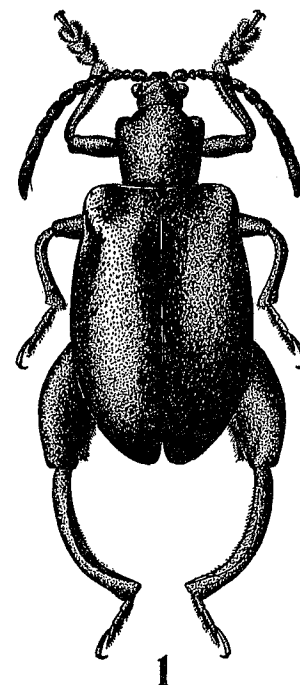
- Fig. 1. *Sagra mouhoti* Baly; Yunnan. $\times 3.68$.
 2. *Temnaspis bidentatus* Pic; Sikang. $\times 4$.
 3. *Colobaspis pallida* n. sp.; holotype. $\times 4$.
 4. *Colobaspis femorata* n. sp.; holotype. $\times 4$.

Plate 14

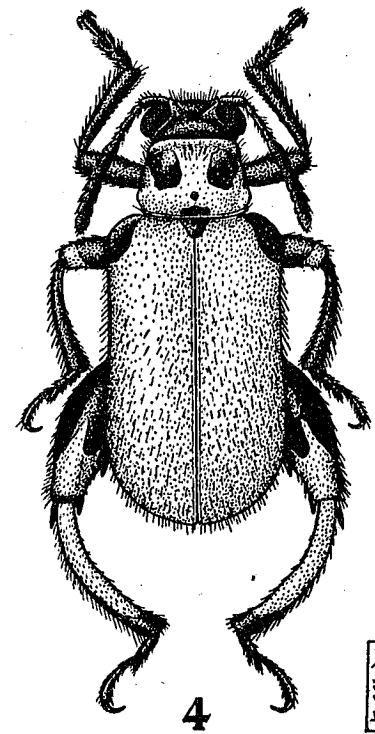
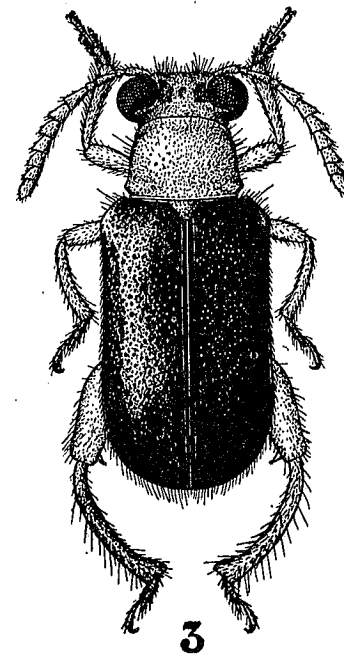
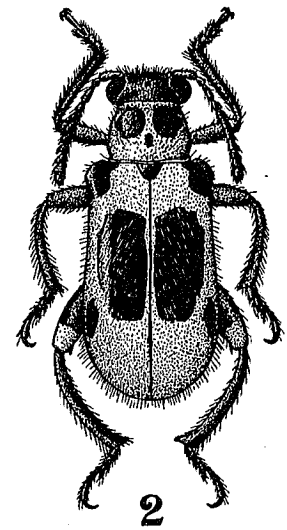
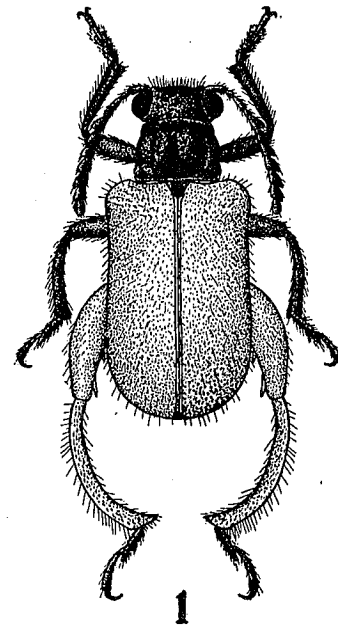
- Fig. 1. *Colobaspis nankinea* Pic; Chekiang. $\times 5.50$.
 2. *Colobaspis pulchra* (Baly); Chekiang. $\times 5.50$.
 3. *Colobaspis insignis* (Baly); Hainan I. $\times 7.38$.
 4. *Colobaspis kwangtungensis* n. sp.; holotype. $\times 5.50$.







麥潤興



PLANT-BEETLES FROM SOUTH AND WEST CHINA.
II. CRIOCERINAE (CHRYSOMELIDAE)¹

By J. LINSLEY GRESSITT

Lingnan Natural History Survey and Museum, Lingnan University.

This paper largely concerns the leaf-beetles of the subfamily Criocerinae from South and West China and Hainan Island contained in the Lingnan Natural History Survey and Museum² and the collection of the writer. Most of the specimens now at hand belong to the latter, or were collected by the writer in southern and western China for Lingnan University in 1940. Those in the writer's collection were collected by him on the Island of Hainan in 1935 and in southeastern China (E. Kwangtung, SE. Kiangsi and SW. Fukien Provinces) in 1936. The remainder of the material was collected in Hainan in 1929 by the Lingnan University Fifth Hainan Expedition, and on the campus of Lingnan University in Canton and at a few other localities in Kwangtung, by Prof. W. E. Hoffmann, Y. W. Djou, F. K. To, K. C. Yeung, T. Y. Chue, and the writer. A few specimens from the University of Hong Kong, the California Academy of Sciences, the University of Nanking, West China Union University and Musée Heude, Université l'Aurore, Shanghai, are also included, and some Chinese species collected in Formosa and Japan by the writer are included in the keys to make the latter more serviceable.

The specimens enumerated in this paper number a few hundred, and represent forty-six species. Twenty-one of these species are described as new to science, and several additional ones are newly recorded from China.

From the tentative determinations in the empty collection drawers of the Museum, and on the mailing lists, apparently a number of species additional to those known from China or included in this paper were destroyed by the war.

The illustrations were prepared by Mr. Jose Gomez.

¹ Contribution from the Lingnan Natural History Survey and Museum.

² Almost the entire collection of this group belonging to the Lingnan Natural History Survey and Museum was destroyed in the mail on its way to the writer, then in California, with the burning of the Canton Post Office at the time of the fall of Canton to the Japanese in October 1938. Five hundred and four specimens of about thirty-five species of this subfamily were lost, together with a few thousand other beetles of various groups. All the criocerids that remain from the former collection are a few odd specimens, mostly duplicates of common species from Canton, and a few taken in Hainan in 1929.

Subfamily Criocerinae

Key to Chinese Genera

- Tarsal claws separate..... *Crioceris*
 Tarsal claws fused for about their basal halves or thirds..... *Lema*

Genus *Crioceris* Geoffroy

Crioceris Geoffroy, 1762, Hist. Ins. Paris 1: 237.

Key to Species

1. Elytra not unicolorous: reddish with blue, black or yellow spots, black with red or orange markings, or yellowish with bronzy along suture. 2
 Elytra unicolorous..... 7
2. Elytra orange-brown and black, or red and black..... 3
 Elytra reddish or bronzy brown with yellow spots, or yellowish with bronzy suture..... 4
3. Pronotum and elytra orange, the latter with 5 to 7 black spots on each side and the former with four indistinct spots in a transverse row..... 14-punctata
 Pronotum and elytra black, the latter with humeral portions more or less orange..... scapularis
4. Dorsal surfaces reddish; humeri each with a squarish yellow spot..... 5
 Elytra bronzy brown with four large yellow spots or yellowish with bronzy suture..... 6
5. Interocular area deeply grooved medially; prothorax feebly constricted at middle, minutely and irregularly punctured; elytra almost impunctate laterally..... major
 Interocular area hardly grooved medially; prothorax strongly constricted at middle, with a pair of minute puncture-rows along median line of disc; elytra practically impunctate on apical third..... luteohumeralis
6. Dorsal surfaces bronzy brown, elytra with four large yellow spots, the posterior pair occupying almost the posterior two-fifths, except along the suture..... hainanensis
 Elytra yellowish with the suture bronzy; head and prothorax bronzy reddish brown..... cupreosuturalis
7. Dorsal surfaces metallic bronzy, with red, brown or greenish tints..... 8
 Dorsal surfaces not distinctly metallic; elytra generally reddish, testaceous, or brownish..... 9
8. Pronotum distinctly punctured, with a pair of parallel rows of punctures along median line of disc; elytra each with a pair of foveae at end of basal quarter; legs greenish..... iridescens
 Pronotum almost impunctate, lacking two median rows of punctures; elytra lacking a pair of deep foveae near base of each; legs reddish, hardly metallic..... rufometallica
9. Elytra not impressed with extraordinarily large irregular punctures; generally reddish or testaceous..... 10
 Elytra strongly swollen behind scutellum, dark reddish brown, impressed with very large irregular punctures on basal portions and on external halves and apices..... gibba
10. Dorsal surfaces not contrastingly bicolorous; prothorax reddish or paler..... 11
 Dorsal surfaces contrastingly bicolorous; head, prothorax and scutellum shiny black; elytra red or orange castaneous..... impressa
11. Elytra testaceous to orange ochraceous, not reddish..... 12
 Elytra reddish..... 14

12. At least antennae and parts of legs black or pitchy black; sides of metasternum at least partly punctured or pubescent..... 13
 Body, including appendages, entirely pale ochraceous; sides of metasternum largely impunctate; elytra irregularly punctured basally; pronotum with a pair of median longitudinal rows of fine punctures..... ochracea
13. Elytra heavily punctured to apices; prothorax reddish and fully as long as broad; antennae thickened distally; body less than 6 mm in length..... minor
 Elytra very finely punctured posteriorly; prothorax broader than long, similarly colored to elytra; antennae not distinctly thickened distally; body more than 8 mm in length..... smilacis
14. Ventral surfaces and legs entirely black, or nearly so; basal portions of femora often pitchy or reddish..... 15
 Ventral surfaces and legs largely reddish or pitchy..... 16
15. Pronotum rather convex, with a single median longitudinal row of punctures; distal antennal segments barely broader than long..... egena
 Pronotum rather flattened on disc, with two median rows of punctures, or with scattered punctures; distal antennal segments appreciably broader than long..... impressa
16. Elytra distinctly punctured throughout, not very finely so posteriorly; more than outermost puncture-row grooved near apex..... 17
 Elytra not distinctly punctured posteriorly, only outermost puncture-row deeply impressed near apex..... 19
17. Sides of metasternum glabrous and with a groove parallel to lateral margin; preapical antennal segments at least nearly as broad as long..... 18³
18. Pronotum distinctly punctured; preapical antennal segments strongly flattened and broadened, nearly twice as wide as long..... laticornis
 Pronotum distinctly and deeply punctured; preapical antennal segments subcylindrical, not quite as broad as long..... chinensis
19. Preapical antennal segments much longer than broad, cylindrical or only slightly compressed; elytra not very strongly raised basally..... 20
 Preapical antennal segments compressed, almost as broad as long; elytra distinctly raised basally, incompletely punctured; sides of metasternum partly glabrous and with a groove almost parallel to lateral margin..... semipunctata
20. Lateral borders of metasternum glabrous and reddish or pitchy; antennae slightly compressed..... 21
 Lateral portions of metasternum black and densely pubescent; antennae cylindrical distally..... smilacis
21. Prothorax longer than broad, some fine median punctures on disc; elytra parallel-sided, not depressed behind basal portion, with scattered large punctures on basal third..... neptis
 Prothorax no longer than broad, impunctate; elytra slightly broadened posteriorly, slightly depressed behind basal portion, and with very few punctures basally..... subpolita

24. *Crioceris chinensis* Jacoby.

Crioceris chinensis Jacoby, 1888, Proc. Zool. Soc. London: 340 (Kiu-kiang).

³ Alternative description omitted by author. Perhaps *potens* should have been included here. [Editor.]

One specimen (Lingnan Nat. Hist. Museum) was collected at Kweichow, alt. 1000 meters, Kweichow Prov., SW. China, July 11, 1940, J. L. Gressitt. New to Kweichow Province.

Distribution.—Central and southwestern China.

25. *Crioceris cupreosuturalis* Gressitt, n. sp.

Female.—Moderately large, dorso-ventrally compressed, narrow anteriorly, rounded posteriorly; tricolorous, partly metallic. Body reddish brown to metallic bronzy or bluish black; elytra yellowish testaceous, narrowly bronzy brown along suture; head reddish brown with bronzy tints; antennae pitchy black tinged with blue; prothorax bronzy reddish brown; scutellum dark bronzy brown; ventral surfaces bright reddish brown, darker in parts, thoracic pleura and coxae bronzy; legs greenish bronzy, with swollen portions of femora reddish. Head, ventral surfaces and legs in part clothed with silvery buff hairs.

Head as broad as prothorax, finely and incompletely punctured, coarsely rugose-punctate adjacent to superior eye-lobes, medially grooved on occiput. Antennae reaching to end of basal third of elytra, broadened distally; scape large, nearly as broad as long, slightly longer than third segment; fourth longer than third and shorter than fifth; fifth and following subequal. Prothorax slightly longer than broad, as broad at apex as at base, deeply constricted at middle of each side, feebly grooved parallel to base; disc impressed with two subparallel rows of feeble punctures along center, a single large puncture on each side before middle, and a few other punctures of varying size, mostly near antero-lateral angles and near anterior margin. Scutellum strongly narrowed and rounded apically, impunctate. Elytra large, subparallel in basal two-thirds, conjointly rounded apically; each impressed with eleven rows of moderately large punctures and an additional submarginal row of small punctures, finely punctured in part, impunctate along three longitudinal stripes, one median, the other two sublateral. Legs with femora strongly swollen, posterior pair barely reaching fourth abdominal segment; first hind tarsal segment shorter than following two united. Length 7.8 mm; breadth 3.4.

Holotype, female (Univ. of Nanking, Coll. Agric.), Mt. Omei, Szechuan Prov., W. China, Sept. 10, 1938, C. S. Tsi, collector.

Differs from *C. rufometallicus* Pic in having the elytra yellowish, striped along the suture with bronzy, and with three impunctate stripes on each, instead of the apices being impunctate.

Distribution.—Western China.

26. *Crioceris egena* Weise.

Crioceris egena Weise, 1922, Tijdschr. Ent. 65: 41 (Fukien).

Numerous specimens (Lingnan Nat. Hist. Museum and Gressitt coll.) were taken at Nam-cha-chuen, SW. of Nodda, July 8, and a grove 1.5 mi. S. of Nodda, Hainan I., July 13, 1929, Lingnan University Fifth Hainan Expedition; Fan-ta, SE. of Nodda, July 17, and Cheung-kon-ts'uen, E. of Nodda, July 18, Hainan I., 1935, J. L. Gressitt; Canton, May 16, and Loh-kong-tung, 20 mi. SE. of Canton, July 17, 1932, Y. W.

20, 2-4 GRESSITT: PLANT-BEETLES FROM CHINA

Djou; Linchow, Lin Distr., N. Kwangtung, Aug. 2, 1934, F. K. To; Tsek-chü, Hong Kong, May 6, and Cheung-chow I., near Hong Kong, May 9-13, 1940, F. K. To; Waichow, Hwei-yang Distr., south central Kwangtung, Apr. 4, 1940, J. L. Gressitt and F. K. To. New to Kwangtung and Hainan Island.

Distribution.—Fukien; Kwangtung; Hainan Island.

27. *Crioceris gibba* Baly.

Crioceris gibba Baly, 1861, Jour. Ent. 1: 280, pl. 13, fig. 3 (China); Jacoby & Clavareau, 1904, Gen. Ins. 23: pl. 5, fig. 4.

Female.—Body dark reddish brown, pitchy black on most of head and neck, antennae beyond fourth segment, on sides, and a pair of longitudinal stripes on disc, on prothorax, on smooth portions of elytra, swollen portions of femora, and most of ventral surfaces of body. Head and ventral surfaces, in part, with silvery pubescence, and legs banded with the same; antennae with dark pubescence. Occiput feebly punctured and with a deep median sulcus. Antennal scape as broad as long; second segment shorter than broad; third and fourth subequal, each about as broad as long; fifth cylindrical, nearly twice as long as broad; sixth and seventh similar but slightly broader; eighth to eleventh slightly shorter and about as broad as long. Prothoracic disc strongly convex, with two parallel rows of minute punctures anteriorly. Elytra strongly convex basally, depressed across suture at end of basal third; disc of each with about 45 large and deep irregular foveae on basal third, sides and apex, those at sides largest. Length 10 mm; breadth 4.2.

A few specimens were collected at Tsin-leong San, alt. 850 meters, near Mei-hsien, Mei Distr., E. Kwangtung, June 5, 1936, by J. L. Gressitt.

Distribution.—Southeastern China.

28. *Crioceris hainanensis* Gressitt, n. sp. (Pl. 15, Fig. 1).

Male.—Body dark reddish brown tinged with metallic greenish bronzy; elytra marked with four large rounded-oblong yellowish testaceous spots: one on each humerus and one on posterior portion of each elytron, the latter two coming very close to suture, and the extreme apices reddish; abdomen reddish brown; antennae pitchy black. Ventral surfaces and legs in part clothed with sparse short golden buff hairs; antennae clothed with duller, shorter hairs.

Head (excluding neck) about as long as broad, strongly narrowed, and then suddenly constricted, behind eyes; clypeus and frons depressed, feebly punctured; triangular portion of occiput smooth except for a fine median groove and a central fovea. Antennae nearly three-fourths as long as body, moderately slender; scape not greatly swollen, twice as long as second segment; third and fourth subequal, each nearly as long as scape; fifth as long as third and fourth combined and slightly longer than each of following. Prothorax barely longer than broad, convex anteriorly, deeply constricted on each side at middle; disc smooth, feebly and sparsely punctured, slightly convex in middle, with a transverse depression before and behind. Scutellum smooth, rounded behind. Elytra suboblong,

evenly rounded posteriorly; each swollen near base, depressed at end of basal third and impressed with ten rows of small punctures on basal two-thirds, beyond which it is smooth. Ventral surfaces impunctate and shiny on glabrous areas. Tarsi about as long as tibiae. Length 6 mm; breadth 2.3.

Holotype, male (loan deposit, California Academy of Sciences), Tahan, alt. 750 meters, near Red Mist Mountain, central Hainan Island, S. China, June 21, 1935, J. L. Gressitt. Paratopotypes in Lingnan Natural History Museum and Gressitt collection.

Differs from *C. cruciata* Guérin, of India, in having the pale portions of the elytra not quite so extensive and the dark parts, as well as the rest of the body, bronzy instead of reddish, the prothorax more strongly constricted, etc.

Distribution.—Hainan Island.

29. *Crioceris impressa* Fabricius.

Crioceris impressa Fabr., 1787, Mant. Ins. 1: 88; 1792, Ent. Syst. 2(2): 6 (India); Lacordaire, 1845, Monogr. Phytoph. 1: 562; Baly, 1865, Trans. Ent. Soc. London (3) 4: 32; Jacoby, 1908, Fauna Brit. India, Chrys. 1: 72; Weise, 1922, Tijdschr. Ent. 65: 41.

Several specimens (Lingnan Nat. Hist. Museum and Gressitt coll.) were taken at Ngor-ma-chuen, south of Nodoo, July 10, 1929, Lingnan University Fifth Hainan Expedition; Yim-na San, Mei Distr., NE. Kwangtung Prov., June 14, and Liung-chon San, south of Shanghang, SW. Fukien Prov., July 21, 1936, J. L. Gressitt; Western Hills, alt. 2000 meters, near Kunming (Yunnan-fu), Yunnan, July 5-6, Shin-kai-sze, alt. 1500 meters, Omei Shan, Szechuan, W. China, Aug. 9, and Lan-t'au Island, near Hong Kong, alt. 800 meters, Aug. 28, 1940, J. L. Gressitt. Some specimens (Univ. of Nanking) were taken at Kuan-hsien, Szechuan, July 28, 1938, K. F. Chen.

Distribution.—India; Ceylon; Andaman Is.; Nicobar Is.; Malay Archipelago; Philippine Is.; Siam; western and southern China; Formosa.

30. *Crioceris iridescens* Pic.

Crioceris iridescens Pic, 1916, Mel. Exot. Ent. 20: 17 (Yunnan).

Two specimens (Lingnan Nat. Hist. Museum) were collected in the Western Hills, alt. 2000-2100 meters, near Kunming (Yunnan-fu), Yunnan, SW. China, July 5-6, 1940, J. L. Gressitt.

Distribution.—Yunnan.

31. *Crioceris laticornis* Gressitt, n. sp. (Pl. 16, Fig. 3).

Female.—Body fairly broad, somewhat dorso-ventrally compressed. Dorsal surfaces brownish red, somewhat pitchy brown on sides and base of pronotal disc; ventral surfaces pitchy red-brown, darkest on sides of metasternum; antennae and legs reddish brown. Antennae clothed with short golden buff pubescence beyond fourth segment; ventral surfaces partly clothed with pale golden pubescence; lateral portions of metasternum glabrous.

Head (excluding neck) about as broad as long, constricted some dis-

tance behind eyes; frons with a few large punctures; occiput with median portion sparsely punctured and with a central depression, and lateral portions closely rugose-punctate. Antennae less than one-half as long as body; fifth and following segments greatly broadened and flattened, penultimate segments almost twice as broad as long; second segment fully twice as broad as long; third nearly as broad as long; fourth broader than long. Prothorax fully as long as broad, moderately constricted at middle of each side; disc with an incomplete median row of punctures and many fine punctures scattered over rest of surface, except on basal portion which is slightly depressed. Scutellum narrowed and rounded apically, largely glabrous and impunctate. Elytra subparallel-sided, slightly raised behind scutellum and depressed behind basal quarter; disc of each impressed with ten regular rows of small punctures at middle, the punctures larger on basal third, the outermost puncture-row in a deep groove for its entire length, the next two, as well as sutural row, moderately grooved in apical half; all the interspaces raised at extreme apex. Ventral surfaces irregularly punctured. Legs stout. Length 9 mm; breadth 4.

Holotype, female (Lingnan Nat. Hist. Museum), Fooi-iu, NW. of Nodoo, Hainan Island, S. China, Aug. 21, 1929, Lingnan University Fifth Hainan Expedition; paratypes (some in U. S. National Museum and California Academy of Sciences), near Nodoo, Hainan, Aug. 17-22, and groves around Mei-fu-ts'uen, 9 li E. of Nodoo, Aug. 12-18, 1929, Lingnan Univ. Fifth Hainan Expedition; Sheung-shui-heung, Lin Distr., N. Kwangtung, S. China, Aug. 16, 1934, F. K. To; and White Cloud Mountain, Canton, Kwangtung, May 15, 1934, K. C. Yeung.

The paratypes measure from 8.5 to 11 mm in length. In one specimen the head and pronotum, as well as the antennae, are almost black.

This species differs from *C. impressa* Fabr. in being narrower, with the occiput more concave, the antennae much broader and flatter, and the elytra more strongly ridged posteriorly.

Distribution.—South China; Hainan Island.

32. *Crioceris luteohumeralis* Pic.

Crioceris luteohumeralis Pic, 1923, Mel. Exot. Ent. 38: 10 (Tonkin).

One specimen (Lingnan Nat. Hist. Museum) was collected at Namcha-chuen, 10 li SW. of Nodoo, Hainan I., July 6, 1929, Lingnan University Fifth Hainan Expedition. New to China.

Distribution.—Tonkin; Hainan I.

33. *Crioceris major* Pic (Pl. 16, Fig. 1).

Crioceris major Pic, 1916, Mel. Exot. Ent. 19: 15 (Tonkin).

One male (Lingnan Nat. Hist. Museum) was taken at Kau-lin San, Lien-ping Distr., N. Kwangtung, S. China, Apr. 22, 1940, by J. L. Gressitt and F. K. To; another male (Hong Kong University) was taken at Ti Tam Dook (T'i-t'am-took), Hong Kong Island, June 29, 1937. New to China.

Distribution.—Tonkin; S. China; Hong Kong.

34. *Crioceris minor* Pic.

Crioceris minor Pic, 1916, Mel. Exot. Ent. 20: 18 (China).

Numerous specimens (Lingnan Nat. Hist. Museum and Gressitt coll.) were taken at Taam-yuen-tung, Lin Distr., N. Kwangtung, June 4-6, 1934, F. K. To; Kuliang, alt. 800 meters, near Foochow, Fukien, July 30, 1934, J. L. Gressitt; Gang-keu, S. of Shanghang, SW. Fukien, July 26, 1936, J. L. Gressitt; Mui-hang to Sin-fung, Apr. 11, Sin-fung to Lungkai, Apr. 12, and Lung-kai to Lin-p'ing, Apr. 13, Sin-fung and Lin-p'ing Districts, N. Kwangtung, 1940, J. L. Gressitt and F. K. To; and Meitan, alt. 950 meters, E. of Tseng-yih, N. Kweichow Prov., SW. China, July 19, 1940, J. L. Gressitt.

Distribution.—South China.

35. *Crioceris neptis* Weise (Pl. 16, Fig. 4).

Crioceris neptis Weise, 1922, Tijdschr. Ent. 65: 41 (Fukien).

A few specimens (Gressitt collection) were collected at Tai-yong, near Wu-king-fu, WNW. of Swatow, E. Kwangtung, Aug. 8, 1936, J. L. Gressitt. New to Kwangtung.

Distribution.—Fukien; Kwangtung.

36. *Crioceris ochracea* Gressitt, n. sp. (Pl. 15, Fig. 4).

Female.—Body testaceous, tinged with reddish ochraceous, particularly on prothorax and abdomen; legs and antennae slightly paler; eyes black. Elytra somewhat transparent. Ventral surfaces and antennae sparsely clothed with short golden buff hairs.

Head (excluding neck) about as broad as long, suddenly constricted a short distance behind eyes; clypeus strongly convex and feebly punctured; occiput triangular, convex, with a few punctures at sides and a median fovea posteriorly. Antennae moderately slender, three-fifths as long as body; scape nearly as broad as long; second segment subglobular; third as long as scape, two-thirds as long as fourth; fifth one-half again as long as fourth, slightly longer than each of following segments, which are subequal. Prothorax slightly longer than broad, a little wider near apex than at base, deeply constricted at sides just behind middle; disc feebly convex and nearly impunctate. Scutellum narrowed and rounded posteriorly. Elytra distinctly broadened behind middle, smooth, basal half of each with a few scattered punctures of various sizes, in part arranged in rows. Ventral surfaces minutely punctulate. Third tarsal segment broad. Length 8.6 mm; breadth 4.

Holotype, female (loan deposit, California Academy of Sciences), Gang-keu, alt. 500 meters, south of Shanghang, SW. Fukien, SE. China, July 24, 1936, J. L. Gressitt; paratype (Lingnan Nat. Hist. Museum), Hong San, SE. Kiangsi Prov., July 16, 1936, J. L. Gressitt.

Differs from *C. pallidipes* Pic in having the pronotum indistinctly punctured and sulcate, the elytra irregularly punctured basally and smooth apically, and the antennae slender.

Distribution.—Fukien; Kiangsi.

37. *Crioceris potens* Weise.

Crioceris potens Weise, 1922, Tijdschr. Ent. 65: 39 (Fukien; Japan).

A few specimens (California Academy of Sciences) were collected at Hang-chow, Chekiang Prov., E. China, May 18, 1923, by Dr. E. C. Van Dyke. New to Chekiang Province.

Distribution.—Fukien; Chekiang; Japan.

38. *Crioceris rufometallica* Pic (Pl. 15, Fig. 2).

Crioceris rufometallicus Pic, 1923, Mel. Exot. Ent. 38: 10 (Tonkin).

Male.—Body surfaces bronzy red-brown, glossy and rather metallic; antennae pitchy red with scape bronzy; legs reddish, femora darker and bronzy at sides and beneath, tibiae slightly metallic, tarsi paler reddish with pitchy claws. Body in part irregularly clothed with short pubescence: blackish brown on antennae and silvery yellow on head, ventral surfaces and legs; large part of metasternum and a spot on side of each abdominal segment, glabrous.

Head a little longer than broad, deeply constricted a short distance behind eyes; clypeus nearly impunctate; occiput minutely punctate, with a deep posterior longitudinal groove. Antennae moderately stout, the segments flattened and broadened beyond fourth; scape nearly as broad as long, smooth and glabrous; following segments punctured and hairy; second broader than long; third and fourth each about as broad as long; fifth and following a little longer than broad. Prothorax a little longer than broad, anterior border strongly convex; sides moderately constricted at middle; disc smooth and with only few minute punctures arranged in two parallel rows. Scutellum narrow, slightly pubescent. Elytra slightly expanded behind humeri and feebly narrowed posteriorly; disc of each with a basal swelling followed by a transverse depression and impressed with ten rows of punctures at middle, the punctures deeper and irregular on base, small and widely spaced in middle and lacking on apical third. Glabrous portions of ventral surfaces impunctate. Length 8 mm; breadth 3.

Several specimens (Lingnan Nat. Hist. Museum and Gressitt coll.) were taken at Ta-hian, near foot of Five Finger Mts., Hainan, June 18, Nodda, July 11, and Dwa-bi (Tai-pin-ts'uen), foot of Loi Mother Mt., Hainan, July 20, 1935, J. L. Gressitt. New to China.

Distribution.—Tonkin; Hainan I.

39. *Crioceris scapularis* Baly.

Crioceris scapularis Baly, 1859, Ann. Mag. Nat. Hist. (3) 3: 193 (N. China); Jacoby & Clavareau, 1904, Gen. Ins. 23: pl. 5, fig. 1.

A few specimens (Gressitt coll. and Lingnan Nat. Hist. Museum) were collected by the writer at Yim-na San, Mei Distr., NE. Kwangtung Prov., June 11, 1936. New to S. China.

Distribution.—E. China.

40. *Crioceris semipunctata* (Fabricius).

Lema semipunctata Fabr., 1801, Syst. Eleuth. 1: 472 (Sumatra).

Crioceris semipunctata Lacordaire, 1845, Monogr. Phytoph. 1: 558; Jacoby, 1908, Fauna Brit. India, Chrys. 1: 73.

Numerous specimens (Lingnan Nat. Hist. Museum and Gressitt coll.) were taken at Nam-cha-chuen, SW. of Nodoo, Hainan, July 8; grove near Beggar Village, SW. of Nodoo, July 9; grove 1.5 mi. S. of Nodoo, July 13, 25 and 27, and NNE. of Nodoo, Aug. 17-29, 1929, Lingnan University Fifth Hainan Expedition; between Fan-ta and Cheung-kon-ts'uen, E. of Nodoo, July 17, Ta-hau, S. of Vo-lau, Hainan, July 4-5, and Vo-lau, 30 km WSW. of Nodoo, July 9, 1935, J. L. Gressitt.

Distribution.—India; Ceylon; Sumatra; Java; Hainan.

41. *Crioceris smilacis* Gressitt, n. sp. (Pl. 17, Fig. 2).

Female.—Broad and dorso-ventrally compressed; body bright orange testaceous, black on antennae, palpi, mandibles, base of labrum, sides of prosternum, anterior portions of fore coxae, meso- and metapleura, sides of metasternum, outer sides of posterior coxae, bases and apices of femora, and tibiae and tarsi; trochanters and eyes pitchy. Black portions of ventral surfaces and legs clothed with moderately dense silvery buff pubescence; pale portions very sparsely clothed; central portion of metasternum nearly glabrous.

Head (excluding neck) nearly as broad as long, suddenly and deeply constricted a short distance behind eyes; clypeus minutely punctured; occiput triangular, raised anteriorly, finely punctured at sides and grooved posteriorly. Antennae about one-half as long as body, of moderate thickness; scape nearly as broad as long; second segment broader than long; third and fourth subequal, a little longer than scape; fifth cylindrical, nearly twice as long as fourth, subequal to each of following. Prothorax as broad as long, as wide at antero-lateral angles as at base; moderately constricted at each side just behind middle; disc smooth and feebly convex, with only a few small punctures in two rows on anterior portion and a single fovea on midline between center and base. Scutellum narrowed and rounded-truncate behind. Elytra broad, subparallel, rounded posteriorly; disc of each feebly swollen at base and impressed with ten rows of fine punctures, the ninth incomplete and the inner ones arranged somewhat in pairs, the punctures only slightly longer basally. Ventral surfaces impunctate on glabrous areas. Tarsi nearly as long as tibiae. Length 9.5 mm; breadth 3.7.

Paratypes.—Dorsal surfaces pale orange to dark reddish; vertex and occiput partly black or pitchy; scutellum black clothed with silvery hairs; pronotum with scattered punctures near anterior border, with the median pair of puncture-rows extending farther posteriorly and the posterior fovea lacking. Length 7-9.5 mm; breadth 2.7-3.7.

Holotype, female (United States National Museum), Hong San, alt. 950 meters, SE. Kiangsi, SE. China, June 28, 1936, J. L. Gressitt; paratype, female (Lingnan Nat. Hist. Museum), Canton, Kwangtung, May 10, 1937, C. K. Maak; paratype (Calif. Acad. Sci.), Canton, May 12, 1937. Additional paratypes: Siu-kwong Village, Lam-mo Distr., S. Hunan

Prov., July 23-25, 1934, F. K. To; Canton, Kwangtung, May 16, 1932 and May 26, 1941, F. K. To; Hong San, SE. Kiangsi Prov., June 25-27 and July 15, and Yim-na San, E. Kwangtung Prov., June 14, 1936, J. L. Gressitt.

Differs from *C. impressa* F. in having the body flatter, the occiput more triangular and less even, the antennae longer, the elytra much more finely punctured, etc.

Host plant.—*Smilax china* Linn.

Distribution.—South China.

Genus *Lema* Fabricius

Lema Fabricius, 1798, Suppl. Ent. Syst.: 90.

Key to Species

1. Elytra entirely metallic blue, green or violet, unicolorous.....2
Elytra testaceous or reddish, at least in part.....15
2. Prothorax metallic bluish or black.....3
Prothorax reddish or testaceous.....9
3. Pronotum with a narrow, deep groove across it some distance anterior to base; anterior portion of disc hardly punctured; occiput marked with reddish or pitchy.....4
Pronotum with subbasal groove not narrow, sometimes obsolete; anterior portion of disc sometimes punctured; occiput not partly reddish.....6
4. Pronotum lacking a transverse groove before middle; elytral punctures much smaller than their interspaces.....5
Pronotum with a transverse groove before middle, interrupted on median line; elytral punctures partly larger than their interspaces.....djoui
5. Pronotum greenish black with two transverse basal grooves; elytral punctures roundish, moderately large basally.....coronata
Pronotum bluish, with a single transverse basal groove; elytral punctures minute, mostly longer than broad.....cyanella
6. Pronotum feebly or sparsely punctured anteriorly; dorsal surfaces blue tinged with greenish or bronzy black.....7
Pronotum densely punctured anteriorly; dorsal surfaces blue; abdomen reddish posteriorly.....concinnipennis
7. Prothorax constricted close to middle, finely punctured or nearly impunctate, hardly broader anteriorly than basally.....8
Prothorax constricted close to base, closely and finely punctured at each side of constricted portion, distinctly broader anteriorly than posteriorly; body metallic blue-green above.....viridula
8. Pronotum practically impunctate, with a shallow arcuate groove between middle and base; elytra black tinged with greenish; scutellum broader than long.....angustepunctata
Pronotum finely and sparsely punctured, with a single large puncture between middle and base, lacking an arcuate groove; elytra greenish blue with purplish reflection; scutellum as long as broad.....sikanga
9. Pronotum with one or more transverse grooves across central portion.....10
Pronotum with only a single subbasal transverse groove, or with none at all.....13
10. Antennae and legs largely blackish or pitchy; ventral surfaces of body at least partly pitchy and dull reddish.....11
Antennae, legs and ventral surfaces of body entirely orange.....rufonubes

11. Ventral surfaces partly pitchy and partly reddish; pronotal disc impunctate; punctures on basal portions of elytra partly as large as interspaces, transversely or longitudinally. 12
- Ventral surfaces, excluding prosternum, entirely black; pronotal disc with two longitudinal rows of fine punctures; punctures on basal portions of elytra mostly much smaller than interspaces. *pulchrula*
12. Anterior transverse pronotal groove quite distinct; prothorax broader than long, slightly pitchy at each side; interocular area closely punctulate. *binhana*
- Anterior transverse pronotal groove often indistinct; interocular raised area feebly punctured. *coromandeliana*
13. Pronotum with a feeble subbasal groove; ventral surfaces of body black or pitchy. 14
- Pronotum lacking any groove; ventral surfaces of body and legs reddish orange. *fortunei*
14. Prothorax strongly convex, constricted near middle, nearly impunctate; legs metallic bluish green. *honorata*
- Prothorax feebly convex, constricted near base, closely punctured; legs orange. *oryzae*
15. Elytra in part marked with metallic blue, green or black. 16
- Elytra reddish, brownish or testaceous; unicolorous. 23
16. Elytra yellowish or brownish testaceous, with black discal markings. 17
- Elytra reddish with metallic blue markings, or orange with black sutural, and sometimes marginal, borders. 19
17. Head and prothorax largely testaceous, feebly punctured. 18
- Head and prothorax metallic greenish, closely punctulate; elytra with a variable number of spots. *decempunctata*
18. Elytral discs largely black; pronotum with four small round spots; sides of prothorax deeply constricted. *trapezinotata*
- Each elytral disc with two rounded black spots; pronotum lacking distinct discal spots; sides of prothorax feebly constricted. *fanheanga*
19. Pronotum with two transverse grooves across central portion. 20
- Pronotum with only subbasal grooves. 21
20. Elytra with a large distinct subapical blue spot common to both, extending from end of basal third to a short distance before apices; elytral punctures mostly smaller than interspaces. *commelinae*
- Elytra with the sutural portions, from scutellum to apices, bluish black or pitchy; elytral punctures mostly longer than interspaces. *trisulcata*
21. Elytra with sutural, or sutural and marginal, borders black; basal antennal segments, ventral surfaces of body, and parts of legs ochraceous or pitchy. 22
- Elytra with humeral and posterior discal spots of blue or black; basal antennal segments, ventral surfaces and legs black. *adamsi*
22. Body largely pale brownish testaceous, with sutural borders of elytra narrowly black; prothorax rather evenly swollen and rounded laterally in anterior portion. *downesi*
- Body largely reddish brown, with both sutural and external margins of elytra blackish; prothorax broadened anteriorly to angulate anterio-lateral corners. *marginalis*
23. Pronotum with a feeble transverse groove anterior to middle, sometimes obliterated in central portion. 24
- Pronotum lacking any transverse groove anterior to middle. 25

24. Dorsal surfaces reddish; antennae, legs and ventral surfaces black; anterior pronotal groove fairly distinct. *castanea*
- Dorsal surfaces testaceous brown; antennae, legs and ventral surfaces more or less ochraceous; anterior pronotal groove indistinct on central portion. *rufotestacea*
25. Pronotum with a distinct narrow groove across middle of basal portion. 26
- Pronotum lacking a distinct narrow groove across middle of basal portion; body pale yellowish testaceous to ochraceous, with antennae, tibiae and tarsi black. *vandae*
26. Head and prothorax reddish to pitchy brown. 27
- Head and prothorax black; posterior femora and ventral surfaces of body reddish brown, remainder of legs pitchy. *becquarti*
27. Ventral surfaces of body largely ochraceous brown, partly pitchy. 28
- Ventral surfaces of body largely black. 29
28. Interocular area swollen and shiny, with a deep central fovea; labrum ochraceous; elytra swollen near base, the punctures suddenly much smaller and very narrow posterior to subbasal depression. *bohemani*
- Interocular area smoothish, with fine punctures and hairs, and a short, narrow postmedian sulcus; labrum black; elytra fairly even, the punctures gradually becoming smaller posteriorly. *inconspicua*
29. Pronotum crossed by a deep, narrow, transverse groove between middle and base. 30
- Pronotum lacking a deep, distinct, transverse groove; legs black; antennae pitchy; elytral punctures quite large basally and much smaller posteriorly. *duplicata*
30. Legs and antennae black; elytra distinctly punctured throughout; body rather narrow. *chinensis*
- Legs and antennae largely reddish to pitchy; elytra almost impunctate in posterior half; body fairly broad. *corpulentina*

42. *Lema angustepunctata* Gressitt, n. sp. (Pl. 18, Fig. 3).

Female.—Body black; dorsal surfaces slightly metallic bluish black, tinged with greenish and bronzy. Ventral surfaces and legs clothed with sparse, short, silvery gray pubescence.

Head (excluding neck) about as broad as long; feebly constricted almost immediately behind eyes; labrum large; frons minutely punctulate; occiput medially grooved anteriorly, feebly punctulate. Antennae about three-fourths as long as body, fairly slender; scape small, one-half longer than broad; third and fourth slender, subequal, each longer than scape; fifth one-half again as long as fourth, slightly longer than each of following. Prothorax slightly broader than long, as broad at the moderately prominent antero-lateral angles as at base, rather strongly constricted behind middle of each side; disc impunctate, with a feeble transverse groove between middle and base. Scutellum short, smooth and level behind, its posterior margin rounded. Elytra moderately broad, slightly narrowed and broadly rounded posteriorly; disc of each feebly swollen at base, slightly depressed at end of basal quarter in sutural half, and impressed with ten rows of small punctures at middle; punctures only slightly larger basally and mostly longer than wide and less than a puncture-length apart longitudinally; spaces between puncture-rows

slightly raised near apex. Ventral surfaces micropunctulate. Legs slender. Length 5.3 mm; breadth 2.3.

Holotype, female (United States National Museum), Yim-na San (Yam-na Shan), alt. 650 meters, Mei Distr., E. Kwangtung, SE. China, June 16, 1936, J. L. Gressitt; paratype, female (Gressitt coll.), Liung-chon San, SW. Fukien, July 21, 1936, and paratype (California Acad. Sci.), Liung-chon San, July 21, J. L. Gressitt; paratype (Lingnan Nat. Hist. Museum), Kau-lin San, N. Kwangtung Prov., April 21, 1940, J. L. Gressitt and F. K. To.

Differs from *L. coronata* Baly in having only a single feeble transverse depression across base of pronotal disc, in having the occiput distinctly grooved medially and not reddish posteriorly, the elytral punctures much narrower, and in having the body broader.

Distribution.—Kwangtung; Fukien.

43. *Lema binhana* Pic.

Lema binhana Pic, 1924, Mel. Exot. Ent. 41: 11 (Tonkin).

A single specimen (Gressitt collection) possibly referable to this species was taken by the writer at Ta-hian, near foot of Five Finger Mountains, alt. 600 meters, central Hainan Island, June 11, 1935. This form is not very distinct from *L. coromandeliana* (F.), and may actually prove to be identical with it. The premedian transverse pronotal groove of *coromandeliana* is a variable character. New to Hainan Island.

Distribution.—Tonkin; Hainan I.

44. *Lema becquarti* Gressitt, n. sp.

Castaneous brown; antennae, head and prothorax black, except for occipital tubercles and basal margin of prothorax which are pitchy red; scutellum and elytra reddish castaneous; metathorax reddish ochraceous; legs largely pitchy black, with posterior femora ochraceous and parts of anterior and middle femora ochraceous brown. Antennae thinly clothed with silvery buff pubescence; legs and ventral surfaces of body moderately clothed with pale golden buff pubescence.

Head (excluding neck) almost as broad as long; frons with a few oval punctures preapically; occiput impunctate, feebly grooved laterally, concave medially, with a subtuberculate swelling on each side. Antennae two-thirds as long as body, slender; scape slightly longer than broad, twice as long as second segment; third slightly longer than scape, practically as long as fourth segment; fifth slightly longer than second and third combined; fifth to eighth slightly diminishing in length; eighth to last subequal in length. Prothorax almost as broad as long, deeply constricted at middle; apical margin with a short collar; antero-lateral angles subacute; disc with a few feeble punctures along central portion of median line and transversely between antero-lateral angles, and with a deep subtransverse groove between middle and base, as well as a feeble and incomplete groove close to basal margin. Scutellum convex, impunctate, narrowly rounded posteriorly. Elytra slightly constricted behind humeri, narrowed in posterior half; disc of each swollen in basal quarter, rather

deeply depressed behind swelling, impressed with ten regular and complete rows of relatively fine punctures which are several puncture-widths apart on swelling and along suture and only one or two puncture-widths apart near apex and external margin. Ventral surfaces of body minutely punctulate; metasternum with a narrow smooth strip at each side bordered internally by a narrow groove. Legs slender with femora swollen beyond middle. Length 6.8 mm; breadth 2.85.

Holotype (Musée Heude, Université l'Aurore, Shanghai), Moka Shan, Chekiang Province, E. China, June 6, 1937, the Rev. Père Octave Piel, collector.

This species differs from the unspotted form of *L. decempunctata* Gebler in being larger, and in having the antennae longer and more slender, the occiput impunctate and with a pair of strong swellings, the prothorax longer, more deeply constricted at sides, and with the disc swollen, deeply grooved, and much less punctate, and the elytra less even basally and much more finely punctured throughout. This species is named in honor of my friend Père B. Becquart of Musée Heude, as a token of gratitude for many kindnesses extended to me.

Distribution.—E. China (Chekiang).

45. *Lema bohemani* Clark.

Lema russula Boheman, 1858, Resa Eugen. Ent.: 153 (Hong Kong).

Lema Bohemani Clark, 1866, Cat. Phytoph.: 24 (Hong Kong).

Specimens in the Lingnan Nat. Hist. Museum were collected at Canton, July 28, 1932, Y. W. Djou; Lingnan University, Canton, Aug., 1939, J. L. Gressitt; White Cloud Mountain, Canton, July 6, 1932, Y. W. Djou; between Tam-sui and Sam-tung, Apr. 3, Waichow, Apr. 4, Hwei-yang Distr., south central Kwangtung, and Lung-kai to Lin-p'ing, Apr. 13, Lien-p'ing Distr., N. Kwangtung, 1940, J. L. Gressitt and F. K. To; Pe-pei, alt. 300 meters, N. of Chungking, SE. Szechuan Prov., W. China, July 26-27, 1940, J. L. Gressitt; 2 mi. S. of Nodoo, Hainan Island, June 28, 1929, Lingnan University Fifth Hainan Expedition; Hoihow, N. Hainan I., Apr. 1-3, 1932, F. K. To. Those in the writer's collection were taken at Yim-na San, NE. Kwangtung, June 11-15, Wong-sa-shui, SE. Kiangsi, July 10-11, and Liung-chon San, SW. Fukien, July 21, 1936, J. L. Gressitt.

Host plant.—*Commelina nudiflora* Linn.

Distribution.—Formosa; SE. China; Hainan I.

46. *Lema castanea* Jacoby.

Lema castanea Jacoby, 1908, Fauna Brit. India, Chrys. 1: 37 (Assam).

Numerous specimens (Lingnan Nat. Hist. Museum and Gressitt coll.) were taken at Canton, Kwangtung, July 28, 1932, Y. W. Djou, July 21, 1935, W. E. Hoffmann, Aug. 10, October, Nov. 16, 25, 1939, Jan. 5, 17, Apr. 25, June 15, and July 12, 1940 and May 22, 1941, J. L. Gressitt or assistants; Ying-to, Hwei-yang Distr., SC. Kwangtung, Apr. 5, 1940, J. L. Gressitt and F. K. To; and Liamui (Leng-moon), E. C. Hainan I., Aug. 1, 1935, J. L. Gressitt. New to China.

Host plant.—*Commelina nudiflora* Linn.

Distribution.—Assam; Kwangtung; Hainan I.

47. *Lema chinensis* Jacoby.

Lema chinensis Jacoby, 1890, Entomologist, 23: 85 (Chang-yang).

A few specimens (Gressitt coll. and Lingnan Nat. Hist. Museum) were collected by the writer at Sunwu, SE. Kiangsi Prov., July 13, 1936, and Liung-chon San, south of Shanghang, SW. Fukien Prov., July 21, 1936. New to South China.

Distribution.—Central and southeastern China.

48. *Lema commelinae* Gressitt, n. sp.

Male.—Slender, subcylindrical. Body largely red, partly greenish black and bluish green: antennae pitchy black, slightly greenish on basal segments; anterior portion of head greenish black; elytra with a large oval bluish green area occupying most of posterior three-fourths, but not touching external margins or apices; meso- and metathoracic pleura and legs, including coxae, greenish black. Third and following antennal segments clothed with silvery gray pubescence; sides of head, ventral surfaces of body, and legs, sparsely clothed with silvery buff pubescence.

Head (excluding neck) about as broad as long; frons finely punctured; occiput grooved medially, swollen on each side, sparsely and finely punctured. Neck suddenly constricted, impunctate. Antennae two-thirds as long as body, fairly slender; scape almost as broad as long, larger than second segment; third segment slender, as long as scape; fourth barely longer than third; fifth as long as second and third combined; sixth and following subequal to, or slightly shorter than, fifth, each about three times as long as broad. Prothorax fully as broad as long, obtuse at antero-lateral angles, strongly constricted just behind middle of each side; disc traversed by a strong transverse groove between middle and base, which is impressed with a fovea at center, and a much less distinct transverse depression anterior to middle, which is interrupted at center; surfaces almost impunctate. Scutellum convex, subtruncate posteriorly. Elytra feebly narrowed posteriorly, rounded apically; surface of each slightly swollen on basal fifth, behind which it is slightly depressed, punctured in ten regular rows; punctures large and deep on basal two-fifths, smaller and more longitudinally oblong posteriorly, the interspaces slightly raised in apical third. Ventral surfaces nearly impunctate. Legs with swollen femora and slender tibiae and tarsi. Length 6–6.5 mm; breadth 2.3–2.5.

Holotype, male (Lingnan Natural History Museum), Canton, Kwangtung, South China, Aug. 1, 1932, Y. W. Djou, collector; allotype, female (Gressitt collection), Yim-na San, Mei Distr., NE. Kwangtung Prov., June 14, 1936, J. L. Gressitt; several paratopotypes (U. S. Nat. Mus.; Calif. Acad. Sci.; Lingnan Mus.), Campus of Lingnan University, Canton, July 28, 1932, Y. W. Djou, April 17, 1933, W. E. Hoffmann, and May, 1941, J. L. Gressitt.

This species differs from *L. semifulva* Jacoby, of India, in being larger, more heavily punctured, with the elytral marking greenish instead of black, and more oval, commencing farther posteriorly and not reaching apices, the abdomen entirely red, etc.

Host plant.—*Commelina nudiflora* Linn. (Commelinaceae).

Distribution.—S. China.

49. *Lema concinnipennis* Baly.

Lema concinnipennis Baly, 1865, Ann. Mag. Nat. Hist. (3) 16: 157 (N. China); 1873, Trans. Ent. Soc. London: 70.

A specimen (Gressitt collection) was taken at Liung-chon San, S. of Shanghang, SW. Fukien Prov., SE. China, on July 22, 1936, by J. L. Gressitt. New to Fukien Province.

Distribution.—"N. China"; Fukien.

50. *Lema coromandeliana* (Fabricius).

Leptura coromandeliana Fabr., 1798, Ent. Syst. Suppl.: 154.

Lema coromandeliana Fabr., 1801, Syst. Eleuth. 1: 475; Lacordaire, 1845, Mon. Phytoph. 1: 377; Baly, 1865, Trans. Ent. Soc. London (3) 4: 24; Jacoby, 1881, Notes Leyden Mus.: 199; Weise, 1892, Deutsche Ent. Zeit.: 387; Jacoby, 1908, Fauna Brit. India, Chrys. 1: 25.

Numerous specimens (Lingnan Nat. Hist. Museum) were collected on the campus of Lingnan University, Canton, May 4, 16, July 1, 28, Aug. 1 and 4, 1932, Y. W. Djou, Apr. 1932, Apr. 21 and 26, 1935, W. E. Hoffmann, Aug., Oct., Nov., and Dec., 1939, May and June, 1940, and June, 1941, J. L. Gressitt; Chung Shan Park, Kai-kok, Chung Shan Distr., Aug. 11, 1933, H. F. Chan and K. C. Lee; grove 2 mi. SW. of Nodoa, June 28, 1929, Lingnan University Fifth Hainan Expedition; Waichow, Apr. 4 and Ying-to, Apr. 5, Hwei-yang Distr., SE. Kwangtung, 1940, J. L. Gressitt and F. K. To. Specimens in the writer's collection were taken at Mei-hsien, Mei Distr., NE. Kwangtung, June 8, 1936, J. L. Gressitt.

Host plant.—*Commelina nudiflora* Linn.

Distribution.—India; Ceylon; Sumatra; Java; S. China; Hainan I.

51. *Lema coronata* Baly.

Lema coronata Baly, 1873, Trans. Ent. Soc. London: 72 (Nagasaki).

Some specimens (Gressitt coll.) were taken at Tsin-leong San, Mei Distr., E. Kwangtung, June 8, 1936, J. L. Gressitt. New to China.

Distribution.—S. Japan; SE. China.

52. *Lema corpulentina* Gressitt, n. sp. (Pl. 17, Fig. 1).

Body broad, widened behind middle, broader than deep. Dorsal surfaces ochraceous brown; eyes pitchy; antennae ochraceous; legs ochraceous with posterior femora and apices of third and last tarsal segments dark pitchy brown; ventral surfaces of body pitchy black, pale on prosternum and mesopleura. Head, legs and ventral surfaces of body thinly clothed with fine golden buff hairs.

Head (excluding neck) slightly broader than long, not quite as broad as prothorax; frons convex and minutely punctured; occiput deeply grooved on each side, impressed with a single fovea between posterior borders of eyes, otherwise impunctate. Antennae about one-half as long as body, thickened distally; scape compressed, nearly as broad as long; second segment much smaller, as broad as long; third segment barely as long as scape, two-thirds as long as fourth; fifth not quite as long as third and fourth combined, slightly longer than each of following. Prothorax broader than long, slightly wider at base than at apex, deeply constricted at middle of each side; disc almost impunctate, crossed by a moderately deep transverse groove slightly closer to middle than to base. Scutellum small, declivitous, narrowed posteriorly, impunctate. Elytra broad, widest behind middle, evenly rounded apically; disc of each moderately swollen on base near scutellum, longitudinally grooved between swelling and humerus and slightly depressed behind swelling, punctured in ten rows at middle, the punctures large on basal quarter and very small on remainder, the outermost puncture-row grooved for entire length, all the interspaces raised in apical quarter. Ventral surfaces of body minutely and irregularly punctured. Femora strongly swollen; tarsi narrow basally and apically. Length 7.8 mm; breadth 3.4.

Holotype (loan deposit, California Academy of Sciences), Ta-hian, alt. 600 meters, foot of Five Finger Mountains, central Hainan Island, S. China, June 15, 1935, J. L. Gressitt.

Differs from *L. bohemani* Clark in being broader and more dorso-ventrally compressed, in having the occiput less swollen, ungrooved posteriorly and foveate at center instead of grooved medially, the pronotal disc more convex at center, and the elytra broader, less swollen basally and more finely punctured on central portions.

Distribution.—Hainan Island.

53. *Lema decempunctata* Gebler.

Lema decempunctata Gebler, 1830, Ledeb. Reise 2(3): 196 (Riddersk); Lacordaire, 1845, Monogr. Phytoph.: 597; Baly, 1873, Trans. Ent. Soc. London: 76.

Lema ropunctata Gebler, 1830, Ledeb. Reise 2(3): 196.

One specimen (Lingnan Nat. Hist. Museum) was collected on the campus of Lingnan University, Canton, June 4, 1934, by K. H. Li. New to South China.

Distribution.—E. Siberia; China.

54. *Lema djoui* Gressitt, n. sp.

Subparallel-sided; body only slightly broader than deep. Dorsal surfaces of body dark steel blue with slight tinges of bronzy green; occiput reddish at sides and just behind swellings; elytra tinged with reddish purple externally and apically; ventral surfaces of body black tinged with greenish blue with some pitchy brown on first abdominal segment; legs black, somewhat greenish or bronzy on femora. Antennae, head, legs

and ventral surfaces of body finely and irregularly clothed with thin golden buff pubescence.

Head (excluding neck) slightly broader than long, practically as broad as prothorax; frons depressed anteriorly, finely punctured; occiput sparsely punctured, obliquely grooved on each side, and central portion with two oblique swellings joining anteriorly and with a deep depression between them posteriorly; neck suddenly constricted a short distance behind eyes. Antennae about one-half as long as body; scape swollen, nearly as broad as long; second segment slightly longer than broad; third almost as long as scape; fourth barely longer than third; fifth about as long as second and third combined, slightly longer than each of following segments. Prothorax distinctly broader than long, broader at apex than at base, moderately constricted at middle of each side; disc practically impunctate, with two transverse grooves across central portion and another near base, the anteriormost obsolete on median line and the second with a single fovea at middle. Scutellum short and truncate behind, largely impunctate. Elytra strongly convex, narrowed and rounded apically; disc of each very slightly raised near scutellum, impressed with ten regular rows of punctures, the punctures fairly uniform and moderately large throughout, mostly longer than spaces between them longitudinally, largest on second fifth; interspaces between rows slightly raised laterally and apically. Ventral surfaces of body irregularly and minutely punctulate. Legs with femora swollen, smooth and shiny, and tarsi slender. Length 6 mm; breadth 2.5.

Holotype (Lingnan Natural History Museum), campus of Lingnan University, Honam Island, Canton, Kwangtung Province, S. China, July 13, 1932, Y. W. Djou, collector.

This species differs from *L. coronata* Baly and *L. cyanella* (Linn.) in having two transverse grooves across the middle of the pronotum and the elytral punctures mostly larger than their interspaces, longitudinally, and from *L. concinnipennis* Baly in having the pronotum impunctate and the abdomen blackish posteriorly.

This species is named in honor of Mr. Djou Yu-wen of the Lingnan Natural History Survey and Museum, who collected this species, as a slight token of gratitude for assistance rendered the writer.

Distribution.—S. China.

55. *Lema downesi* Baly.

Lema Downesi Baly, 1865, Ann. Mag. Nat. Hist. (3) 16: 156.

Lema nigrosuturalis Clark, 1866, App. Cat. Phytoph.: 37; Weise, 1903, Deut. Ent. Zeit.: 19.

Three specimens (Lingnan Nat. Hist. Museum) were taken by the writer at Pe-pe, alt. 300 meters, north of Chungking, Szechuan Prov., W. China, July 26-27, 1940. One specimen (Univ. of Nanking, Coll. of Agric.) was collected at Chengtu, Szechuan, July 14, 1938, by K. F. Chen. New to China.

Distribution.—Bombay; Bengal; W. China.

56. *Lema duplicata* Gressitt, n. sp.

Elongate, subparallel-sided, somewhat dorso-ventrally compressed. Body reddish above, orange ochraceous on elytra and front of head; antennae, legs and ventral surfaces of body black, the latter pitchy in part. Antennae moderately clothed with shiny black hairs; anterior portion of head, legs and ventral surfaces largely clothed with pale golden buff hairs.

Head (excluding neck) distinctly broader than long, slightly narrower than prothorax; frons feebly convex, punctured at sides; occiput closely punctured laterally, central portion convex, sparsely punctured, grooved posteriorly. Antennae less than one-half as long as body, slightly broadened and compressed distally; scape swollen, almost as broad as long; second segment broader than long; third swollen apically, about as long as scape; fourth a little longer than third; fifth almost as long as third and fourth combined, longer than each of following segments, which are subequal. Prothorax barely as long as broad, slightly broader basally than apically, deeply constricted just behind middle of each side; disc moderately convex, minutely punctulate, a broad, shallow, subtransverse depression between middle and base, with a single puncture at its middle. Scutellum small, rounded-truncate posteriorly. Elytra long, parallel-sided; disc of each impressed with ten fairly regular rows of punctures, large anteriorly and smaller posteriorly; spaces between rows distinctly raised in posterior half. Ventral surfaces in part finely punctured. Legs with femora strongly swollen and tarsi moderately slender. Length 8 mm; breadth 3.2.

Paratype.—Ventral surfaces of body, as well as second and third antennal segments, entirely black; sides of occiput pitchy red-brown. Length 9.2 mm; breadth 3.65.

Holotype (Lingnan Natural History Museum) NNE. of Nodda, Tan Distr., NWC. Hainan Island, S. China, Aug. 29–30, 1929, Lingnan University Fifth Hainan Expedition; paratopotype, same data.

Differs from *L. crioceroides* Jacoby, of Burma, in having the occiput punctured, the antennae less broadened, the transverse pronotal groove not very distinct, and in being somewhat larger.

Distribution.—Hainan Island.

57. *Lema fanheanga* Gressitt, n. sp. (Pl. 17, Fig. 4).

Female.—Moderately broad, somewhat dorso-ventrally compressed. Body largely pale above and dark beneath; head testaceous except for black clypeus, labrum and mandibles; antennae black except for testaceous scape and pitchy red second and third segments; prothorax testaceous, slightly dull on constricted portion of each side; elytra testaceous with two subrounded black spots on disc of each: one on basal portion near suture, the other in center just behind middle; ventral surfaces of hind thorax and abdomen black; legs testaceous with tarsi and apices of tibiae pitchy black; middle and hind coxae pitchy black. Ventral surfaces and legs clothed with minute golden buff hairs.

Head as broad as long, slightly constricted immediately behind eyes;

frons finely punctulate on pale portion; occiput slightly convex, finely punctulate and briefly grooved medially behind middle. Antennae slender, about two-thirds as long as body; scape one-third again as long as broad; second segment longer than broad; third and fourth subequal, each longer than scape; fifth one-half again as long as fourth, subequal to sixth, seventh and last, and slightly longer than eighth, ninth and tenth. Prothorax barely broader than long, feebly constricted just behind middle of each side; disc slightly convex, minutely punctured near anterior border and along middle, a transverse groove between middle and base with a fovea at its center, and another less distinct groove just before base. Elytra four-fifths again as long as broad, slightly narrowed posteriorly; disc of each feebly swollen basally and depressed near suture at end of basal quarter, impressed with ten rows of punctures which become gradually smaller towards apices, the spaces between rows subcostate posteriorly. Ventral surfaces of body micropunctulate. Legs slender. Length 5.5 mm; breadth 2.3.

Holotype, female (loan deposit, California Academy of Sciences), Fanheang, alt. 500 meters, N. of Five Finger Mts., SC. Hainan Island, S. China, June 8, 1935, J. L. Gressitt.

Differs from *L. burmaensis* Jacoby in having the legs largely, and the antennae basally, testaceous, and the head not strongly raised and deeply grooved between the eyes, the prothorax with the principal basal sulcus not very close to basal margin and the first elytral black spot not coinciding with postbasal depression.

Distribution.—Hainan Island.

58. *Lema fortunei* Baly.

Lema fortunei Baly, 1859, Trans. Ent. Soc. London (2) 5: 148 (N. China); Jacoby & Clavareau, 1904, Gen. Ins. 23: 7.

Several specimens (Gressitt coll. and Lingnan Nat. Hist. Museum) were collected by the writer at Gang-keu, S. of Shanghang, SW. Fukien Prov., July 26, 1936. Some specimens (Univ. of Nanking) were taken at Omei Shan, Szechuan, Nov. 11, 1938 by C. S. Tsi; and one (W. China Union Univ.) was taken at Tubaokou, Sikang, Aug. 16, 1939, by D. S. Pen. New to South and West China.

Distribution.—"N. China"; Fukien; Szechuan; Sikang.

59. *Lema inconspicua* Gressitt, n. sp.

Small, somewhat laterally compressed, subparallel-sided. Body reddish testaceous, darker above and paler beneath; anterior end of head pitchy black; antennae pitchy brown, becoming blackish distally, bases of segments, and large part of first two, reddish ochraceous; prothorax with a transverse band of indistinct squarish pitchy spots across middle; elytra with a larger pair of similar spots behind scutellum; posterior portion of metathorax and coxae pitchy black; apices of tibiae and tarsal segments blackish. Antennae with very thin pale pubescence; anterior portion of head, legs, and ventral surfaces of body moderately clothed with pale golden buff pubescence.

Head (excluding neck) almost as broad as long; frons nearly impunctate; occiput moderately convex, sparsely and minutely punctulate, impressed along central portion with a feeble incomplete longitudinal groove. Antennae moderately slender, slightly more than one-half as long as body; scape ovate; second segment elongate-ovate, three-fourths as long as scape; third similar to second, barely longer and more slender; fourth very slightly longer than third; fifth as long as third and fourth combined, subequal to sixth and seventh; eighth to last subequal, a little shorter than the preceding. Prothorax nearly as broad as long, moderately constricted just behind middle of each side, impressed with a distinct arcuate groove across disc between middle and base; surfaces nearly impunctate. Scutellum smooth, subtrapeziform. Elytra subparallel-sided, narrowly rounded posteriorly; disc of each impressed with ten rows of moderate punctures at middle, the punctures larger basally and smaller apically, the outermost row in a deep groove throughout entire length, spaces between rows strongly raised in apical third and slightly so in central portion and near external margin. Ventral surfaces micropunctulate. Femora strongly swollen. Length 4.2 mm; breadth 1.45.

Holotype (loan deposit, California Academy of Sciences), Ta-hau, near Vo-lau, 30 km WSW. of Nodoo, Hainan Island, S. China, July 4, 1935, J. L. Gressitt, collector.

Differs from *L. delaneyi* Baly in having the metasternum and legs largely reddish, the elytra hardly depressed near base, and the pronotum with faint pitchy spots.

Distribution.—Hainan Island.

60. *Lema marginalis* Gressitt, n. sp. (Pl. 18, Fig. 2).

Female.—Body largely reddish ochraceous, paler on elytra, and marked with black: head with clypeus, labrum, mandibles, eyes and sides of neck black; antennae black except on first four segments, which are largely reddish; prothorax reddish with a pair of parenthesis-shaped marks anterior to middle of disc and a spot on each side, of pitchy; scutellum dull reddish; elytra testaceous, duller basally, with humeri and external and sutural margins, not quite to apices, black; ventral surfaces reddish; legs with tarsi and apices of tibiae pitchy black. Head, ventral surfaces and legs sparsely clothed with short golden buff hairs.

Head longer than broad, feebly constricted just behind eyes; labrum large; clypeus minutely punctulate; occiput triangular with a deep median groove and a swelling on each side. Antennae two-thirds as long as body, of moderate thickness apically; scape swollen, a little longer than broad; second segment slender, nearly twice as long as broad; third and fourth subequal; fifth one-half again as long as fourth, slightly longer than each of following. Prothorax a little broader than long, barely broader near apex than at base, moderately constricted just behind middle of each side; disc impunctate, with two feeble transverse grooves across basal portion and a slight depression on each side before middle. Elytra narrow, feebly swollen basally; each impressed with ten rows of small punctures, slightly larger basally and smaller apically, with the interareas subcostate near apices. Length 5.5 mm; breadth 2.25.

tures, slightly larger basally and smaller apically, with the interareas subcostate near apices. Length 5.5 mm; breadth 2.25.

Holotype, female (loan deposit, Calif. Acad. Sci.), Ta-hau, alt. 150 meters, near Vo-lau, 30 km WSW. of Nodoo, Hainan Island, S. China, July 5, 1935, J. L. Gressitt.

Differs from *L. adamsi* Baly in having the basal antennal segments more slender, the prothorax with two basal transverse depressions, the elytra more even basally, more costate apically and margined suturally and externally with black.

Distribution.—Hainan Island.

61. *Lema oryzae* Kuwayama.

Lema oryzae Kuwayama, 1931, Insecta Matsumurana 5: 155 (Formosa).

Numerous specimens (Lingnan Nat. Hist. Museum) were collected on rice between Wui-lung and Tai-k'ang, Apr. 8, Mui-hang, Apr. 10, Sin-fung Distr., Sin-fung to Lung-kai, Apr. 12, Lung-kai to Lien-p'ing, Apr. 13, and Kau-lin San (Chiu-lin Shan), alt. 700 m, Apr. 16-23, Lien-p'ing Distr., N. Kwangtung, 1940, by J. L. Gressitt and F. K. To; Kunming (Yunnan-fu), alt. 1900 m, Yunnan, July 5, and Meitan, alt. 900 m, E. of Tsengyih, N. Kweichow, July 19, 1940, J. L. Gressitt. Specimens in the writer's collection were taken at Yim-na San, NE. Kwangtung, June 13, and Gang-keu, SE. of Shanghang, SW. Fukien, July 25, 1936, J. L. Gressitt.

Host plant.—*Oryza sativa* Linn. (Rice).

Distribution.—Formosa; S. China.

62. *Lema pulchrula* Gressitt, n. sp. (Pl. 18, Fig. 1).

Male.—Body black; elytra metallic greenish blue, violet-blue at sides; scutellum pitchy black; prothorax entirely red; head red except for black clypeus, labrum, mandibles and genal angles; inner sides of coxae, mesosternum and apices of intercoxal processes of metasternum and first abdominal segment orange. Antennae, lower portions of head, and ventral surfaces of body sparsely clothed with short, pale, golden buff hairs.

Head (excluding neck) almost as broad as long, moderately constricted a short distance behind eyes; clypeus sparsely punctured around edges; occiput with two large rounded swellings with a narrow groove between. Antennae slender; three-fourths as long as body; scape a little longer than broad; second segment nearly as long as scape, but more slender; third a little longer, not quite as long as fourth; fifth two-thirds again as long as fourth, slightly longer than each of following. Prothorax a little broader than long, deeply constricted slightly behind middle, some horizontal longitudinal ridges in upper part of constriction on each side, a moderately deep transverse groove crossing disc between, and a little behind, lateral constrictions, with a fovea at its center; anterior portion of disc strongly convex, finely and sparsely punctured. Scutellum slightly emarginate apically. Elytra narrow, subparallel; disc of each

slightly swollen at base, grooved above humerus, depressed at end of basal quarter and impressed with ten regular rows of punctures at middle; the punctures mostly shorter than their interspaces, longitudinally, and only slightly smaller towards apex, and with a broad raised strip near apex between second and third puncture-rows, and a similar one between eighth and ninth. Ventral surfaces finely punctulate. Length 5.5 mm; breadth 1.9.

Holotype, male (United States National Museum), Hong San, alt. 850 meters, SE. Kiangsi Prov., SE. China, June 28, 1936, J. L. Gressitt; allotype, female (Gressitt coll.), June 25; paratopotype (Lingnan Nat. Hist. Museum), June 25.

Differs from *L. balyana* Jacoby in having the anterior angles of the prothorax distinct, the head constricted behind eyes and the elytra with longitudinal swellings posteriorly.

Distribution.—SE. China (S. Kiangsi).

63. *Lema rufonubes* Gressitt n. sp. (Pl. 15, Fig. 3).

Male.—Body pale ochraceous; elytra deep metallic greenish blue; eyes, labrum and apical portion of clypeus black; tarsal claws pitchy. Ventral surfaces, legs, antennae and anterior portion of head thinly and sparsely clothed with minute pale goldish hairs, densest on antennae, tarsi and sides of hind-body.

Head practically as broad as prothorax, nearly as broad as long; labrum and clypeus sparsely punctured, the latter somewhat ridged proximally; occiput moderately swollen, feebly punctured and ungrooved. Antennae two-thirds as long as body, fairly slender; scape swollen, nearly as broad as long; second segment two-thirds as long as scape; third feebly thickened apically, not quite as long as first two combined; fourth subequal to third; fifth one-third longer than fourth, subequal to each of following. Prothorax hardly longer than broad, deeply constricted a little behind middle; disc strongly swollen and impunctate, bounded posteriorly by a moderately deep arcuate groove. Scutellum truncate posteriorly, glabrous, ochraceous. Elytra suboblong, moderately plane above on basal portion; each with ten regular rows of deep punctures at middle, the punctures on the average smaller than the spaces between them, and the intervals between rows subcostate posteriorly. Ventral surfaces shiny; abdomen micropunctulate. Length 7 mm; breadth 2.6.

Female.—Occiput slightly depressed posteriorly; antennae three-fifths as long as body; pronotal disc minutely punctulate; elytra each with a subbasal swelling followed by a transverse depression. Length 7.5 mm; breadth 2.8.

Holotype, male (United States National Museum), Ta-han (Ta-hon), alt. 750 m, near Red Mist Mt., C. Hainan Island, June 22, 1935, J. L. Gressitt; allotype, female (Lingnan Nat. Hist. Museum), Cheung-kon-ts'uen, alt. 300 meters, east of Nodua, July 18, 1935; paratype, male (Gressitt coll.), Cheung-kon, July 19, all taken by the writer.

Differs from *L. coromandeliana* (F.) in being stouter, with the prothorax lacking a premedian groove, and the body entirely ochraceous except for the blue elytra. The specific name refers to Red Mist Mt.

Distribution.—Hainan Island.

64. *Lema rufotestacea* Clark.

Lema rufotestacea Clark, 1866, App. Cat. Phytoph.: 29; Jacoby, 1908, Fauna Brit. Ind., Chrys. 1: 36.

Several specimens (Lingnan Nat. Hist. Museum) were collected at a grove 2 mi. NE. of Nodua, Hainan, July 1, and a grove near Woh-hau-chuen, E. of Nodua, July 3, 1929, Lingnan University Fifth Hainan Expedition; Lingnan University campus, Canton, July 5, Nov. 15-22, and Dec. 6, 1939, J. L. Gressitt; and Waichow, Hwei-yang Distr., south central Kwangtung, Apr. 4, 1940, J. L. Gressitt and F. K. To.

Host plant.—*Commelina nudiflora* Linn.

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

65. *Lema sikanga* Gressitt, n. sp.

Female.—Broad, dorso-ventrally compressed, widened posteriorly; entirely dark, metallic. Body purplish blue to green above, black tinged with greenish beneath; antennae black; pronotum greenish blue; elytra steely greenish blue with purple reflections; ventral surfaces black with faint greenish tints; legs black, very faintly tinged with green. Head, ventral surfaces and legs sparsely and incompletely clothed with silvery buff hairs.

Head narrower than prothorax, longer than broad; sparsely and irregularly, but distinctly, punctured; areas bordering superior eye-lobes closely rugulose-punctate; occiput grooved medially to behind center. Antennae reaching to about end of basal third of elytra; scape swollen, but slightly longer than broad, not quite as long as third segment; fourth hardly longer than third; fifth nearly as long as third and fourth combined, slightly longer than sixth and following, which are subequal. Prothorax as broad as long, wider at apex than base, constricted just behind middle; disc very finely and sparsely punctured, with a single large puncture between center and base. Scutellum as long as broad, rounded apically, impunctate. Elytra broad, widest behind middle; surface of each with eleven rows of moderately small punctures before middle. Ventral surfaces with minute punctures only on thoracic pleura and parts of sides of abdominal sternites. Legs with femora swollen, posterior pair reaching to end of third abdominal segment; first hind tarsal segment almost as long as following two united. Length 6.6 mm; breadth 3.1.

Holotype, female (Univ. of Nanking, Coll. Agric.), Mou-pin, Sikang Prov., W. China, Aug. 6, 1939, S. N. Hsia, collector.

Differs from *L. psyche* Baly, of N. India, in having the elytra more finely punctured and without postbasal depressions, and both dorsal and ventral surfaces tinged with green.

Distribution.—West China (Sikang).

66. *Lema trapezinotata* Gressitt, n. sp. (Pl. 18, Fig. 4).

Moderately slender, parallel-sided, somewhat dorso-ventrally compressed. Body testaceous to black: head orange testaceous; antennae black with scape testaceous and second and third segments pitchy brown; prothorax orange testaceous, disc of notum with four small, rounded, black spots with a trapeziform arrangement, the anterior pair larger, more distant, close to anterior border, posterior pair just behind middle; scutellum and elytra orange ochraceous, the latter each with a large, black area occupying most of disc, pale border broadest apically; ventral surfaces testaceous with sides of meso- and metathoraces, including coxae, largely black; legs testaceous with tarsi pitchy brown, tibiae partly ochraceous and femora with a small pitchy black spot on each side beyond middle. Antennae, head, legs and ventral surfaces of body sparsely clothed with pale buff hairs.

Head (excluding neck) distinctly broader than long, strongly narrowed and then deeply constricted behind eyes; frons convex, sparsely punctured; occiput finely punctured at sides, with triangular portion convex and impunctate except for two small foveae on median line. Antennae barely more than one-half as long as body, moderately slender; scape subglobose, slightly longer than broad; second segment distinctly longer than broad; third about as long as scape, not quite as long as fourth; fifth longer than second and third segments combined; fifth to eighth decreasing in length; eighth to last subequal. Prothorax as broad as long, slightly broader at apex than at base, moderately constricted just behind middle; disc with a few minute punctures along median portion, convex on anterior three-quarters, followed by a broad, shallow, slightly arcuate groove. Scutellum narrow, rounded truncate apically, impunctate. Elytra parallel-sided; disc of each impressed with ten fairly regular rows of moderate punctures, the punctures somewhat finer posteriorly; interspaces between rows slightly raised in apical third, outermost row grooved throughout. Ventral surfaces minutely and irregularly punctulate. Length 6.4 mm; breadth 2.7.

Paratypes.—Testaceous portions sometimes reddish ochraceous to almost pitchy; pronotal spots sometimes larger and less distinct. Length 5.8–6.6 mm; breadth 2.4–2.8.

Holotype (United States National Museum), Wong-sa-shue, south of Sung-wu, southeastern Kiangsi Province, southeastern China, July 11, 1936, J. L. Gressitt; *paratypes* (Gressitt coll. and Lingnan Nat. Hist. Museum) Hong San, east of Sung-wu, S. Kiangsi, July 15–16, 1936, J. L. Gressitt.

Differs from *L. histrio* Clark in having the head partly punctured, the labrum pale, the antennae largely black with the second to fifth segments not regularly increasing in length, the pronotum with the subbasal groove shallow instead of deep, the elytral discs almost entirely black; and the legs and ventral surfaces of body partly black.

Distribution.—SE. China (S. Kiangsi).

67. *Lema trisulcata* Gressitt, n. sp. (Pl. 16, Fig. 2).

Female.—Body red and black: head black on frons, clypeus, labrum and palpi; antennae completely black; prothorax and scutellum entirely red; elytra red with the sutural half of each, narrowly near base, and exceeding the median line posteriorly, of bluish black; ventral surfaces pitchy black marked with brick red on middle of metasternum, and posterior and lateral margins of abdominal sternites and base of first; legs black. Head, antennae, ventral surfaces and legs sparsely clothed with short silvery gray hairs.

Head (excluding neck) nearly as broad as long, suddenly constricted almost immediately behind eyes; frons and clypeus finely punctulate; labrum nearly impunctate; occiput with the sublateral grooves forming the shape of a bell, briefly acute anteriorly, finely punctulate, grooved medially, with a swelling on each side of middle. Antennae barely one-half as long as body, somewhat slender; scape subglobose; second small, nearly as broad as long; third and fourth subequal, each a little longer than scape; fifth one-half again as long as fourth, subequal to seventh and a little longer than others. Prothorax not quite as broad as long, slightly wider near apex than at base, with prominent antero-lateral angles and feeble and gradual lateral constrictions; disc with three transverse grooves—one before, and one behind, middle, and one near base, the first nearly obliterated on median line, the second with a fovea at middle; punctures lacking. Scutellum emarginate-truncate. Elytra narrow, subparallel; each heavily punctured, most of the punctures less than one puncture-width apart in any direction except on apical third where they are narrower and the longitudinal interspaces subcostate. Ventral surfaces micropunctulate; first abdominal sternite finely carinate medially on basal two-thirds. Length 6.4 mm; breadth 2.4.

Holotype, female (loan deposit, California Academy of Sciences), Nodda, alt. 180 meters, Tan Distr., NWC. Hainan, June 28, 1935, J. L. Gressitt.

Differs from *L. semifulva* Jacoby in having the occiput more punctured, the prothorax narrower and more distinctly grooved before middle, the elytra more heavily punctured, particularly on central and sutural portions, and marked with pitchy blue-black from base to apex and in having the abdomen partly pitchy, etc.

Distribution.—Hainan Island.

68. *Lema vandae* Gressitt, n. sp. (Pl. 17, Fig. 3).

Female.—Body broad and moderately deep. Pale yellowish testaceous; third and following antennal segments pitchy to black; tibiae and tarsi black. Ventral surfaces very sparsely clothed with short golden buff hairs; femora nearly glabrous.

Head (excluding neck) as broad as long, suddenly constricted a very short distance behind eyes; clypeus nearly impunctate; occiput triangular, acute anteriorly, impunctate but with a median fovea posteriorly. An-

tennae not quite one-half as long as body, of moderate thickness; scape subglobular, nearly as thick as long; second segment broader than long; third and fourth subequal, each barely as long as scape; fifth as long as third and fourth combined, slightly longer than sixth and each of following. Prothorax hardly as long as broad, broadest at base, strongly constricted at middle of each side; disc impunctate, slightly convex behind middle and depressed before base. Scutellum emarginate-truncate posteriorly. Elytra broad, widened behind middle, broadly rounded apically; disc of each feebly swollen near scutellum and impressed with ten rows of punctures; the punctures small and fairly uniform, only slightly larger on basal quarter, mostly separated by one to two puncture-widths longitudinally. Ventral surfaces finely punctured in part. Last tarsal segment nearly as long as first three combined. Length 9.8 mm; breadth 4.3.

Paratype.—Body darker; ochraceous brown; pronotum distinctly punctured. Length 9.4 mm; breadth 4.4.

Holotype, female (loan deposit, California Academy of Sciences), Victoria, Hong Kong, July 20, 1940, G. A. C. Herklots and C. S. Ng, reared on *Vanda lamellata*. Paratopotypes (Hong Kong University), same data. Paratype (Lingnan Nat. Hist. Museum), Ta-hian, alt. 600 meters, near foot of Five Finger Mountains, Hainan, I., June 14, 1935, J. L. Gressitt.

Differs from *L. bohemani* Clark in being larger, more parallel-sided, with the body paler, the pronotum lacking a distinct transverse subbasal groove, and the elytra lacking postbasal depressions.

Host plant.—*Vanda lamellata* Lindl. (Orchidaceae).

Distribution.—Hong Kong; Hainan Island.

69. *Lema viridula* Gressitt, n. sp.

Female.—Dorsal surfaces dark metallic green; prothorax slightly bronzy; elytra feebly tinged with blue; ventral surfaces greenish blue. Ventral surfaces, antennae and legs clothed with minute silvery buff hairs, densest on metepisterna and antennae.

Head flattened, not quite as broad as prothorax, about as broad as long; eyes distant, space between them flattish, separated from occiput by a feebly arched groove; occiput plane, micropunctulate, with a narrow fovea behind center. Antennae hardly more than one-half as long as body, slightly thickened in apical half; scape nearly as broad as long; second segment one-half as long; third and fourth subequal, each about as long as scape; fifth one-half again as long as fourth, subequal in length to each of following segments. Prothorax longer than broad, widest at anterior angles, strongly constricted near base with anterior portion subglobular; surfaces finely and closely punctulate at sides, and sparsely so on disc, the latter with three or four punctures in a row along median line. Scutellum short, emarginate behind. Elytra each with ten rows of punctures at middle; the punctures distinct throughout, longer than broad, mostly longer than spaces between them longitudinally. Ventral

surfaces minutely punctured, a little more heavily so on sides of metasternum. Length 3.8 mm; breadth 1.3.

Holotype, female (United States National Museum), Hong San, alt. 750 meters, SE. Kiangsi Prov., SE. China, June 23, 1936, J. L. Gressitt; paratopotype, female (Gressitt coll.), same data.

Differs from *L. coronata* Baly in being smaller and narrower with the prothorax relatively longer, more globular anteriorly and more strongly and more posteriorly constricted; the elytral punctures more regular, deeper and narrower, etc.

Distribution.—SE. China (S. Kiangsi).

Explanation of Plates

Plate 15

- Fig. 1. *Crioceris hainanensis* n. sp.; holotype. $\times 7.8$.
 2. *Crioceris rufometallica* Pic; Nodda, Hainan I. $\times 7.8$.
 3. *Lema rufonubes* n. sp.; holotype. $\times 7.5$.
 4. *Crioceris ochracea* n. sp.; paratype. $\times 8.4$.

Plate 16

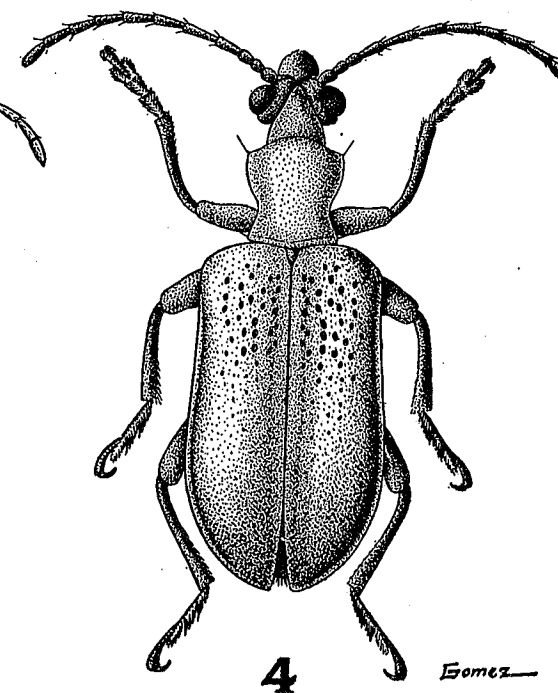
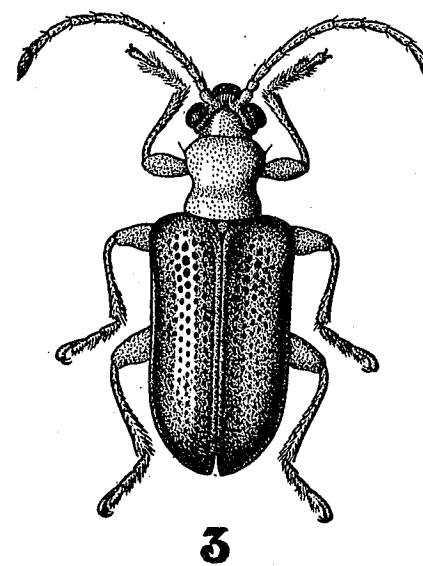
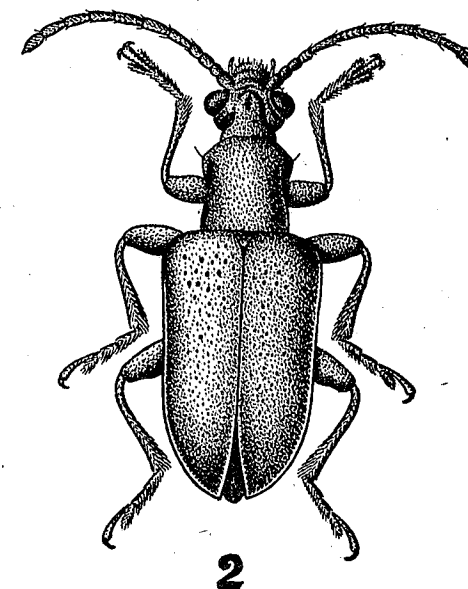
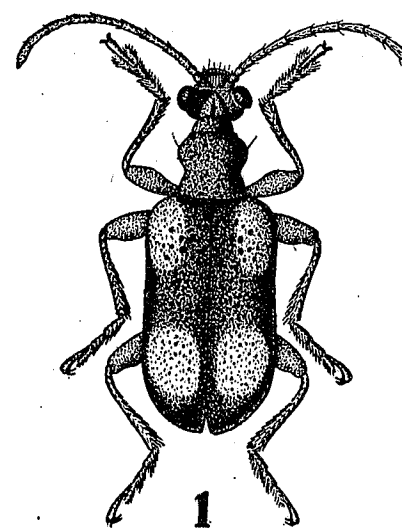
- Fig. 1. *Crioceris major* Pic; Hong Kong. $\times 5.7$.
 2. *Lema trisulcata* n. sp.; holotype. $\times 9.3$.
 3. *Crioceris laticornis* n. sp.; holotype. $\times 5.2$.
 4. *Crioceris neptis* Weise; E. Kwangtung. $\times 6.0$.

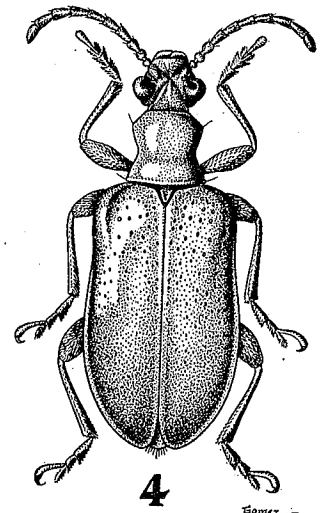
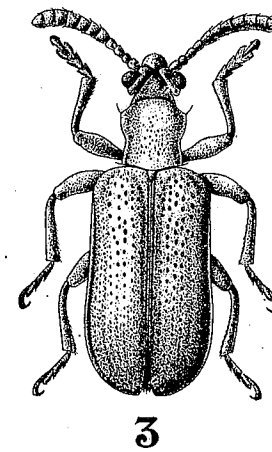
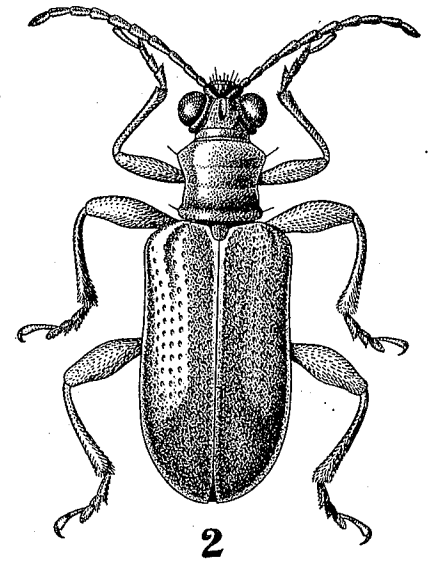
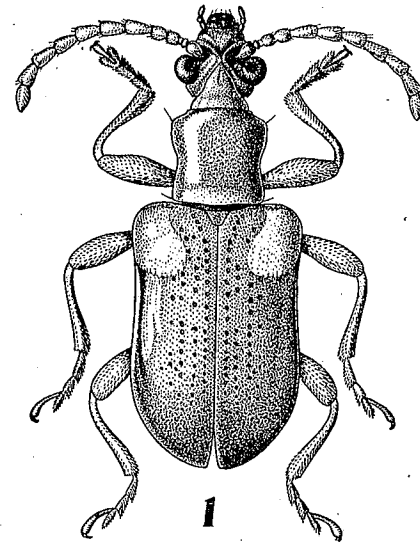
Plate 17

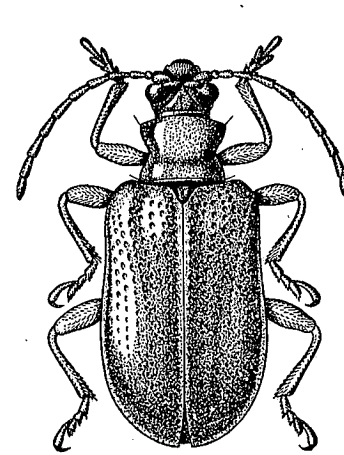
- Fig. 1. *Lema corpulentina* n. sp.; holotype. $\times 6.5$.
 2. *Crioceris smilacis* n. sp.; holotype. $\times 6.5$.
 3. *Lema vandae* n. sp.; paratype; Hainan I. $\times 6.5$.
 4. *Lema fanheanga* n. sp.; holotype. $\times 12.0$.

Plate 18

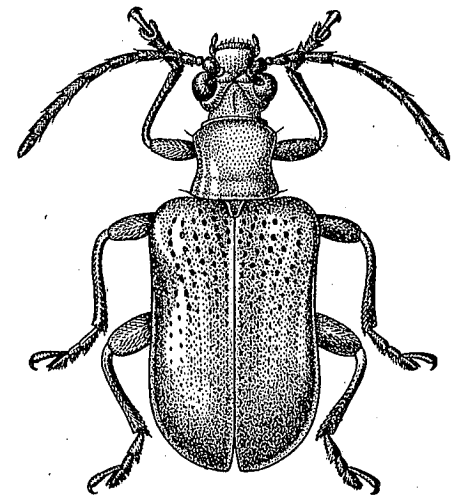
- Fig. 1. *Lema pulchrula* n. sp.; holotype. $\times 9.7$.
 2. *Lema marginalis* n. sp.; holotype. $\times 9.7$.
 3. *Lema angustepunctata* n. sp.; holotype. $\times 9.7$.
 4. *Lema trapezinotata* n. sp.; holotype. $\times 8.8$.



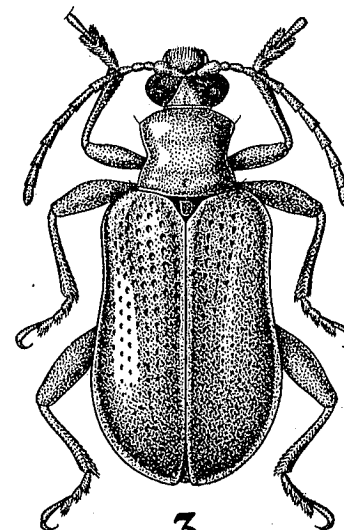




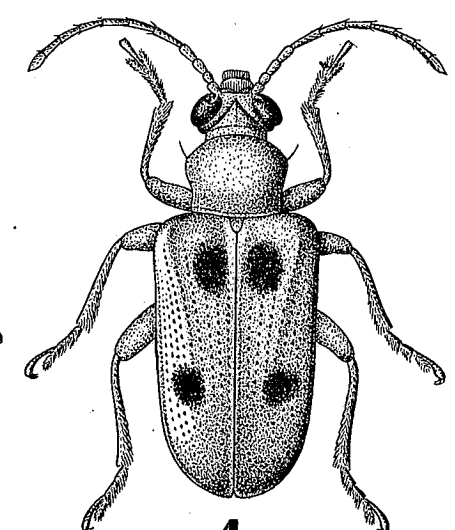
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2

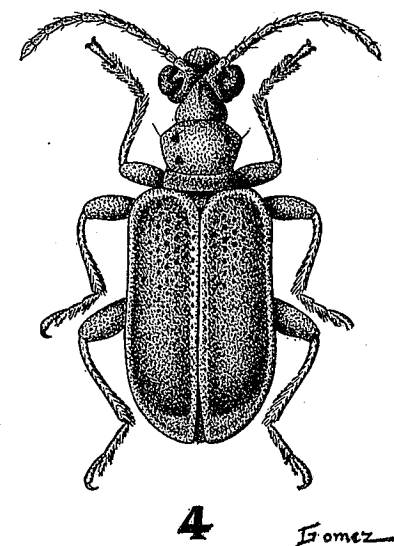
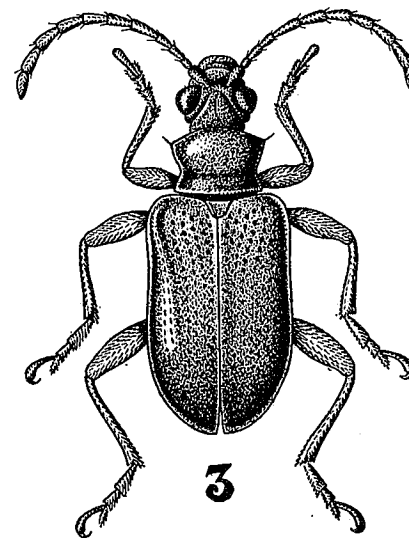
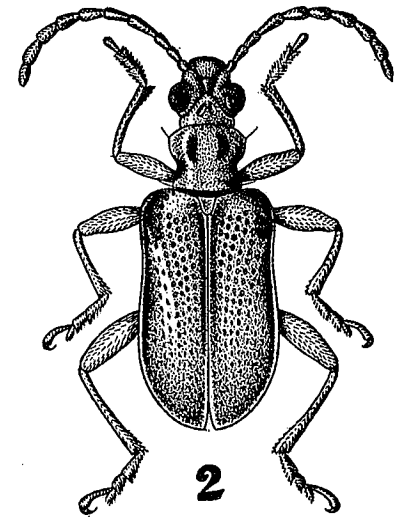
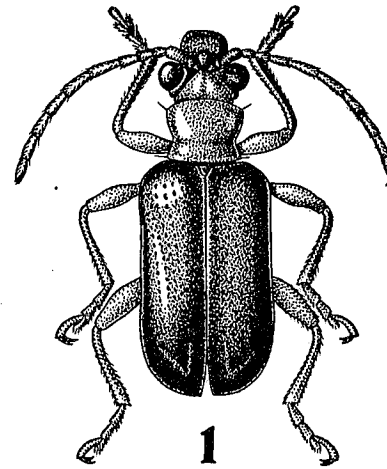


3



4

Gomez



Gomez

PLANT-BEETLES FROM SOUTH AND WEST CHINA.
III. CLYTRINAE, CRYPTOCEPHALINAE AND
CHLAMYDINAE (COLEOPTERA)¹

By J. LINSLEY GRESSITT

Lingnan Natural History Survey and Museum, Lingnan University.

This installment concerns the chrysomelid-beetles of the subfamilies Clytrinae, Cryptocephalinae and Chlamydinae from South and West China, with a few from East China, in the collection of the Lingnan Natural History Survey and Museum, together with some from the writer's collection, the College of Agriculture of the University of Nanking, the Biology Department of West China Union University and the Musée Heude, Université l'Aurore, Shanghai. Sixty-nine species of the three subfamilies are listed, and of these, thirty-five are described as new species and seven additional are newly recorded from China. Part of the Lingnan Natural History Museum material in the subfamilies Clytrinae and Cryptocephalinae was lost during the fall of Canton in 1938. The type specimens are deposited in the collections from which they originated, with some of the allotypes or paratypes deposited in the United States National Museum or the California Academy of Sciences in San Francisco, and some from the writer's collection (holotypes) placed on loan deposit in the latter institution.² The illustrations were prepared by Mr. Mak Yuen-hing. I am indebted to Dr. Sicién Chen, of the Academia Sinica, for help in various regards.

CYCLICA

Subfamily Clytrinae

About forty-five species of this subfamily have been recorded from China. In the present collection, only nine species are now at hand from South and West China, as much of the material was lost during the present war. One of the species is described as new, and another is newly recorded from China.

Key to Genera

1. Elytra not strongly lobed or sinuous at sides, more or less parallel. 2
- Elytra strongly lobed at bases of sides and narrowed posteriorly; pygidium exposed; eyes bordered internally by a strip with fine hairs. Diapromorpha

¹ Contribution from the Lingnan Natural History Survey and Museum.

² Some of the allotypes and paratypes of species described in the first two installments, the dispositions of which were not mentioned, have since been deposited in the United States National Museum and the California Academy of Sciences.

2. Antennae moderately serrate; elytra not dilated in male. 3
 Antennae very strongly serrate; elytra strongly dilated laterally in male *Clytrasoma*
3. Base of prothorax generally as broad as that of elytra; scutellum generally as broad as long and subcarinate posteriorly. 4
 Base of prothorax generally narrower than base of elytra; scutellum usually longer than broad and not carinate posteriorly. *Clytra*
4. Head of male not greatly different from that of female, much narrower than prothorax; anterior legs not longer than others. *Cyaniris*
 Head of male much larger than that of female, almost as broad as prothorax; anterior legs slightly longer than others. *Coptocephala*

Genus *Diapromorpha* Lacordaire

Diapromorpha Lacord., 1848, Monogr. Phytoph. 2: 227.

Subgenus *Aspidolopha* Lacordaire

Aspidolopha Lacord., 1848, Monogr. Phytoph. 2: 252.

Key to Species

1. Head and femora black or metallic; eyes strongly oblique; pronotum distinctly punctured; elytra heavily punctured. 2
 Head and femora ochraceous; eyes not strongly oblique; pronotum practically impunctate; elytra finely punctured. *pallidiceps*
2. Dorsal surfaces of body pale, unspotted; pronotum punctured only at sides and along basal margin. *melanophthalma*
 Dorsal surfaces of body marked with black or metallic on scutellum, basal portion of pronotum, and some areas on elytra, including humeri; pronotum punctured almost throughout. *thoracica*

70. *Diapromorpha (Aspidolopha) melanophthalma* Lacordaire

Aspidolopha melanophthalma Lacordaire, 1848, Monogr. Phytoph. 2: 254 (Bengal).

Diapromorpha (Aspidolopha) melanophthalma Jacoby and Clavareau, 1906, Gen. Ins. 49: 30.

Five specimens (Lingnan Natural History Museum) were taken on Hainan Island; one in groves around Moi-fu-ts'uen, 9 li E. of Nodoo, Aug. 12-18, and one near Nodoo, Aug. 17-22, 1929; Lingnan University Fifth Hainan Expedition; two at Hoihow, N. Hainan, April 1-8, and one at Nodoo, April 23-25, 1932, F. K. To. New to China.

Distribution.—Bengal; Tenasserim; Tonkin; Hainan I.

71. *Diapromorpha (Aspidolopha) pallidiceps* Gressitt, n. sp. (Pl. 20, Fig. 7)

Female.—Relatively slender; nearly parallel-sided; slightly narrowed anteriorly; subcylindrical. Pale ochraceous; posterior portions of elytral discs pellucid testaceous; metathorax largely, and abdomen entirely, black; antennae ochraceous basally, pitchy black beyond third segment; tarsi and apices of tibiae pitchy black. Dorsal surfaces glabrous; ventral surfaces of body moderately clothed with silvery buff subadpressed hairs; legs with short golden buff hairs.

Head fully two-thirds as broad as prothorax, slightly wider than

deep, fairly smooth and largely impunctate, but with three rounded depressions forming an equilateral triangle in center between eyes, and a few minute punctures bordering eyes; hairy strips bordering eyes not very distinct; eyes large, moderately broad, only slightly oblique, distant above. Antennae reaching slightly beyond humeri, strongly compressed and rather deeply serrate; scape swollen; second segment broader than long; third much smaller than second; fourth large, as broad as fifth and following. Prothorax practically twice as broad as long, somewhat rounded at sides, slightly narrower at apex than at base; disc convex, smooth and shiny, impunctate except at extreme base. Scutellum large, almost as long as broad, subacute and nearly carinate posteriorly, impunctate. Elytra hardly broader than prothorax, feebly narrowed posteriorly, separately rounded apically; sides sinuate, strongly produced below humeri; discs finely subseriate-punctate on basal three-fifths of each, almost impunctate posteriorly. Ventral surfaces finely and irregularly punctured; abdomen swollen laterally. Legs slender; first hind tarsal segment not quite as long as following two united. Length 5.4 mm; breadth 3.1.

Holotype, female (loan deposit, California Academy of Sciences, San Francisco), Ta-hian (Ta-sian-kwan), alt. 600 meters, N. of Five Finger Mts., central Hainan Island, S. China, June 18, 1935, J. L. Gressitt.

Differs from *D. (A.) melanophthalma* Lacordaire in being more slender, with the head broader, the eyes less oblique, the hairy strips beside eyes less distinct, the pronotum less punctate, the elytra less narrowed posteriorly and less heavily punctured, besides having the head pale instead of black and the ventral surfaces black instead of green.

Distribution.—Hainan Island.

72. *Diapromorpha (Aspidolopha) thoracica* Jacoby

Aspidolopha thoracica Jacoby, 1892, Ann. Mus. Civ. Genova 32: 879 (Burma); Hoffmann, 1937, Lingnan Sci. Jour. 16: 632 (Hainan).

Diapromorpha (Aspidolopha) thoracica Jacoby and Clavareau, 1906, Gen. Ins. 49: 30.

One specimen (Lingnan Natural History Museum) was taken in a grove 3 li. N. of Nodoo, Hainan Island, July 11, 1929, Lingnan University Fifth Hainan Expedition.

Distribution.—Burma; Tonkin; Hainan I.

Genus *Clytra* Laicharting

Clytra Laich., 1781, Verz. Tyroler Insekt. 1: 165.

73. *Clytra duodecimmaculata* (Fabricius)

Cryptocephalus duodecimmaculatus Fabr., 1775, Syst. Ent.: 106.

Clythra duodecimmaculatus Fabr., 1798, Ent. Syst. Suppl.: 112.

Eight specimens (Lingnan Natural History Museum) are at hand from Hainan Island; Fan-ta-ts'uen to Kap-wa-ts'uen, Hung-mo-tung, May 6, Beggar Village, SW. of Nodoo, July 16, on trail, Nam-fung to Poh-shang, July 24-25, Fan-ta-ts'uen to Poh-shang, Hung-mo-tung,

July 31-Aug. 1, grove around Nodda, Aug. 9-15, 1929, Lingnan University Fifth Hainan Expedition; and Faan-na, 9 mi. S. of Nodda, Tan Distr., July 14-15, 1932, F. K. To.

Distribution.—Java; Sumatra; Hainan I.

Genus *Clytrasoma* Jacoby

Clytrasoma Jacoby, 1908, Fauna Brit. India, Col. 2: 149.

74. *Clytrasoma palliata* (Fabricius)

Clythra palliata Fabr., 1801, Syst. Eleuth. 2: 30 (E. India).

Clytrasoma palliata Jacoby, 1908, Fauna Brit. India, Col. 2: 150.

Some specimens (Lingnan Natural History Museum) were taken at Fong-tong-ping, Lien Distr., N. Kwangtung Prov., S. China, June 30, 1934, by F. K. To. A few (Univ. Nanking, Coll. Agric.) were collected at Chengtu, Szechuan Prov., W. China, July 6, 1938, by K. F. Chen. New to Kwangtung and Szechuan.

Distribution.—India; Tonkin; Szechuan; Kwangtung; Fukien; Formosa.

Genus *Cyaniris* Redtenbacher

Cyaniris Redt., 1845, Gatt. deutsch. Käfer.: 118.

Key to Subgenera

Body form somewhat robust, more or less oblong or ovoid; third antennal segment much longer than broad. *Cyaniris*
Body form elongate, cylindrical, rounded anteriorly and posteriorly; second, third and fourth antennal segments short, fourth larger than third. *Exomis*

Subgenus *Cyaniris* s. str.

Cyaniris Redtenbacher, 1845, Gatt. deutsch. Käfer.: 118.

Gynandrophthalma Lacordaire, 1848, Monogr. Phytoph. 2: 256.

Key to Species

Elytra broadly rounded posteriorly, generally pale with two black bands, sometimes entirely pale or with only humeral spots, and sometimes entirely black except for pale apical spots; pronotum entirely pale. *nigrifrons*
Elytra narrowed posteriorly, entirely black; pronotum black on central portion and orange at sides. *subacuminata*

75. *Cyaniris (Cyaniris) nigrifrons* (Hope), new combination

Clythra nigrifrons Hope, 1842, Proc. Ent. Soc. London: 51 (China); Ann. Mag. Nat. Hist. 11: 64 (E. India); 1845, Trans. Ent. Soc. London 4: 12; Lacordaire, 1848, Monogr. Phytoph. 2: 393; Miwa, 1931, Syst. Cat. Formosan Col.: 185 (Clythra); Wu, 1937, Cat. Ins. Sin. 3: 788.

Numerous specimens (Lingnan Natural History Museum; Univ. Nanking; W. China Union Univ.) of this variable complex were collected in Kwangtung, Fukien, Kiangsi, Hupeh, Kweichow, Szechuan and Sikang Provinces, South, West and Central China: Yam-na Shan (Yim-na San),

Mei Distr., NE. Kwangtung, Sept. 13-18, 1933, F. K. To, and June 14-15, 1936, J. L. Gressitt; San-po-hui, 30 li. W. of Yuet-loi, Mei Distr., Kwangtung, Aug. 7-9, 1933, F. K. To; Linchow, Lien Distr., N. Kwangtung, Aug. 6, 1934, F. K. To; Cha-po-hui, Kien-yang Distr., Fukien, May 10-18, 1933, D. C. Ngu; Yen-ping, Nan-ping Distr., Fukien, June-July, 1933, D. C. Ngu; Kuliang, Min-how Distr., Fukien, July 6-29, 1932, S. B. Tang; Hwang-mei and vicinity, Hwang-mei Distr., Hupeh, July 1-14, 1935, Y. W. Djou; Kweiyang, alt. 1000 meters, July 11-12, and Meitan, E. of Tseng-yih, alt. 950 meters, July 17, Kweichow, and Pe-pei, alt. 300 meters, N. of Chungking, Szechuan, July 28-29, 1940, J. L. Gressitt; Chengtu, Szechuan, June 28-July 5, 1938, F. K. Chen; Moupin, Sikang, July 23, 1939, S. N. Hsia; and Lung-tung, Sikang, Aug. 21, 1939, Miss D. S. Pen.

This species has many color forms, and has had various names applied to it, but the writer hesitates to put the other names into synonymy till fuller evidence is at hand.

Distribution.—Kiangsu; Chekiang; Fukien; Kwangtung; Kiangsi; Hupeh; Kweichow; Szechuan; Sikang; Formosa.

76. *Cyaniris (Cyaniris) subacuminata* Pic

Cyaniris subacuminata Pic, 1927, Mel. Exot. Ent. 48: 28 (China).

One specimen (Lingnan Natural History Museum) was collected at Kunming (Yunnan-fu), alt. 1900 meters, Yunnan, SW. China, July 1, 1940, by J. L. Gressitt.

Distribution.—"China"; Yunnan.

Subgenus *Exomis* Weise

Exomis Weise, 1889, Horae Soc. Ent. Rossicae 23: 577.

77. *Cyaniris (Exomis) peploteroides davidis* (Lefevre)

Clytra davidis Lefevre, 1893, Ann. Soc. Ent. France 62: 113 (Yunnan).

Cyaniris (Exomis) peploteroides ab. *Davidis* Clavareau, 1913, Col. Cat. 53: 67.

One female specimen was collected in the Western Hills, alt. 2100 meters, near Kunming (Yunnan-fu), Yunnan, SW. China, July 7, 1940, by J. L. Gressitt.

The writer is temporarily using *davidis* as a subspecies of *peploteroides*, till evidence is at hand of their proper relationship.

Distribution.—Yunnan.

Genus *Coptocephala* Lacordaire

Coptocephala Lacord., 1848, Monogr. Phytoph. 2: 345.

Subgenus *Physauchenia* Lacordaire

Physauchenia Lacord., 1848, Monogr. Phytoph. 2: 367.

78. *Coptocephala (Physauchenia) pallens* (Fabricius)

Cryptoccephalus pallens Fabr., 1787, Mant. Ins. 1: 81.

Physauchenia pallens Lacordaire, 1848, Monogr. Phytoph. 2: 368.

A large number of specimens (Lingnan Natural History Museum)

were taken in Kwangtung and Fukien Provinces, Hong Kong, and Hainan Island, South China: Canton, Kwangtung, Aug. 2, 1932, Y. W. Djou, spring, 1933, P. P. Hoh, May 18, 1933, May 26, 1933, W. E. Hoffmann, and Aug. 17, 1940, F. K. To; Lung-ping-hui, May 18-20, and Sing-tsz-chan, May 22-23, Lien Distr., N. Kwangtung, F. K. To; Cha-shan, Kien-ning Distr., Fukien, June 1933, D. C. Ngu; Cheung-chau I., near Hong Kong, June 4, 1939, J. L. Gressitt and May 9-13, 1940, F. K. To; Lan-t'au I., near Hong Kong, alt. 800 meters, Aug. 31, 1940, Gressitt; Hong-lok-yuen, near Tai-po, New Territories, Hong Kong, May 26, 1941, Y. H. Mak and J. L. Gressitt; Hoihow, N. Hainan, April, 1932, F. K. To; Nodda, Hainan, Apr. 26-30, June 4-10, 1932, F. K. To and June 11, O. K. Lau and F. K. To; near Nodda, Aug. 17-22, 1929, Lingnan University Fifth Hainan Expedition; Kachek, Hainan, May 13-16, 1932, F. K. To; Lam-ko, Lin-kao Distr., Hainan, May 23-25, 1932, F. K. To; Taai-po, 27 miles from Nam-fung, Lin-kao Distr., Hainan, F. K. To; Fan-ta to Cheung-kon-ts'uen, E. of Nodda, July 17, 1935, Gressitt.

Host plants.—*Citrus* spp.

Distribution.—India; Tonkin; Kwangtung; Fukien; Hong Kong; Hainan I.; Formosa.

Subfamily Cryptocephalinae

About ninety-one species of this subfamily have so far been recorded in the literature as occurring in China. Only forty-one species are now at hand from South and West China, as most of the writer's specimens are in California, and much of the Lingnan Natural History Museum material has been lost or is with the former collection. Nineteen species are here described as new to science, and four more are newly recorded from China. Thus, one hundred and fourteen species are now known from China in this group.

Key to Genera

1. Antennae short, rarely reaching beyond base of prothorax, with terminal segments somewhat thickened 2
Antennae long and slender, generally reaching beyond middle of elytra *Cryptocephalus*
2. Scutellum visible, not covered by a projection of pronotum 3
Scutellum hidden, covered by a projection of pronotum *Dioryctus*
3. Upper lobes of eyes touching or nearly touching *Coenobius*
Upper lobes of eyes widely separated, not nearly touching *Melixanthus*

Tribe Monachini

Genus *Dioryctus* Suffrian

Dioryctus Suffrian, 1860, Linn. Ent. 14: 3.

Key to Species

1. Dorsal surfaces entirely red; body length over 3 mm 2
Dorsal surfaces often in part marked with black; body length less than 3 mm 3

2. Next-to-outermost puncture-row not grooved anteriorly; external margins of elytra strongly sinuate; body length about 4 mm *grandis*
Next-to-outermost puncture-row distinctly grooved anteriorly; external margins of elytra almost angulate near middle; body length less than 3.5 mm *fracticeps*
3. Pronotum reddish or ochraceous, impunctate; elytra reddish ochraceous with black markings 4
Pronotum red or black, finely punctured; elytra entirely red or with basal margins narrowly black 5
4. Each elytron with a broad basal black band and a large black spot behind middle, sometimes touching suture; form distinctly ovate *kweiyangensis*
Each elytron with three small rounded discal spots; one near middle of base, other two placed transversely at middle, as well as subhumeral marginal black stripe; form broad, uneven, humeri and posterior-lateral angles of elytra slightly projecting *bodhisatva*
5. Pronotum reddish; elytra entirely red, or narrowly pitchy black along basal, and sometimes sutural, margins 6
Pronotum entirely black; elytra red; body form subelongate-ovate *nigricollis*
6. Elytra narrowly pitchy black along bases, sometimes also along suture and external margin and on humeri; elytral punctures distinct and regular *auricacumen*
Elytra entirely red; elytral punctures not very distinct with scattered minute punctures between rows *exilis*

79. *Dioryctus auricacumen* Gressitt, n. sp. (Pl. 19, Fig. 1)

Male.—Broadly and bluntly ovate in dorsal outline. Body reddish, slightly ochraceous or pale pitchy on ventral surfaces, pitchy black along basal margins of elytra, as well as on humeri and very narrowly along sutural and external margins; posterior portion of metasternum pitchy black. Antennae, head and ventral surfaces of body sparsely clothed with short golden buff hairs.

Head less than one-half as broad as prothorax, rounded in anterior outline, fairly smooth and minutely punctured. Antennae reaching beyond elytral bases; fifth and following segments distinctly broadened and flattened. Prothorax not quite twice as broad as long, almost regularly rounded laterally and anteriorly in dorsal outline; disc minutely punctured throughout. Elytra gradually narrowed behind humeri and broadly rounded apically; disc of each with eleven rows of fine punctures, last two rows slightly sulcate and apex irregularly punctured. Legs and ventral surfaces of body finely and irregularly punctured. Length 2 mm; breadth 1.6.

Female.—Elytra with humeri only partly black, sutural and external margins not bordered with black. Length 2.15 mm; breadth 1.65.

Holotype, male (Lingnan Natural History Museum), Omei Shan: near summit, at about alt. 3000 meters, Szechuan Province, West China, Aug. 11, 1940, J. L. Gressitt collector; allotype, female (United States National Museum), same data.

Differs from *D. exilis* Weise in being slightly larger and more elongate.

gate, in having the head paler, the elytra banded with black basally and more distinctly punctured, and the metasternum partly black.

The specific name refers to the translation of *Chin-ting* (Golden Peak), the summit of Mt. Omei, the type locality.

Distribution.—West China (Szechuan).

80. *Dioryctus bodhisatva* Gressitt, n. sp. (Pl. 19, Fig. 2)

Female.—Broadly rounded, not quite ovate; humeri bluntly projecting. Body reddish ochraceous; legs and parts of elytra paler ochraceous; bases of pronotum and elytra very narrowly black; each elytron marked with black as follows: (1) a moderate-sized roundish spot on disc near middle of base, but closer to suture than external margin, and not touching base; (2 and 3) two slightly smaller roundish spots placed transversely at about middle, inner one less distinct and less rounded than outer one; and (4) an oblique marginal band from basal margin in front of humerus to just before lateral emargination. Antennae, ventral surfaces of body, and parts of head sparsely clothed with short golden buff pubescence.

Head about one-half as broad as prothorax, round in frontal outline, minutely punctured on frons, sparsely and minutely punctulate on occiput, with three short straight impressed lines converging at center, forming a broad, inverted "Y." Antennae reaching slightly beyond elytral bases; scape flattened-elliptical; following segments slender; last six broadened and somewhat flattened. Prothorax not quite twice as broad as long, evenly narrowed anteriorly, truncate apically; disc smooth, evenly convex and impunctate. Elytra slightly longer than broad, narrowed anteriorly and posteriorly, with humeri and postero-lateral angles somewhat bluntly projecting; disc of each with eleven regular rows of minute punctures, the outer two rows somewhat sulcate in posterior half, extreme apical portions irregularly and more distinctly punctured. Ventral surfaces of body finely and irregularly punctured. Femora distinctly swollen. Length 2.2 mm; breadth 1.65.

Holotype, female (Lingnan Natural History Museum), Omei Shan: near summit, at about alt. 3000 meters, Szechuan Province, West China, Aug. 11, 1940, J. L. Gressitt collector.

Differs from *D. exilis* Weise in being slightly larger, less rounded in dorsal outline, with the humeri and posterior angles slightly projecting, the pronotum impunctate, and the coloration paler and with small black spots on the elytra.

The specific name refers to the type locality, a famous sacred Buddhist mountain, and also to the shape of the insect's body, which resembles a certain type of Buddha image.

Distribution.—West China (Szechuan).

81. *Dioryctus exilis* Weise (Pl. 19, Fig. 3)

Dioryctus exilis Weise, 1922, Tijdschr. Ent. 65: 43 (Yunnan).

One male specimen (Lingnan Natural History Museum) was col-

lected at Kweiyang, alt. 1000 meters, Kweichow Province, SW. China, July 12, 1940, by J. L. Gressitt. New to Kweichow.

Distribution.—SW. China (Kweichow and Yunnan).

82. *Dioryctus fracticeps* Gressitt, n. sp. (Pl. 20, Fig. 1)

Male.—Fairly broad, rounded oblong. Body reddish castaneous above, ochraceous brown beneath; antennae ochraceous on first three and one-half segments, pitchy black on remainder; sides of metasternum and central portions of femora slightly pitchy; basal margins of prothorax and elytra very narrowly pitchy black; labrum and mandibles pitchy to black. Legs and ventral surfaces of body sparsely clothed with brief pale hairs.

Head less than one-half as broad as prothorax, rounded in frontal outline, closely punctured on frons and sparsely so on occiput, with a short longitudinal groove between upper ends of eyes. Antennae reaching well beyond humeri; scape long and compressed; second segment nearly as long as third; fifth and following segments flattened and distinctly broadened apically. Prothorax not quite twice as broad as long, evenly rounded at sides and truncate anteriorly; disc practically impunctate, smooth and shiny. Elytra slightly narrowed behind humeri; each broadly rounded apically and with eleven regular rows of distinct punctures, the outer two rows grooved throughout. Ventral surfaces of body finely and irregularly punctured; prosternal intercoxal process flat, with raised lateral margins but without a median carina. Length 3.3 mm; breadth 2.45.

Holotype, male (Lingnan Natural History Museum), Tung-chung, Lan-t'au Island, near Hong Kong, Aug. 7, 1934, Y. W. Djou, collector.

Differs from *D. laetus* Weise in being smaller and more darkly colored, in having the pronotum nearly impunctate, the penultimate puncture-row of each elytron distinctly grooved and the last continuing forward to basal angle, and the prosternum much less than twice as broad as long.

The specific name refers to the type locality, *Lan-t'au* meaning "broken head."

Distribution.—Lan-t'au Island (near Hong Kong).

83. *Dioryctus grandis* Baly

Dioryctus grandis Baly, 1865, Trans. Ent. Soc. London (3) 4, 1: 64, pl. 2, fig. 5; Hoffmann, 1937, Lingnan Sci. Jour. 16: 632 (Hainan I.).

Six specimens (Lingnan Natural History Museum) were collected in Kwangtung and Hainan Island: Nam-cha-chuen, 10 li SW. of Nodaa, Hainan I., July 6, 1929, Lingnan University Fifth Hainan Expedition; Chan-mo-cheung, San-po, 30 li W. of Yuet-loi, Aug. 10, Yuet-loi-hui, 40 li NW. of Ping-chuen, Aug. 4-5, and Tsing-leung Shan, 13 mi. S. of Sai-yeung, Mei-hsien, Oct. 6-11, Mei Distr., NE. Kwangtung, 1933, F. K. To; Paak-wan-shan-ts'uen, Sheung-shui-heung, Aug. 24, and Iu-ling-paai, Yao Shan, Oct. 1-2, Lein Distr., N. Kwangtung, 1934, F. K. To. New to the Kwangtung mainland.

Distribution.—Sumatra; Penang; Hainan I.; Kwangtung.

84. *Dioryctus kweiyangensis* Gressitt, n. sp. (Pl. 19, Fig. 7)

Male.—Relatively narrow, bluntly ovate. Body ochraceous tinged with red, paler on legs, elytral apices and last abdominal segment; elytra with a broad black band covering basal third and extending to ends of lateral projections, each with a large roundish black spot occupying much of remainder and touching external margin and suture; basal margin of pronotum and sutural margins of elytra very narrowly black; labrum and mandibles pitchy; sides of prosternum and most of metasternum and first four abdominal segments black or pitchy black. Legs and ventral surfaces of body sparsely and briefly clothed with pale buff pubescence.

Head less than one-half as broad as prothorax, round in frontal outline, finely punctured, with a short longitudinal depression between upper parts of eyes. Antennae reaching beyond elytral bases; scape flattened-ovate; second segment nearly as long as third; sixth to last segments broadened and flattened. Prothorax not quite twice as broad as long, slightly rounded laterally and rounded-truncate anteriorly; disc smooth and impunctate. Elytra moderately narrowed posteriorly and rounded-truncate apically; disc smooth, impressed with eleven regular rows of minute punctures, the last two or three rows more distinct and slightly grooved, a few irregular punctures on lateral lobe and near extreme apex. Ventral surfaces minutely and irregularly punctured; femora and tibiae compressed; lateral borders of prosternum strongly raised and angulate near middle. Length 2.75 mm; breadth 1.65.

Female.—Posterior elytral spots slightly smaller, not touching suture or external margins. Length 2.8–2.9 mm; breadth 1.8–1.9.

Holotype, male (Lingnan Natural History Museum), Kweiyang, alt. 1000 meters, Kweichow Province, SW. China, July 11, 1940, J. L. Gressitt, collector; allotype, female (United States National Museum), and paratype, female (California Academy of Sciences), same data.

Differs from *D. maculatus* Weise in being smaller and narrower, with the antennae entirely pale, the pronotum immaculate, and the elytra with only a basal band and two posterior, sometimes confluent, spots of black on elytra. Differs from *D. humeralis* Pic in being narrower and in having a large black spot on the posterior portion of each elytron.

Distribution.—SW. China (Kweichow).

85. *Dioryctus nigricollis* Gressitt, n. sp. (Pl. 19, Fig. 5)

Female.—Relatively narrow; ovate, strongly convex. Body reddish brown beneath, black on pronotum and red on elytra; head pitchy reddish; antennae pitchy beyond middle; legs dull ochraceous. Legs and ventral surfaces of body sparsely clothed with short pale hairs.

Head less than one-half as broad as prothorax, round in frontal outline, slightly convex, minutely and sparsely punctulate. Antennae reaching to about humeri; scape flattened-ovate; second segment longer than third; third to fifth very slender; sixth to last broadened and flattened. Prothorax less than twice as broad as long, feebly rounded at sides, rounded-truncate apically; posterior process forming a 90 degree

angle; disc smooth but minutely punctured throughout. Elytra narrowed and rounded posteriorly; disc of each with eleven fairly regular rows of minute punctures, with some extra irregular punctures on lateral lobe and at extreme apex. Legs and ventral surfaces of body minutely punctured, more strongly so on metasternum; prosternum with lateral borders strongly raised, each forming an obtuse angle near its middle. Length 2.5 mm; breadth 1.8.

Male.—Head reddish ochraceous, pitchy black on upper portions of occiput; elytra a little more distinctly punctured. Length 2.25 mm; breadth 1.4.

Paratype.—Elytra less distinctly punctured, with suggestions of minute punctures between the rows.

Holotype, female (Lingnan Natural History Museum), Omei Shan, south side, at about alt. 2000 meters, Szechuan Province, W. China, Aug. 12, 1940, J. L. Gressitt collector; allotype, male (United States National Museum), Omei Shan, near summit, at about alt. 3000 meters, Aug. 11; paratype, female (California Academy of Sciences), same data as type.

Differs from *D. exilis* Weise in being more elongate, with the pronotum black, the elytra in general more regularly punctured, etc.

Distribution.—West China (Szechuan).

Genus *Coenobius* Suffrian

Coenobius Suffrian, 1857, Linn. Ent. 11: 61.

Key to Species

1. Body entirely shiny black above; pronotum with lateral grooves incomplete or lacking; body length less than 2 mm. 2
Prothorax reddish brown, with a distinct obliquely transverse groove on each side; body length more than 2 mm. *sulcicollis*
2. Pronotum largely impunctate on anterior and central portions; interpunctural spaces of dorsal surfaces of elytral discs flat; legs largely pale. 3
Pronotum punctured throughout; all of interpunctural spaces of elytral discs distinctly raised; legs largely pitchy or black. *chinensis*
3. Pronotum almost entirely impunctate, except for a row of punctures parallel to basal margin; head pitchy black in front; antennae pitchy distally. *piceipes*
Pronotum distinctly punctured at sides as well as along basal margin; head brownish ochraceous; antennae entirely pale. *flavicornis*

86. *Coenobius chinensis* Baly

Coenobius chinensis Baly, 1877, Trans. Ent. Soc. London: 214 (China).

One specimen (Lingnan Natural History Museum) was collected at Meitan, alt. 900–950 meters, E. of Tsengyih, N. Kweichow Province, SW. China, July 18, 1940, by the writer. This is the first definite locality record for this species.

Distribution.—"China"; Kweichow.

87. *Coenobius flavicornis* Gressitt, n. sp. (Pl. 19, Fig. 6)

Female.—Minute; ovate-cylindrical. Body shiny black; antennae testaceous; front of head reddish ochraceous; legs ochraceous; tarsi testaceous. Antennae, legs and abdomen sparsely clothed with short pale hairs.

Head less than one-half as broad as prothorax; frons plane, sparsely and minutely punctured. Antennae reaching to about base of elytra; first two segments moderately swollen; scape twice as long as second; third to fifth segments very slender; sixth to last slightly broadened and compressed. Prothorax slightly more than one-half again as broad as long, narrowed and slightly rounded at sides; apex with a short collar separated by a narrow transverse groove; disc convex and shiny, nearly impunctate anteriorly and on central portion, distinctly, but not very closely, punctured at sides; basal margin obtusely angulate at middle, paralleled by a row of deep punctures. Scutellum extremely narrow, emarginate basally. Elytra slightly narrowed and rounded posteriorly; disc of each with eleven regular rows of fine punctures, sixth and seventh rows meeting just behind middle; interspaces smooth and level on dorsal surfaces and slightly convex at sides. Pygidium and posterior abdominal sternites minutely punctulate; first abdominal sternite nearly impunctate; metasternum with a few punctures at sides. Length 1.8 mm; breadth 1.

Holotype, female (loan deposit, California Academy of Sciences), Yim-na San (Yam-na Shan), alt. 550 meters, SE. of Mei-hsien, Mei Distr., NE. Kwangtung Province, SE. China, June 15, 1936, J. L. Gressitt collector.

Differs from *C. lateralis* Weise in having the pronotum not very strongly punctured laterally, the elytral interspaces flat on dorsal surfaces and the metasternum only slightly punctured laterally.

Distribution.—SE. China (E. Kwangtung).

88. *Coenobius piceipes* Gressitt, n. sp. (Pl. 19, Fig. 4)

Body short; briefly fusiform-cylindrical. Shiny black; antennae pitchy with basal five or six segments pale ochraceous; head pitchy black above and reddish brown on lower half; palpi nearly testaceous; legs pitchy brown with tarsi and apices of tibiae dull testaceous. Antennae, legs and pygidium clothed with sparse, brief pale pubescence.

Head less than one-half as broad as prothorax, round in frontal outline; frons convex and sparsely punctured; clypeus narrow and arcuate, separated from frons by a narrow arched groove. Antennae reaching slightly beyond elytral bases; first and second segments moderately broadened and flattened. Prothorax about two-thirds as long as broad, evenly narrowed and feebly rounded at sides, rounded-truncate apically; apex forming a narrow constricted collar separated from remainder by a narrow transverse groove; disc smooth and impunctate, with a short oblique groove at middle of each side; a transverse row of distinct punctures parallel, and close, to basal margin, except at angular central posterior process. Scutellum very narrow, emarginate basally. Elytra evenly narrowed and rounded posteriorly; disc of each with eleven regular

rows of fine punctures, sixth and seventh rows uniting near middle; dorsal interspaces flat and smooth; lateral interspaces moderately convex, but not carinate. Posterior abdominal sternites and pygidium closely and finely punctulate; base of abdomen less densely so; metasternum largely impunctate. Femora swollen and shiny, not perceptibly punctured. Length 1.6-1.9 mm; breadth 1-1.1.

Holotype, female (Lingnan Natural History Museum), Meitan, alt. 900-950 meters, E. of Tseng-yih, N. Kweichow Province, SW. China, July 19, 1940, J. L. Gressitt collector; allotype, male (United States National Museum), July 18; paratype, female (California Academy of Sciences), July 18; paratype, male (Lingnan Mus.), July 19.

Differs from *C. laevicollis* (Jacoby) in having the elytral bases non-carinate, the elytral punctures minute and uniform, and the femora pitchy.

Distribution.—SW. China (Kweichow).

89. *Coenobius sulcicollis* Baly

Coenobius sulcicollis Baly, 1873, Trans. Ent. Soc. London; 86 (Nagasaki).

One specimen (Lingnan Natural History Museum) was taken at Keung-tin-heung, Lin Distr., N. Kwangtung Province, S. China, July 15, 1934, by F. K. To. New to China.

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

Tribe Cryptocephalini

Genus *Cryptocephalus* Geoffroy

Cryptocephalus Geoffroy, 1762, Hist. Ins. Paris I: 231.

Key to Species

1. Superior eye-lobes distinctly more widely separated than antennal insertions.....2
Superior eye-lobes not distinctly more widely separated than antennal insertions.....16
2. Elytra essentially unicolorous, lacking bands or spots, sometimes bordered on suture or external margins with a color different from ground-color.....3
Elytra not unicolorous, marked with dark or palespots, bands or stripes 8[6?]
3. Elytra pale: testaceous to ochraceous, sometimes dark along suture....4
Elytra dark: metallic bluish or greenish black, sometimes pale along external margins.....5
4. Elytral discs entirely testaceous, irregularly punctured; pronotum yellow to orange, heavily marked with two broad black stripes from apex to base.....*luridipennis*
Elytral discs partly testaceous and partly pale brownish ochraceous, narrowly bordered with black, except at apices; pronotum ochraceous, darkened only on extreme borders.....*hainanicus*
5. Pronotum entirely pale; head and legs largely pale; basal antennal segments testaceous; pygidium sparsely punctured.....8
Pronotum with a very large centro-basal black area; head and legs black; basal antennal segments pitchy; pygidium closely and finely punctured; elytra heavily punctured.....*discoderus*

6. Elytral epipleurae pale; ventral surfaces of body at least partly pale; pronotum testaceous or orange testaceous.7
Elytra entirely dark metallic bronzy green, including epipleurae; ventral surfaces of body entirely black; pronotum and legs reddish ochraceous.?discoderus
7. Ventral surfaces of body largely black except along lateral margins of sternites; legs and part of head pitchy brown; elytra metallic blue, deeply punctured, many of punctures larger than their longitudinal interspaces.festivus
Ventral surfaces of body, as well as legs and head, entirely testaceous; elytra metallic bronzy green, finely punctured, most of punctures much smaller than their longitudinal interspaces.slocumi
8. Pronotum distinctly punctured over most of its surface.9
Pronotum apparently impunctate over most of its surface.12
9. Pronotal disc largely or entirely dark: black or green; elytral puncturation at least partly confused.10
Pronotal disc largely reddish, with a pair of small black spots near center and some black markings along base; elytral punctures in regular distinct rows.11
10. Pronotal disc black, bordered anteriorly and laterally with yellow; elytra yellow, each with suture and two transverse bands connecting with a sinuous stripe from humerus to near apex, of black.koltzei
Pronotum entirely metallic green; elytra pale ochraceous brown, each with three metallic bronzy green spots.regalis
11. Pronotum quite distinctly punctured; legs and borders of abdomen ochraceous; elytra orange with five black spots on disc of each.duodecatus
Pronotum not always distinctly punctured; legs and abdomen almost entirely black; elytra reddish with two irregular, not quite complete, transverse black bands, as well as extreme base and apex being black.trifasciatus
12. Pronotum unicolorous or nearly so: black or ochraceous.13
Pronotum pale with a pair of separate or fused black discal spots.14
13. Pronotum ochraceous; elytra yellowish testaceous with a broad pitchy black discal stripe on each extending from base nearly to apex, as well as external and sutural margins being narrowly black.suavis
Pronotum black; elytra yellowish testaceous with two irregular black bands, as well as apices and suture being black.lushanensis
14. Elytra pale with irregular black spots, or black with a large, yellowish testaceous spot on central portion of each, touching external margin but not suture.15
Elytra reddish with two irregular subtransverse discal or basal bands of black, as well as suture and apex being black.trifasciatus
15. Elytra yellowish testaceous, each with an anterior and a posterior pair of black discal spots, sometimes posterior pair lacking; abdomen black; femora largely reddish ochraceous.decastictus
Elytra black, each with a large yellowish testaceous spot on central portion, touching external margin but not suture; abdomen largely testaceous; femora largely black.moupinensis
16. Superior eye-lobes distinctly less widely separated than antennal insertions.17
Superior eye-lobes about as widely separated as antennal insertions.22
17. Elytra not entirely pale; either spotted, banded or reticulated with black; pronotum spotted or unspotted.18

- Elytra entirely pale: testaceous or ochraceous; pronotum unicolorous; dark or pale.19
18. Pronotum marked with black on disc; elytra crossed by a largely free basal band, and a postmedian row of spots, of black; metasternum black.bryanti
Pronotum entirely ochraceous; elytra marked with large black reticulations, leaving six pale spots (3:2:1) on each elytron; legs and ventral surfaces of body entirely pale.luteosignatus
19. Dorsal surfaces of body, as well as ventral surfaces and femora, almost entirely pale; antennal scape pale.20
Pronotum black, except for narrowly pale or pitchy borders; legs and parts of ventral surfaces of body pitchy or black; antennal scape pitchy; pronotum indistinctly punctured; antennae as long as body.hongshanus
20. Basal five antennal segments ochraceous to slightly pitchy; borders of scutellum pale; pronotum not distinctly punctate; head sparsely punctured; body fairly narrow.21
Antennae entirely black beyond scape; borders of scutellum narrowly black; pronotum finely punctured; head closely punctured; body relatively broad.piceolimbatus
21. Elytra with punctures small, almost entirely much smaller than spaces between rows; pronotum with minute, indistinct punctures; tibiae and tarsi largely pitchy.subunicolor
Elytra with punctures large, those on basal half mostly larger than spaces between rows; pronotum impunctate; tibiae and tarsi ochraceous.sublineatus
22. Elytra entirely, or almost entirely, black or metallic.23
Elytra reddish or pale, often spotted, striped, or banded with black.27
23. Pronotum distinctly marked with black, or largely black.24
Pronotum entirely reddish or ochraceous; legs largely pale; elytra entirely black or metallic.25
24. Elytra narrowly bordered with yellow posteriorly, remainder black; pronotum strongly narrowed anteriorly, with nearly straight sides, pale yellow marked with a pair of black discal spots; legs testaceous.pallidoapicalis
Elytra entirely dark blue or greenish black; pronotum rounded at sides, strongly convex, marked with a large discal black spot sometimes covering most of surface; legs largely black.discoderus
25. Ventral surfaces of body reddish or ochraceous; front of head distinctly punctured; body more than 4.5 mm long.26
Ventral surfaces of body black; front of head indistinctly punctured; body less than 3.5 mm long.?discoderus
26. Pronotum, ventral surfaces of body, and legs ochraceous; pronotum minutely punctulate; elytra heavily punctured, with minute punctures between some of puncture-rows, and some of main punctures nearly as large as spaces between rows.pieli
Pronotum, legs and ventral surfaces of body reddish; pronotum impunctate; elytra finely punctured, with spaces between puncture-rows lacking minute punctures, and much wider than any of punctures.simulator
27. Elytra unicolorous; dark-red or ochraceous; unspotted; pronotum unicolorous: black or ochraceous.28
Elytra pale, spotted, striped or banded with black, or black with a broad yellow band; pronotum sometimes spotted.29

28. Body reddish ochraceous, paler beneath, with parts of sides of abdominal segments and most of antennae black or pitchy; scutellum rounded apically. *talianus*
Elytra dark red; pronotum black; head, legs, antennae and ventral surfaces of body pitchy; scutellum acute apically. *nigrorufus*
29. Elytra yellow or reddish ochraceous with a few black discal spots or narrow humeral and sutural stripes of black. 30
Elytra yellow or pale ochraceous with one or more black bands, or black with a broad transverse yellowish band. 31
30. Elytra reddish with three black discal spots on each and posterior portion of suture black; head strongly punctured; pronotum finely punctulate, unspotted. *ngae*
Elytra testaceous or ochraceous, each with an incomplete black stripe extending posteriorly from humerus, and suture narrowly black; head finely punctured; pronotum impunctate, marked with a pair of black spots near center. *lingnanensis*
31. Elytra pale with one or two transverse black bands; pronotum partly black and partly pale basally. 32
Elytra black with a broad yellowish band slightly behind middle; pronotum reddish, unspotted; antennae pitchy basally. *bicoloripennis*
32. Elytra yellow with a broad basal and a postmedian band, as well as sutural and posterior margins, of black; pronotum yellow with a transverse black discal band, finely punctured; front of head sparsely and indistinctly punctured. *burmanicus*
Elytra pale ochraceous with humeri and a single incomplete transverse band near middle, black; pronotum impunctate, ochraceous with a large basal black area; front of head distinctly, and in large part closely, punctured. *subsimilis*

90. *Cryptocephalus bicoloripennis* Chujo

Cryptocephalus bicoloripennis Chujo, 1934, Jour. Soc. Trop. Agric. (Taiwan) 6: 518 (S. Formosa).

One specimen (Lingnan Natural History Museum) provisionally referred to this species was collected at Shiu-chow (Shaukwan), K'uh-kiang Distr., N. Kwangtung Prov., S. China, Aug. 15, 1932, by Y. W. Djou. New to China.

Distribution.—Formosa; Kwangtung.

91. *Cryptocephalus bryanti* Gressitt, n. sp. (Pl. 20, Fig. 6)

Female.—Body pale yellowish testaceous, slightly ochraceous on pronotum; marked with black or pitchy as follows: head pitchy black on mouthparts, at antennal insertions, and along a narrow longitudinal stripe between superior eye-lobes; antennae slightly tinged with pitchy on first five segments, pitchy to black on remainder; pronotum with anterior margin very pitchy black and disc with a pair of roughly triangular, subtransverse blackish spots on central portion just anterior to middle; scutellum pitchy black; elytra with basal, sutural and apical margins narrowly black or pitchy, and disc of each with three small pitchy black spots: first longitudinally oval, on humerus and touching base, second suboblong, transverse, between humerus and suture, not touching

base, and third transverse, at beginning of apical quarter, extending from external margin nearly to suture; ventral surfaces with most of metasternum and metepisterna, and sublateral portions of basal abdominal segments and central portions of posterior abdominal segments pitchy black; tarsi pitchy. Ventral surfaces of body with very sparse, short pale hairs.

Head less than one-half as broad as prothorax, nearly round in frontal outline, minutely and somewhat closely punctured, slightly raised between antennal insertions and longitudinally grooved between superior eye-lobes. Antennae reaching to beginning of apical third of elytra, fairly slender, slightly compressed; third and fourth segments subequal, each shorter than scape or fifth segment; sixth to last larger than fifth, subequal. Prothorax not quite twice as broad as long, somewhat rounded laterally, swollen anteriorly on disc, which is smooth, shiny and practically impunctate. Scutellum longer than broad, convex, strongly raised posteriorly, obtusely angulate posteriorly, impunctate. Elytra only slightly longer than broad, evenly narrowed posteriorly, rounded-truncate apically; disc of each with eleven somewhat oblique rows of fairly deep punctures, with a few scattered extremely minute punctures between rows; major punctures mostly separated longitudinally by spaces about equal in size to punctures. Ventral surfaces of body distinctly punctured. Length 2.5 mm; breadth 1.65.

Holotype, female (Lingnan Natural History Museum), near Fooi-iu northwest of Nodda, Hainan Island, South China, Aug. 26, 1929, Lingnan University Fifth Hainan Expedition; allotype, male (United States National Museum), and two paratypes (California Academy of Sciences and Lingnan Mus.), Lan-t'au Island, alt. 800 meters, near Hong Kong, Aug. 31, 1940, J. L. Gressitt.

Differs from *C. doherthyi* Jacoby, of Burma, in being much smaller, in having the pronotum marked with a pair of small dark spots, the scutellum pitchy black, the elytra with two basal black marks, a narrower preapical mark, and the suture and apical margins, as well as parts of the ventral surfaces of the body, pitchy black.

Named for Mr. G. E. Bryant of the Imperial Institute of Entomology, who made a partial determination of the collection of Chrysomelidae from the Lingnan University Fifth Hainan Expedition, designating this species as "Not in British Museum."

Distribution.—Hainan Island.

92. *Cryptocephalus burmanicus* Jacoby

Cryptocephalus burmanicus Jacoby, 1889, Ann. Mus. Civ. Genova 29: 159 (Burma).

Four specimens (Lingnan Natural History Museum) were collected at the following localities: near Nodda, Tan Distr., Hainan Island, S. China, Aug. 17-22, 1929, Lingnan University Fifth Hainan Expedition; river by city wall of Hwang-mei, Hwang-mei Distr., Hupeh Prov., SC. China, Aug. 3, 1933, Y. W. Djou; Western Hills, near Kunming (Yunnan-

fu), Yunnan Prov., SW. China, July 5-6, 1940, J. L. Gressitt. New to China.

Distribution.—Burma; Yunnan; Hupeh; Hainan I.

93. *Cryptocephalus decastictus* Fairmaire

Cryptocephalus decastictus Fairm., 1888, Ann. Soc. Ent. Belg. 32: 36 (Yunnan).

Numerous specimens (Lingnan Natural History Museum; U. S. National Museum; California Academy of Sciences) were collected at Kunming (Yunnan-fu), alt. 1900 meters, Yunnan Prov., SW. China, July 1-5, 1940, J. L. Gressitt; a few were taken in the Western Hills, alt. 2000-2100 meters, near Kunming, Yunnan, July 5-6; and one at Omei Shan; Ta-o-sze, alt. 1250 meters, Szechuan Prov., Aug. 16, 1940, J. L. Gressitt. New to Szechuan.

Distribution.—W. China (Yunnan and Szechuan).

94. *Cryptocephalus discoderus* Fairmaire

Cryptocephalus discoderus Fairm., 1889, Ann. Soc. Ent. France (6) 9: 69 (Kweichow).

Cryptocephalus discoidalis Jacoby, 1890, Entomologist 23: 89 (Yunnan).

Cryptocephalus yunnanus Pic, 1917, Mel. Exot. Ent. 24: 10 (Yunnan), new synonym.

Cryptocephalus yunnanus var. *semicaerulescens* Pic, 1922, Mel. Exot. Ent. 36: 28 (Yunnan), new synonym.

Several specimens (Lingnan Natural History Museum; U. S. National Museum) were taken at the Western Hills, alt. 2000-2100 meters, near Kunming, Yunnan Prov., SW. China, July 6-7, 1940, J. L. Gressitt, and one at Kunming (Yunnan-fu), alt. 1900 meters, July 4, 1940, Gressitt. Several additional specimens (Lingnan Natural History Museum), at present placed here with some uncertainty, were taken at the following places: Kuling, Kiu-kiang Distr., N. Kiangsi Prov., EC. China, July 23-26, 1933, Y. W. Djou; Taam-yuen-tung, Lien Distr., N. Kwangtung Prov., May 29-30, 1934, F. K. To; Kunming, Yunnan Prov., July 2, Kweiyang, Kweichow Prov., July 11, and Nien-hwo-shih to summit, alt. 2000-3000 meters, Omei Shan, Szechuan Prov., Aug. 10, 1940, J. L. Gressitt. Unrecorded from Kiangsi, Kwangtung and Szechuan Provinces.

From a study of the material at hand, the writer has no doubt that the four above names refer to a single species. However, the material seen from Kwangtung, Kiangsi, Kweichow and Szechuan may represent more than one species different from this variable form.

Distribution.—Yunnan; Kweichow; Szechuan; Kwangtung; Kiangsi.

95. *Cryptocephalus duodecatus* Fairmaire

Cryptocephalus duodecatus Fairm., 1889, Ann. Soc. Ent. France (6) 9: 70 (Kiangsi).

Two specimens (Lingnan Natural History Museum) are at hand, one from 6 miles south of Hwang-mei, Hwang-mei Distr., Hupeh Prov., SC. China, Aug. 1-6, 1933, Y. W. Djou collector; the other from Sing-tsz-chan,

Lien Distr., N. Kwangtung, S. China, June 27-28, 1934, F. K. To collector. New to Hupeh and Kwangtung Provinces.

Distribution.—Kiangsi; Hupeh; Kwangtung.

96. *Cryptocephalus festivus* Jacoby

Cryptocephalus festivus Jacoby, 1890, Entomologist 23: 88, pl. 1, fig. 4. (Chang-Yang).

One specimen (West China Union University, Biol. Dept.) was collected at Soochow, Kiangsu Province, East China.

Distribution.—E. China.

97. *Cryptocephalus hainanicus* Gressitt, n. sp. (Pl. 20, Fig. 5)

Male.—Body testaceous to pale reddish ochraceous, slightly marked with black: head orange ochraceous, paler at sides, feebly pitchy at center of occiput; mandibles blackish; antennae pitchy reddish basally, pitchy black beyond fourth segment; pronotum orange ochraceous, slightly paler laterally and basally; scutellum ochraceous, bordered with black; elytra pale brownish ochraceous with large parascutellar, lateral, sutural and apical areas pale yellowish, and extreme basal, sutural and external margins narrowly pitchy black; epipleurae pale; legs and ventral surfaces of body orange ochraceous, pitchy brown on tarsi and distal portions of femora. Antennae, legs and ventral surfaces of body sparsely clothed with very short golden buff pubescence.

Form robust, slightly narrowed posteriorly. Head less than one-half as broad as prothorax, minutely and sparsely punctured; superior eye-lobes more widely separated than antennal insertions. Antennae reaching to just beyond middle of body, compressed but feebly broadened; scape about as long as third and fourth segments combined; fifth slightly longer than fourth and distinctly shorter than sixth. Prothorax almost twice as broad as long, convex laterally; disc smooth and minutely punctured. Scutellum distinctly longer than broad, subacute apically, foveate basally and minutely punctured at sides. Elytra with eleven rows of minute punctures on each, with a few still smaller punctures on some of interspaces. Ventral surfaces of body closely and finely punctured. Length 2.85 mm; breadth 1.8.

Holotype, male (Lingnan Natural History Museum), Hoihow, near sea-level, Kiung Shan Distr., N. Hainan Island, South China, April 1-8, 1932, F. K. To collector.

Differs from *C. colon* Suffrian in being smaller, in lacking the discal spots on the elytra, and in having the suture narrowly black, the scutellum largely pale, and the antennae largely dark.

Distribution.—Hainan Island.

98. *Cryptocephalus hongshanus* Gressitt, n. sp. (Pl. 20, Fig. 2)

Male.—Body black or pitchy to pale ochraceous brown: head dark ochraceous brown, paler on frons and below antennal insertions; antennae pitchy black, partly reddish brown on basal segments; pronotum black, tinged with dark pitchy brown, entire border reddish brown; scutellum

pitchy brown; elytra pale ochraceous brown, nearly testaceous, with extreme basal border narrowly pitchy black and epipleurae partly pitchy; ventral surfaces of body pitchy black, with prosternum, middle of first abdominal sternite and all of last abdominal segment testaceous; legs pitchy black, tinged with reddish at bases of femora. Antennae, legs and ventral surfaces of body thinly clothed with golden buff hairs.

Head one-half as broad as prothorax; occiput sparsely and unevenly, though distinctly, punctured; frons trapeziform, slightly concave, nearly impunctate; superior eye-lobes less widely separated than antennal insertions. Antennae as long as body, relatively slender; scape barely longer than third segment; third and fourth subequal; fifth and following longer. Prothorax less than twice as broad as long, narrowed anteriorly, distinctly rounded at sides; disc strongly convex, smooth and shiny, practically impunctate; basal margin slightly concave in each half. Scutellum longer than broad, narrowed and subrounded apically, impunctate, but with a mid-basal fovea. Elytra hardly narrowed posteriorly, rounded-truncate apically; disc of each with eleven regular rows of punctures of various sizes: some as wide as spaces between rows, but mostly much smaller; interstices mostly feebly raised and impunctate. Ventral surfaces of body irregularly punctured: minutely so at sides of abdomen, more coarsely and sparsely on metasternum. Length 3.5 mm; breadth 1.9.

Holotype, male (loan deposit, California Academy of Sciences), Hong San (Hong Shan), alt. 1000 meters, east of Sungwu, S.E. Kiangsi Province, SE. China, June 30, 1936, J. L. Gressitt collector.

Differs from *C. fokiensis* Weise in being more slender, in having the pronotum more black than pitchy, the elytra orange instead of black, and more than twice as long as the prothorax, and the prothorax less than twice as broad as long.

Distribution.—SE. China (S. Kiangsi).

99. *Cryptocephalus koltzei* Weise

Cryptocephalus koltzei Ws., 1887, Arch. Naturg. 53, 1: 171 (Siberia).

Cryptocephalus flavopictus Jacoby, 1890, Entomologist: 88, pl. 1, fig. 5 (Chang-yang).

A specimen (West China Union University, Biol. Dept.; Chr. 904) was collected at Nanking, Kiangsu Prov., East China.

Distribution.—Siberia; E. China.

100. *Cryptocephalus lingnanensis* Gressitt, n. sp.

Male.—Body ochraceous, marked in part with black: head pitchy black between upper lobes of eyes, at antennal insertions, and on labrum; antennae pitchy brown beyond third segment; pronotum with extreme anterior and posterior margins and a pair of subtransverse, somewhat diamond-shaped spots just before center, black; scutellum pitchy black; elytra with extreme basal margins, suture, apical and posterior lateral margins and a longitudinal stripe extending posteriorly from base along humerus to about middle, of pitchy black; posterior tarsi pitchy brown. Legs and ventral surfaces of body with short pale buff hairs.

Head about one-half as broad as prothorax, broader than deep, distinctly punctured, even except for a slight longitudinal groove between superior eye-lobes. Antennae reaching to about middle of body, moderately compressed and expanded; scape much longer than third segment; fourth a little longer than third and shorter than fifth, distinctly broadened; sixth and following larger. Prothorax about two-thirds as long as broad, strongly swollen anteriorly and rounded at sides; disc smooth and shiny, indistinctly punctulate. Scutellum longer than broad, bluntly triangular, convex, with a single fovea at middle of base. Elytra barely longer than broad, distinctly narrowed posteriorly and rounded-truncate apically; disc of each with eleven fairly regular rows of small, but distinct, punctures; interspaces minutely and irregularly punctulate. Ventral surfaces of body minutely punctured. Length 3.25 mm; breadth 2.

Holotype, male (Lingnan Natural History Museum), White Cloud Mountain (Pak-wan San), Canton, Kwangtung Province, South China, July 6, 1932, Y. W. Djou collector; allotype, female (U. S. National Museum), Aug. 2, 1932, Y. W. Djou; paratype, male (California Academy of Sciences), Tung-chung, Lan-t'au Island, near Hong Kong, Aug. 7, 1934, Y. W. Djou; paratype, female (Lingnan Mus.), Kam-ting Shan, Haa-tsak, Chung Shan Distr., S. Kwangtung Prov., Aug. 10, 1933, H. Y. Chan and K. C. Lee; paratype, male (Gressitt coll.), Yam-na Shan (Yim-na San), SE. of Ping-chuen, Mei Distr., NE. Kwangtung, Sept. 1-5, 1933, F. K. To.

Differs from *C. suavis* Duvivier in having the antennae broader, the prothorax more swollen and broader anteriorly, the elytra more narrowed and truncate posteriorly, with the humeral stripe short and narrow, as well as in having two black spots on the pronotum.

The name *lingnanensis* refers both to the literal meaning of *Lingnan*: "south of the mountains," the classical name for southernmost China, and to Lingnan University, the main campus of which is about two miles from the type locality of the species.

Distribution.—South China (Kwangtung).

101. *Cryptocephalus luridipennis* Suffrian

Cryptocephalus luridipennis Suffr., 1854, Linn. Ent. 9: 99 (Siberia).

A female (West China Union University, Biol. Dept.; Chr. 908) with entirely pale ochraceous elytra, collected at Soochow, Kiangsu Prov., East China, is provisionally referred to this species. The pronotal, femoral and head markings are typical.

Distribution.—E. Siberia; N. and E. China; Japan.

102. *Cryptocephalus lushanensis* Gressitt, n. sp.

Female.—Body black, in part yellow or pitchy red: head black with some small reddish ochraceous marks on frons, vertex and occiput; antennae ochraceous at base, pitchy beyond; prothorax shiny black with a short narrow median pitchy line near apex and another by each lateral margin near base; scutellum black; elytra black with three irregular yellow bands, first narrow, incomplete, extending posteriorly at each end,

touching scutellar suture, second broadest near elytral suture, sinuate, extending forward along epipleuron, third wide near suture, narrow externally; ventral surfaces pitchy black, reddish on mesothorax and apical margin of pygidium; legs reddish ochraceous. Front of head, ventral surfaces and legs briefly and sparsely clothed with golden buff hairs.

Head slightly more than one-half as broad as prothorax at base, finely and sparsely punctured; eyes with lobes subequal, more distant above than antennal insertions. Antennae slender, reaching to about end of first third of elytra; scape compressed, fully as long as second and third segments combined; fourth hardly as long as third; fifth and sixth each respectively longer, following subequal. Prothorax as broad as long; disc convex, practically impunctate. Scutellum narrow, rounded apically, obliquely inclined, impunctate. Elytra convex exteriorly, broadly rounded apically; surface of each with eleven rows of fine punctures before middle. Ventral surfaces finely punctured, closely so at sides. Legs short, posterior femora reaching just beyond middle of abdomen; first hind tarsal segment shorter than following two united. Length 4.2 mm; breadth 2.25.

Holotype, female (West China Union University, Biol. Dept.), Lushan, Sikang Province, West China, July 17, 1938, Miss D. S. Pen collector.

Differs from *C. koltzei* Weise in having the head and pronotum almost entirely black, the latter nearly impunctate, the elytra more glossy and more finely punctured, with the transverse bands reaching external margins and not joined sublaterally by a longitudinal stripe.

Distribution.—West China (Sikang).

103. *Cryptocephalus luteosignatus* Pic

Cryptocephalus luteosignatus Pic, 1922, Mel. Exot. Ent. 35: 10 (Tonkin); Chujo, 1934, Arb. morph. taxon. Ent. Berlin-Dahlem 1: 287 (Formosa).

Several specimens (Lingnan Natural History Museum) were taken on Cheung-chau Island, near Hong Kong, May 9-13, 1940, F. K. To; Tung-chung, Lan-t'au Island, near Hong Kong, Aug. 7-19, 1934, Y. W. Djou; Lan-t'au camp, alt. 800 meters, Lan-t'au I., Aug. 31, 1940, J. L. Gressitt; Un-long, New Territories, Hong Kong, Sept. 19, 1940, Gressitt. Some specimens (Gressitt collection) were taken at Hong San, E. of Sungwu, SE. Kiangsi Prov., SE. China, June 30, 1936, Gressitt. A specimen (West China Union University, Biol. Dept.) was collected at Soochow, Kiangsu, E. China. Unrecorded from China.

The writer suspects that *C. multifenestratus* Pic may be the same as this species.

Distribution.—Tonkin; Hong Kong; Kiangsi; Kiangsu; Formosa.

104. *Cryptocephalus moupinensis* Gressitt, n. sp. (Pl. 20, Fig. 8)

Female.—Broad, abbreviated, narrowed posteriorly, slightly wider than deep; bicolorous. Body testaceous, extensively marked with black: head black with vertex, frons and apex of labrum testaceous, and clypeus, base of labrum and mandibles pitchy; antennae black on last seven seg-

ments, pitchy on third and fourth, testaceous on first two; prothorax orange testaceous with a pair of large narrowly separated subrounded black spots, centered before middle; scutellum black; elytra black, each marked with a very large subtransverse spot, centered at about middle, suboblong and rounded internally, bordering external margin and reaching to first puncture-row from suture; ventral surfaces testaceous on prosternum, pitchy on mesosternum, black on metasternum and meso- and metapleura and pale orange testaceous with irregular pitchy marks on abdomen; legs black with posteriorly diminishing basal portions of femora and tibiae ochraceous. Body glabrous above, sparsely and briefly clothed with golden-buff hairs beneath.

Head less than one-half as broad as prothorax, a little broader than deep in frontal outline, deeply and irregularly punctured; frons broad and suberescens; vertex feebly raised; occiput slightly depressed in center. Antennae reaching beyond base of prothorax, slightly flattened beyond fourth segment; scape fully as long as second and third segments united; fourth a little longer than third, shorter than fifth; sixth to last subequal in length to, but broader than, fifth. Prothorax practically as broad as elytra at base, broadly rounded anteriorly, truncate in center of anterior border; surface impunctate in central portion, sparsely micro-punctulate at sides and near base, and with a few distinct punctures in an oblique depression on each side of base and along basal and external margins. Scutellum large, narrowly cordiform. Elytra broad, separately rounded apically; each with eleven rows of distinct punctures before middle with less regular rows of minute punctures alternating with them. Ventral surfaces densely punctured on metathorax, more heavily and less closely punctured on abdomen. Legs with first hind tarsal segment barely longer than second. Length 4.2 mm; breadth 2.8.

Holotype, female (University of Nanking, Agric. Coll.), Mou-pin, Sikang Prov., West China, July 26, 1939, S. N. Hsia, collector, paratype (Lingnan Natural History Museum), same data.

Differs from *C. lefevrei* Jacoby in having the pronotum pale with a pair of roundish black spots near anterior border, the elytra with a large yellowish spot on middle of each side, not reaching suture, and the elytral interstices finely pale.

Distribution.—West China (Sikang).

105. *Cryptocephalus ngae* Gressitt, n. sp.

Male.—Body reddish ochraceous to reddish castaneous, marked in part with black or pitchy: head reddish ochraceous with mandibles black and labrum and a small spot in middle of occiput pitchy; antennae reddish with distal six or seven segments dark pitchy brown; pronotum dark reddish ochraceous with faint suggestions of somewhat pitchy areas on disc; scutellum reddish bordered with pitchy black; elytra reddish castaneous with extreme basal margins, a moderately broad stripe along posterior half of suture, and three discal spots of black on each: first rounded oval, on humerus, second roundish, near base between humerus and suture, and third slightly larger, a little broader than long, on median

portion of disc just behind center; ventral surfaces of body tinged with pitchy black on sides of metathorax and center of abdomen; legs reddish ochraceous, paler on tarsi. Antennae, legs and ventral surfaces of body sparsely clothed with golden buff pubescence.

Form robust and convex, narrowed and bluntly rounded posteriorly. Head less than one-half as broad as prothorax, convex and strongly punctured; superior eye-lobes not quite as widely separated as antennal insertions. Antennae reaching to about middle of body, moderately compressed and expanded; scape nearly as long as third and fourth segments combined; fifth barely longer than fourth; sixth and following each longer than fifth. Prothorax a little less than twice as broad as long, convex anteriorly and rounded at sides; disc finely but distinctly punctured. Scutellum bluntly triangular, with a basal fovea and a few minute punctures. Elytra impressed with eleven regular rows of moderate-sized punctures; interspaces finely punctured. Ventral surfaces of body finely and deeply punctured. Length 4.25 mm; breadth 2.5. Paratype: Length 3.9 mm; breadth 2.35.

Holotype, male (Lingnan Natural History Museum), Tai-ping-fu, Sung-shen Distr., Kwangsi Prov., South China, Aug. 5-6, 1934, E. R. Tinkham; allotype, female (United States National Museum), Nanning, Yih-ning Distr., Kwangsi Prov., Aug. 2-3, 1934, E. R. Tinkham; paratype, male (California Academy of Sciences), K'ei-luk, Swatow, SE. Kwangtung Prov., Aug. 22, 1933, Y. C. Ng.

Differs from *C. guttifer* Suffrian in being reddish instead of yellow, in lacking distinct spots on the pronotum, in having the inner basal spot of the elytra free from the basal margin, and the external margins not black.

Named in honor of Y. C. Ng (Mrs. S. S. Mak), who collected the paratype.

Distribution.—S. China (Kwangsi and Kwangtung).

106. *Cryptocephalus nigrorufus* Gressitt, n. sp. (Pl. 20, Fig. 4)

Female.—Body largely black or pitchy; elytra brownish red with suture and extreme bases narrowly pitchy; pronotum black with a slight pitchy tinge; scutellum blackish, pitchy at center; head, antennae, legs and ventral surfaces of body pitchy black to dark pitchy brown. Legs, antennae and ventral surfaces of body moderately clothed with silvery buff hairs.

Head less than one-half as broad as prothorax, somewhat convex with two or three small depressions in a longitudinal row between upper portions of eyes; remainder of surfaces finely and irregularly punctured. Antennae about one-half as long as body, compressed and slightly expanded; scape as long as second and third segments combined; fourth segment subequal to third and nearly as long as fifth; sixth and following broader and very slightly longer. Prothorax nearly two-thirds as long as broad, strongly narrowed anteriorly, feebly convex at sides; disc evenly swollen, practically impunctate; basal margin concave on each side of middle. Scutellum much longer than broad, emarginate basally, acute

apically, smooth and nearly impunctate. Elytra moderately narrowed posteriorly, rounded-truncate apically; disc of each with eleven regular rows of minute punctures, some of which disappear posteriorly; interspaces smooth and impunctate. Ventral surfaces of body closely and minutely punctured. Length 3.4 mm; breadth 1.8.

Holotype, female (Lingnan Natural History Museum), Hoihow, northern Hainan Island, S. China, May 12-14, 1932, O. K. Lau collector.

Differs from *C. nigrosuturalis* Jacoby in having the pronotum entirely black, the elytra red with the suture entirely dark and the puncturation much finer.

Distribution.—Hainan Island.

107. *Cryptocephalus pallidoapicalis* Pic (Pl. 19, Fig. 9)

Cryptocephalus pallidoapicalis Pic, 1917, Mel. Exot. Ent. 24: 10 (Yunnan).

Two specimens (Lingnan Natural History Museum) were collected in the Western Hills, alt. 2100 meters, near Kunming (Yunnan-fu), Yunnan, SW. China, July 7, 1940, by J. L. Gressitt.

Distribution.—Yunnan.

108. *Cryptocephalus piceolimbatus* Pic

Cryptocephalus piceolimbatus Pic, 1920, Mel. Exot. Ent. 32: 25 (China).

One specimen (University of Nanking, Coll. Agric.) taken at Cheng-tu, Szechuan Prov., W. China, June 22, 1938, is tentatively referred to this species.

Distribution.—"China"; Szechuan.

109. *Cryptocephalus pieli* Pic

Cryptocephalus Pielii Pic, 1928, Mel. Exot. Ent. 51: 33 (China).

Three specimens (Lingnan Natural History Museum) were collected as follows: Kuling, Kiu-kiang Distr., N. Kiangsi Prov., EC. China, July 23-26, 1933, Y. W. Djou; Taam-yuen-tung, June 7-9 and Fong-tong-ping, July 2-3, Lien Distr., N. Kwangtung, 1934, F. K. To. One specimen (University of Nanking, Coll. Agric.) was taken at Hsia-tan, Hunan Prov., central China, July 8, 1935.

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

110. *Cryptocephalus regalis* Gebler

Cryptocephalus regalis Gebler, 1830, Ledeb. Reise (2) 3: 208 (Siberia).

Three specimens (Lingnan Natural History Museum) were collected at Wu-tsu-tsz, Hwang-mei Distr., Hupeh Prov., central China, Aug. 25-29, 1933, by Y. W. Djou.

Distribution.—Siberia; Manchuria; N. and C. China; Japan.

111. *Cryptocephalus simulator* Gressitt, n. sp.

Female.—Body dark reddish to ochraceous; scutellum, elytra and basal margin of pronotum shiny black; appendages partly pitchy; head

reddish ochraceous; labrum and clypeus darker reddish; mandibles and eyes black; antennae black, somewhat reddish proximally, with scape ochraceous; prothorax dark reddish, narrowly black on basal margin, slightly pitchy on lateral margins; ventral surfaces reddish ochraceous; legs reddish ochraceous with tarsi pitchy black. Lower front of head, ventral surfaces of body and legs with sparse suberect pale silvery buff hairs.

Form broad, cylindrical, rounded anteriorly, nearly truncate posteriorly. Head fully one-half as broad as prothorax at base, round in frontal outline, deeply and somewhat closely punctured except on upper portion of occiput; frons subtrapezoidal, twice as wide as high, elevated but flat; vertex concave in middle, with a swelling on each side obliquely behind antennal insertions; superior eye-lobes almost as widely separated as antennal insertions. Antennae nearly two-thirds as long as body, flattened and broadened distally; scape compressed, smooth, about as long as following two segments united; third and following segments subequal in length. Prothorax with anterior foramen distinctly deeper than wide; not quite as broad as elytra, narrowed anteriorly, rounded-truncate apically, convex on basal margin, almost impunctate on disc. Scutellum slightly convex, narrowed and rounded behind, impunctate. Elytra wide, subrectangular; each broadly and separately rounded apically and impressed on disc with eleven regular rows of moderately small, close punctures, the interspaces smooth. Ventral surfaces rather closely punctured, particularly on sides of metathorax. Legs short; posterior femora barely reaching beyond middle of abdomen; first hind tarsal segment as long as following two segments united. Length 5.5 mm; breadth 3.8.

Holotype, female (West China Union Univ., Biol. Dept.), Tienchuan, Sikang Prov., W. China, July 27, 1939, Miss D. S. Pen collector.

Differs from *C. pili* Pic in being more reddish, with the pronotum impunctate, and the elytra much more finely punctured, with the interspaces impunctate.

Distribution.—West China (Sikang).

112. *Cryptocephalus slocumi* Gressitt, n. sp. (Pl. 20, Fig. 9)

Female.—Body pale ochraceous; elytra dark metallic green with a bronzy tinge except for the epipleurae, which are pale testaceous; scutellum greenish black; extreme basal margin of pronotum black; head with mandibles pitchy and sides of face pale yellow; antennae pitchy black beyond fourth segment; pro- and mesosternum testaceous; tarsal claws pitchy. Legs and ventral surfaces of body sparsely clothed with short golden buff hairs.

Body suboblong and compressed-cylindrical. Head slightly more than one-half as broad as prothorax, round in frontal outline, smooth, very sparsely and indistinctly punctured; superior eye-lobes more widely separated than antennal insertions; frons trapeziform; labrum bilobed. Antennae moderately slender, somewhat compressed, three-fourths as long as body; scape longer than third segment; fourth longer than scape,

practically as long as each of following segments. Prothorax not quite twice as broad as long, narrowed anteriorly and rounded at sides, with lateral margins slightly expanded; disc strongly convex, smooth, impunctate; basal margin obtusely convex. Scutellum raised posteriorly, narrowly rounded apically, impunctate. Elytra hardly narrowed posteriorly, rounded-truncate apically; disc of each impressed with eleven regular rows of fine punctures, the punctures mostly separated longitudinally by spaces greater than their diameters; spaces between rows level and impunctate. Ventral surfaces of body closely punctured on sides of metathorax and very sparsely punctured on abdominal sternites. Length 4.6 mm; breadth 2.55.

Holotype, female (University of Nanking, Coll. of Agric.) Cheng-tu, Szechuan Province, W. China, May 18, 1939; paratype (Lingnan Natural History Museum), same data.

Differs from *C. discoderus* Fairmaire in having the head, pronotum, legs and ventral surfaces of the body entirely pale, and the elytra more finely punctured and dark bronzy green with the epipleurae pale yellow.

Distribution.—West China (Szechuan).

113. *Cryptocephalus suavis* Duvivier

Cryptocephalus suavis Duv., 1892, Ann. Soc. Ent. Belg. 36: 401 (Sikkim).

Several specimens (Lingnan Natural History Museum) were taken as follows: grove 2 miles NE. of Nodda, Hainan Island, July 1, 1929, Lingnan University Fifth Hainan Expedition; Hoihow, Hainan I., 1932, W. E. Hoffmann; Ying-to, N. of Waichow, Hwei-yang Distr., SC. Kwangtung, April 5, and Koon-yan-kok, between Waichow and Ho-yun, SC. Kwangtung, April 6, 1940, J. L. Gressitt and F. K. To. New to Kwangtung mainland.

Distribution.—Sikkim; Kwangtung; Hainan I.

114. *Cryptocephalus sublineatus* Pic?

Cryptocephalus sublineatus Pic, 1915, Mel. Exot. Ent. 16: 12 (Yunnan).

A single specimen (Lingnan Natural History Museum) taken at Kweiyang, alt. 1000 meters, Kweichow Prov., SW. China, July 11, 1940, J. L. Gressitt, is questionably referred to this name. Unrecorded from Kweichow.

Distribution.—Yunnan; Kweichow.

115. *Cryptocephalus subsimilis* Clavareau

Cryptocephalus simulans Jacoby, 1908, Fauna Brit. India, Col. 2: 197, fig. 74 (Travancore; not of Schaeffer).

Cryptocephalus subsimilis Clavareau, 1913, Col. Cat. 53: 189.

Several specimens (Lingnan Natural History Museum) were taken on Hainan Island, as follows: Nodda, June 24, Aug. 15-22, S. of Nodda, June 25, and Lin-fa Shan, near Hau-ying-ts'uen, E. of Nodda, Aug. 5-8, 1929, Lingnan University Fifth Hainan Expedition; Hau-ying-ts'uen,

July 29-30, Lam-ko, May 23-25, and Ts'ung-to (Sam-kok-ling), 9 miles SE. of Nodda, June 14-16, Lin-kao Distr., 1932, F. K. To.

Distribution.—India; Hainan I.

116. *Cryptocephalus subunicolor* Gressitt, n. sp. (Pl. 20, Fig. 3)

Female.—Body almost entirely orange testaceous, paler on sides of thoracic and abdominal sternites and pygidium, slightly marked with pitchy or blackish: antennae pitchy brown beyond fourth segment; extreme basal margins of prothorax, scutellum and elytra narrowly pitchy black; tarsi and postbasal portions of tibiae pitchy brown. Antennae, legs and ventral surfaces of body very thinly clothed with golden buff pubescence.

Form subrectangular and compressed-cylindrical, rounded anteriorly. Head not quite one-half as broad as prothorax, minutely and sparsely punctured, longitudinally concave between superior eye-lobes; latter much less widely separated than antennal insertions. Antennae not quite as long as body, fairly slender; scape slightly longer than third segment, which is not quite as long as fourth; fifth and following distinctly longer. Prothorax slightly more than one-half as long as broad, narrowed anteriorly, slightly convex at sides; disc smooth, minutely and indistinctly punctured. Scutellum longer than broad, truncate apically, emarginate basally, convex and impunctate. Elytra more than twice as long as prothorax, nearly parallel-sided, rounded apically; disc of each impressed with eleven fairly regular rows of deep, but not very large, punctures; most of punctures much smaller than interspaces transversely, and about as large, or larger, than longitudinal interspaces; spaces between puncture-rows all somewhat raised and very feebly punctured. Ventral surfaces of body irregularly punctured. Length 4.1 mm; breadth 2.4.

Holotype, female (Lingnan Natural History Museum), Lung-ping-hui, Lien Distr., N. Kwangtung Province, South China, May 18-20, 1934, F. K. To collector.

Differs from *C. gestroi* Jacoby in having the antennae largely pitchy instead of black, the tibiae and tarsi largely pitchy instead of yellow, the head distinctly punctured, the fourth antennal segment only slightly longer than the third, and the pronotal disc definitely, though minutely, punctured.

Distribution.—South China (Kwangtung).

117. *Cryptocephalus talianus* Pic?

Cryptocephalus talianus Pic, 1915, Mel. Exot. Ent. 16: 12 (Yunnan).

One specimen (University of Nanking, Coll. Agric.) taken near the Sikang-Szechuan border, west of Kuan-hsien, Szechuan Prov., West China, Aug. 2, 1938, by K. F. Chen, is provisionally referred to this name.

Distribution.—Yunnan; Szechuan-Sikang border.

118. *Cryptocephalus trifasciatus* Fabricius

Cryptocephalus trifasciatus Fabr., 1787, Mant. Ins. 1: 81 (China); 1801, Syst. Eleuth. 2: 46; Suffrian, 1854, Linn. Ent. 9: 12; 1860, 14: 9; Baly, 1873, Trans. Ent. Soc. London: 88; Fairmaire, 1889, Ann. Soc. Ent. France (6) 9: 70; Miwa, 1931, Syst. Cat. Formosan Col.: 185 (Formosa).

Numerous specimens (Lingnan Natural History Museum) were taken in Kwangtung, Hong Kong and Hainan Island: White Cloud Mountain, Canton, Aug. 2, 1932, Y. D. Djou; Lingnan University Campus, Canton, May 7, 1936, F. K. To, October, 1939, J. L. Gressitt; Shiu-chow (Shau-kwan), K'uh-kiang Distr., N. Kwangtung, Aug. 15, 1932, Y. W. Djou; Fong-tong-ping, Hoh-kai-hon, Lien Distr., N. Kwangtung, July 4-5, 1934, F. K. To; Cheung-chau Island, near Hong Kong, May 9-13, 1940, F. K. To; Nodda, Hainan Island, June 24-25, Aug. 17-22, Nam-cha-chuen, SW. of Nodda, July 8, groves around Mei-Fu-ts'uen, 9 li E. of Nodda, Aug. 12-18, E. Nodda, Aug. 29-30, Fan-ta-ts'uen to Poh-shang, Hung-mo-tung, July 31-Aug. 1, groves near Fooi-iu, SW. of Nodda, Aug. 23, Fan-ta-ts'uen to Kap-wa-ts'uen, Hung-mo-tung, May 5, 1929, Lingnan University Fifth Hainan Expedition; Man-cheong, Wen-ch'ang Distr., Hainan, Apr. 18, 1932, W. E. Hoffmann and O. K. Lau; Naam-fung, SSW. of Nodda, June 24, July 3-4, 1932, O. K. Lau and F. K. To; Nodda, Apr. 27, Lam-ko, Lin-kao Distr., May 23-25, Tsung-to (Sam-kok-ling), 9 miles SE. of Nodda, June 14-16, Faan-na, 9 miles S. of Nodda, July 14-15, Hau-ying-ts'uen, 6 miles SE. of Nodda, July 31, and Naam-fung, July 7, Hainan I., 1932, F. K. To; Ta-hian, N. side of Five Finger Mts., SC. Hainan I., June 18, Dome Mountain to Nodda, July 13, and Fan-ta to Cheung-kon-ts'uen, E. of Nodda, July 17, Hainan, 1935, J. L. Gressitt.

Distribution.—"China"; Chekiang; Fukien; Kwangtung; Hong Kong; Hainan I.; Formosa; Japan.

Genus *Melixanthus* Suffrian

Melixanthus Suffr., 1854, Linn. Ent. 9: 8.

119. *Melixanthus minimus* Gressitt, n. sp. (Pl. 19, Fig. 8)

Male.—Body reddish ochraceous to orange testaceous, slightly marked with black: head pitchy black, except for ochraceous labrum; pronotum reddish ochraceous, very narrowly pitchy at borders; scutellum pitchy brown, darker at borders; elytra orange testaceous with a small humeral pitchy brown spot on each side and suture narrowly brownish; ventral surfaces of body pitchy black on most of metathorax and first four abdominal segments, pale ochraceous on remainder; legs ochraceous. Legs and ventral surfaces of body very sparsely clothed with pale buff hairs.

Head less than one-half as broad as prothorax, broader than deep, smooth, slightly convex, finely punctured; frons with a raised, densely punctulate area; superior eye-lobes more widely separated than antennal insertions. Antennae reaching to about base of prothorax; third and fourth segments subequal to each other and to scape and fifth segment.

Prothorax five-eighths as long as broad, distinctly rounded at sides; disc finely but deeply punctured. Scutellum triangular-cordiform, minutely punctured. Elytra one-sixth longer than broad, slightly narrowed posteriorly, separately rounded apically; disc of each with eleven rows of fine punctures which become indistinct on posterior third; interspaces flat, with scattered minute punctures. Ventral surfaces of body finely and irregularly punctured. Length 1.9 mm; breadth 1.

Holotype, male (Lingnan Natural History Museum), Ngai-chau, Yai Distr., southern Hainan Island, South China, May 27-30, 1932, W. E. Hoffmann and O. K. Lau.

Differs from *M. assamensis* Jacoby in being smaller, with the antennae longer, the pronotum distinctly punctured, the elytra with the puncture-rows indistinct posteriorly, the interspaces finely punctured, and the humeri and margins less darkened.

Distribution.—S. Hainan Island.

Subfamily Chlamydinae

(Fulcidacinae)

Up to the present time twelve species of this subfamily have been made known from China. The material at hand includes nineteen species, and of these fifteen are described as new to science, and two additional ones are newly recorded from China. This brings the present total of known Chinese species in this group to twenty-nine. All the Chinese species belong to the genus *Chlamys* in its larger sense, that is, including *Exema* of Lacordaire.

Genus *Chlamys* Knoch

Chlamys Knoch, 1801, Neue Beytr. Insektenk. 1: 122.

Exema Lacordaire, 1848, Monogr. Phytoph. 2: 643, 844.

Arthrochlamys Ihering, 1905, Rev. Mus. Paul. 6: 642.

Myochlamys Ihering, 1907, Ann. Mus. Nat. Buenos-Aires 14: 251.

Boloschesis Jacobson, 1924, Rev. Russe d'Ent. 18: 239.

Key to Species

1. Dorsal surfaces at least partly marked with orange or pitchy brown. 2
Pronotum and elytra entirely black, or very nearly black, sometimes metallic. 7
2. Pronotum and elytra irregularly marked with pitchy or brownish; body length 4.5 mm or less. 3
Pronotum orange-brown anteriorly, rest of dorsal surfaces black; body 5 mm in length. *semirufa*
3. Pygidium lacking a uniform median ridge, its surface irregular, with six or eight depressions. 4
Pygidium with a more or less complete fine median ridge. 5
4. Elytral tubercles all more or less rounded or at least very blunt; elytra entirely reddish except for punctures and borders; head and anterior margin of pronotum largely orange. *martialis*
Elytral tubercles largely acute or ridge-like; elytra black with pitchy red raised areas; head and anterior margin of pronotum partly black and partly pitchy red. *rustica*

5. Pygidium with a transverse ridge crossing slightly dorsal to middle; pronotum irregular and with ridges anteriorly. 6
Pygidium lacking a transverse ridge near middle; pronotum rather plane anteriorly; elytra broadly rounded apically. *cheni*
6. Elytra broadly truncate apically, with ectoapical angles distinct; pronotum with submedian ridges extending to extreme bases. *angularis*
Elytra broadly rounded apically, with a tubercle above each rounded ectoapical angle; pronotum with submedian ridges not reaching extreme base. *subferruginea*
7. Central portion of pronotal disc somewhat regularly convex, with fairly even surfaces, or a few regular, longitudinal, or slightly oblique, fine ridges. 8
Central portion of pronotal disc very unevenly convex, with irregular ridges or tubercles. 13
8. Pronotum very even, without any distinct ridges. 9
Pronotum with some fine longitudinal or oblique ridges. 10
9. Pronotum shiny, regularly punctured, lacking a distinct broad groove at top of posterior declivity; scutellum deeply emarginate posteriorly, with very narrow lateral prolongation; head and legs almost entirely orange ochraceous. *maculiceps*
Pronotum dull, irregularly punctured, with a broad distinct groove at top of posterior declivity; scutellum feebly emarginate posteriorly, with moderately acute lateral projections; head largely pitchy black. *piceifrons*
10. Pygidium lacking three distinct and complete, equal, longitudinal ridges; head and legs completely black. 11
Pygidium with three more or less sharply defined, complete, equal, sub-longitudinal ridges, alternating with sparsely punctured shiny strips. 12
11. Pronotum with four subregular carinae; pygidium with a feeble, incomplete, longitudinal ridge on each side of, and parallel to, median carina; antennae ochraceous. *pallidicornis*
Pronotum with six partly sinuate carinae; pygidium with a complete and distinct, but sinuous and dull, ridge on each side of median carina; antennae dark. *aterrima*
12. Head and legs largely reddish brown; sides of pronotum distinctly punctured; pygidial ridges completely parallel. *sexcarinata*
Head and legs entirely black; sides of pronotum reticulate-granulose; lateral pygidial ridges not quite parallel near upper ends. *reticulicollis*
13. Pygidium unarmed laterally. 14
Pygidium armed at each side with a single acute tooth; antennae and legs reddish to pitchy; body large. *stercoralis*
14. Elytra with posterior-lateral angles prominent and tuberculate. 15
Elytra with posterior-lateral angles not prominent or tuberculate, generally more or less rounded. 17
15. Head black; pygidium with lateral carinae incomplete below, not reaching raised apical area. 16
Head reddish; pygidium with lateral carinae extending ventrad to a raised, apical, punctate area. *latiuscula*
16. Elytral apices with a broad, common, truncate projection extending farther posteriorly than posterior-lateral angles; occiput with a small

- round deep depression; median pygidial carina not very sharp
 *diminuta*
 Elytra apices lacking a single, broad, even, common, truncate projection
 extending farther posteriorly than postero-lateral angles; occiput
 with a large, moderately depressed area; median pygidial carina
 narrow and sharply raised. *tuberculithorax*
 17. Front of head black; pronotum not very deeply grooved along middle;
 body partly bronzy. 18
 Front of head largely reddish; pronotum deeply grooved along part of
 median line. 19
 18. Pygidium with connective ridges extending obliquely from lateral ridges
 to median keel at near middle; vertex without a depression between
 eyes. *pilifrons*
 Pygidium with connective ridge extending transversely, though incom-
 pletely, from lateral ridges to median carina well above middle;
 vertex with a depression between eyes. *fulvitaris*
 19. Pygidium sparsely punctured, about thirty punctures in each lateral de-
 pression; median basal keel of each elytron not tuberculate; occiput
 without a median depression. *latiuscula*
 Pygidium closely punctured, about forty-five punctures in each lateral
 depression; median basal keel of each elytron in form of a tubercle;
 occiput with a slight median depression. *montana*

120. *Chlamys angularis* Gressitt, n. sp. (Pl. 22, Fig. 2)

Relatively long and narrow, subhexagonal, gradually narrowed posteriorly and truncate apically, with sharp postero-lateral angles. Body black marked with pitchy red and orange; head with frons and most of vertex and sides of occiput reddish orange; antennae ochraceous, slightly duller distally; prothorax black with all of raised areas orange or orange red and margins narrowly pitchy; scutellum black; elytra with all of raised areas orange red or reddish and depressed areas pitchy with black punctures; pygidium and ventral surfaces of body largely black with scattered tinges of dark reddish or pitchy; legs largely reddish with middle and hind tibiae and hind femora extensively suffused with pitchy black, and anterior tibiae slightly so; tarsi ochraceous red. Body largely glabrous, but labrum, antennae, abdominal sternites and tarsi with a few pale goldish hairs.

Head slightly more than one-half as broad as prothorax, convex, finely and not very closely punctured; occiput with a median concave coarsely punctured area paralleled on each side by an irregular ridge. Antennae reaching to about middle of prosternal process; scape almost three times as long as broad; second segment broader than long; third slender; fourth slightly enlarged; fifth and following flattened and broadened. Prothorax more than three-fourths as long as broad, suddenly narrowed beyond middle and rounded apically; central portion of disc with a large but not very high swelling reaching to anterior margin, its posterior portion obliquely declivitous and medially grooved with two parallel carinae not continuing anteriorly; dorsal surface with many low irregular ridges or tubercles, including a pair of ridges near anterior margin almost forming an hour-glass; sides also with several low tubercles

in middle and also along margins; depressed areas finely and not very closely punctured, three small areas forming a triangle on anterior portion of discal swelling somewhat velvety black, as if pubescent. Scutellum almost in form of an equilateral triangle, nearly transverse posteriorly, fairly smooth, with a feebly raised area in center. Elytra somewhat evenly narrowed posteriorly, with a few irregularities; apices truncate with a very slightly projecting common truncate process; postero-lateral angles sharp but not projecting; disc of each with relatively small and shallow subseriate punctures and several raised ridges and a few tubercles: a moderate tubercle at middle of base connected to scutellar angle with a basal ridge, both ends of the ridge with lesser, discontinuous ridges extending posteriorly to a prominent short transverse ridge at middle near suture, the outer one giving off a transverse ridge at end of basal third which has two branches extending to parts of raised humeral area, another small irregular and discontinuous ridge extending posteriorly from humerus paralleling external margin to tubercle above postero-lateral angle with a short transverse branch below middle of lateral concavity and connecting with some irregular low ridges on raised area in middle of apical third, one of which extends arcuately forward to outer end of transverse ridge at middle near suture, and finally a prominent longitudinal ridge and a few small tubercles along suture in apical fifth. Ventral surfaces of body with large, shallow, nearly reticulate punctures on metathorax and much smaller ones on abdomen; prosternum broad and short with a slender parallel-sided process; each side of first abdominal segment with three low tubercles. Pygidium much broader than high, with a feeble and indistinct median carina and a pair of broader, but feebly raised, sinuous lateral carinae which do not quite reach apical raised area and which have an indistinct transverse connective; depressed areas finely but not very closely punctured. Length 3.5 mm; breadth 1.85.

Holotype (Lingnan Natural History Museum) Taam-yuen-tung, Lien Distr., N. Kwangtung Prov., S. China, May 26-27, 1934, F. K. To.

Differs from *C. lewisii* Baly in being more slender and more angular, with distinct orange markings, particularly on pronotum, and in having the occiput with a pair of lateral ridges, the prothorax not much broader than long and with many more small tubercles on disc, the elytral discs with more carinae than tubercles and the depressed areas not rugose, and the pygidium with the median carina feebler, etc.

Distribution.—South China (Kwangtung).

121. *Chlamys aterrima* Gressitt, n. sp. (Pl. 21, Fig. 6)

Male.—Relatively slender and subcylindrical, narrowed anteriorly and posteriorly. Body and appendages entirely black; antennae and mouthparts very slightly pitchy. Body surfaces glabrous.

Head barely more than one-half as broad as prothorax, slightly deeper than wide, convex and finely reticulate-punctate, with a longitudinal median depression on vertex and occiput. Antennae slender; scape about twice as long as broad; second segment slightly broader than long;

third and fourth slender; fifth and following slightly expanded. Prothorax about two-thirds as long as broad, unevenly narrowed at sides; central portion of disc moderately swollen, its lateral outline evenly rounded anteriorly, gradually declivitous posteriorly and uneven only at top, with three raised points, the posteriormost highest; posterior declivity slightly grooved, its lateral carinae continuing obliquely forward along upper edge of postero-lateral declivities; median groove continued forward almost to anterior margin, bordered by a pair of slightly sinuous carinae which connect at their posterior origins with a pair of more sinuous oblique carinae continuing antero-laterally almost to anterior margin; each side with an irregular raised area at middle; surfaces deeply and somewhat finely punctured. Scutellum acutely produced postero-laterally, feebly emarginate posteriorly, smoothish except for a slightly raised area at center. Elytra narrowed behind humeri and again before apices, slightly rounded-truncate apically, with fairly distinct postero-lateral angles; disc of each impressed with deep, not very dense, and in part longitudinally elongate punctures, and bearing nine fairly distinct tubercles and a few minute ones: a moderate-sized one at middle of base, a smaller one between it and scutellum, both connected by a low ridge, three fairly small ones forming a transverse arc just before middle, two transversely placed tubercles just behind middle, one near suture and the other near external margin, the former highest, central portion of apical half with about five fairly small tubercles, a larger longitudinal one at top of posterior declivity near suture, and a slightly lesser one above postero-lateral corner. Ventral surfaces of body coarsely and not very closely, though shallowly, punctured on metathorax, more finely so, and nearly reticulate, on abdomen; prosternum minutely punctured, gradually narrowed posteriorly, its process not very narrow, slightly widened in middle and blunt apically; each side of first abdominal segment with two feebly raised areas, one of them above leg cavity. Pygidium subrounded, with a very feeble median carina and two large, punctured lateral sinuate carinae commencing at top and joining just before apex. Length 2.8 mm; breadth 1.65.

Paratype.—Median carina of pygidium slightly sinuous, indistinct near top. Length 3 mm; breadth 1.7.

Holotype, male (Lingnan Natural History Museum), Tai-pin-ts'uen, Lam-ka-heung, foot of Lai-mo-ling (Loi Mother Mt.), Kiung-shan Distr., central Hainan Island, S. China, Apr. 28–30, 1935, F. K. To; paratopotype (United States National Museum), Apr. 25–26; paratype (California Academy of Sciences), Uen-moon-tung, about 20 miles south of Fan-ta-ts'uen in Ting-an Distr., Hainan, July 14–15, 1935, F. K. To; paratype (Lingnan Mus.), Cheng-kon-ts'uen, Ka-luk-tung, east of Nam-fung, Hainan, July 17–18, 1935, F. K. To.

Differs from *C. palliditarsis* Chen in having the occipital concavity less distinct, the pronotal carinae more sinuate, the elytra feebly punctured, the pygidium with the median carina very feeble and the lateral carinae not strongly sinuate at middle, and in having the antennae and tarsi black.

Distribution.—Hainan Island.

122. *Chlamys cheni* Gressitt, n. sp.

Moderate-sized, unevenly narrowed posteriorly. Body largely pitchy black beneath and rusty brown mixed with pitchy black above: head rusty brown, slightly darker on mouthparts and center of occiput; antennae rusty; prothorax rusty brown on most of raised areas and black on median and lateral depressions; scutellum black; elytra largely rusty brown, with punctures and deeper depressions pitchy black; ventral surfaces pitchy black, tinged with reddish brown on prosternum, sides of abdominal sternites and raised areas of pygidium; legs rusty brown to pitchy brown, darkest on hind pair.

Head deeper than wide, one-half as wide as prothorax, finely and closely punctured, with a shallow depression at center of occiput. Prothorax four-sevenths as long as broad, feebly and irregularly swollen laterally; disc strongly raised, particularly behind middle: a median groove with an irregular ridge on each side, the latter overhanging postero-laterally and suddenly declivitous posteriorly; each side of disc with a long oblique depression, deep in part, with a tubercle below its middle; surfaces in part rugulose on raised areas, with remainder finely and in part closely punctured. Scutellum short and broad, nearly truncate posteriorly in central portion, and produced at each postero-lateral angle; surface finely granulose laterally. Elytra closely and deeply punctured, partly in sublongitudinal rows; humeral swellings prominent, large, subparallel-sided; disc of each with about nine raised areas: first two on inner half of basal margin, connected by a low basal ridge, outer one much higher; third and fourth tuberculate, the former double, placed on inner half near end of basal third; fifth and sixth just behind middle, fifth small, tuberculate, near external margin, sixth near suture, forming a short transverse ridge; seventh consisting of a large moderately raised area with several small tubercles on central portion of posterior third; eighth and ninth at edges of posterior declivity, near external margin and suture, respectively. Ventral surfaces of body with shallow, nearly reticulate punctures, with a narrow median carina and on each side a broader, less distinct, slightly sinuate, incomplete ridge, legs finely and indistinctly punctured. Length 3.3 mm; breadth 2.25.

Holotype, female (Lingnan Natural History Museum), Omei Shan: below Shin-kai-sze, alt. 1200 meters, Szechuan Province, W. China, Aug. 17, 1940, J. L. Gressitt collector.

Differs from *C. castanea* Chen in being less cylindrical, the elytra rounded posteriorly with the tubercles on their posterior halves rather small, and in having the pronotum very deeply grooved and strongly carinate on the posterior portion, but lacking distinct ridges on front and sides.

Named in honor of my friend Dr. Sicien Chen of the Academia Sinica.

Distribution.—West China (Szechuan).

123. *Chlamys diminuta* Gressitt, n. sp. (Pl. 21, Fig. 2)

Male.—Relatively slender and strongly tuberculate; sides and apices

very uneven. Body entirely black; antennae pitchy reddish brown; mouthparts pitchy reddish black; tarsi pale reddish ochraceous. Body surfaces glabrous.

Head not quite one-half as broad as prothorax, distinctly deeper than wide, convex and finely reticulate-punctate, with a small shallow depression between antennal insertions and a large, deep, sparsely punctured one in central portion of occiput. Antennae fairly short, not reaching base of prosternal process; scape about one-third as broad as long; second segment slightly longer than broad; third to fifth small and slender; sixth to last flattened and somewhat expanded. Prothorax slightly more than two-thirds as long as broad, convex and irregular at sides; central portion of disc moderately raised, gradually declivitous posteriorly, almost overhanging anteriorly, bearing five pairs of prominent tubercles or short angular ridges, three pairs along median portion forming a discontinuous longitudinal groove, median pair in form of a subarcuate ridge and connected with antero-lateral pair; each side with two irregular tubercles, anterior one smaller; surfaces impressed with deep and not very large punctures. Scutellum short, angulate postero-laterally, slightly emarginate posteriorly and relatively smooth with a slight ridge on middle of base. Elytra strongly narrowed in basal third, subparallel-sided posteriorly; apices with postero-lateral angles prominent, but not extending as far posteriorly as a rounded tubercle on each side between each and a minute tubercle on each side of suture; disc of each with about eleven prominent tubercles and five smaller ones besides humeral swelling: a large one at middle of base, three forming a transverse arc near end of basal third, middle one largest, a large one at middle near suture and a somewhat smaller one opposite it near external margin and below a distinct arcuate cavity, two mediocre ones and an irregular raised area in middle of apical half, a very prominent tubercle at top of posterior declivity near suture, a similar one above postero-lateral corner, and the last slightly below it towards suture; intervening surfaces of disc irregularly and in part coarsely impressed with deep punctures. Ventral surfaces of body shallowly reticulate-punctate; prosternum subtriangular, slightly concave, its process angularly enlarged at middle and obtusely angulate apically; each side of abdomen with three subequal low tubercles including one above leg-cavity. Pygidium rounded-triangular with a complete median carina and a sinuate one on each side commencing at base, joining median carina with a transverse connective at end of basal two-fifths and ending in an arc almost meeting median carina at beginning of apical third; depressed areas finely and not very closely punctured. Length 2.8 mm; breadth 1.35.

Paratypes.—In some cases occipital depression less deep and less clearly defined, more or less continuous with depression of vertex, and lateral carinae of pygidium less distinct, more punctured, sometimes nearly reaching apical raised punctured area, and transverse connective sometimes obtuse instead of straight. Length 2.2–2.8 mm; breadth 1.1–1.6.

Holotype (Lingnan Natural History Museum), Cheung-kon-ts'uen,

Ka-luk-kong, E. of Nam-fung, Kiung-shan Distr., Hainan Island, S. China, Apr. 8–9, 1935, F. K. To; paratype (United States National Museum), Sam-ah-kong, Yai Distr., S. Hainan I., Feb. 1, 1935, F. K. To; paratype (California Academy of Sciences), Yao Shan, Lien Distr., N. Kwangtung Prov., Apr. 24–26, 1934, F. K. To; paratype (Lingnan Mus.), Honam Island, Canton, Kwangtung, Apr. 17, 1936, F. K. To. Additional paratypes from Sam-ah-kong, Jan. 24–26, and Ngai-uen City, Jan. 31, Yai Distr., Hainan, 1935, F. K. To, and Si-tsu-tsz, Kwang-mei Distr., Hupeh Prov., C. China, Aug. 8–12, 1933, Y. W. Djou.

Differs from *C. palliditarsis* Chen in having the antennae darker, the pronotum more tuberculate, the elytra without transverse carinae behind mid-basal tubercles, and with the lateral carinae of the pygidium with a transverse connective near middle.

Distribution.—Hainan Island; Kwangtung; Hupeh.

124. *Chlamys fulvitaris* Achard

Chlamys fulvitaris Achard, 1919, Ann. Soc. Ent. Belg. 59: 38 (Tchao-bin-io, China).

Some specimens (Musée Heude, Shanghai; Lingnan Natural History Museum) were taken at T'ien-mu Shan, Chekiang Prov., SE. China, May 21, 1937, by Rev. Père Octave Piel.

Distribution.—"Tchao-bin-io"; Chekiang.

125. *Chlamys latiuscula* (Chujo), new combination (Pl. 22, Fig. 1)

Exema latiuscula Chujo, 1940, Trans. Nat. Hist. Soc. Formosa 30: 284 (Central Formosa).

Two specimens (Lingnan Natural History Museum) were collected at Cheung-kon-ts'uen, Ka-luk-kong, E. of Nam-fung, Hainan Island, Apr. 4–11, 1935, by F. K. To. New to China.

Distribution.—Formosa; Hainan.

126. *Chlamys maculiceps* Gressitt, n. sp. (Pl. 21, Fig. 4)

Moderately broad; surfaces relatively even with few tubercles and none on prothorax. Body black; head, antennae and legs reddish ochraceous, a median line on occiput and swollen portions of posterior femora pitchy black; labrum and mandibles pitchy. Body surfaces glabrous, except for a few minute pale golden hairs on mouthparts, antennae, legs and last abdominal sternite.

Head more than one-half as broad as prothorax, feebly convex, shallowly reticulate-punctate, a moderate longitudinal groove along middle of occiput. Antennae nearly reaching to apex of prosternum; scape more than twice as long as broad; second segment as broad as long; third and fourth small and cylindrical; fifth broadened apically; sixth and following very broad. Prothorax not quite two-thirds as long as broad, evenly convex anteriorly in both dorsal and lateral outlines; extreme base somewhat expanded at sides; entire surface closely and deeply impressed with medium-fine punctures; central portion of disc moderately raised, declivitous posteriorly at an angle of about 40 degrees, lacking a groove on

declivity, almost evenly rounded above, lacking carinae or tubercles but with three shallow indistinct grooves, one median and the other two oblique and not extending very far forward; sides lacking tubercles. Scutellum with narrowly prolonged posterio-lateral angles, strongly and angularly emarginate posteriorly, slightly irregular on central portion. Elytra somewhat evenly narrowed behind humeral swellings, broadly rounded apically, without projecting tubercles; disc of each deeply and subrugosely, though in part seriately, punctured, and bearing four more or less complete fine sublongitudinal carinae: first commencing with a small tubercle on basal margin beside scutellum, extending obliquely towards suture and terminating at a short transverse ridge just behind middle; second commencing with a slightly larger tubercle at middle of base, meeting outer end of subcentral transverse ridge and finally joining fourth row above apex; third starting from above humerus, indistinct basally, giving out a transverse branch to second carina before middle and ending in an irregular raised postmedian area; and fourth commencing below humerus, paralleling external margin, with a slight break just before apex. Ventral surfaces of body subreticulate-punctate: sparsely and shallowly on metathorax and closely, deeply and finely on abdomen; prosternum triangular, subrugose, its process narrow and acute. Pygidium broader than deep, with a distinct, though low, median carina and an indistinct, sinuate raised strip on each side; surfaces deeply and in part closely punctured, deeply concave on each side of central raised area. Length 3.1 mm; breadth 2.

Holotype (Lingnan Natural History Museum), Taam-yuen-tung, Lien Distr., N. Kwangtung Prov., S. China, May 26-27, 1934, F. K. To; three paratopotypes (United States National Museum; California Academy of Sciences; Lingnan Mus.), June 4-9.

Differs from *C. capitata* Bowditch in having the prothorax without any tubercles or carinae, but with only a few indistinct grooves, the elytra with the suture toothed throughout, though more finely so in basal quarter, and the pygidium with the lateral carinae almost obsolete and substituted by general raised areas.

Distribution.—South China (Kwangtung).

127. *Chlamys martialis* Gressitt, n. sp.

Subcylindrical, slightly and irregularly narrowed posteriorly. Body largely rusty red above and pitchy black to reddish brown beneath: head pale reddish brown, almost orange in part, darker to pitchy on center of occiput and at antennal insertions; mandibles pitchy black; palpi reddish ochraceous; antennae ochraceous; prothorax with borders and raised discal areas reddish or rusty brown to orange brown anteriorly, the depressed areas pitchy black; scutellum black, pitchy at posterior angles; elytra largely rusty brown, with punctures, suture and external margin pitchy or blackish; ventral surfaces of body largely pitchy black, rusty brown on metepisterna, sides of abdominal segments, and raised areas of pygidium; legs pitchy brown, with tarsi and parts of femora reddish.

Head slightly more than one-half as broad as prothorax, nearly as

broad as deep, finely and closely punctured, depressed along median portion of occiput. Antennae reaching to posterior angle of prosternum; scape broad and flattened; remaining segments very slender, moderately broadened beyond fifth. Prothorax five-sixths as broad as long, strongly swollen on disc, but not very irregular or strongly tuberculate; disc obliquely and sinuately depressed on each side, with an incomplete parallel pair of ridges along median line and some oblique, sinuate ones extending out from these; sides with a few irregular slightly raised areas and the remainder closely and finely punctured or somewhat rugose. Scutellum short and broad, its anterior and posterior margins each with three angular short projections; posterio-lateral angles strongly produced. Elytra rough, slightly narrowed posteriorly and nearly truncate apically; disc of each with deep, moderate-sized punctures and about a dozen blunt or rounded tubercles, most of them fairly prominent, the highest ones at middle of basal margin, near suture at about middle, and on posterior two-fifths. Ventral surfaces coarsely reticulate-punctate on metathorax, more finely so on abdomen, and minutely punctulate on prosternum. Pygidium with an irregular raised area in middle which sends two branches dorsally and three ventrally, forming a number of depressed areas; apical portion also somewhat raised. Length 3.2 mm; breadth 2.2.

Holotype (Lingnan Natural History Museum), Sin-fung to Lung-kai, near border of Sin-fung and Lien-p'ing District, N. Kwangtung Province, S. China, Apr. 12, 1940, J. L. Gressitt and F. K. To collectors.

Differs from *C. chinensis* Baly in having the antennae reddish, the pronotum with fine punctures and low irregular or sinuous rugosities without any suggestions of reticulate arrangement, and the elytra entirely rusty red except for the punctures, and with many small or medium-sized bluntly rounded tubercles and practically no distinct carinae.

Distribution.—South China (Kwangtung).

128. *Chlamys montana* Gressitt, n. sp.

Broad and robust, feebly and irregularly narrowed posteriorly, rounded-truncate apically. Body black, somewhat shiny; head reddish-ochraceous with postocciput and middle of occiput pitchy black; labrum pitchy brown; mandibles pitchy black; antennae ochraceous basally, reddish brown distally; legs reddish brown suffused with pitchy black on posterior femora and tibiae and lower borders of anterior and middle femora and tibiae. Elytra, front of head, antennae, legs and ventral surfaces of body sparsely clothed with minute pale golden hairs, generally one to each puncture.

Head more than one-half as broad as prothorax, slightly convex, closely and finely rugose-punctate, with an indistinct shallow groove along middle of occiput. Antennae reaching to base of prosternal process; scape more than twice as long as broad; second segment as broad as long; third and fourth nearly cylindrical; fifth slightly flattened; sixth and following as broad as, or broader than, long. Prothorax two-thirds as long as broad, broadly rounded anteriorly, distinctly tuberculate laterally and with moderate-sized subrugose punctures on most of surfaces;

central portion of disc strongly and irregularly swollen, gradually declivitous posteriorly to a point a moderate distance before posterior margin, suddenly declivitous anteriorly a short distance from front margin; posterior declivity grooved only at top between two small tubercles which connect with indistinct ridges along upper edges of posterior-lateral declivities; top of swelling concave between a pair of irregular raised areas, each giving rise to an oblique antero-lateral carina which does not reach anterior margin; front of swelling with a pair of rough tubercles; each side of prothorax with a large blunt tubercle along middle and an irregular ridge parallel to anterior portion of lateral margin, with a feeble ridge paralleling margin to half-way between side and middle of posterior margin. Scutellum fully twice as broad as long, slightly produced posterior-laterally, slightly emarginate apically and fairly smooth. Elytra as broad as length at suture, constricted behind humeri, slightly narrowed posteriorly and broadly rounded apically at margins with slightly projecting posterior-lateral tubercles; disc of each distinctly but not very deeply punctured, with a few raised ridges and tubercles: first ridge starting with a small tubercle at base by scutellum, nearly obsolete before and behind a strongly raised portion on basal quarter, terminating in a strongly raised slightly oblique ridge just behind center, second ridge starting with a strong tubercle at middle of base, continuing posteriorly as a feeble ridge touching inner end of a short high oblique ridge at end of basal third and outer end of inner submedian oblique ridge and terminating in a prominent longitudinal tubercle at top of posterior declivity; third ridge starting above humerus, not very distinct, but terminating in a group of small tubercles on raised area of apical third; fourth starting behind humerus, parallel to external margin, giving off a transverse internal branch just behind middle, almost obsolete posteriorly but terminating in a moderate horizontal tubercle above posterior-lateral corner; in addition, there is a small longitudinal tubercle close to suture at beginning of apical quarter. Ventral surfaces of body with shallow, rounded, not quite reticulate, punctures; prosternum rounded-triangular, subrugose, posterior process slender and acute; first abdominal segment with a slight longitudinally arcuate ridge on each side of middle and a feeble low swelling at middle of each side. Pygidium rounded-triangular, with an indistinct basally obsolete median carina and a pair of slightly sinuous lateral carinae extending from base to apex; depressed areas finely and irregularly punctured. Length 3.9 mm; breadth 2.3.

Paratypes.—Tubercles and ridges of pronotal disc sometimes more or less confluent; median pygidial ridge sometimes complete and more or less distinct. Length 3–3.8 mm; breadth 1.75–2.2.

Holotype (Lingnan Natural History Museum), Omei Shan: Shin-kai-sze, alt. 1500 meters, Szechuan Prov., W. China, Aug. 8, 1940, J. L. Gressitt collector; five paratopotypes (United States National Museum; California Academy of Sciences; Lingnan Mus.), alt. 1000–1500 meters, Aug. 8–17.

Differs from *C. setosa* Bowditch in having the pronotum glabrous, the surfaces shiny but not bronzed, the fourth antennal segment slender,

the posterior pronotal declivity grooved only at top, the elytra rounded posteriorly, and the pygidium with the lateral carinae less sinuate and unconnected.

Distribution.—West China (Szechuan).

129. *Chlamys pallidicornis* Gressitt, n. sp. (Pl. 21, Fig. 1)

Male.—Elongate, subcylindrical, feebly enlarged in central portions. Body entirely black, somewhat dull on elytra and slightly shiny on pronotum; antennae reddish ochraceous; labrum and palpi pitchy red; mandibles pitchy black. Tarsi and head sparsely clothed with minute golden hairs.

Head one-half as broad as prothorax, slightly deeper than wide, closely and finely subrugose-punctate, with a small indistinct depression between antennal insertions and another more evident one between upper borders of eyes; frons short and deeply emarginate apically. Antennae reaching nearly to apex of prosternal process; scape large, one-half as broad as long; second segment subglobular; third and fourth fairly small and slender; fifth to last distinctly broadened and flattened. Prothorax two-thirds as long as broad, deeply and in part densely and subrugosely punctured; central portion of disc moderately raised and somewhat evenly convex, obliquely declivitous posteriorly and gradually sloping anteriorly to front margin; median line somewhat depressed and paralleled on each side with a slightly raised, feebly sinuous carina from a point anterior to top of posterior declivity to near anterior margin, posterior origin of this carina; upper edge of posterior-lateral declivity indistinctly ridged; each side of pronotum with a low indistinct tubercle near base. Scutellum transversely subtrapeziform, feebly produced at posterior-lateral angles and very slightly emarginate posteriorly; surface roughened, concave posteriorly. Elytra nearly parallel-sided except for projecting humeri, broadly rounded-truncate apically; surface of each deeply punctured and bearing a few tubercles as follows: first row with three mediocre unconnected tubercles, first conical, at end of basal quarter, second slightly transverse and largest, at middle, and third feeble, longitudinal, at beginning of apical quarter; second row commencing with a very feeble tubercle at middle of basal margin, reappearing with a short obliquely transverse ridge at end of basal quarter, connecting with third row, continuing posteriorly as a feebly raised strip to middle tubercle of first row, and ending in a fairly prominent longitudinally carinate tubercle at top of posterior declivity; third row very incomplete and without any distinct tubercles; fourth row forming a slightly raised fine carina from below posterior end of humeral swelling to side of posterior declivity, almost parallel to external margin. Ventral surfaces of body heavily and somewhat closely punctured, nearly reticulate in part; prosternum fairly narrow, distinctly punctured, its posterior process evenly narrowed and bluntly angulate apically; sides of first abdominal segment not distinctly tuberculate, except for upper end of leg cavity. Pygidium broad, convex, sparsely punctured, with a fine

median carina and an indistinct longitudinal raised area on each side. Femora deeply punctured. Length 2.9 mm; breadth 1.6.

Holotype, male (Lingnan Natural History Museum), Yao Shan, Lien District, N. Kwangtung Prov., S. China, Apr. 24-26, 1934, F. K. To collector.

Differs from *Chlamys chujoi* Gressitt, new name,³ in having the tarsi entirely black, the head pubescent and not reticulate, the longitudinal and oblique carinae of each side of pronotal swelling continuous and not forked, the elytra less tuberculate, the fourth row forming a simple carina, and in having the pygidium unicarinate.

Distribution.—South China (Kwangtung).

130. *Chlamys piceifrons* Gressitt, n. sp. (Pl. 22, Fig. 4)

Robust, distinctly narrowed posteriorly, rounded-truncate apically, feebly tuberculate. Body black; head pitchy black, reddish on frons, genae and labrum; antennae reddish ochraceous; legs reddish brown, pitchy black on most of posterior femora and tibiae and lower edges of anterior and middle femora and tibiae; tarsi reddish ochraceous. Body surfaces glabrous.

Head one-half as broad as prothorax, barely deeper than wide, finely and densely punctured, more heavily so on frons, irregularly depressed on central portion of occiput. Antennae reaching to middle of prosternal process; scape three times as long as broad; second segment subglobular; third and fourth slender and cylindrical; fifth slightly broadened apically; sixth and following transverse. Prothorax five-sevenths as long as broad, rounded apically, subevenly narrowed laterally, finely and irregularly punctured; central portion of disc strongly and somewhat evenly raised, gradually declivitous posteriorly and almost evenly rounded in lateral outline from top of swelling to anterior border; posterior declivity feebly depressed along middle; top of swelling with a broad shallow median groove extending almost to anterior margin, though nearly obsolete in anterior half; each side of swelling with a feeble oblique groove joining lateral depression anteriorly; each side of prothorax with a long low tubercle above middle and a feebly raised longitudinal ridge parallel to lateral margin; none of raised areas carinate or distinctly tuberculate, at most feebly corrugated or rugulose. Scutellum twice as broad as long, distinctly produced postero-laterally, slightly emarginate apically; surface slightly declivitous posteriorly. Elytra distinctly narrowed behind femoral swellings, rounded-truncate apically; disc of each moderately strongly and somewhat closely punctured with a few blunt tubercles and feeble ridges; first row starting with a low tubercle at base beside scutellum, connected by an indistinct ridge with another small tubercle at end of basal quarter and a blunt transverse ridge just behind middle, reappearing as a small low tubercle beside su-

³ For *Exema sexcostata* Chujo, 1940, Trans. Nat. Hist. Soc. Formosa 30: 279 (Formosa), preoccupied by *Exema sexcostata* Lacordaire, 1848, Monogr. Phytoph. 2: 859 (Colombia).

ture at beginning of apical quarter; second row starting with a moderate tubercle at middle of base, indistinctly connected with a short transverse ridge at end of apical quarter, continuing more distinctly past outer end of submedian transverse ridge and less distinctly continuing to a moderately prominent blunt longitudinal tubercle at top of posterior declivity; third row indistinct, passing above lateral concavity and ending in a rugose raised area at middle of apical half; fourth row very feeble, with a short transverse ridge below lateral cavity and a mediocre blunt horizontal tubercle above postero-lateral corner. Ventral surfaces of body subreticulately punctured, more coarsely so on metathorax; prosternum rounded-triangular, rugose and concave, its process nearly parallel-sided; first abdominal segment carinate at middle of base and with three low raised areas at each side, middle one largest. Pygidium broadly ovate, deeper than wide, with a fine but complete median carina and a pair of broad, indistinct and incomplete subparallel lateral carinae; depressed areas finely and sparsely punctured. Length 3.4 mm; breadth 2.15.

Holotype (Lingnan Natural History Museum), Tai-pin-ts'uen, Lam-Ka-heung, Lai-mo-ling, Kiung-shan Distr., Hainan Island, S. China, May 15-16, 1935, F. K. To collector.

Differs from *C. yunnana* Bowditch in lacking bronze tints, in having the head partly red and pitchy black, in having the fifth antennal segment only slightly broadened, in lacking carinae and strong tubercles on the pronotum and in having the prosternum more triangular.

Distribution.—Hainan Island.

131. *Chlamys pilifrons* Lefevre ?

Chlamys pilifrons Lefevre, 1883, Ann. Soc. Ent. France (6) 3: Bull. p. lxii (E. Indies).

Four specimens (Lingnan Natural History Museum) taken at Kunming (Yunnan-fu), July 2-5, and the Western Hills, near Kunming, Yunnan Prov., SW. China, July 6, 1940, by the writer, are tentatively referred to this species.

Distribution.—E. India; SW. China.

132. *Chlamys reticulicollis* Gressitt, n. sp. (Pl. 21, Fig. 3)

Moderately broad, distinctly narrowed posteriorly, rounded anteriorly and rounded-truncate apically. Body and appendages entirely black, except for a few minute pale hairs on labrum, antennae, and tarsi.

Head about one-half as broad as prothorax, moderately convex, subfinely reticulate-punctate, with centers of vertex and occiput very slightly depressed. Antennae fairly slender, not reaching to apex of prosternal process. Prothorax nearly two-thirds as long as broad; surface reticulate-granulose: finely punctured, with numerous minute grooves connecting punctures in all directions, dividing surface into small subgranular triangular or diamond-shaped raised areas; central portion of disc moderately raised, gradually sloping in front to anterior margin, irregularly declivitous posteriorly, with one small and one medium-sized dorsal tubercle at top, as viewed from side, equipped with an indistinct

and incomplete oblique carina along upper edge of postero-lateral declivity, a pair of sinuous carinae along median portion, not reaching anterior margin, and another pair of sinuous oblique carinae between the preceding two pairs, connected at bases to median pair, and likewise not quite reaching anterior margin; each side with a feeble tubercle near middle. Scutellum about three times as broad as long, angularly produced at postero-lateral angles and emarginate apically. Elytra constricted behind humeral swelling, subevenly narrowed posteriorly and broadly rounded apically, with a slightly projecting tubercle above each postero-lateral corner; disc of each with fairly coarse, deep punctures, in part subseriatly arranged, and with several moderate tubercles and a few indistinct ridges: a feeble swelling at base beside scutellum, a tubercle near suture at end of basal quarter, a short transverse tubercle beside suture just behind middle, a short low longitudinal ridge close to suture near beginning of apical quarter, a fairly strong tubercle obliquely behind it at top of posterior declivity, a moderate tubercle at middle of base followed after a short distance by two small tubercles arranged transversely, then a short transverse ridge just before middle, a pair of feeble oblique ridges, then an irregular raised area in middle of apical half, a feeble ridge paralleling external margin with a slight transverse tubercle below lateral concavity, and finally ending in a moderate tubercle above postero-lateral corner. Ventral surfaces of body reticulate-punctate, coarsely and shallowly so on metathorax and more finely so on abdomen; prosternum broad, slightly concave and finely rugulose, gradually narrowed into posterior process, which is slightly broadened in middle and somewhat suddenly narrowed to an angle at apex; first abdominal sternite with a median carina and with two slight lateral swellings on each side, the first above leg cavity. Pygidium nearly round, with three almost parallel similar longitudinal carinae extending from base to apex on a central raised area, which has only a few small punctures and fine striae; lateral depressed area coarsely and sparsely punctured. Length 3 mm; breadth 1.65.

Holotype (Lingnan Natural History Museum), Keung-tin-heung, Lien Distr., N. Kwangtung Prov., S. China, July 15, 1934, F. K. To collector.

Differs from *C. fulvitaris* Achard in having the prothorax less swollen and tuberculate, more finely and evenly carinate, and reticulate-granulose instead of simply punctured, the elytra much less strongly tuberculate, the pygidium with more distinct lateral carinae, and the tarsi black.

Distribution.—South China (Kwangtung).

133. *Chlamys rustica* Gressitt, n. sp.

Moderately large, somewhat narrowed posteriorly, subtruncate. Pitchy reddish brown to black: head pitchy black with middle of frons reddish and raised areas on occiput reddish brown; antennae pitchy, scape reddish brown; prothorax pitchy black, raised areas dull reddish brown, a central, diamond-shaped area on disc and three smaller ones on

each side satiny black; scutellum pitchy; elytra pitchy black on humeri, depressed areas and punctures, raised areas pitchy reddish brown; ventral surfaces of body pitchy black, partly tinged with reddish, particularly on raised areas of pygidium and sides of first abdominal segment; legs pitchy reddish brown, paler reddish on tarsi. Ventral surfaces of first three tarsal segments clothed with golden buff pubescence.

Head slightly deeper than broad, five-eighths as broad as prothorax; frons shallowly reticulate-punctate; occiput with a central, slightly depressed, finely punctured area with an irregular region on each side, closely punctured near eyes and sparsely punctured posteriorly with a few reticulations. Prothorax not quite as broad as elytra, strongly swollen on disc; oblique lateral depressions relatively feeble; surfaces with many irregular, in part reticulate ridges, leaving depressions of irregular sizes and shapes, including a large diamond-shaped one on center of disc, most of them with fairly close moderate-sized punctures; a pair of tubercles at top of posterior declivity of disc. Scutellum about twice as broad posteriorly as anteriorly, ridged medially, impunctate, bi-emarginate apically. Elytra with humeral projections large, somewhat flattened laterally and parallel-sided; disc of each with about twelve irregular, more or less raised or tuberculate areas: first two very close to base, small; third broad, indistinct, on center opposite humerus; fourth, fifth and sixth, small, in a subtransverse band just behind humerus, fourth and fifth connected by a ridge; seventh and eighth just behind middle, near external margin and suture, respectively, eighth joined to fifth by an oblique ridge; ninth large, feebly raised, coarsely punctured, as is third; tenth small, longitudinal, very near suture opposite ninth; eleventh and twelfth most strongly raised, at edges of posterior declivity near external margin and suture, respectively; depressed areas on sides with fairly large punctures. Ventral surfaces of body coarsely but shallowly reticulate-punctate on metasternum and first abdominal sternite, more finely so on remaining sternites; pygidium nearly round, carinate medially with a sinuate carina on each side from base to near apex, curving inward and joining just above center, curving inward again apically but not joining; apical portion and parts of sides raised and subreticulate, depressed areas sparsely but deeply punctured. Legs with femora sparsely and shallowly punctured, tarsi broad at third segment. Length 4.4 mm; breadth 2.7.

Holotype (Lingnan Natural History Museum), Tung-chung, Lan-t'au Island, near Hong Kong, Aug. 7, 1934, Y. W. Djou, collector; paratype (United States National Museum), same data; paratype (California Academy of Sciences), Wong-ngau-tai, Lien Distr., N. Kwangtung Prov., Aug. 15, 1934, F. K. To collector.

Differs from *C. chinensis* Baly in being much larger, more evenly narrowed posteriorly, with the pronotum more evenly convex but more irregularly rugose, the elytra with less strongly raised swellings, less regular punctures, the general coloration darker, etc.

Distribution.—Lan-t'au Island (near Hong Kong); N. Kwangtung.

134. *Chlamys semirufa* Chen (Pl. 22, Fig. 3)

Chlamys semirufa Chen, 1941, in press. (Tonkin.)

One specimen (Lingnan Natural History Museum) was taken at Yao Shan, Lien Distr., N. Kwangtung Prov., S. China, Apr. 29-30, 1934, by F. K. To. New to China.

Distribution.—Tonkin; Kwangtung.

135. *Chlamys sexcarinata* Gressitt, n. sp. (Pl. 21, Fig. 5)

Relatively narrow, subcylindrical, slightly narrowed posteriorly, rounded-truncate apically. Body black, somewhat shiny above; head reddish with postocciput and a median line on occiput pitchy black; labrum and palpi reddish ochraceous; mandibles dark pitchy; antennae reddish ochraceous basally, slightly pitchy distally; legs reddish brown, tinged with pitchy on posterior femora and tibiae and slightly so on anterior and middle pairs. Body surfaces glabrous except for a few minute pale golden hairs on antennae and legs.

Head not quite one-half as broad as prothorax, slightly deeper than wide, evenly convex except for a shallow longitudinal groove on occiput, shallowly reticulate-punctate. Antennae not reaching to apex of prosternal process; scape nearly one-half as broad as long; second segment subglobular; third and fourth segments slender and cylindrical; fifth distinctly broadened apically; sixth and following transverse. Prothorax two-thirds as long as broad, convex anteriorly, slightly uneven at sides with a small convexity at middle of each; surfaces finely rugose or granulose-punctate on raised areas and finely but not very closely punctured on depressed areas of sides, a conspicuous single grooved row of punctures parallel to anterior margin; central portion of disc distinctly raised, its transverse outline suddenly and concavely declivitous posteriorly and evenly convex from top of posterior declivity to anterior margin; posterior declivity not distinctly grooved except at extreme top and bottom; ridges at top of posterior declivity giving rise immediately to a pair of moderately distinct oblique carinae extending along upper edge of postero-lateral declivity, continuing forward a very short distance and giving rise to another pair of slightly curved oblique carinae extending towards, but not reaching, sides of anterior margin, continuing forward after a very slight break as a pair of parallel ridges reaching almost to anterior margin; each side of prothorax with a low swelling near middle and a slightly raised area parallel to lateral margin. Scutellum acutely produced postero-laterally, slightly emarginate apically; surface with a pair of raised oblique lines. Elytra constricted behind humeri, somewhat evenly narrowed posteriorly, broadly rounded apically, deeply and subseriatly punctured; disc of each with very distinct ridges and a few tubercles: first row starting just behind scutellum as a low ridge slightly raised at end of basal quarter and strongly raised where it meets a short transverse tubercle just behind middle, reappearing in apical quarter as a slight longitudinal ridge near suture; second row starting with a fairly prominent tubercle at middle of base, continuing posteriorly as a fine ridge past a higher transverse ridge at end of basal third, joining

outer end of submedian tubercle and continuing as a more distinct ridge to top of posterior declivity, where it is most prominent, curving outward to join an oblique ridge-like tubercle above postero-lateral corner; third row starting above humerus, continuing as a moderately distinct ridge to premedian transverse ridge where it becomes almost obsolete, curving about lateral concavity and ending in an irregular raised area in middle of apical half; fourth row feeble, with a short transverse branch below lateral depression. Ventral surfaces of body shallowly and subreticulately punctured, more heavily so on metasternum; prosternum not very broad, subtriangular, finely reticulate, its process long, parallel-sided, declivitous apically; first abdominal segment with a fine carina along middle of base and a low swelling at middle of each side. Pygidium slightly deeper than wide, with three subequal, nearly parallel carinae from base to apex; depressed areas smooth, and minutely and sparsely punctured. Length 3 mm; breadth 1.9.

Holotype (Lingnan Natural History Museum), Taam-yuen-tung, Lien Distr., N. Kwangtung Prov., S. China, June 4-6, 1934, F. K. To collector; twenty-eight paratopotypes (United States National Museum; California Academy of Sciences; Academia Sinica; Musée Heude; Lingnan Mus.), May 26-June 19; one paratype, Keung-tin-heung, Lien Distr., N. Kwangtung, July 15, 1934, F. K. To.

Differs from *C. ruficeps* Chen in being narrowed and rounded posteriorly, in having the front of the head reticulate-punctate, the prothorax in part minutely and not very closely punctured, and partly rugose-punctate, with the dorsal swelling of disc not rounded, but angulate posteriorly, with the longitudinal groove starting at top of posterior declivity and of equal width throughout, the carinae fine but sharp, and the lateral tubercles not prominent, and the elytra with the ridges mostly feeble or practically obsolete.

Distribution.—South China (Kwangtung).

136. *Chlamys stercoralis* Gressitt, n. sp. (Pl. 22, Fig. 5)

Large and broad, robust, irregularly narrowed posteriorly, subtruncate apically. Body somewhat shiny black; labrum and palpi reddish ochraceous; antennae orange ochraceous on basal half, dull chestnut brown distally; legs pitchy black, anterior and middle femora largely reddish; tarsi reddish ochraceous. Front of head, prosternum, prothoracic episterna and coxae distinctly clothed with minute golden hairs; anterior margin of pronotum, metasternum and abdominal sternites more sparsely clothed with the same; a few pale hairs on antennae and legs.

Head one-half as broad as prothorax, concave on central portion and along median line of occiput; frons with a slightly raised arcuate ridge below antennal insertions; surfaces with small foveate punctures. Antennae reaching slightly beyond apex of prosternal process; scape three times as long as broad; second segment broader than long; third cylindrical; fourth distinctly broadened apically; fifth and following segments strongly flattened, broader than long and rounded externally. Prothorax nearly two-thirds as long as broad, rounded apically, convex

laterally, impressed with fine, not very close punctures; central portion of disc moderately raised, its lateral outline convexly declivitous posteriorly, almost evenly rounded anteriorly with a few slight irregularities and a slight depression before anterior margin; posterior declivity distinctly grooved to base, with prominent lateral ridges which continue intermittently and subsinuately almost to anterior margin, giving off a feeble oblique ridge along upper edge of postero-lateral declivity, and a stronger, more sinuate ridge towards side of anterior margin; each side of prothorax with a large rounded tubercle above middle, a large rugose area near antero-lateral corner, and a low ridge along posterior portion of lateral margin and external half of basal margin. Scutellum three-fifths as long as broad, angularly produced postero-laterally, slightly emarginate apically; surface irregular, declivitous posteriorly. Elytra almost as broad as long, unevenly narrowed posteriorly, rounded-truncate apically, coarsely punctured; disc of each with several prominent ridges and tubercles; first row starting with a moderate arcuate ridge on sutural half of basal margin, continuing posteriorly in a somewhat sinuate fashion, strongly raised at end of basal quarter and still more prominent where it joins the high, slightly oblique transverse carina just behind middle, reappearing in the form of a slight tubercle beside suture in beginning of apical quarter; second row starting with a large high tubercle at middle of base, continuing posteriorly for a short distance as a high longitudinal ridge, suddenly almost disappearing for a short distance, then becoming prominent again and joining inner end of a prominent transverse ridge at end of basal two-fifths, continuing in a straight line past outer end of submedian transverse ridge and ending in a long prominent ridge-like tubercle at top of posterior declivity; third row less regular, starting some distance from base between second row and humerus, crossing transverse ridge from second row and continuing less distinctly above lateral concavity and ending in a large raised area with many small tubercles in middle of apical half; fourth row starting below humerus, moderately distinct, giving off a transverse ridge below lateral concavity, and ending after a short break below a very large horizontal tubercle above postero-lateral corner; in addition there is a moderate tubercle between midbasal tubercle and commencement of third longitudinal ridge. Ventral surfaces of body with rounded, subreticulate punctures, nearly as large on abdomen as on metathorax; prosternum subtriangular, convex, slightly emarginate anteriorly, its process fairly broad, and blunt apically; first abdominal segment with two blunt tubercles at each side including one above leg cavity. Pygidium slightly broader than high, armed near base of each lateral margin with a prominent slender tooth directed slightly downward and outward; surface finely and somewhat closely punctured, with three complete carinae: middle one straight and distinct, lateral ones slightly sinuous, less distinct, and punctured. Length 4.7 mm; breadth 3.2.

Holotype (Lingnan Natural History Museum), Cheung-kon-ts'uen, Ka-luk-kong, 18 miles east of Nam-fung, Kiung-shan Distr., central Hainan Island, S. China, Apr. 11-12, 1935, F. K. To collector; paratype

(United States National Museum), Tai-k'ang to Mui-hang via Lam-tin, Lung-moon Distr., central Kwangtung Prov., S. China, Apr. 9, 1940, J. L. Gressitt and F. K. To.

Differs from *C. clermonti* Achard in being smaller and distinctly narrowed posteriorly, in having the front of the head, the anterior portion of the prothorax, and parts of the ventral body surfaces and appendages clothed with minute golden hairs, and in having the pygidium armed with a prominent sharp tooth on each side near base.

Distribution.—Kwangtung; Hainan Island.

137. *Chlamys subferruginea* Gressitt, n. sp.

Robust, subcylindrical, somewhat rounded anteriorly and posteriorly, with moderately prominent tubercles above postero-lateral corners of elytra. Body largely rusty red, in part marked with pitchy, black or orange red: head orange red, slightly duller on middle of occiput and on sides, including genae; antennae reddish ochraceous, slightly duller apically; prothorax pale orange red on raised portions of anterior half and sides, rusty red on raised areas of discal swelling, pitchy black on most of depressed areas; scutellum pitchy black; elytra largely rusty red with deeper punctures and depressed areas, as well as suture, pitchy black; ventral surfaces of body rusty red, largely black on metasternum; pygidium dull orange red, depressed areas pitchy; legs largely reddish. Body surfaces almost entirely glabrous.

Head less than one-half as broad as prothorax, as broad as deep, convex, with a slight depression along middle of occiput; surfaces finely reticulate-punctate. Antennae with the fifth segment slightly broadened apically. Prothorax two-thirds as long as broad, rounded anteriorly, convex and slightly irregular at sides, with finely and closely punctured irregular depressed areas and many slightly raised impunctate areas or low ridges: central raised area of disc steeply declivitous posteriorly and subevenly rounded anteriorly in lateral outline with a median longitudinal groove extending from top of posterior declivity to anterior margin, broadened in middle and bordered by a pair of longitudinal ridges which are slightly discontinuous at middle and give off about four irregular carinae externally which form a few closed or open reticulations; in addition there is an incomplete oblique ridge above part of postero-lateral declivity; anterior margin largely paralleled by a low raised impunctate strip; sides with some irregular raised areas. Scutellum twice as broad as long, angulate postero-laterally, feebly emarginate apically, relatively smooth. Elytra constricted behind humeri, slightly narrowed and broadly rounded apically, with a tubercle above each postero-lateral angle; disc of each with about eight prominent tubercles and a few low swellings and ridges: a tubercle at middle of base, three forming a transverse arch at end of basal quarter, the outer two connected and almost joined to humeral swelling, two short transverse tubercles just behind middle, one near suture, the other below lateral concavity, a prominent longitudinal tubercle at top of posterior declivity near suture and another slightly smaller and acute one above postero-lateral corner, and an irregular

raised area in middle of apical half; second ridge nearly complete though feeble, third ridge feeble and incomplete; depressed areas moderately, though not deeply, punctured. Ventral surfaces of body subreticulately punctured, more coarsely so on metathorax; prosternum subtriangular; each side of first abdominal segment with three low swellings. Pygidium broader than deep, finely and deeply punctured on depressed areas, with an irregular low median carina with a pair of incomplete low lateral ridges which are connected above middle and nearly so below middle. Length 2.8 mm; breadth 1.6.

Holotype (Lingnan Natural History Museum), Fat-loh, Yai Distr., southern Hainan Island, S. China, March 7, 1935, F. K. To collector.

Differs from *C. chinensis* Baly in having the antennae pale and the body largely rusty or orange red, and the elytra almost lacking raised lines but with eight prominent tubercles and a few low ones, and not deeply punctured.

Distribution.—Hainan Island.

138. *Chlamys tuberculithorax* Gressitt, n. sp. (Pl. 22, Fig. 6)

Male.—Moderately elongate, somewhat narrowed posteriorly, truncate apically; pronotal disc strongly swollen and with many tubercles. Body black, tinged above with dull to slightly metallic bluish black; antennae and tarsi reddish ochraceous; labrum and palpi slightly darker; mandibles dark pitchy.

Head one-half as broad as prothorax, as broad as deep, somewhat uneven, finely granulose on central portion with a slight depression between antennal insertions, a large shallow sparsely punctured depression on upper portion of occiput. Antennae not reaching apex of prosternal process; scape broad; second segment subglobular; third and fourth segments small and slender; fifth and following segments broadened and flattened. Prothorax nearly five-sixths as long as broad, sparsely punctured, with intervening areas divided by grooves into small triangular or diamond-shaped areas; central portion of disc very strongly swollen, bearing about eight high or moderate tubercles or short, sometimes angular, elevated ridges on each side, three principal pairs along central portion forming in part a discontinuous median groove, anterior pair produced farther forward than anterior margin of thorax; anterior margin and sides with several small or moderate-sized tubercles. Scutellum much broader than long, strongly produced at postero-lateral angles, slightly emarginate at sides and apex, tridentate basally; surface fairly even. Elytra subevenly narrowed posteriorly, truncate and slightly emarginate apically with postero-lateral angles prominent; disc of each very rough, with a few large punctures placed irregularly, basal third with several low tubercles including one at middle of base, one near suture and end of basal quarter and humeral swelling, second third separated from first by a high oblique ridge on central portion, connected by two low ridges with a large blunt tubercle near suture just behind middle, and also with a transverse ridge-like tubercle near external margin below arcuate lateral cavity; apical third with about seven tubercles,

three of them larger, forming a triangle and including the one at top of posterior declivity and the prominent one at postero-lateral angle. Ventral surfaces of body coarsely punctured, most deeply on metasternum, in general more or less reticulated; prosternum triangular and concave, its posterior process triangularly broadened preapically. Pygidium subtriangular with basal margin and central portions of lateral margins distinctly raised, with a sharp median carina more strongly raised below middle and a pair of impunctate sinuate lateral carinae bending towards median carina and connecting with it by means of oblique ridges above middle, intervening depressed areas sparsely punctured on upper half and granulose below. Legs distinctly punctured. Length 4 mm; breadth 2.

Holotype, male (Lingnan Natural History Museum), Tai-pin-ts'uen, Lai-mo-ling, Kiung-shan Distr., Hainan Island, S. China, Apr. 28-30, 1935, F. K. To collector.

Differs from *C. fulvitaris* Achard in being much longer and more angular, in having a large sparsely punctured concave area on occiput, many high tubercles on pronotal swelling, more prominent and irregular elytral tubercles, and much more distinctly carinated pygidium.

Distribution.—Hainan Island.

Explanation of Plates

Plate 19

- Fig. 1. *Dioryctus auricacument* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 2. *Dioryctus bodhisatva* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 3. *Dioryctus exilis* Weise (Mag. $\times 13.2$).
 4. *Coenobius piceipes* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 5. *Dioryctus nigricollis* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 6. *Coenobius flavicornis* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 7. *Dioryctus kweiyangensis* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 8. *Melixanthus minimus* Gressitt, n. sp., holotype (Mag. $\times 13.2$).
 9. *Cryptocephalus pallidoapicalis* Pic (Mag. $\times 13.2$).

Plate 20

- Fig. 1. *Dioryctus fracticeps* Gressitt, n. sp., holotype (Mag. $\times 11.0$).
 2. *Cryptocephalus hongshanus* Gressitt, n. sp., holotype (Mag. $\times 7.3$).
 3. *Cryptocephalus subunicolor* Gressitt, n. sp., holotype (Mag. $\times 7.3$).
 4. *Cryptocephalus nigrorufus* Gressitt, n. sp., holotype (Mag. $\times 7.3$).
 5. *Cryptocephalus hainanicus* Gressitt, n. sp., holotype (Mag. $\times 11.0$).
 6. *Cryptocephalus bryanti* Gressitt, n. sp., holotype (Mag. $\times 7.3$).
 7. *Diapromorpha (Aspidolopha) pallidiceps* Gressitt, n. sp., holotype (Mag. $\times 7.3$).
 8. *Cryptocephalus moupinensis* Gressitt, n. sp., holotype (Mag. $\times 7.3$).
 9. *Cryptocephalus slocumi* Gressitt, n. sp., holotype (Mag. $\times 7.3$).

Plate 21

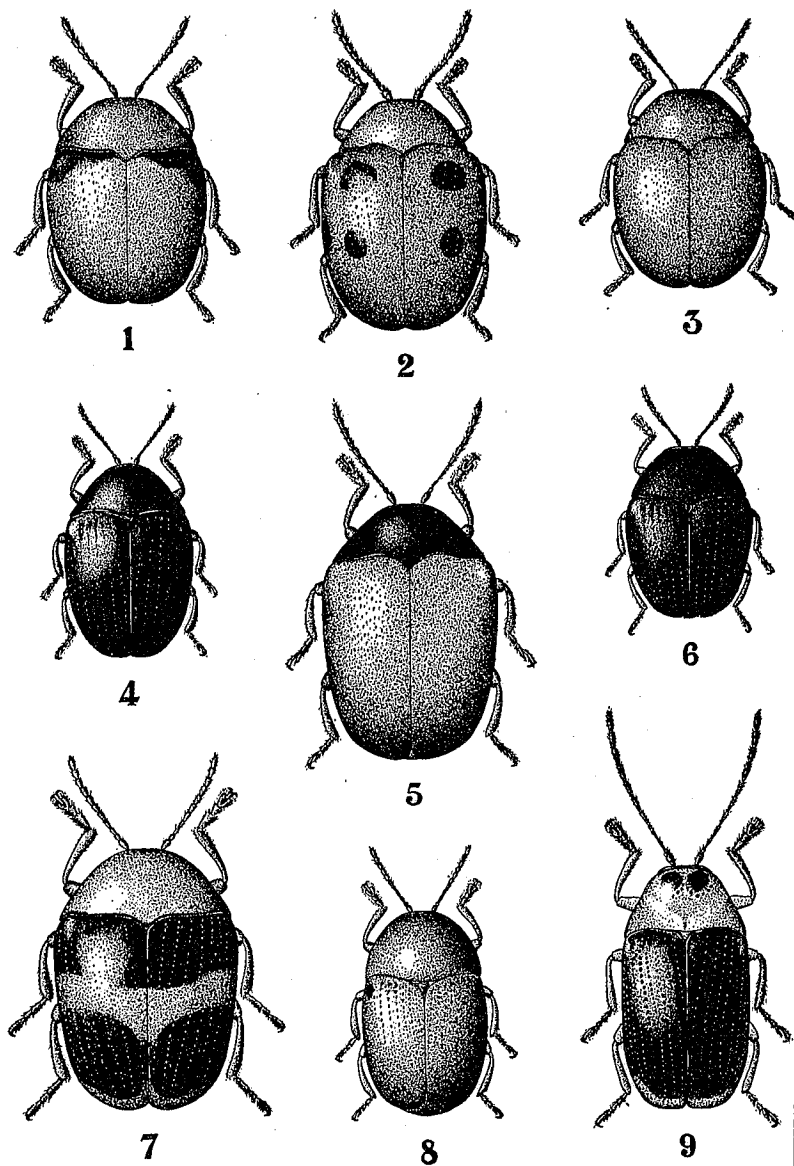
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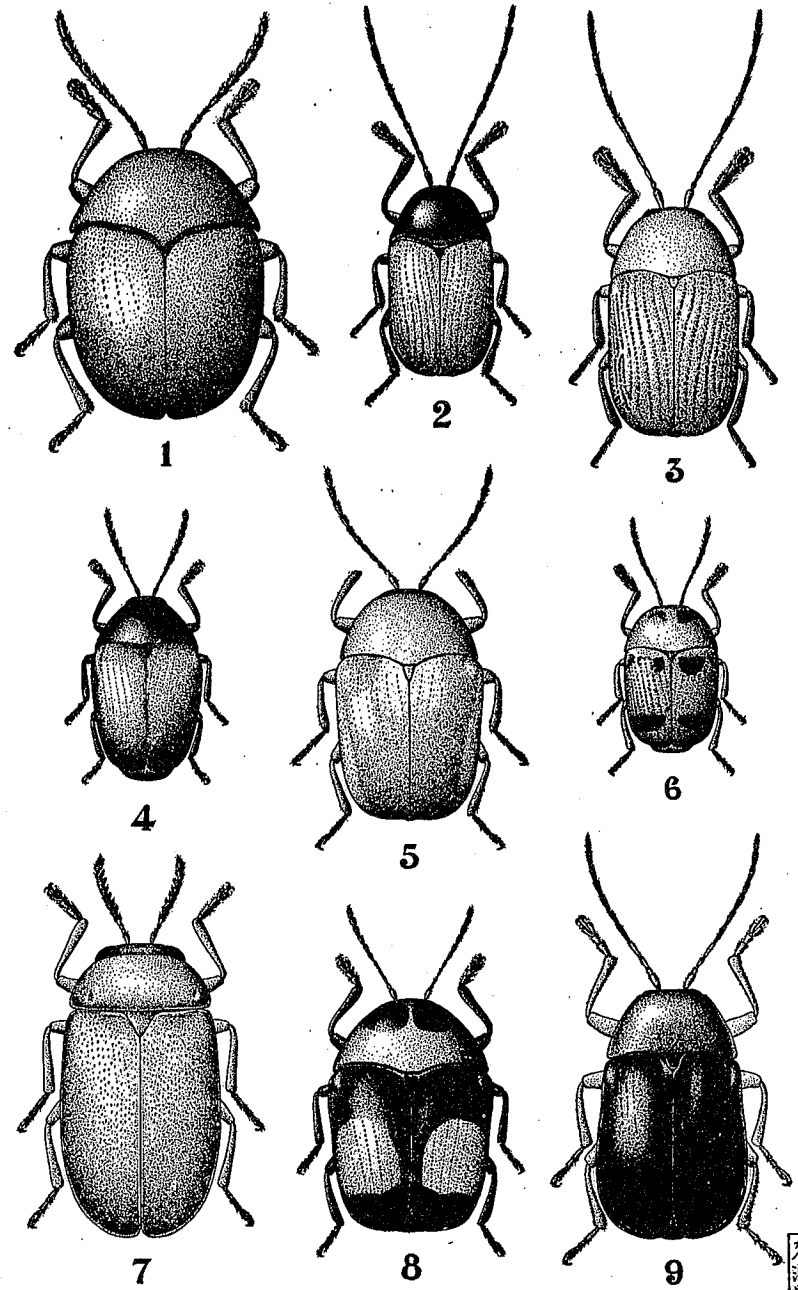
- Fig. 1. *Chlamys pallidicornis* Gressitt, n. sp., holotype (Mag. $\times 18.6$).
 2. *Chlamys diminuta* Gressitt, n. sp., holotype (Mag. $\times 18.6$).
 3. *Chlamys reticulicollis* Gressitt, n. sp., holotype (Mag. $\times 18.6$).
 4. *Chlamys maculiceps* Gressitt, n. sp., holotype (Mag. $\times 18.6$).
 5. *Chlamys sexcarinata* Gressitt, n. sp., holotype (Mag. $\times 18.6$).
 6. *Chlamys aterrima* Gressitt, n. sp., holotype (Mag. $\times 18.6$).

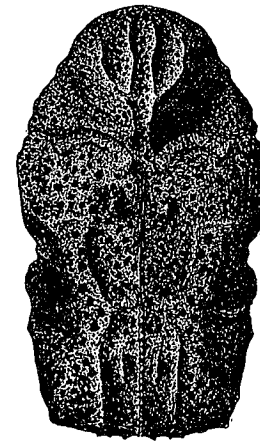
Plate 22

(Each figure includes dorsal view of body and surface of pygidium.)

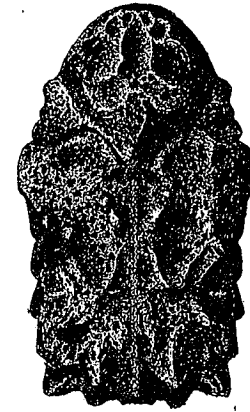
- Fig. 1. *Chlamys latiuscula* (Chujo) (Mag. $\times 13$).
 2. *Chlamys angularis* Gressitt, n. sp., holotype (Mag. $\times 13$).
 3. *Chlamys semirufa* Chen (Mag. $\times 13$).
 4. *Chlamys piceifrons* Gressitt, n. sp., holotype (Mag. $\times 13$).
 5. *Chlamys stercoralis* Gressitt, n. sp., holotype (Mag. $\times 13$).
 6. *Chlamys tuberculithorax* Gressitt, n. sp., holotype (Mag. $\times 13$).







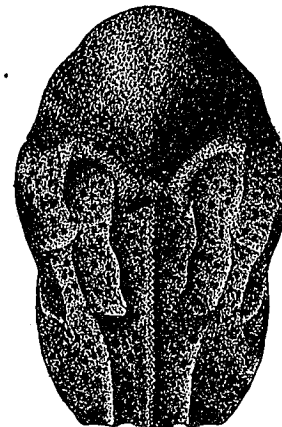
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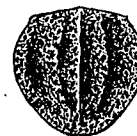
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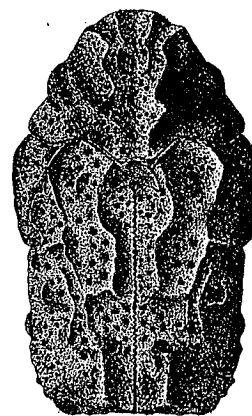


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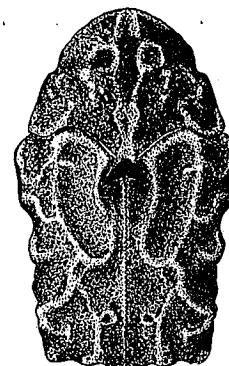
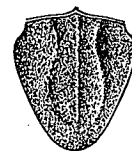


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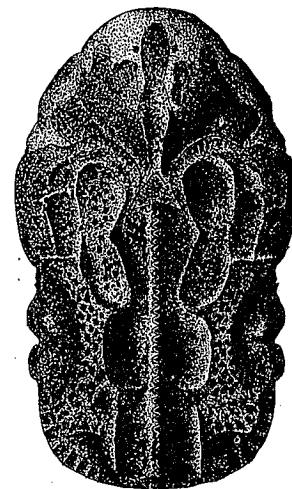




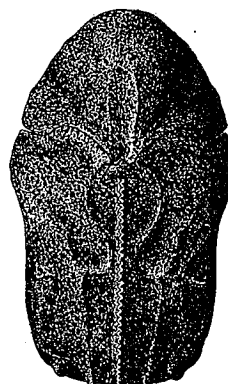
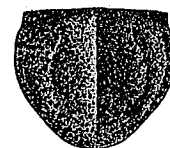
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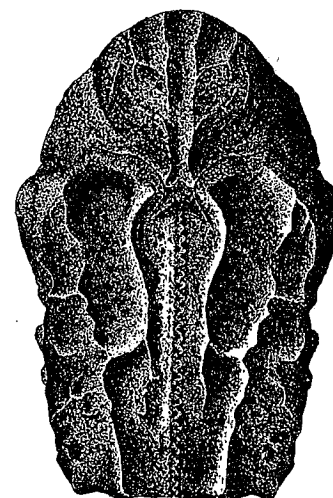
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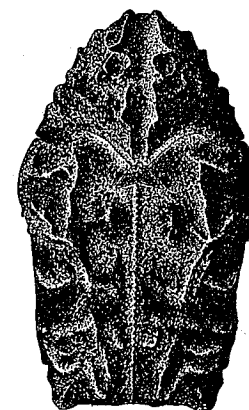
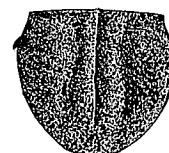
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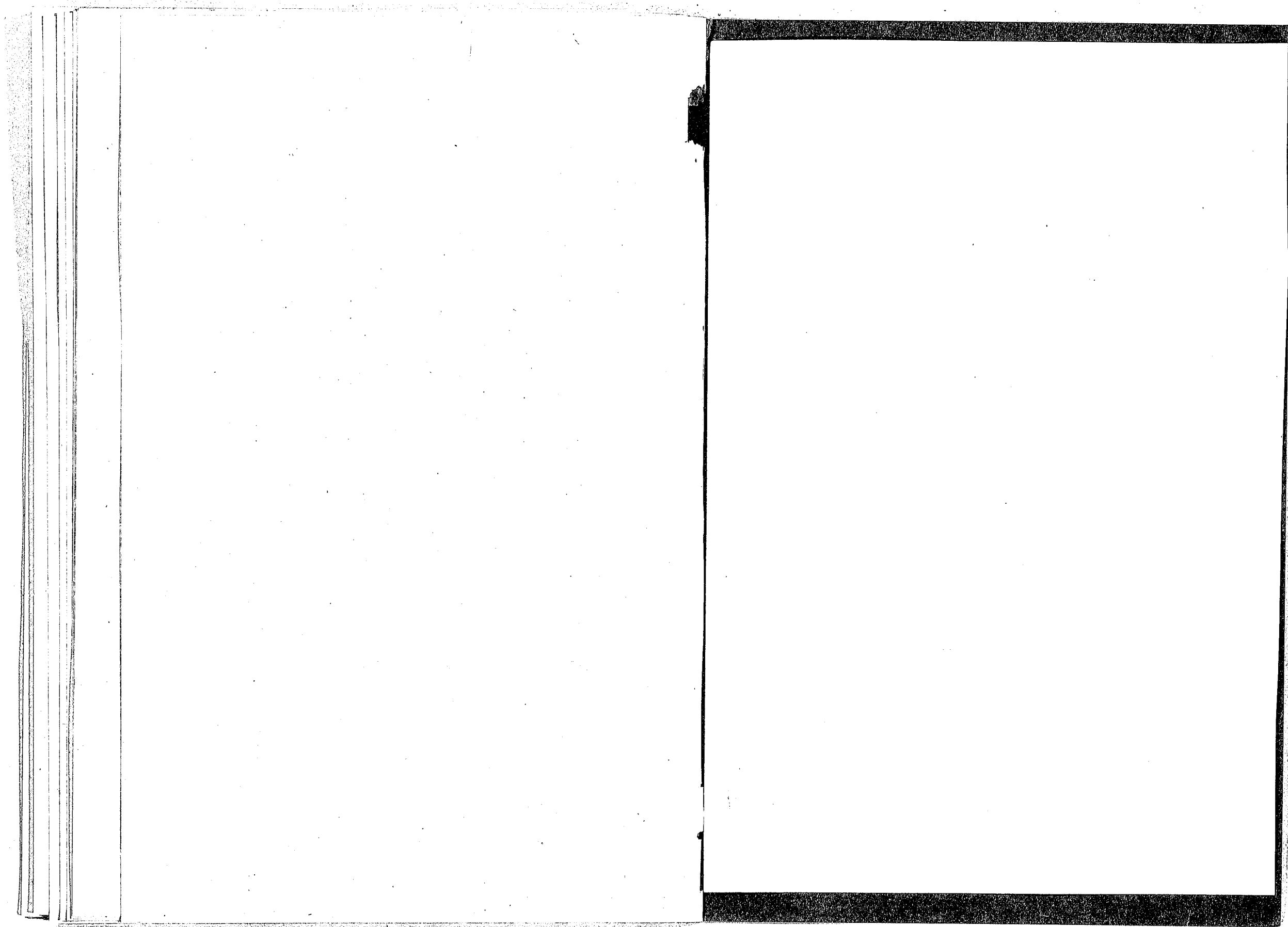


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THE FLORA OF FUKIEN
and
Floristic Notes on Southeastern China

By FRANKLIN P. METCALF, PH.D.

Professor of Botany and Curator of the Herbarium, Fukien Christian University, Foochow, China, 1923-1929; professor of Botany, Biology Department, and Curator of the Herbarium, Botanical Survey, Lingnan University, Canton, China, 1931-1940; Rockefeller Fellow, 1928; Lingnan University Fellow, 1931; Guggenheim Fellow, 1940; Harvard University Fellow, 1941.

The first fascicle of this Flora of Fukien has been issued and includes the following families: Cycadaceae, Ginkgoaceae, Taxaceae, Amentaceae, Pinaceae, Gnetaceae, Casuarinaceae, Saururaceae, Piperaceae, Chloranthaceae, Salicaceae, Myricaceae, Juglandaceae, Betulaceae, Fagaceae. Subsequent parts will be issued as completed.

The aim of this publication is to provide a guide for the college student and the systematist in identifying the plants of southeastern China, with special reference to Fukien.

The cost of the first fascicle is \$1.50 U. S. currency, post free.

Copies can be obtained from the American Director, Lingnan University, 150 Fifth Avenue, New York, N. Y.

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