



<http://dx.doi.org/10.11646/zootaxa.3949.2.1>

<http://zoobank.org/urn:lsid:zoobank.org:pub:28B64406-0249-4289-B4C5-66E794D5435D>

Revision of the genus *Aulacophora* from Taiwan (Coleoptera: Chrysomelidae: Galerucinae)

CHI-FENG LEE¹ & RON BEENEN²

¹Applied Zoology Division, Taiwan Agricultural Research Institute, Taichung 413, TAIWAN. E-mail: chifeng@tari.gov.tw

²Martinus Nijhoffhove 51, NL-3437 ZP Nieuwegein, THE NETHERLANDS. E-mail: r.beenen.wxs.nl

Table of contents

Abstract	151
Introduction	152
Material and methods	152
Key to species of the genus <i>Aulacophora</i> from Taiwan	153
<i>Aulacophora analis</i> (Weber, 1801)	153
<i>Aulacophora bicolor</i> (Weber, 1801)	156
<i>Aulacophora frontalis</i> Baly, 1888	160
<i>Aulacophora indica</i> (Gmelin, 1790)	164
<i>Aulacophora kotoensis</i> Chûjô	167
[<i>Aulacophora abdominalis</i> (Fabricius, 1781)]	169
<i>Aulacophora lewisii</i> Baly, 1886	170
<i>Aulacophora nigripennis</i> Motschulsky, 1857	174
<i>Aulacophora opacipennis</i> Chûjô, 1962	176
<i>Aulacophora palliata</i> (Schaller, 1783)	178
<i>Aulacophora tibialis</i> Chapuis, 1876	181
Species excluded from Taiwan fauna	185
<i>Aulacophora apicipes</i> Jacoby, 1896	185
Discussion	188
Acknowledgements	188
References	188

Abstract

Ten species of the genus *Aulacophora* Chevrolat, 1836 are reported for Taiwan. Specimens of *A. opacipennis* Chûjô, 1962 collected from Southeast Asia were misidentified by Kimoto (1989) and should be identified as *A. apicipes* Jacoby, 1896. Color photos of habitus and drawings of male and female genitalia from eleven species (including *A. apicipes*) are presented. The following synonymies are proposed: *Aulacophora analis* (Weber, 1801) = *Galeruca quadraria* Olivier, 1808 (syn. nov.); *A. indica* (Gmelin, 1790) = *Rhaphidopalpa pubescens* Allard, 1888 (syn. nov.); *A. apicipes* Jacoby, 1896 = *A. nigripalpis* Chen and Kung, 1959 (syn. nov.). Lectotypes are designated for *Crioceris abdominalis* Fabricius, 1781, *C. testacea* Fabricius, 1787, *Galleruca bicolor* Weber, 1801, *Galeruca quadraria* Olivier, 1808, *Aulacophora semiopaca* Jacoby, 1886, *A. frontalis* Baly, 1888, *A. lewisii* Baly, 1886, *A. intermedia* Jacoby, 1892, *A. semifusca* Jacoby, 1892, *A. dohrni* Jacoby, 1899, *A. almora* Maulik, 1936, *A. apicipes* Jacoby, 1896, *A. tenuicincta* Jacoby, 1897, *Rhaphidopalpa pubescens* Allard, 1888, *R. bengalensis* Weise, 1892, *R. ceramensis* Weise, 1892, *R. chinensis* Weise, 1892, and *Orthaulaca (Ceratia) cattigarensis* Weise, 1892. A key to the Taiwanese species is provided.

Key words: taxonomy, new synonymy, lectotype designation, leaf beetles, Cucurbitaceae, Fabaceae

Introduction

Species of *Aulacophora* had been intensively studied since some of them can cause serious damage of cucurbits. Revisional works were mainly focused on regions, such as China (Chen and Kung 1959), Taiwan (Chûjô 1962), China and Korea (Gressitt & Kimoto 1963), Indochina (Kimoto 1989), Malaysia (Mohamedsaid 1994), Sundaland (Barroga & Mohamedsaid 2002), New Caledonia (Beenen 2008), and the Oriental species with yellow elytra (Anand & Cox 1986) and metallic color (Medvedev 2001). However, most of them still caused taxonomic confusion since type specimens have not been examined and both sexes of the same species were not associated and studied. Thus, robust sample sizes are required for revision of this genus.

Another taxonomic problem occurs in the confusing status of *Crioceris abdominalis* Fabricius, 1781 and *C. testacea* Fabricius 1787. Although types of these species exist and are deposited in the KIEL-collection at Copenhagen, they are mixed together and with very few labels. Both species were treated as the same (Wilcox 1972) or redescribed based on single female syntype and one male respectively (Anand & Cox 1986) which were not well represented. Five types deposited in the KIEL-collection have been studied and two are designated as lectotype of *C. abdominalis* and *C. testacea* by considering nomenclatural stability and well represented by the species at the present study.

The Taiwan Chrysomelid Research Team (TCRT) was founded in 2005 and is composed of 10 members. Most of them are amateurs aiming to make an inventory of all species of Chrysomelidae in Taiwan. Specimens of the genus *Aulacophora* have been extensively collected and studied, and host plants recorded. Diagnostic characters were assessed and the status of all species was evaluated based on a large series of specimens.

Material and methods

More than 300 specimens have been examined. About half were collected by TCRT and deposited at the Taiwan Agricultural Research Institute (TARI). The others are deposited in the historical collection at the same institute.

To prepare drawings of the adult reproductive systems, the abdomens of adults were separated and boiled in a 10% KOH solution, cleared in distilled water, and then mounted on microscope slides in glycerin for observation. Specimens were examined and drawings were made using a Leica M165 stereomicroscope. Microscope slides were examined and illustrated using a Nikon ECLIPSE 50i microscope. Body parts were then stored in glycerin tubes with the dry mounted specimens.

Host plants are recorded by observing adult feeding behavior in the field. Plants were identified by Chih-Kai Yang.

Specimens examined are deposited at the following institutes and museums.

BMNH	The Natural History Museum, London, UK [Michael Geiser];
BPBM	Bernice P. Bishop Museum, Hawaii, USA [Shepherd Myers];
IZAS	Institute of Zoology, Academia Sinica, Beijing, China [Ruie Nie]
IRSB	Institute Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium [Pol Limbourg] ;
JBCB	Jan Bezděk collection, Brno, Czech Republic;
KIEL	Universitetets Zoologiske Museum, Copenhagen, Denmark [Sree Gayathree Selvantharan] ;
MCSN	Museo Civico di Storia Naturale “Giacomo Doria”, Genova, Italy [Roberto Poggi];
MCZC	Museum of Comparative Zoology, Harvard University, Massachusetts, USA [Philip D. Perkins] ;
MNHN	Museum National d’Histoire naturelle, Paris, France [Antoine Mantilleri];
MNHUB	Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung an der Humboldt-Universität zu Berlin, Berlin, Germany [Joachim Willers];
PAHC	Paul Aston collection, Hong Kong, China;
RBCN	Ron Beenen collection, Nieuwegein, The Netherlands;
RMNH	National Museum of Natural History, Leiden, the Netherlands [Hans Huijbregts];
TARI	Taiwan Agricultural Research Institute, Taichung, Taiwan;
ZMUM	Zoological Museum of Moscow Lomonosov State University, Moscow, Russian [Alexey Moseyko].

Exact label data are cited for all type specimens of the described species; a double slash (//) divides the data on different labels and a single slash (/) divides the data in different rows. Other comments and remarks are in square brackets: [p]—preceding data are printed, [h]—preceding data are handwritten, [w]—white label, [y]—yellow label, [b]—blue label, and [r]—red label.

Key to species of the genus *Aulacophora* from Taiwan

1. Elytron yellowish brown, some with black spots, or black elytron with yellow apex 2
 - Whole elytron black 7
2. Whole elytron yellowish brown 3
 - Elytron yellowish brown with black spots or black elytron with yellow apex 5
3. First antennomere enlarged and elytra with erect hairs behind elytra humerus in male; cone-like pygidium projecting elytral apex in female; scutellum yellowish brown 4
 - Without such sexually secondary characters; scutellum blackish brown *A. tibialis*
4. With a pair of tubercles on pronotum in male; pygidium slender and black in female *A. kotoensis*
 - Without tubercles on pronotum in male; pygidium wide and yellowish brown *A. indica*
5. Elytron yellow with two big black square patches, one at humerus and the other at apical 1/3 *A. analis*
 - Not such patterns. 6
6. Elytron yellow with one black spot on humerus; or two transverse rows of black spots, anterior row composed of two spots, one at humerus, the other near suture, posterior row composed of transverse band (Figs 18, 20); some with posterior rows connected with each other (Fig. 21); some with basal 1/4 black and one pair of small yellow spots at base near humerus, and posterior rows connected with each other (Fig. 22) or separated bands (Fig. 24); some with anterior row composed of two spots and apical half black (Fig. 23); some with basal 2/3 (Fig. 25) or most of elytra black (Fig. 26) but with one pair of small yellow spots near humerus *A. bicolor*
 - Basal 1/3 (Fig. 125), 2/3 (Fig. 126), or most of elytra (Fig. 123) black without yellow spots at base, meso- and metathoracic and abdominal ventrites black; or black elytron with yellow apical margin extending into middle (Fig. 124), meso- and metathoracic and abdominal ventrites yellow *A. tibialis*
7. Meso- and metathoracic ventrites, and legs black. *A. nigripennis*
 - Whole ventral surface yellow 8
8. Antennomeres III to V filiform in both sexes 9
 - Antennomeres III to V triangular in male 10
9. Elytron opaque (Fig. 80); antenna of male more slender than female; apical margin of abdominal ventrite V truncate in female *A. opacipennis*
 - Elytron shining (Figs 73, 75); antenna of male wider than female; apical margin of abdominal ventrite V sinuate in female *A. lewisii*
10. Antennomere III longer than wide, and vertex with longitudinal groove (Fig. 111) in male; antennomeres VII to X relatively wider than that of *A. palliata* (2.8–3.2 times longer than wide) in female *A. frontalis*
 - Antennomere III long as wide, and vertex with transverse ridges (Fig. 112) in male; antennomeres VIII to X relatively slender than that of *A. frontalis* (3.5–3.7 times longer than wide) in female. *A. palliata*

Aulacophora analis (Weber, 1801)

(Figs 1–3, 10–17)

Galleruca analis Weber, 1801: 55. (Sumatra).

Triaplatys analis: Fairmaire, 1883: 56.

Aulacophora analis: Baly, 1888: 176 (Indonesia: Sumatra, Sulawesi; Philippines, including Sulu islands); Allard, 1888: 322 (Adelaide); Chûjô, 1962: 85 (Taiwan: Lanyu island).

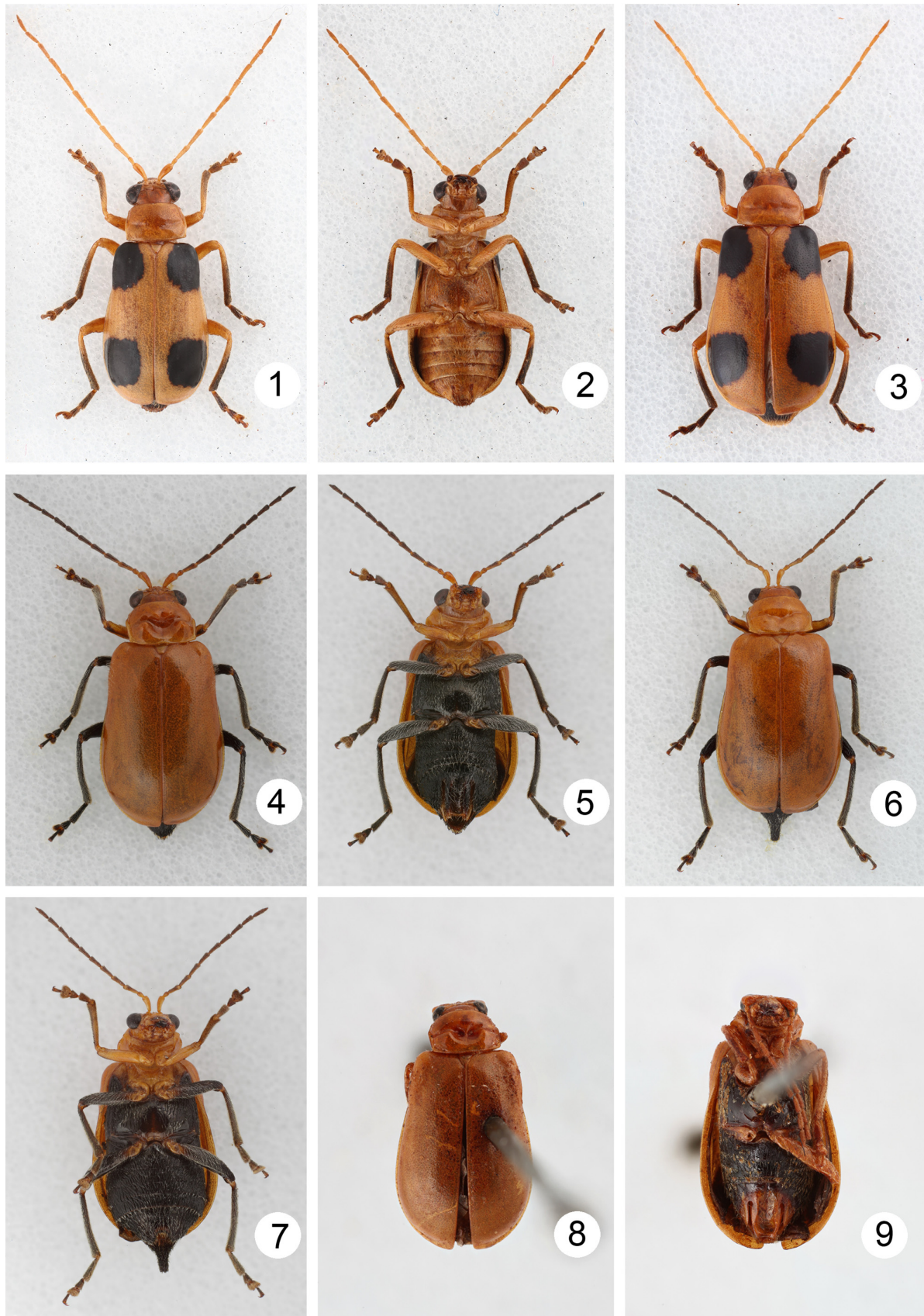
Ceratia analis: Miwa, 1931: 189 (Taiwan: Lanyu island).

Galeruca quadraria Olivier, 1808: 626 (Indes orientales). **New synonym**

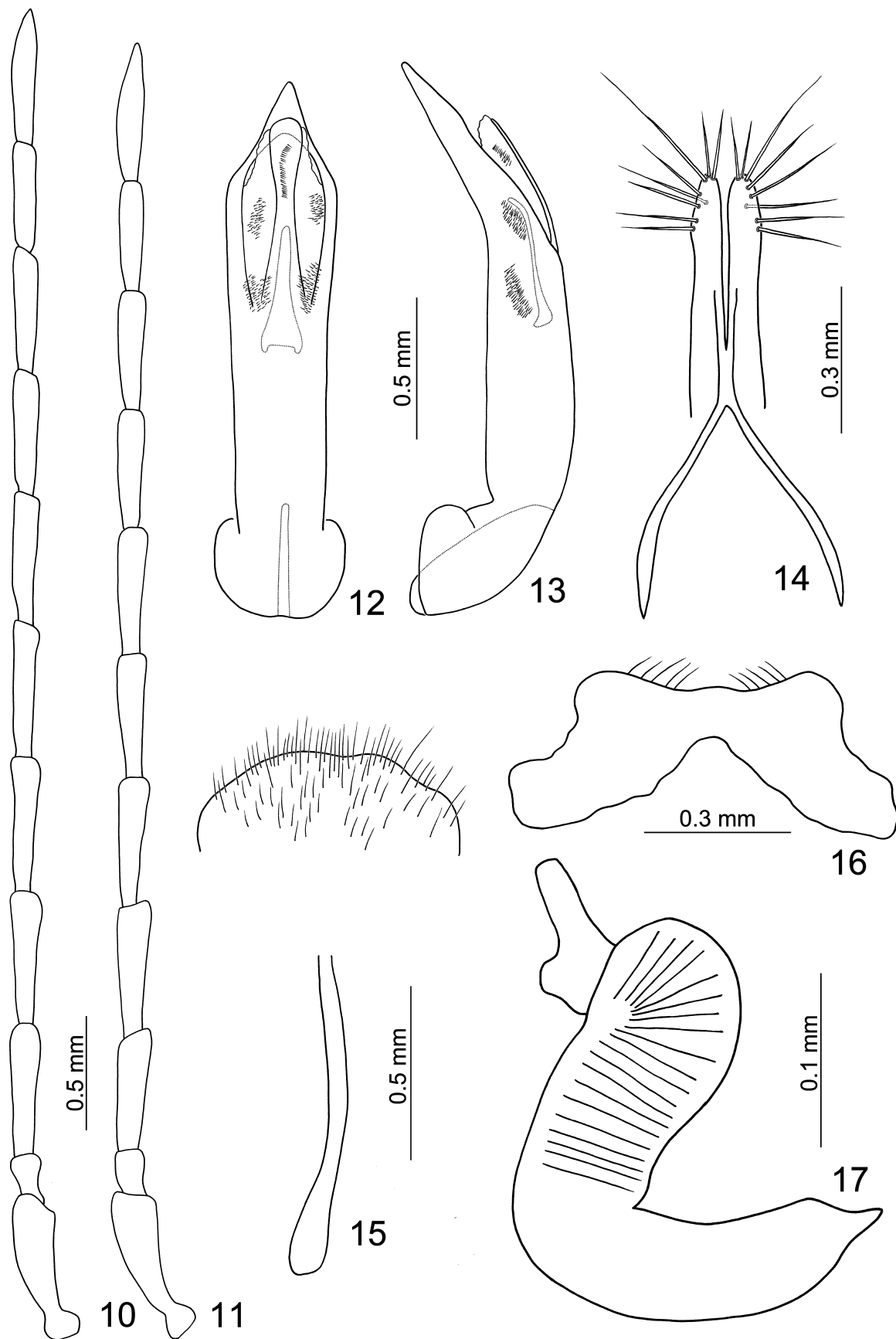
Aulacophora quadraria: Allard, 1888: 322 (Adelaide); Barroga, 2001: 44 (Indonesia: Bali); Barroga & Mohamedsaid, 2002: 142 (Indonesia: Sumatra, Java; Malaysia: Sabah).

Type material. *Galleruca analis*: lectotype ♀ (KIEL), here designated, labeled: “Weber / analis. / 1743 [w, h] // analis [w, h]”. This is the only specimen available in Fabricius’ collection. It is uncertain if there are other type specimens.

Galeruca quadraria: lectotype ♀ (MNHN), here designated, labeled: “Galeruca / quadraria / Oliv. [h, w] // SY6 / 36 [h, w, circle label] // TYPE [p, r] // MUSÉUM PARIS / COLL. GÉNÉRALE [p, y] // G. quadraria / Oliv. / Java / Coll. Labillardiere [h, y] // SYNTYPE [p, r] // SYNTYPE / Aulacophora / quadraria (Olivier, 1808) [p, w] //



FIGURES 1–9. Habitus of *Aulacophora* species. 1. *A. analis*, Lanyu Island, male, dorsal view; 2. Ditto, ventral view; 3. *A. analis*, Lanyu Island, female, dorsal view 4. *A. kotoensis*, Lanyu Island, male, dorsal view; 5. Ditto, ventral view; 6. *A. kotoensis*, Lanyu Island, female, dorsal view; 7. Ditto, ventral view; 8. Lectotype of *Crioceris abdominalis*, dorsal view; 9. Ditto, ventral view.



FIGURES 10–17. Diagnostic characters of *Aulacophora analis* (Weber). 10. Antenna, male; 11. Antenna, female; 12. Penis, dorsal view; 13. Penis lateral view; 14. Gonocoxae; 15. Abdominal ventrite VIII, female; 16. Abdominal tergite VIII, male; 17. Spermatheca.

MNHN / EC4692 [p, w]". This is the only specimen found at the MNHN, It is uncertain if there are other type specimens.

Other specimens examined. INDONESIA. Java: 1♀, 1922, leg. Andrewes (BMNH); Sulawesi: 1♀, Tondano, leg. Forsten (BMNH); Sumatra: 1♀, Dolok Mekangir, 5.VII.1974, leg. Diehl (MNHUB); 4♀, Sandaran Agong, Korinchi Lake, 1914 (BMNH); 1♂, leg. Baly (BMNH); **PHILIPPINES.** 1925, leg. E. M. Ledyard (BMNH); Luzon: 1♂, 1905, leg. Sharp (BMNH); 1♂, 1905, leg. Fry (BMNH); **TAIWAN.** Taitung: 2♀, Lanyu Island, same locality, 26.VI.2009, leg. U. Ong (MNHUB); 4♂, 3♀, same locality, 4.IV.2011, leg. Y.-T. Wang (BMNH, RBCN); 1♂, 1♀, same locality, 17.III.2012, leg. T. H. Lee (MCSN); 1♂, 1♀, same locality, 17.III.2012, leg. M.-H. Tsou (TARI); 1♂, 1♀, same locality, 14.IV.2013, leg. B.-X. Guo (TARI); 4♀, same locality, 14.IV.2014, leg. Y.-T. Chung (TARI).

Diagnosis. *Aulacophora analis* is similar to *A. bicolor* with yellowish brown body and black spots on the elytron but *A. analis* display the characteristic and uniform patterns of arrangement of black spots on the elytron which is different from *A. bicolor*.

Males. Length 5.5–7.0 mm, width 2.7–3.7 mm. General color (Figs 1–2) yellowish brown but elytron with two large, black square patches at antero-lateral angles and behind middle respectively, apical 2/3 of tibia, and tarsus black. Antenna (Fig. 10) filiform and extremely slender, antennomere I not enlarged; ratio of length of antennomeres III to XI about 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 0.9 : 0.9 : 0.8 : 1.0; ratio of length to width from antennomere III to XI about 4.3 : 4.3 : 4.6 : 4.9 : 4.7 : 4.7 : 5.0 : 4.7 : 5.9. First tarsomeres of front and middle legs swollen. Apex of abdominal tergite VIII weakly emarginate (Fig. 16), convex at middle, with several long setae along apical margin; base weakly sclerotized. Median lobe of abdominal ventrite V rectangular, disc weakly depressed. Penis (Figs 12–13) slender, parallel-sided, abruptly narrowed from apical 1/6 to apex, apex pointed; almost straight in lateral view, curved at apical 1/6; tectum well sclerotized, slender, apically widened, apex rounded; endophallus with clusters of dense stout setae, and with one longitudinal sclerite, apex weakly recurved and rounded, basally widened.

Females. Length 7.8–8.2 mm, width 4.0–4.5 mm. Similar to male (Fig. 3), but antennomeres III–V slender (Fig. 11); ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.1 : 1.1 : 1.1 : 1.0 : 1.0 : 0.9 : 1.2; ratio of length to width from antennomere III to XI about 3.5 : 3.9 : 4.1 : 4.2 : 4.3 : 4.2 : 4.6 : 4.5 : 5.6. Apical margin of abdominal ventrite V truncate. Gonocoxae (Fig. 14) wide, apex of each gonocoxa with eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 15) weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with extremely dense short setae along apical margin, disc with dense short setae; spiculum short. Spermathecal receptaculum (Fig. 17) a little swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plant. Cucurbitaceae: *Trichosanthes quinquangulata* A. Gray (present study).

Distribution. Indonesia, Malaysia (Sabah), Philippines, Taiwan (only Lanyu Island).

***Aulacophora bicolor* (Weber, 1801)**

(Figs 18–34)

Galleruca bicolor Weber, 1801: 56 (Indonesia: Sumatra); Fabricius, 1801: 482 (redescription).

Aulacophora bicolor: Baly, 1886: 19 (Indonesia: Sumatra, Java, Sulawesi, Gilolo, Flores, Lombok; Philippines; Sri Lanka); Allard, 1888: 320 (Borneo); Allard, 1889: 308 (Cambodia: Pnomh Penh); Allard, 1891: 230 (Laos: Luang Prabang); Chûjô, 1935b: 205 (Japan: Ryukyus); Maulik, 1936: 187 (India, including Andaman and Nicobar; Taiwan); Chen & Kung, 1959: 374 (China: Yunnan); Chûjô, 1962: 86 (Taiwan); Gressitt & Kimoto, 1963: 484 (China: Hainan, Vietnam); Kimoto, 1964: 305 (Japan: Ryukyu islands); Kimoto, 1989: 51 (Thailand, Laos); Mohamedsaid, 1994: 378 (Malaysia); Mohamedsaid, 2000: 348 (Malaysia); Barroga, 2001: 40 (Indonesia: Bali).

Ceratia bicolor: Miwa, 1931: 189 (Taiwan).

Galleruca haemorrhoea Fabricius, 1803: 293 (new name for *bicolor* Fabricius, 1801).

Galeruca sexpunctata Olivier, 1808: 627 (Timor)

Aulacophora sexpunctata: Jacoby, 1884b: 213 (Sumatra); Allard, 1888: 322 (India); Schönfeldt, 1890: 174 (Japan: Ryukyus); Duvivier, 1891: 146 (Java).

Ceratia (Orthaulaca) sexpunctata: Weise, 1922: 62.

Aulacophora bicolor ab. *sexpunctata*: Chûjô, 1935a: 83.

Aulacophora hemichroa Gistel, 1857 (Java): 540; Monrós & Bechyně, 1956: 1132 (as synonym of *bicolor*).

Aulacophora sexnotata Chapuis, 1876: 100 (Philippines); Weise, 1922: 62 (as synonym of *sexpunctata*).

Aulacophora bicolor var. *sexnotata*: Baly, 1886: 19; Allard, 1888: 320 (Philippines);
Aulacophora semiopaca Jacoby, 1886: 51; Baly, 1887: 268 (as synonym of *bicolor*).

Type material. *Galleruca bicolor*: lectotype ♂ (KIEL), here designated, labeled: “Weber / bicolor. / 1723 [w, h] // bico / lor [w, h] // *Aulacophora bicolor* (Weber) / det. by G.F. Barroga, 1999 [w, p]. There are two types of *G. bicolor* in the KIEL collection. The other is attributed to *A. ritsemae*.

Galleruca sexpunctata: most of Olivier’s specimens were in very bad condition when given to MNHN in 1995. The types should be destroyed by pests. (Mantilleri personal communication).

Aulacophora hemichora: Gistel’s specimens are in very bad condition and most of them didn’t bear any label. Thus the types are either lost or not detectable anymore.

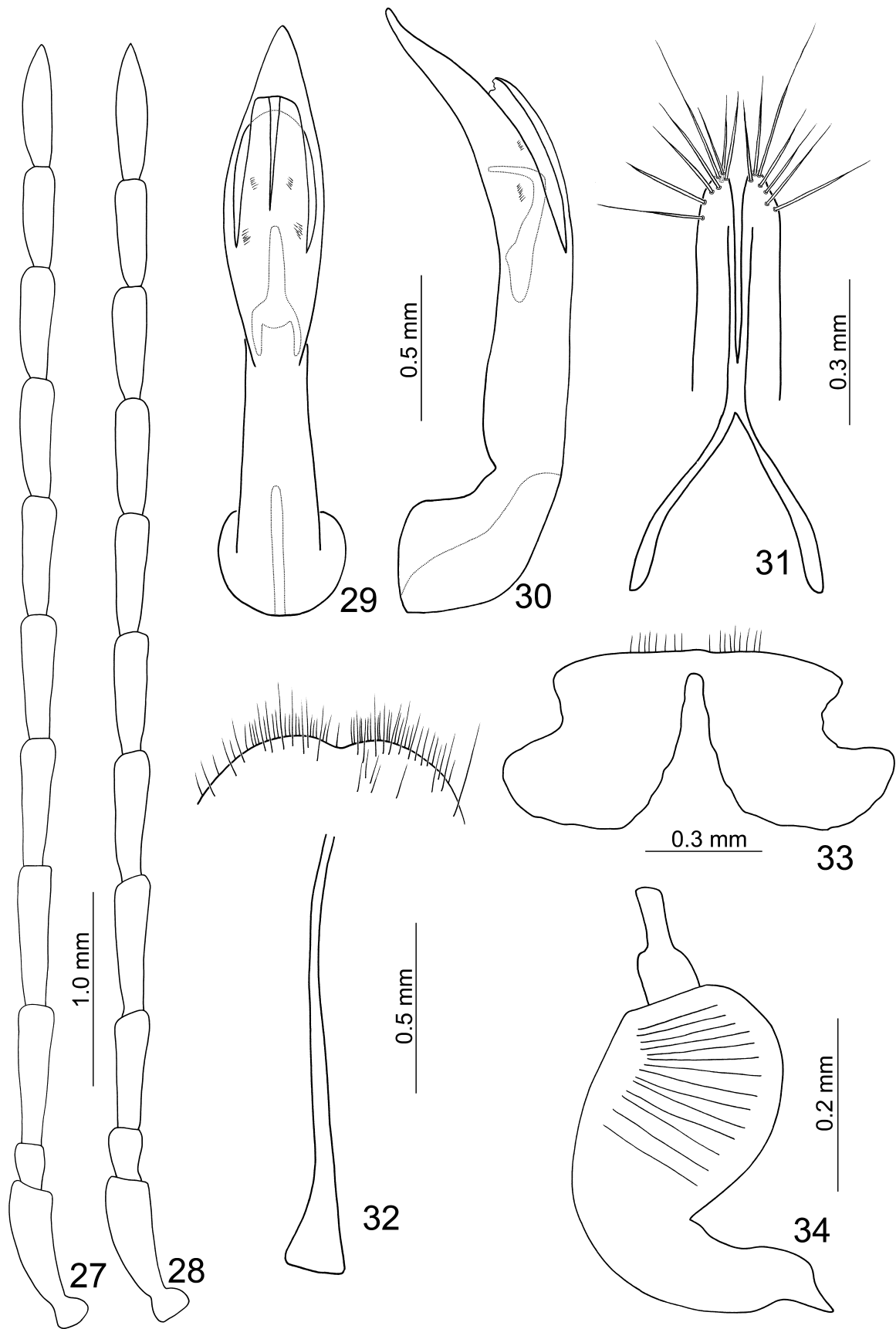
Aulacophora sexnotata: Chapuis’s types were originally deposited at the IRSB. They were studied and borrowed by Barroga and Mohamedsaid (2002), and lost during return of the specimens (Limbourg personal communication).

Aulacophora semiopaca: lectotype ♂ (MCSN), here designated, labeled: “Sumatra / Mto. Singalang / Luglio 1878 O. Beccari [w, p] // Typus [w, p, red letters and borders] // semiopaca / Jac. [w, h] // *Aulacophora* / semiopaca Jac [b, h] // SYNTYPUS [p] / *Aulacophora* / semiopaca / Jacoby, 1886 [r, h] // Museo Civico / di Genova [w, p]”. Paralectotypes: 4♂, 3♀ (MCSN), labeled: “Sumatra / Mto. Singalang / Luglio 1878 O. Beccari [w, p] // SYNTYPUS [p] / *Aulacophora* / semiopaca / Jacoby, 1886 [r, h] // Museo Civico / di Genova [w, p]”; 2♀ (MCZC), labeled: “Sumatra / Mto. Singalang / Luglio 1878 O. Beccari [w, p] // 1st Jacoby / Coll. [w, p] // ♀ [w, h] // Type [p] / 17568 [r, h] // *semiopaca* Jac. [b, h]”; 1♀ (BMNH), labeled: “Type / H. T. [w, p, round label with red border] // Sumatra / Mto. Singalang / Luglio 1878 O. Beccari [w, p] // Jacoby Coll. / 1909-28a. [w, p] // *semiopaca* Jac [b, h] // SYN- / TYPE [w, p, round label with blue border]”.

Other specimens examined. **CHINA.** Hainan: 1♂, Dwa Bi, 25.VII.1935, leg. L. Gressitt (BPBM); **INDONESIA.** 1♂, Gilolo island, leg. Baly (BMNH); Java: 5♂, 2♀, Noesa Kembangan, leg. Drescher (MNHUB); 9♂, 17♀, Sukabumi, 1893, leg. H. Fruhstorfer (MNHUB); Sumatra: 1♂, Ajer Mantoior, Agosio, 1878, leg. O. Beccari (BMNH); 2♀, Brastagi, 17.VII.1972, leg. Erber (MNHUB); 1♀, Bukittinggi, Canyon, 7.IX.1979, leg. Erber (MNHUB); 1♀, Dolok Meraugir, 5.VII.1974, leg. Diehl (MNHUB); 1♂, same locality, 5.X.1974, leg. Diehl (MNHUB); 2♀, same locality, 15.XII.1974, leg. Diehl (MNHUB); 1♂, 1♀, Mt. Singalang, Luglio, 1878, leg. Obeccari (BMNH); **JAPAN.** Okinawa: 4♂, 2♀, Yonaguni Island, 28.III.2014, leg. Y.-T. Wang (TARI); Nansei Shotō: 1♂, 2♀, Iriomote, Funaura, 30 IV 1996, F.J. de Vries (RBCN); **LAOS.** 1♀, Luang Namtha env., 800–1200 m, V.1997, leg. native collector (JBCB); Vientiane: 1♂, Ban Van Eue, 15–31.V.1965, leg. native collector (BPBM); 1♂, same locality, 31.VII.1965, leg. native collector (BPBM); 1♀, same locality, 31.V.1966, leg. native collector (BPBM); 1♂, same locality, 1–15.IX.1967, leg. native collector (BPBM); 1♀, Phou Kou Khouei, 31.V.1966, leg. native collector (BPBM); **PHILIPPINES.** 2♀ (BMNH); **TAIWAN.** Chiayi: 2♂, Chungpu, 3.III.2010, leg. H.-T. Shih (TARI); Ilan: 1♂, Chinyang, 23.X.2011, leg. C.-H. Hsieh (TARI); Kaoshiung: 3♂, Kosempo (= Chiasien), 1–20.III.1908, leg. H. Sauter (BMNH); 1♂, Namahsia, 11.I.2013, leg. B.-X. Guo (TARI); 1♀, Tengchih, 2–5.VI.2008, leg. C.-F. Lee (TARI); 1♂, same locality, 19.III.2013, leg. Y.-T. Chung (TARI); 1♀, same locality, 8.VI.2013, leg. W.-C. Liao (TARI); Nantou: 1♀, Hsitou, 15.VI.2011, leg. C.-F. Lee (TARI); 2♀, Lugu, 10.IX.2014, leg. H.-T. Shih (TARI); 1♂, Wanfengtsun, 4.X.2007, W.-T. Liu (TARI); Pingtung: 1♀, Chiehchihlaishan, 14.II.2012, leg. J.-C. Chen (TARI); 1♂, 1♀, Kenting, 24.XI.2009, leg. C.-F. Lee (TARI); 1♂, Lilungshan, 13.III.2012, leg. J.-C. Chen (TARI); 1♀, same locality, 8.III.2014, leg. J.-C. Chen (TARI); 1♂, 2♀, Machia, 11.III.2013, leg. Y.-T. Chung (MNHUB); 1♀, Nanjenshan, 19.X.2008, leg. W.-C. Wang (TARI); 2♂, Neiwen, 24.II.2012, leg. J.-C. Chen (TARI); 1♂, Peitawushan, 4.IV.2013, leg. Y.-T. Chung (TARI); 4♂, Shouka, 24.II.2012, leg. M.-H. Tsou (RBCN); 1♂, 1♀, Sulin, 15.IV.2009, leg. U. Ong (TARI); 1♂, Tahanshan, 28.VIII.2010, leg. Y.-L. Lin (TARI); 1♂, 1♀, same locality, 25.II.2012, leg. J.-C. Chen (TARI); 1♀, 3.IX.2012, leg. Y.-T. Chung (TARI); 1♀, same locality, 29.IV.2014, leg. J.-C. Chan (TARI); 1♂, same locality, 23.V.2014, leg. Y.-T. Chung (TARI); Tainan: 2♂, Meiling, 14.IV.2010, leg. B.-X. Guo (MNHUB); 2♀, same locality, 24.IV.2013, leg. B.-X. Guo (MNHUB); Taipei: 1♀, Fushan, 1.IV.2011, leg. S.-F. Yu (TARI); 1♀, Jiajiuliao, 18.VIII.2009, leg. Y.-T. Wang (TARI); 1♀, Taipei City Zoo, 12.VI.2007, leg. C.-F. Lee (TARI); Taitung: 1♀, Tajen, 18.X.2008, leg. W.-C. Wang (TARI); Yulin: 1♀, Touliu, 4.I.2009, leg. H.-T. Shih (TARI); **THAILAND.** Mae Hong Son: 2♀, SE of Soppong, 1500 m, 23–27.V.1999, leg. M. Řiha (JBCB); Phitsanulok: 1♀, Nam Muang vill., 450 m, 3.V.1999, leg. Řiha (JBCB); **VIETNAM.** 2♂, Buonlol, 1982, leg. L. Medvedev (MNHUB); 1♂, Hoa-Binh, leg. A. Cooman (BPBM); 1♀, Nha-Trang, 1987, leg. M. Opletal (JBCB).



FIGURES 18–26. Habitus of *Aulacophora bicolor* (Weber). 18. Male, Taiwan, dorsal view; 19. Ditto, ventral view; 20. Female, Taiwan, dorsal view; 21. Female, Java, dorsal view; 22. Male, Java, dorsal view; 23. Male, Java, dorsal view; 24. Female, Sumatra, dorsal view; 25. Female, Sumatra, dorsal view; 26. Male, Vietnam, dorsal view.



FIGURES 27–34. Diagnostic characters of *Aulacophora bicolor* (Weber), 27. Antenna, male; 28. Antenna, female; 29. Penis, dorsal view; 30. Penis lateral view; 31. Gonocoxae; 32. Abdominal ventrite VIII, female; 33. Abdominal tergite VIII, male; 34. Spermatheca.

Males. Length 6.6–8.2 mm, width 3.3–4.3 mm. General color (Figs 18–19) yellowish brown but meso- and metathoracic and abdominal ventrites black or blackish brown, middle and hind legs dark brown, outer margins of tibia, and tarsi of front legs dark brown; elytron with two black spots near base, one at humerus, the other placed behind scutellum, and with one transverse black band behind middle and usually intercepted by suture. Antenna (Fig. 27) filiform and extremely slender, antennomere I not enlarged; ratio of length of antennomeres III to XI about 1.0 : 1.0 : 0.9 : 0.9 : 0.9 : 0.9 : 0.8 : 0.8 : 0.9; ratio of length to width from antennomere III to XI about 3.8 : 3.8 : 3.5 : 3.5 : 3.4 : 3.5 : 3.3 : 3.3 : 4.0. Apex of abdominal tergite VIII truncate (Fig. 33), weakly convex at middle, with several short setae along apical margin; base weakly sclerotized. Median lobe of fifth abdominal ventrite rectangular, disc weakly depressed. Penis (Figs 29–30) slender, widest at apical 1/3, apically tapering, apex pointed; narrowest at apical 3/5; almost straight in lateral view, curved at apical 1/3; tectum membranous, parallel-sided, apex truncate; endophallus with clusters of several stout setae, and with one longitudinal sclerite, extremely curved at apical 1/3, basally widened.

Females. Length 8.8–9.8 mm, width 4.3–4.9 mm. Similar to male (Fig. 20), but antennomeres III–V wider (Fig. 28); ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.1 : 1.0 : 1.0 : 1.0 : 1.0 : 0.9 : 1.2; ratio of length to width from antennomere III to XI about 3.3 : 3.7 : 3.6 : 3.3 : 3.3 : 3.2 : 3.3 : 3.3 : 4.5. Apical margin of abdominal ventrite V truncate. Gonocoxae (Fig. 31) wide, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 32) weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with dense short setae along apical margin; spiculum long. Spermathecal receptaculum (Fig. 34) strongly swollen; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Variation. Some specimens collected from China, Taiwan, and Japan have only one pair of black spots on elytral humerus or even no black spots at all; specimens from China, and Southeast Asia have yellow brown legs. Specimens collected from Java have their characteristic color patterns: in addition to typical form, some have well-developed posterior spots and form transverse band (Fig. 21); some have well-developed anterior and posterior spots and form transverse bands (Fig. 22); some have the black apical half (Fig. 23). Specimens collected from Sumatra have also their characteristic color patterns: all have black middle and hind legs; some have black basal 1/5 and one pair of transverse bands at apical 1/3 on elytra (Fig. 24); others have black basal 2/3 of elytra, with one pair of yellow spots at base near humerus (Fig. 25). One specimen from Vietnam has black elytra with yellow apices and one pair of small yellow spots at base near humerus (Fig. 26).

Remarks. Some authors (such as Kimoto 1989; Barroga & Mohamedsaid 2002) thought that *Galleruca bicolor* described by Fabricius (1801) was different from that by Weber (1801). Actually, Fabricius (1801) redescribed *Galleruca bicolor* based on Weber's types (Zimsen 1964).

Host plants. Cucurbitaceae: *Zehneria mucronata* (Bl.) Miq. (present study).

Distribution. Cambodia, China, India, Indonesia, Japan, Laos, Malaysia, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam.

***Aulacophora frontalis* Baly, 1888**

(Figs 35–36, 44–51, 111)

Aulacophora frontalis Baly, 1888: 181 (Malaysia: Sarawak); Jacoby, 1896: 126 (Indonesia: Mentawai islands); Maulik, 1936: 183 (India); Chen & Kung 1959: 375 (China: Yunnan, Guandong); Chûjô, 1962: 96 (Taiwan); Gressitt & Kimoto, 1963: 487 (China: Guandong; Vietnam); Kimoto, 1989: 55 (Thailand, Laos, Cambodia, Vietnam); Mohamedsaid, 1994: 380 (Malaysia); Barroga, 2001: 42 (Indonesia: Bali); Barroga & Mohamedsaid, 2002: 97 (Malaysia, Indonesia: Sumatra, Java); Mohamedsaid, 2000: 348 (Malaysia); Mohamedsaid & Constant, 2007: 166 (Thailand, Cambodia).

Aulacophora palliata: Allard, 1889: 308 (Vietnam: Hué, Saigon = Ho Chi Minh City, Qui Nhon, Tourane; Cambodia: Phnom Penh); Allard, 1891: 230 (Laos: Luang Prabang); Laboissière, 1935: 140 (listed as *frontalis*).

Aulacophora (Ceratia) frontalis: Laboissière, 1929: 258 (Vietnam).

Type material. Lectotype ♂ (BMNH), here designated, labeled: “SYN- / TYPE [w, p, round label with blue border] // Type [w, p, round label with red border] // SAR / 305 [w, h, round label] // Baly Coll. [w, p] // *Aulacophora / frontalis* / Baly / Type [w, h] // This specimen was found without name attached, in Baly's coll. in close proximity to *A. orientalis* or *A. palliata*. It was the only specimen of this group of species having loc.

Sarawak. It is undoubtedly the type. [w, h] // holotype [w, p]". Paralectotypes: 1♂ (BMNH), labeled: "SYN- / TYPE [w, p, round label with blue border] // Type [w, p, round label with red border] // [blue round label] // Borneo [w, h] // Baly Coll. [w, p] // *Aulacophora frontalis* / Baly (♂) [w, p] // not type [w, p]". Although this specimen was labeled as nontype, it cannot be excluded from the type series by original description. 1♂ (MCZC), labeled "SAR. [w, h, round label] // *A. frontalis* Baly [w, h] // 1st Jacoby / Coll. [w, p] // TYPE / F. C. B. Coll. [pink label, p] // Type [p] / 17571 [r, h]"; 1♂ (MCZC), labeled: "SUMAT [w, p] // Jacoby 2nd / Coll. [w, p] // dorhni / Jac [w, h] // Type [p] / 17572 [w, h]".

Other specimens examined. **CAMBODIA.** 1♂, Siem Reap, 7–11.IX.2002, leg. P. Kočárek (JBCB); **INDIA.** Kamataka: 1♂, Coorg distr., 10 km SE of Virajpet, leg. Z. Kejval and M. Trýzna (JBCB); **INDONESIA.** Java: 2♂, 1♀, Batavia, Tanjung Priok, (BMNH); 1♂, Noesa Kembangan, leg. Drescher (MNHUB); Sumatra: 2♂, Soekaranda, leg. Dohrn (MNHUB); 1♂, Nias island (BMNH); **LAOS.** Borikhane: 1♂, Paksane, 28.VIII.1965, leg. native collector; 1♀, same locality, 1.XI.1965, leg. native collector (BPBM); Hua Phan: 1♂, Phu Loei N. P., Ban Sakok, 23–26.V.2001, leg. J. Bezděk (JBCB); Khammouane: 2♀, Phon Tiou, 21–22.IX.1965, leg. native collector (BPBM); 1♂, Ban Khoun Ngeun env., 200 m, 19–31.V.2001, leg. C. L. Peša (JBCB); Vientiane: 1♀, Ban Van Eue, 30.XI.1965, leg. native collector (BPBM); 1♂, Tha Ngone, 6.IX.1965, leg. native collector (BPBM); **MALAYSIA.** Sabah: 1♂, Tenompok, 15.II.1959, leg. T. C. Maa (BPBM); Sarawak: 1♂, Kapit Dist. Merirai, V., 1–6.VIII.1958, leg. T. Maa (BPBM); 1♂, Mt. Matang, XII.1913, leg. G. E. Bryang (BMNH); 2♀, Shelford, 1900 (BMNH); **TAIWAN.** Heitou (= Pingtung), 2♂, 1♀, 22.V.1930, leg. Y. Miwa (TARI); 4♀, same locality, V–VI.1931, leg. Y. Miwa (TARI); **THAILAND.** Choburi: 1♂, Sriracha Dist., 22.X.1966, leg. J. S. Burto (BPBM); **VIETNAM.** 1♂, Minh Hoa, N. of Nha Trang, 28.XI.1960, leg. C. M. Yoshimoto (BPBM); 1♂, Saigon, X.1982, leg. Pokomý (JBCB).

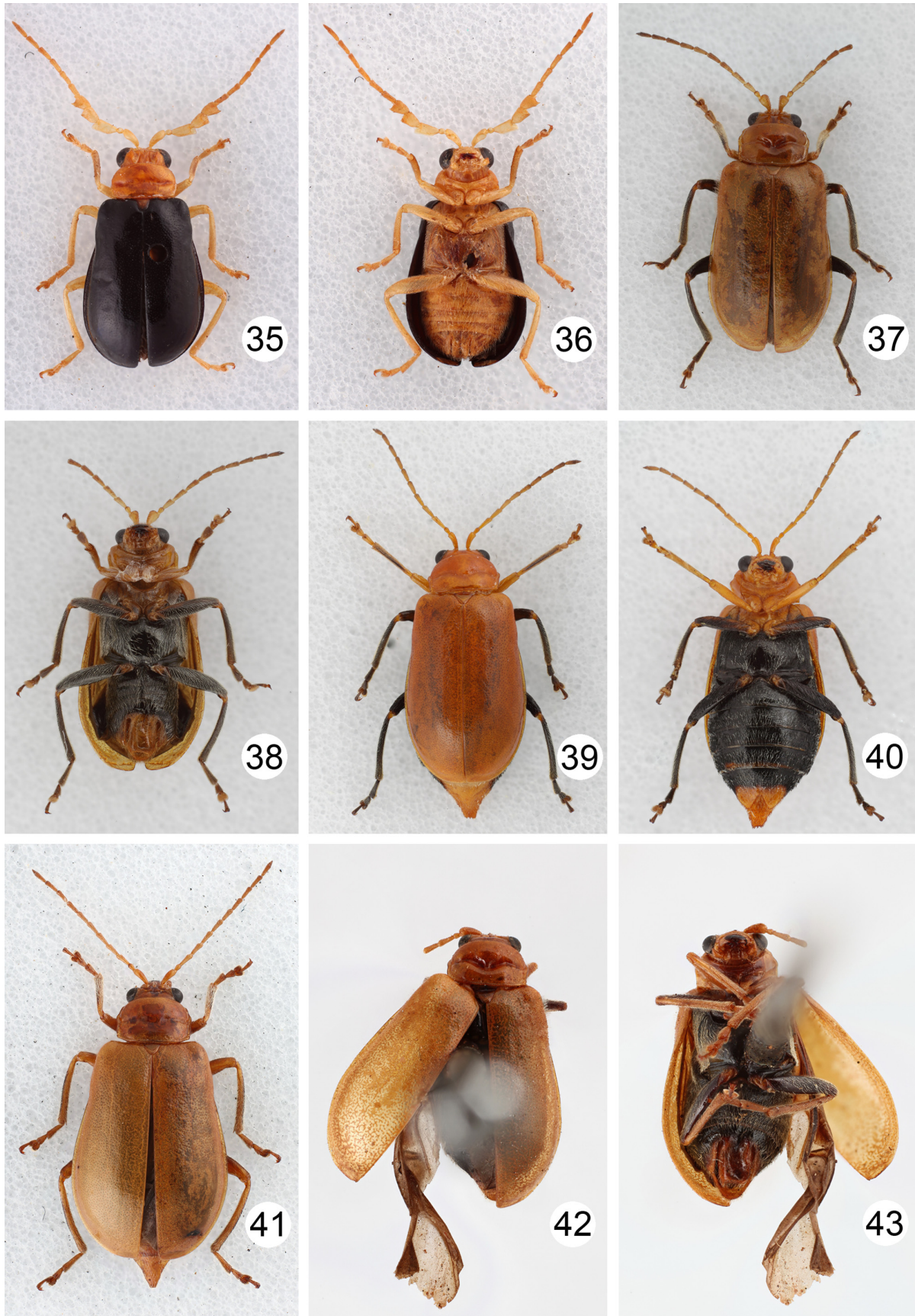
Diagnosis. *Aulacophora frontalis* is similar to *A. palliata* with the modified antennomeres III to V in male but *A. frontalis* have the longitudinal groove on the vertex (Fig. 111) (the transverse ridges in *A. palliata*: Fig. 112) or more slender antennomere III in male, and more wider antennomere VII to X in female.

Males. Length 5.7–6.7 mm, width 2.8–3.5 mm. General color (Figs 35–36) yellowish brown except elytron black and shining. Vertical area of head with a longitudinal groove on each side (Fig. 111). Antenna (Fig. 44) filiform, scape not enlarged, antennomere I swollen and curved; III–V triangular, III with lateral expansion flattened, V with longitudinal groove on lateral expansion; ratio of length of antennomeres III to XI about 1.0 : 0.8 : 0.8 : 0.7 : 0.7 : 0.7 : 0.7 : 0.8; ratio of length to width from antennomere III to XI about 2.5 : 1.5 : 1.5 : 2.8 : 2.9 : 3.1 : 3.2 : 3.4 : 5.2. Apex of abdominal tergite VIII emarginate at middle (Fig. 50), apical margin sinuate and with some setae, base weakly sclerotized. Median lobe of fifth abdominal ventrite short and rectangular, disc depressed near apex, apical margin weakly emarginate at middle. Penis (Figs 46–47) apically tapering from apical 1/4; weakly curved in lateral view; tectum well sclerotized, apically tapering; endophallus with dense, irregularly arranged setae, and with one longitudinal sclerite, apex rounded, basally widened and bifurcate.

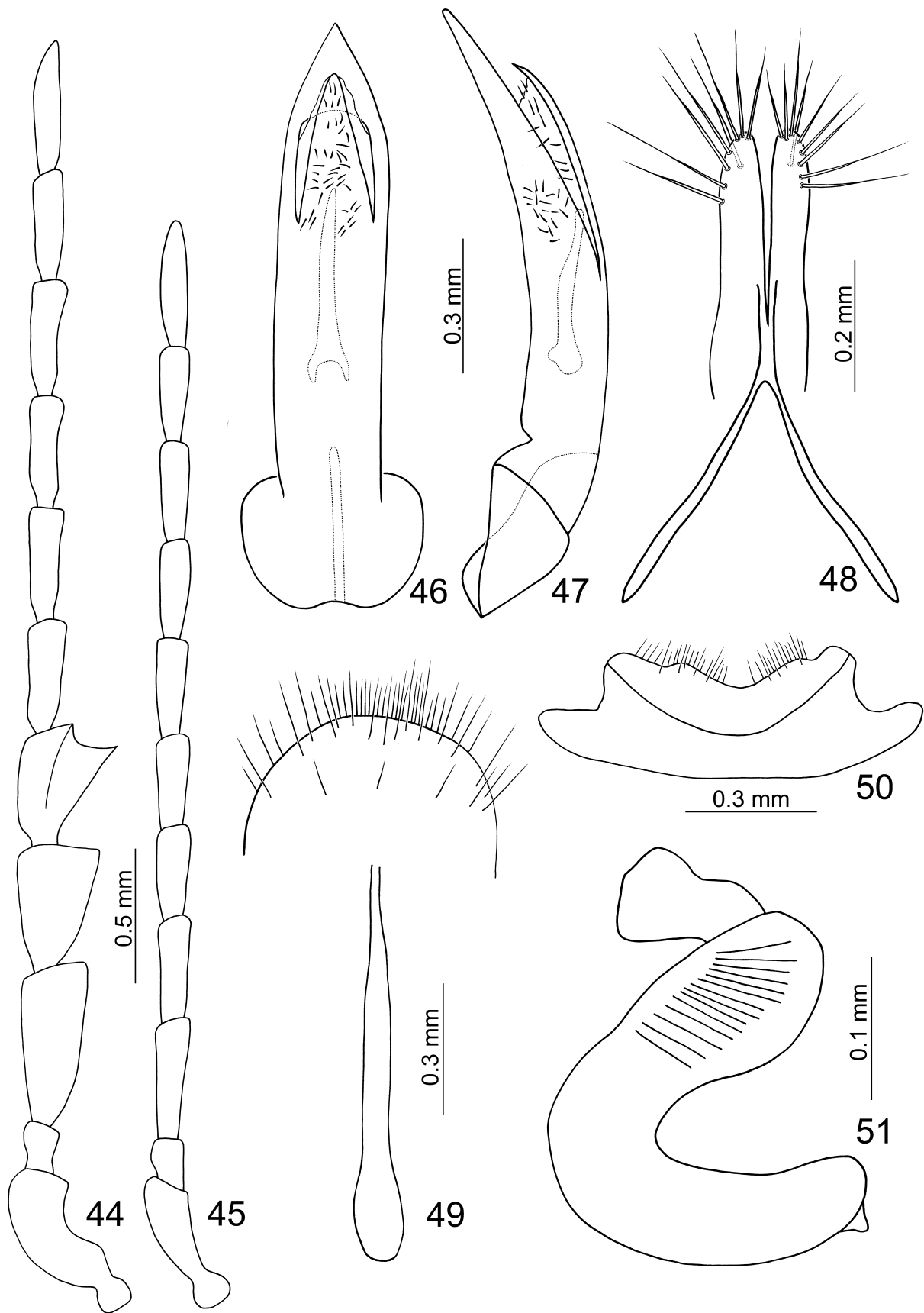
Females. Length 6.5–6.9 mm, width 3.5–3.8 mm. Similar to male, but transverse ridge on vertical area absent; antenna filiform and not modified (Fig. 45), ratio of length of antennomeres III to XI about 1.0 : 0.8 : 0.8 : 0.8 : 0.8 : 0.8 : 0.8 : 1.0; ratio of length to width from antennomere III to XI about 3.4 : 3.1 : 2.8 : 2.8 : 2.9 : 3.1 : 3.2 : 3.1 : 4.6. Apical margin of abdominal ventrite V not modified, rounded. Gonocoxae (Fig. 48) slender, apex of each gonocoxa with eight or nine setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 49) weakly sclerotized; apex narrow, apical margin rounded, surface with dense short setae along apical margin, and several long setae scattered at apical area; spiculum short. Spermathecal receptaculum (Fig. 51) slightly swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plant. Unknown

Distribution. Cambodia, China, India, Indonesia, Laos, Malaysia, Taiwan, Thailand, Vietnam. Only very old specimens collected from Taiwan had been found. Chûjô (1962, 1963) reported this species for Taiwan based on Miwa's specimens collected in 1930s (examined at the present study), and Sauter's ones in 1900s. No recent specimens have been collected. It is supposed that this species is extinct in Taiwan.



FIGURES 35–43. Habitus of *Aulacophora* species. 35. *A. frontalis*, Laos, male, dorsal view; 36. Ditto, ventral view; 37. *A. indica*, Taiwan, male, dorsal view; 38. Ditto, ventral view; 39. *A. indica*, Taiwan, female, dorsal view; 40. Ditto, ventral view; 41. *A. indica*, China, female, dorsal view; 42. Lectotype of *Crioceris testacea*, dorsal view; 43. Ditto, ventral view.



FIGURES 44–51. Diagnostic characters of *Aulacophora frontalis* Baly. 44. Antenna, male; 45. Antenna, female; 46. Penis, dorsal view; 47. Penis lateral view; 48. Gonocoxae; 49. Abdominal ventrite VIII, female; 50. Abdominal tergite VIII, male; 51. Spermatheca.

Aulacophora indica (Gmelin, 1790)

(Figs 37–43, 52–61)

Crioceris testacea Fabricius, 1787: 87 (India); Fabricius, 1792: 4 (redescription).

Aulacophora testacea: Baly, 1879: 445 (India: Assam); Baly, 1886: 13; Allard, 1888: 320 (Indonesia: Celebes = Sulawesi);

Cryptocephalus (Crioceris) indica Gmelin, 1790: 1720. (replacement name for *Crioceris testacea* Fabricius, 1787)

Rhaphidopalpa indica: Laboissière, 1940: 10.

Aulacophora indica: Kimoto, 1970: 416 (Nepal); Kimoto, 1977: 354 (Bhutan); Kimoto, 1989: 57 (India, including Andaman and Nicobar islands, Sri Lanka, Burma, Thailand, Cambodia, Laos, Vietnam, China, Taiwan, Philippines, Japan, including Ryukyu islands, Korea, Russia, Indonesia: Sunda islands, Micronesia, New Guinea, Samoa, Fiji); Mohamedsaid, 1994: 381 (Malaysia); Mohamedsaid, 2000: 348 (Malaysia); Barroga, 2001: 42 (Indonesia: Bali); Barroga & Mohamedsaid, 2002: 102 (Indonesia: Sumatra, Nias, Buru, Java); Mohamedsaid & Constant, 2007: 166 (Thailand, Cambodia); Aston, 2009: 13 (China: Hong Kong).

Galeruca similis Olivier, 1808: 624 (Océan Indien); Kimoto, 1989: 56 (as synonym of *indica*).

Aulacophora similis: Baly, 1886: 16 (China, Japan, India, Malaysia); Jacoby, 1889: 206 (Burma); Duvivier, 1892: 430 (India: Konbir); Chûjô, 1938: 152 (Taiwan); Gressitt, 1955: 28 (Micronesia).

Rhaphidopalpa similis: Allard, 1889: 308 (Vietnam: Hué, Saigon = Ho Chi Minh City, Myho, Qui Nhon, Tourane; Cambodia: Pnom Penh); Allard, 1891: 230 (Laos: Luang Prabang).

Orthaulaca similis: Weise, 1892: 393.

Ceratia similis: Miwa, 1931: 190 (Taiwan).

Rhaphidopalpa femoralis Motschulsky, 1857: 37 (Japan); Baly, 1886: 16 (as synonym of *similis*); Weise, 1892: 395 (Philippines); Ogloblin, 1936: 154 (Korea).

Aulacophora femoralis: Schönfeldt, 1890: 174 (Japan: Ryukyus); Chûjô, 1941: 157 (Japan, Korea); Gressitt & Kimoto, 1963: 486 (China, Vietnam); Kimoto, 1966: 28 (Taiwan).

Rhaphidopalpa coffeae: Allard, 1888: 319 (Japan; misidentification); Weise, 1892: 395 (as synonym of *similis*).

Aulacophora flavipes Jacoby, 1883: 202 (Indonesia: Sulawesi: Saleyar islands); Baly, 1886: 17 (as synonym of *similis*).

Rhaphidopalpa pubescens Allard, 1888: 306 (Annam). **New synonym**

Aulacophora pubescens: Kimoto, 1989: 62.

Rhaphidopalpa bengalensis Weise, 1892: 394 (India: Calcutta).

Rhaphidopalpa ceramensis Weise, 1892: 394 (Indonesia: Ceram island; Borneo); Laboissière, 1932: 153 (Indonesia: Halmahera); Barroga & Mohamedsaid, 2002: 103 (as synonym of *indica*).

Rhaphidopalpa niasiensis Weise, 1892: 394 (Indonesia: Nias and Sumatra); Barroga and Mohamedsaid, 2002: 103 (as synonym of *indica*).

Rhaphidopalpa chinensis Weise, 1892: 395 (China: Shanghai); Ogloblin, 1936: 153 (Vietnam, Mongolia); Laboissière, 1940: 13 (India: Tetara); Gressitt & Kimoto, 1963: 486 (as synonym of *femoralis*).

Aulacophora femoralis chinensis: Chen & Kung, 1959: 375 (China: Hebei, Shaanxi, Shandong, Jiangsu, Zhejiang, Fujian, Guandong, Guanxi, Hubei, Jiangxi, Sichuan, Yunnan).

Type material. *Crioceris testacea*: lectotype ♂ (KIEL), here designated, without labels (see remarks on *A. abdominalis*).

Galeruca similis: most of Olivier's were in very bad condition before given to MNHN in 1995. The types probably have been destroyed by pests. (Mantilleri personal communication).

Aulacophora flavipes: holotype ♀ (MCZC), labeled: "H.E.D. / Engelhard / Saleyer / 20/1, 81 [w, h, round label] // 1st Jacoby / Coll. [w, p] // ♀ [b, h] // Type [p] / 17561 [r, h]".

Rhaphidopalpa pubescens: lectotype ♂ (MNHN), here designated, labeled: "wchinchine [h, w] // Ex.Musæo / 1899 [vertical] / E.ALLARD [p, w] // MUSEUM PARIS / 1952 / COLL. OBERTHUR [p, w] // **TYPE** [p,r] // Rhaphidopalpa / Pubescens All. / Cochinchine [p, y]".

Rhaphidopalpa bengalensis: lectotype ♂ (MNHUB), here designated, labeled: "Calcutta / Hauser [w, h] // India or. / Calcutta [w, p] // ♂ [w, h] // SYNTYPUS / Rhaphidopalpa / bengalensis Weise, 1892 / labelled by MNHUB 2014 [r, p]". Paralectotype: 1 ♀ (MNHUB), labeled: "Calcutta [w, h] / bengalensis / Ws. [w, h] // SYNTYPUS / Rhaphidopalpa / bengalensis Weise, 1892 / labelled by MNHUB 2014 [r, p]".

Rhaphidopalpa femoralis: not studied. They should be deposited at the ZMUM.

Rhaphidopalpa ceramensis: Lectotype ♀ (MNHUB), here designated, labeled: "Ceram / Jllo [w, h] // ex Coll. / J. Weise [w, p] // ceramensis / Ws. [w, h] // Type [r, p] // SYNTYPUS / Rhaphidopalpa / ceramensis Weise, 1892 / labelled by MNHUB 2014 [r, p]". Paralectotypes: 1 ♂, 1 ♀ (MNHUB), labeled: "Ceram / Ribbe [w, h] // ex Coll. / J. Weise [w, p] // Type [r, p] // SYNTYPUS / Rhaphidopalpa / ceramensis Weise, 1892 / labelled by MNHUB 2014 [r, p]"; 1 ♂ (MNHUB), labeled: "Ceram / Jllo [w, h] // ex Coll. / J. Weise [w, p] // Type [r, p] // SYNTYPUS /

Rhaphidopalpa / ceramensis Weise, 1892 / labelled by MNHUB 2014 [r, p]"; 1♀ (MNHUB), labeled: "ex Coll. / J. Weise [w, p] // Type [r, p] // SYNTYPUS / *Rhaphidopalpa / ceramensis* Weise, 1892 / labelled by MNHUB 2014 [r, p]"; 1♀ (MNHUB), labeled: "Ceram / Jlo / C. Ribbe 1884 [w, p] // ex Coll. / J. Weise [w, p] // Type [r, p] // SYNTYPUS / *Rhaphidopalpa / ceramensis* Weise, 1892 / labelled by MNHUB 2014 [r, p]".

Rhaphidopalpa niasiensis: Weise's types were originally deposited at the MNHUB. They was studied and borrowed by Barroga and Mohamedsaid (2002), and lost during return of the specimens (Willers personal communication).

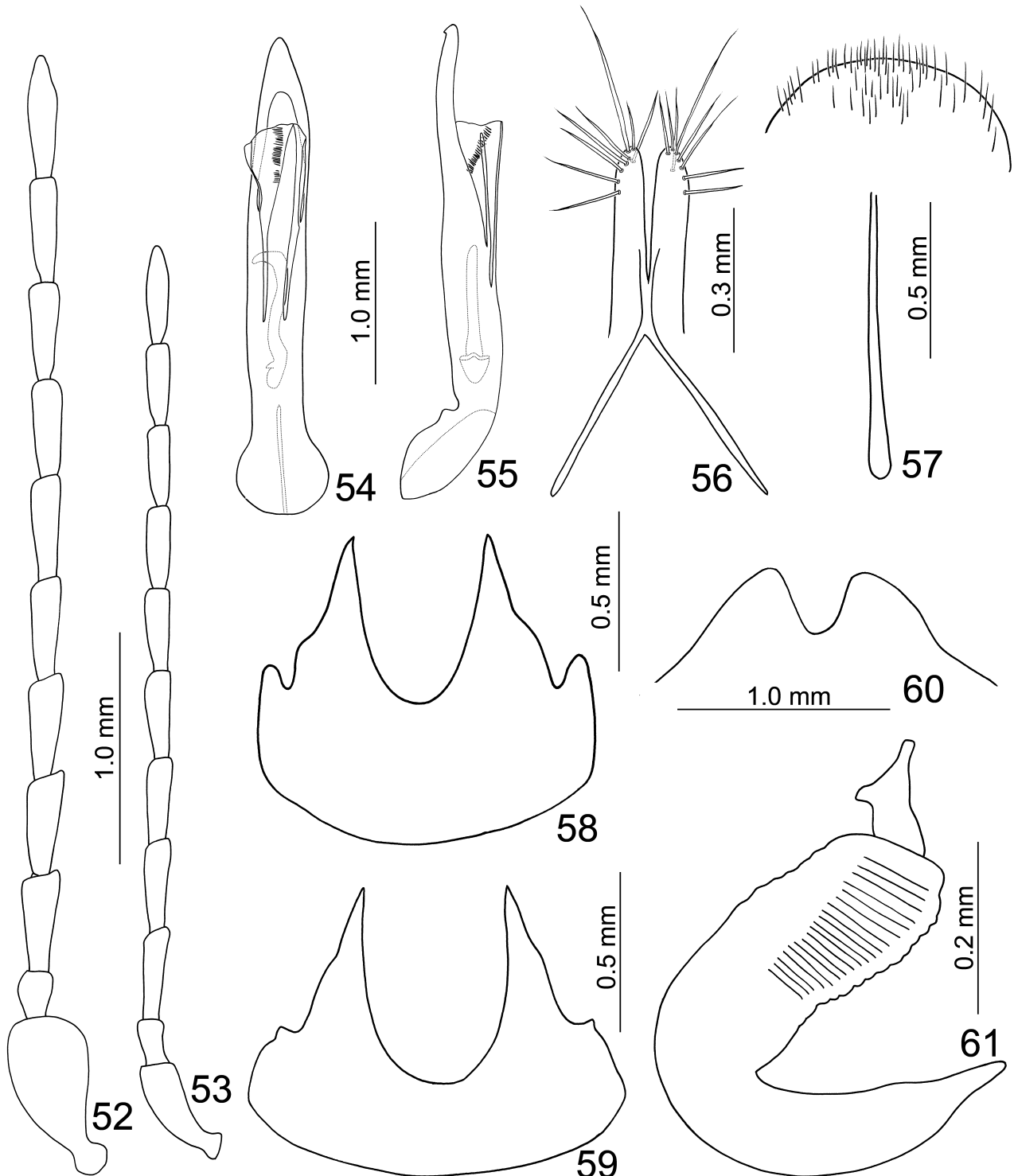
Rhaphidopalpa chinensis: lectotype ♂ (MNHUB), here designated, labeled: "Shanghai / Simon [w, h] // ♂ [w, h] // chinensis / Ws. [w, h]". This is the only specimen available in Weise's collection. It is uncertain if there are other type specimens.

Other specimens examined. **CAMBODIA.** 1♂, Siem Reap, 7–11.XI.2002, leg. P. Kočák (JBCB); **CHINA.** Fujian: 1♀, Changting, Hotien, 19.IV.1941, leg. T. C. Maa (BPBM); 1♀, Chishui, 20.VI.2014, leg. Y.-T. Chung (TARI); 1♀, Shaowu, Tachulan, 11.VI.1942, leg. T. Maa (BPBM); Guandong: 1♂, Lochang, Tintong, 18.VIII.1947, leg. L. Gressitt (BPBM); Hainan: 1♂, Fan Heang, 7.VI.1935, leg. J. L. Gressitt (BPBM); 1♂, Tiaoloshan, 6.V.2011, leg. Y.-T. Chung (TARI); Hong Kong: 1♂, Lantau, Mui Wo, 24.IX.2005, leg. P. Aston (PAHC); Hubei: 1♂, Wang-ga-ying, Lichuan, 23.IX.1948, leg. Gressitt & Djou (BPBM); Sichuan: 1♂, Wanhsien, 3.X.1948, leg. Gressitt & Djou (BPBM); **INDONESIA.** Sumatra: Riau: 2♂, Bukit Tigapuluh N. P., 18–25.I.2000, leg. J. Bezděk (JBCB); **JAPAN.** Okinawa: 1♀, Okinawa island, 8.IV.2014, leg. Y.-T. Wang (TARI); 1♀, Yonaguni island, 28.III.2014, leg. Y.-T. Wang (TARI); **LAOS.** Hua Phan: 1♂, Ban Kangpabong env., 25 km SE of Vient Xai, 14–18.V.2001, leg. J. Bezděk (JBCB); Khammouane: 1♂, Phon tiou, 6.VII.1965, leg. native collector (BPBM); 1♀, same locality, 11.IX.1965, leg. native collector (BPBM); Vientiane: 1♂, Tha Ngone, 20.XI.1965, leg. native collector (BPBM); 1♂, Vientiane, 31.VII.1965, leg. native collector (BPBM); 1♀, same locality, 21.III.1966, leg. native collector (BPBM); **MALAYSIA.** Johor: 1♂, 15 km NW of Kota Tinggi, Muntahak Mt., 13–14.V.2001, leg. M. Řiha (JBCB); **PHILIPPINES.** Batanes: 4♂, 4♀, Itbayat island, 13.IV.2013, leg. Y.-F. Hsu (TARI); 1♀, Sabtang island, 11.IV.2013, leg. Y.-F. Hsu (TARI); **SOUTH KOREA.** 2♂, Jeju-do, Jeju-si, Hwabuk-dong, 28.X.2009, leg. H.-W. Cho (JBCB); **THAILAND.** Chiangmai: 1♂, Chiangdao, 5–11.IV.1958, leg. T. C. Maa (BPBM); Nakornsawan: 1♀, 12.IX.1963 (BPBM); **TAIWAN.** Ilan: 1♂, Taipingthan, 3.VII.2010, leg. M.-H. Tsou (TARI); 1♂, Toucheng, 30.V.2009, leg. H.-J. Chen (TARI); Kaoshiung: 1♀, Meinung, 20.XII.2011, leg. J.-C. Chen (TARI); 4♂, 6♀, same locality, 17.II.2012, leg. J.-C. Chen (TARI); 5♂, 4♀, Hsiaokangshan, 9.III.2013, leg. B.-X. Guo (TARI); 3♂, Yuangan, 16.IV.2013, leg. J.-C. Chen (TARI); Kinmen: 1♂, 1♀, Kinmen island, 11.VII.2001, leg. H.-T. Shih (TARI); Pingtung: 1♂, Checheng, 6.II.2012, leg. J.-C. Chen (TARI); 1♂, Chiehchihlaishan, 14.II.2012, leg. J.-C. Chen (TARI); 2♂, 3♀, Fengchuisha, 29.IV.2012, leg. J.-C. Chen (TARI); 1♂, Lilungshan, 10.III.2014, leg. Y.-T. Chung (TARI); 1♂, Neiwen, 30.X.2012, leg. J.-C. Chen (TARI); Taipei: 3♀, Linshanpi, 15.IX.2007, leg. S.-F. Yu (TARI); 1♀, Manyuehyuan, 9.IX.2011, leg. C.-F. Lee (TARI); 1♀, Menghuanhu, 28.VII.2007, leg. M.-H. Tsou (TARI); 8♂, Pinglin, 8.VII.2008, leg. H.-J. Chen (TARI); 1♀, Sanchih, 11.III.2010, leg. W.-T. Liu (TARI); 1♂, Wanli, 4.VII.2008, leg. W.-T. Liu (TARI); Taitung: 1♀, Lanyu island, 22–26.III.1998, leg. C.-F. Lee (TARI); 1♀, same locality, 27.VI.2010, leg. H.-H. Lee (TARI); 1♀, same locality, 4.IV.2011, leg. Y.-T. Wang (TARI); 5♂, 5♀, same locality, 17.III.2012, leg. M.-H. Tsou (RBCN, TARI); 5♂, 5♀, same locality, 17.III.2012, leg. T.-H. Lee (MCSN, MNHUB); 1♀, same locality, 5.V.2012, leg. S.-F. Yu (TARI); 1♀, same locality, 14.IV.2013, leg. Y.-T. Chung (TARI); 10♂, 12♀, Lutao island, 14.IV.2014, leg. Y.-T. Chung (TARI); 1♂, Taimali, 21.X.2009, leg. W.-T. Liu (TARI); Taoyuan: 1♀, Fuhsing, 15.VII.2009, leg. H.-J. Chen (TARI); 2♂, 3♀, Lofu, 11.IV.2010, leg. M.-H. Tsou (TARI); 1♂, Paling, 11.IV.2010, leg. M.-H. Tsou (TARI); **THAILAND.** Mae Hong Son: 1♂, 1♀, Sopping env., 600 m, 28.V.–2.VI.1999, leg. M. Řiha (JBCB); **VIETNAM.** 1♀, Ap Hung-Lam, 21 km NW of Dilinh, 29.IX–5.X.1960, leg. C. M. Yoshimoto (BPBM); 1♂, Nha Trang, 17–26.XI.1960, leg. C. M. Yoshimoto (BPBM).

Diagnosis. See diagnosis of *Aulacophora abdominalis*.

Males. Length 6.5–8.0 mm, width 3.3–4.0 mm. General color (Figs 37–38) yellowish brown but metathoracic and abdominal ventrites black except apex of fifth abdominal ventrite; middle and hind legs black; outer margins of femur and tibia of front legs black; labrum dark brown; antenna dark brown except three basal antennomeres yellowish brown. Antenna (Fig. 52) filiform and slender, antennomere I enlarged; ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.0 : 1.0 : 1.0 : 0.9 : 1.0 : 1.0 : 1.2; ratio of length to width from antennomere III to XI about 2.6 : 3.0 : 3.2 : 3.0 : 3.1 : 3.0 : 3.1 : 3.7 : 4.4. Pronotum with deep, transverse groove. Elytra with cluster of erect hairs behind humerus. Abdominal tergite VIII well sclerotized (Fig. 58), apical margin bifurcate and apices

cute; with one small process at lateral margin. Median lobe of fifth abdominal ventrite rectangular, disc depressed at left side. Penis (Figs 54–55) slender, parallel-sided, asymmetric and abruptly narrowed at apical 1/7 and apically tapering, apex recurved; almost straight in lateral view; tectum medially sclerotized, apically tapering; endophallus with clusters of short setae, and with one longitudinal sclerite, apically tapering, apex strongly curved in lateral view, basally widened.



FIGURES 52–61. Diagnostic characters of *Aulacophora indica* (Gmelin). 52. Antenna, male; 53. Antenna, female; 54. Penis, dorsal view; 55. Penis lateral view; 56. Gonocoxae; 57. Abdominal ventrite VIII, female; 58. Abdominal tergite VIII, male; 59. Abdominal tergite VIII, paralectotype of *Rhabidopalpa ceramensis*; 60. Apex of abdominal ventrite V, female; 61. Spermatheca.

Females. Length 6.8–8.2 mm, width 3.4–4.1 mm. Similar to male (Figs 39–40), but pronotum with transverse groove shallow; cluster of erect hairs on elytra absent; antennomere I not enlarged (Fig. 53); ratio of length of antennomeres III to XI about 1.0 : 1.0 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 1.1; ratio of length to width from antennomere III to XI about 3.5 : 3.7 : 3.3 : 3.3 : 3.3 : 3.3 : 3.5 : 3.5 : 4.5. Pygidium projecting from elytral apex, apically tapering, apex pointed, or truncate, or emarginate. Middle of apical margin of abdominal ventrite V (Fig. 60) emarginate. Gonocoxae (Fig. 56) slender, apex of each gonocoxa with eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 57) weakly sclerotized; apex narrowly rounded, with dense short setae along apex; spiculum short. Spermathecal receptaculum (Fig. 61) a little swollen; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Variation. Although most of the females have pointed pygidia, few have truncate or emarginate ones. Color of middle and hind legs are also variable among different populations. Black middle and hind legs occur in Taiwan, Japan, Philippines, and Indonesia, while yellow ones (Fig. 41) in India, Laos, Thailand, and Vietnam. Both color forms occur in China. Some exceptions could occur in small populations, such as adults with yellow legs occur in Saleyar islands.

Remarks. The type(s) of *Crioceris testacea* is mixed with those of *C. abdominalis* in the Fabricius collection (KIEL). One male is designated as the lectotype to serve nomenclatural stability. This specimen (Figs 42–43) fits the current definition of *Aulacophora indica* and the color patterns (yellow legs) in India. For more details on the designation of this lectotype see under remarks in the section on *A. abdominalis*. In addition, Kimoto (1989) indicated that *Rhaphidopalpa pubsecens* should belong to another genus with dense hairs on the dorsal surface although the type was not studied. Actually the character indicated by Kimoto (1989) is the erect hairs behind the humerus of the male since this type is deposited at the MNHN and regarded as a junior synonym of *Aulacophora indica* after studying its aedeagus.

Host plants. Cucurbitaceae: including cultivated species.

Distribution. Bhutan, Burma, Cambodia, China, Fiji, India, Indonesia, Japan, Korea, Laos, Malaysia, Micronesia, Nepal, Papua New Guinea, Philippines, Russia, Samoa, Sri Lanka, Taiwan, Thailand, Vietnam.

Aulacophora kotoensis Chûjô

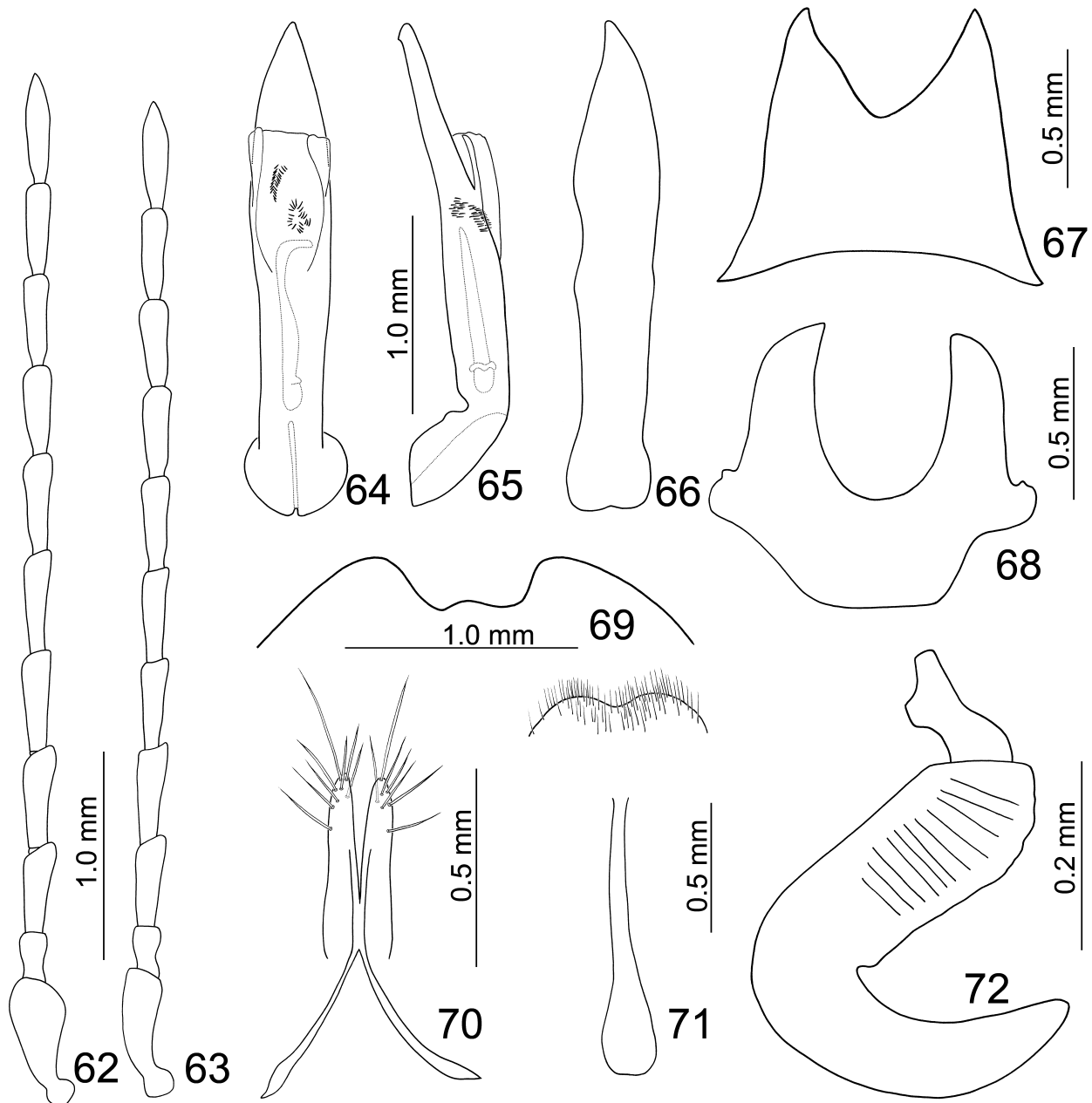
(Figs 4–7, 62–65, 67, 69–72)

Aulacophora kotoensis Chûjô, 1962: 79 (Taiwan).

Type material. *Aulacophora kotoensis*: holotype ♂ (TARI), labeled: “KOTOSHO / (BOTEL-TOBAGO IS.) (= Lanyu island) / FORMOSA / 20.VI–10.VII.1938 / COLL. M. CHUJO [w, p] // Ho / Type [w, p, round label, red letters and border, but faded out] // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1813 [w, p]”. Paratypes: 1♀ (TARI), labeled: “KOTOSHO / (BOTEL-TOBAGO IS.) (= Lanyu island) / FORMOSA / 20.VI–10.VII.1938 / COLL. M. CHUJO [w, p] // ALLo / Type (w, p, round label, gray letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1811 [w, p]”; 1♂, 1♀ (TARI), labeled: “KOTOSHO / (BOTEL-TOBAGO IS.) (= Lanyu island) / FORMOSA / 20.VI–10.VII.1938 / COLL. M. CHUJO [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1820 & 676 [w, p]”; 1♂, 1♀ (TARI), labeled: “KOTOSHO / FORMOSA / IV.1936 / COLL. Y. CHUJO [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1823 & 684 [w, p]”; 2♂, 2♀ (TARI), labeled: “Kotosho / 10 III–14.IV.1920 / Sonan [w, h] // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1422–1424, 2599 [w, p]”; 2♂ (TARI), labeled: “Kotosho / 20.IX.1923 / Col. T. Okuni. [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1425 & 1426 [w, p]”; 1♂, 2♀ (TARI), labeled: “Formosa / Kotosho / III–IV.1932 / S. Hirayama [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 681–683 [w, p]”; 2♂, 2♀ (TARI), labeled: “[Koutousyo] / FORMOSA / XII-1931-II-1932 / S. Hirayama // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *kotoensis* / Chûjô [h] / DET. M. CHUJO [w, p] // 677–680 [w, p]”.

Other specimens examined. TAIWAN. Taitung: 1♂, Lanyu Is., 22–26.III.1998, leg. C.-F. Lee (TARI); 3♂, same locality, 29.III.2009, leg. U. Ong (RBCN); 1♂, 1♀, same locality, 26.IV.2009, leg. U. Ong (BMNH); 1♂,

same locality, 17.III.2012, leg. T.-H. Lee (MNHUB); 2♂, same locality, 17.III.2012, leg. M.-H. Tsou (MNHUB); 2♂, same locality, 5.V.2012, leg. S.-F. Yu (TARI); 2♂, same locality, 14.IV.2013, leg. B.-X. Guo (TARI); 2♂, 14.IV.2013, leg. B.-X. Guo (TARI); 1♂, 22.XI.2013, leg. Y.-T. Chung (TARI); 1♂, 2♀, Hsiaolanyu Is., 26.V.2009, leg. Y.-T. Chung (TARI); 2♂, 1♀, same locality, 25.VI.2009, leg. Y.-T. Chung (TARI); 1♀, same locality, 27.VIII.2009, leg. Y.-T. Chung (TARI).



FIGURES 62–72. Diagnostic characters of *Aulacophora abdominalis* (Fabricius). 62. Antenna, male; 63. Antenna, female; 64. Penis, dorsal view; 65. Penis lateral view; 66. Penis, lectotype of *Crioceris abdominalis*, details omitted; 67. Abdominal tergite VIII, male; 68. Abdominal tergite VIII, lectotype of *Crioceris abdominalis*; 69. Apex of abdominal ventrite V, female; 70. Gonocoxae; 71. Abdominal ventrite VIII, female; 72. Spermatheca.

Diagnosis. *Aulacophora kotoensis* is similar to *A. indica* with the enlarged first antennomere in male and cone-like pygidium projecting from elytral apices in female, but *A. kotoensis* has a pair of tubercles on the pronotum in male (without tubercles in *A. indica*), slender and black pygidium in female (wide and yellowish brown pygidium in *A. indica*).

Males. Length 6.5–7.1 mm, width 3.5–3.8 mm. General color (Figs 4–5) yellowish brown but metathoracic and abdominal ventrites, middle and hind legs black; outer margins of femur and tibia, and tarsi of front legs black;

labrum dark brown; antenna dark brown except three basal antennomeres yellowish brown. Antenna (Fig. 62) filiform and slender, antennomere I enlarged; ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.1 : 1.1 : 1.1 : 1.0 : 1.0 : 1.0 : 1.2; ratio of length to width from antennomere III to XI about 3.9 : 3.4 : 3.5 : 3.5 : 3.4 : 3.2 : 3.6 : 3.6 : 4.7. Pronotum with deep, transverse groove; one pair of tubercles behind groove. Elytra with cluster of erect hairs behind humerus. Abdominal tergite VIII well sclerotized (Fig. 67), apical margin with wide triangular incision and apices acute. Median lobe of abdominal ventrite V rectangular, with median, longitudinal, wide groove and abbreviated near apex. Penis (Figs 64–65) slender, parallel-sided, abruptly narrowed at apical 1/7 and apically tapering, apex recurved; slightly curved from middle to apex in lateral view; tectum laterally sclerotized; endophallus with clusters of short setae, and with one longitudinal sclerite, apically tapering, apex strongly curved in lateral view, basally widened.

Females. Length 7.2 mm, width 3.9 mm. Similar to male (Figs 6–7), but pronotum with transverse groove shallow, and without tubercles; cluster of erect hairs on elytra absent; antennomere I not enlarged (Fig. 63); ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 1.2; ratio of length to width from antennomere III to XI about 3.0 : 3.2 : 3.2 : 3.3 : 3.3 : 3.2 : 3.2 : 3.2 : 4.4. Pygidium projecting from elytral apex, parallel-sided, slender, and apex rounded. Middle of apical margin of abdominal ventrite V (Fig. 69) emarginate, weakly convex at middle of emargination. Gonocoxae (Fig. 70) slender, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 71) weakly sclerotized; apex narrow, apical margin emarginate at middle, with dense short setae along apex; spiculum short. Spermathecal receptaculum (Fig. 72) a little swollen; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plant. Cucurbitaceae: *Trichosanthes quinquangulata* A. Gray (Chûjô 1962; present study).

Remarks. To exclude conspecificity between *Aulacophora kotoensis* and *A. abdominalis* (Fabricius, 1781) it was necessary to study the type specimens of *Crioceris abdominalis* in the Fabricius-collection. The results of the study of these specimens are treated extensively in the section on *Aulacophora abdominalis* and partly in the section on *A. indica*. For the status of *A. kotoensis* it is relevant that we have found no arguments to treat this species as conspecific with *A. abdominalis*.

Distribution. Lanyu and Hsiaolanyu islands (Taiwan). Hsiaolanyu is very small and deserted island which is very close to Lanyu Island. The size of island is about 1.75 km².

[*Aulacophora abdominalis* (Fabricius, 1781)]

(Figs 8–9, 66, 68)

Crioceris abdominalis Fabricius, 1781: 151 (Pacific islands); Fabricius, 1787: 87 (redescription).

Cryptocephalus abdominalis: Gmelin, 1790: 1719.

Galeruca abdominalis: Olivier, 1791: 590; Olivier, 1808: 623.

Galleruca abdominalis: Fabricius, 1792: 23; Fabricius, 1801: 483.

Rhaphidopalpa abdominalis: Dejean, 1837: 402; Weise, 1892: 395.

Aulacophora abdominalis: Baly, 1886: 14.

Type material. *Crioceris abdominalis*: lectotype ♂ (KIEL), here designated, labeled: “abdomina / lis [w, h] // LECTO - / TYPE [w, h, circle label with blue border] // Lectotype / *Crioceris* ♂ / testacea Fab. [h] // N. A. Aslam det. 19 [p] 71 [h, w]”. No paralectotypes designated (see under remarks).

Diagnosis. The lectotype of *Crioceris abdominalis* (Figs 8–9) is similar to *Aulacophora kotoensis* but has yellowish brown antenna and legs. Besides, the penis of the lectotype of *C. abdominalis* is distinctly asymmetric near the apex and shows a lateral excavation at the middle (Fig. 66); abdominal tergite VIII has a semicircular incision and lateral processes and basal margin convex with rounded corners (Fig. 68). *A. kotoensis* has antennae (except basal segments) dark brown and middle and hind legs black. In *A. kotoensis* the penis is parallel sided, narrowed towards apex which is symmetrical; abdominal tergite VIII has a broad triangular incision and basal margin concave with sharp corners.

Remarks. To exclude conspecificity between *Aulacophora kotoensis* and *A. abdominalis* (Fabricius, 1781) it was necessary to study the type specimens of *Crioceris abdominalis* in the Fabricius-collection.

Most of Fabrician types in Kiel had been transferred to the Zoological Museum of Copenhagen (KIEL) (Zimsen 1964). Zimsen (1964) described the Coleoptera Collection as “There are no locality labels in Fabricius’

own collection. Also peculiar are the very small name labels which Fabricius used: usually only a small scrap of paper on which was written the name of the species; never any mention of the genus”.

In 1787 Fabricius described *Crioceris testacea* from India Orient., at present named *Aulacophora indica* (Gmelin). Later, Fabricius (1801) synonymized *Crioceris testacea* with *Crioceris abdominalis* Fabricius, 1781 a species he described from the South Pacific. Most probably he placed his specimens of both *C. abdominalis* and *C. testacea* in his collection together. Because of the uncertainty around the taxa *C. abdominalis* and *C. testacea* (see for example Baly 1879: 445 and Maulik (1936: 175, 197, 198) it was not only to exclude conspecificity between *Aulacophora kotoensis* and *A. abdominalis* (Fabricius, 1781) that made it necessary for us to study the type specimens of *Crioceris abdominalis* in the Fabricius-collection. The examination also could clarify the status of *C. testacea*.

In the KIEL collection there are five specimens besides the name label “abdominalis, 1791”: one male specimen carrying a label in Fabricius handwriting “abdominalis”; the other four specimens without labels. One of them could be identified as *Haplosomoides serena* (Boheman) and one as *Aulacophora coffeae* Hornstedt. The two remaining specimens are a male of *Aulacophora indica* (Gmelin, 1790) and an *Aulacophora* female, that could not be identified.

The labeled specimen was designated as lectotype of *Crioceris testacea* Fabricius by Aslam in 1941. However, designation of the lectotype is not valid since it was never published. Anand and Cox (1986) redescribed *A. abdominalis* and *A. testacea* based on a female specimen collected in the South Pacific during the second voyage of captain Cook (Banks collection) and a male specimen collected in India (Assam) respectively. At least the redescription of *A. abdominalis* is not reliable since the female has fewer diagnostic characters. A redescription based on the presumed syntypes in the Fabricius collection could finally end the uncertainty.

Because the series of syntypes is composed of several species we excluded the specimens of *Haplosomoides serena*, *Aulacophora coffeae* and the female specimen from our examination. The two remaining male specimens are clearly different. One male specimen that has no tubercles on the pronotum is identical with *Aulacophora indica* (Gmelin, 1790), the replacement name for *Crioceris testacea* Fabricius, 1787. This specimen is designated lectotype of *Crioceris testacea* Fabricius, 1787. The other male specimen with a pair of tubercles on the pronotum that unfortunately was labeled by Aslam as the lectotype of *Crioceris testacea*, is designated here as the lectotype of *Crioceris abdominalis*. This is the specimen bearing the Fabricius label “abdominalis”. Both specimens are labeled according these designations and serve nomenclatural stability.

Barroga & Mohamedsaid (2002) and Barroga (2002a) list a single male specimen as the type of *Crioceris testacea* Fabricius they studied from the Fabricius-collection (KIEL). They mention it is labeled as *Crioceris abdominalis* F., but do not list any further labels. In other type specimens they list all label information. Therefore it is not likely they studied the specimen we designated the lectotype of *C. abdominalis*, because in that case they would have listed the label attached by Aslam as well. It is very likely that they have studied the specimen we have designated the lectotype of *C. testacea*. Because Barroga & Mohamedsaid (2002) and Barroga (2002a) do not mention the presence of tubercles on the males pronotum, a character they unlikely would have left unnoticed, makes it plausible that they have studied the male specimen herein designated the lectotype of *Crioceris testacea* Fabricius, 1787.

***Aulacophora lewisii* Baly, 1886**

(Figs 73–76, 82–90)

Aulacophora lewisii Baly, 1886: 24 (China); Baly, 1888: 179 (India, Malaysia); Duvivier, 1892: 430 (India: Mandar); Chen & Kung, 1959: 375 (China: Hong Kong); Gressitt & Kimoto, 1963: 489 (China: Sichuan, Hubei, Anhui, Fujian, Guandong, Guanxi, Hainan; Vietnam); Kimoto, 1964: 305 (Japan: Yakushima, Ryukyus); Kimoto, 1977: 354 (Bhutan); Kimoto, 1989: 59 (Thailand, Cambodia, Laos, Vietnam); Mohamedsaid, 1994: 382 (Malaysia); Mohamedsaid, 2000: 349 (Malaysia); Barroga & Mohamedsaid, 2002: 116 (Malaysia); Mohamedsaid & Constant, 2007: 166 (Thailand, Cambodia); Aston, 2009: 14 (China: Hong Kong).

Ceratia lewisii: Miwa, 1931: 189 (Taiwan).

Orthaulaca (Ceratia) cattigarensis Weise, 1892: 397 (China: Shanghai; Japan); Gressitt and Kimoto, 1963: 489 (as synonym of *lewisii*).

Aulacophora (Ceratia) cattigarensis: Laboissière, 1929: 258 (Vietnam); Chûjô, 1935b: 205 (Japan: Ishigaki island); Chûjô, 1935c: 160 (Taiwan).

Aulacophora cattigarensis: Ogloblin, 1936: 156 (Vietnam); Chen & Kung, 1959: 375 (China: Jiangsu, Zhejiang, Fujian,

Guandong, Guanxi, Sichuan, Yunnan); Chûjô, 1962: 99 (Taiwan).

Aulacophora intermedia Jacoby, 1892: 942; Jacoby, 1896: 126 (Indonesia: Mentawai islands); Maulik, 1936: 181 (India); Gressitt & Kimoto, 1963: 488 (as synonym of *lewisii*).

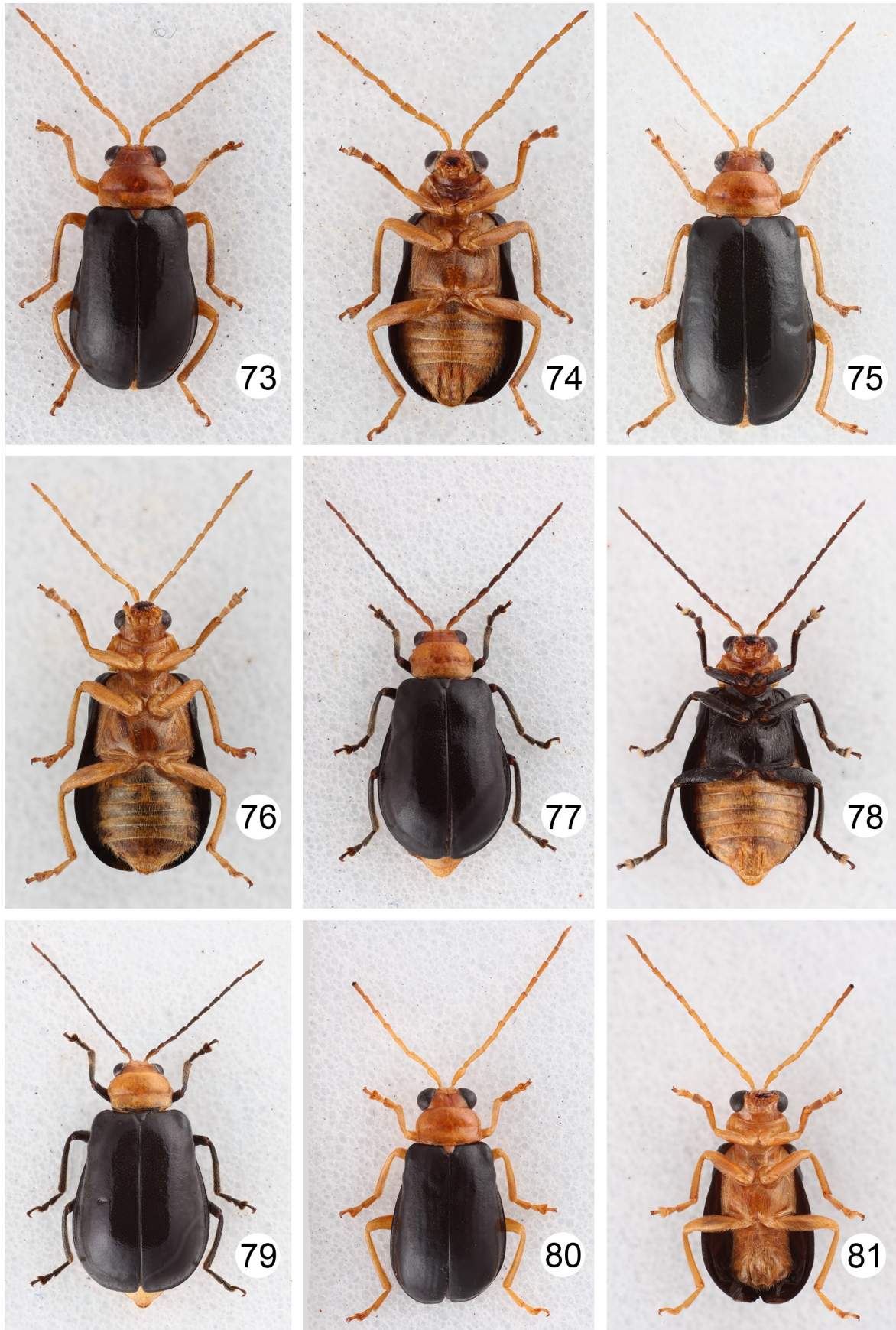
Type material. *Aulacophora lewisii*: lectotype ♀ (BMNH), here designated, labeled: “SYN- / TYPE [w, p, round label with blue border] // Type / H. T. [w, p, round label with red border] // Baly Coll. [w, p] // China [w, h] // Aulacophora / Lewisii / Baly / China [w, h] // BMNH(E) / #1024852 [w, p] // holotype [w, p]”. Paralectotypes: 2♂ (BMNH), labeled: “SYN- / TYPE [w, p, round label with blue border] // Hong / Kong / Lewis [w, h] // Aulacophora / lewisii / Baly (♂) [w, p] // not type [w, p] // BMNH(E) / #1024852 [w, p]”. Although two paralectotypes were labeled as nontype specimens, they cannot be ruled out of type series since the collecting data fits the original description.

Orthaulaca (Ceratia) cattigarensis: lectotype ♀ (MNHUB), here designated, labeled: “Shanghai [w, h] // cattigarensis / Ws [w, h] // SYNTYPUS / Orthaulaca / cattigarensis Wiese, 1892 / labelled by MNHUB 2014 [r, p]”. Paralectotypes: 1♀ (MNHUB), labeled: “Shanghai [w, h] // SYNTYPUS / Orthaulaca / cattigarensis Wiese, 1892 / labelled by MNHUB 2014 [r, p]”; 1♂ (MNHUB), labeled: “Shanghai / Simom ? [w, h] // ♂ [w, h] // SYNTYPUS / Orthaulaca / cattigarensis Wiese, 1892 / labelled by MNHUB 2014 [r, p]”; 1♀ (MNHUB), labeled: “Shanghai / Simom ? [w, h] // SYNTYPUS / Orthaulaca / cattigarensis Wiese, 1892 / labelled by MNHUB 2014 [r, p]”; 1♂, 1♀ (MNHUB), labeled: “Japon [w, h] // SYNTYPUS / Orthaulaca / cattigarensis Wiese, 1892 / labelled by MNHUB 2014 [r, p]”; 1♀ (MNHUB), labeled: “SYNTYPUS / Orthaulaca / cattigarensis Wiese, 1892 / labelled by MNHUB 2014 [r, p]”.

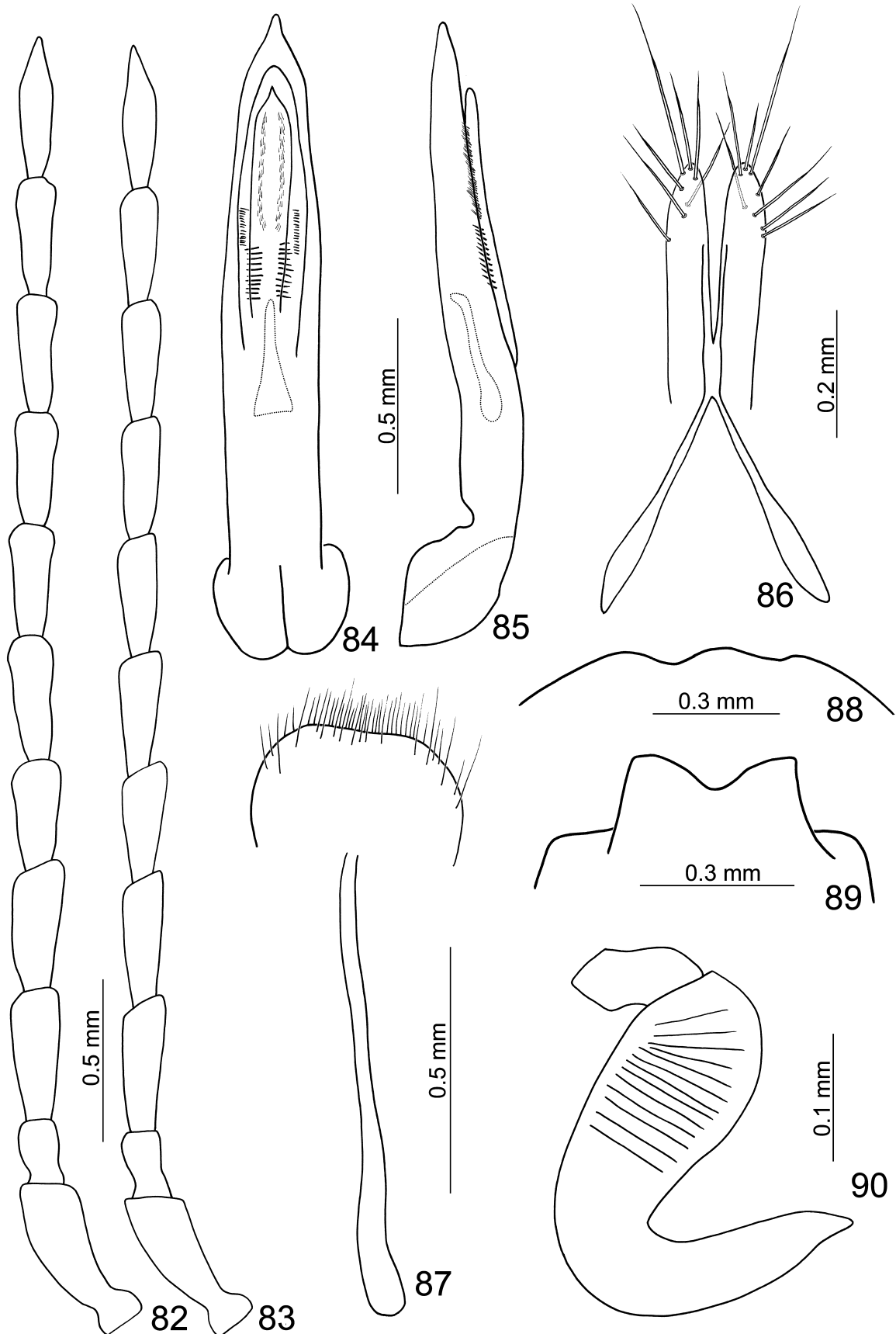
Aulacophora intermedia: lectotype ♂ (BMNH), here designated, labeled: “Type / H. T. [w, p, round label with red border] // Rangoon/ Birmania / Fea 188 [w, p]7[h] // Jacoby Coll. / 1909-28a. [w, p] // *Aulacop. / intermedia* / Jac. [b, h] // SYN- / TYPE [w, p, round label with blue border]”. Paralectotypes: 2♂ (MCZC), labeled: “Carin Chebà / 1000–1100 m / L. Fea V XII-88 [w, p] // *Aulacophora / intermedia* / sp. n. [b, h] // Type [p] / 17560 [r, h]”.

Other specimens examined. **CHINA.** Guandong: 1♂, Tsha-jiu-san, V.-VI.1912, leg. S. V. Mell (BPBM); 1♂, same locality, VIII.1913, leg. S. V. Mell (BPBM); Hainan: 1♂, 1♀, Dome Mountain, 12.VII.1935, leg. J. L. Gressitt (BPBM); Hong Kong: 1♀, Lantau, Tung Chung, 31.VII.2007, leg. P. Aston (PAHC); Sichuan: 1♂, Lungchue-pa to Chang-tau-ging, Wanhsien, 30.IX.1948, leg. Gressitt & Djou (BPBM); 1♀, Suifu, leg. D. C. Graham (BPBM); **INDONESIA.** Java: 1♀, leg. Chev (BMNH); Sulawesi: 1♀, leg. Wallace (BMNH); **LAOS.** Khammouane: 1♂, 2♀, Ban Khoun Ngeun env., 250 m, 20–29.V.2004, leg. E. Jendek and O. Šauša (JBCB); **MALAYSIA.** 1♀, MAL CA (= Malacca), leg. Wallace (BMNH); Pahang: 1♂, Tasik Bera, Pos Iskander, 4–8.V.1993, leg. Sham, Razali and Saiful (JBCB); Penang: 1♂, Peng, leg. Wallace, Baly Coll. (BMNH); 2♂, 2♀, 63 47, leg. Bowring (BMNH); 2♀, Wellesley prov., Kg. Siam, Pinang Tunggal, 7.VIII.1979, leg. J. Pertanian (BMNH); Perak: 1♂, 1905-313, leg. Sharp (BMNH); Sarawak: 1♀, Bidi, 1980-9, leg. C. J. Brooks (BMNH); 3♀, Kuching, 1910, leg. J. E. A. Lewis (BMNH); **PHILIPPINES.** 1♂, 42 22 (BMNH); 1♂, 67 56 (BMNH); 1♂, leg. J. Hano, 67 56 (BMNH); 1♀, 985 (BMNH); **TAIWAN.** Ilan: 2♂, 1♀, Yingshih, 31.VII.2009, leg. H.-J. Chen (TARI); Kaoshiung: 2♀, Maolin, 6.VII.2011, leg. M.-H. Tsou (TARI); 5♂, 1♀, Meinung, 1.III.2012, leg. J.-C. Chen (TARI); 1♀, same locality, 17.VII.2012, leg. J.-C. Chen (TARI); Miaoli: 1♀, Kuantaoshan, 3.XI.2009, leg. S.-F. Yu (TARI); Nantou: 1♂, 2♀, Puli, 14.IX.2012, leg. Y.-P. Huang (TARI); Pingtung: 5♂, 2♀, Chuanfanshih, 26.VIII.2010, leg. J.-C. Chen (TARI); 1♂, Kueishan, 3.VIII.2012, leg. J.-C. Chen (TARI); 1♀, Tahanshan, 15.XI.2013, leg. Y.-T. Chung (TARI); Taipei: 1♀, Chihshanyan, 14.VI.2008, leg. M.-H. Tsou (TARI); 1♂, 1♀, Chuwei, 2006, leg. H.-T. Cheng (TARI); 1♂, 2♀, Kuanyinshan, 28.VI.2008, leg. M.-H. Tsou (TARI); 1♀, Peitou, 6.XI.2006, leg. S.-F. Yu (TARI); 2♂, Taishan, 24.IV.2009, leg. H.-T. Cheng (TARI); 5♀, Taluntou, 23.VI.2009, leg. S.-F. Yu (TARI); Taitung: 8♂, 4♀, Lanyu island, 17.III.2012, leg. T.-H. Lee (TARI); 7♂, 5♀, 17.III.2012, leg. M.-H. Tsou (TARI); 6♂, 5♀, Lutao island, 14.IV.2014, leg. Y.-T. Chung (MNHUB, RBCN, TARI); 1♂, same locality, 16.IV.2014, leg. B.-X. Guo (TARI); Taoyuan: 1♀, Fuhsing, 28.III.2010, leg. M.-H. Tsou (TARI); **THAILAND.** Kanchanaburi: 1♂, Phatad valley, 14–15.IX.2009, leg. V. Hula (JBCB); Nan: 1♂, Ban Huay Kon env., 27.V.–10.VI.2002, leg. P. Průdek and M. Obořil (JBCB).

Diagnosis. *Aulacophora lewisii* is similar to *A. frontalis* and *A. palliata* with the yellowish brown body and black shining elytron but easily identified by the filiform antenna in male and the sinuate apical margin of the abdominal ventrite V in female (the modified and triangular antennomeres III to V in male and the rounded apical margin of the abdominal ventrite V in female of *A. frontalis* and *A. palliata*).



FIGURES 73–81. Habitus of *Aulacophora* species. 73. *A. lewisii*, male, dorsal view; 74. Ditto, ventral view; 75. *A. lewisii*, female, dorsal view; 76. Ditto, ventral view; 77. *A. nigripennis*, male, dorsal view; 78. Ditto, ventral view; 79. *A. nigripennis*, female, dorsal view; 80. *A. opacipennis*, male, dorsal view; 81. Ditto, ventral view.



FIGURES 82–90. Diagnostic characters of *Aulacophora lewisii* Baly. 82. Antenna, male; 83. Antenna, female; 84. Penis, dorsal view; 85. Penis lateral view; 86. Gonocoxae; 87. Abdominal ventrite VIII, female; 88. Apex of abdominal ventrite V, female; 89. Abdominal tergite VIII, male; 90. Spermatheca.

Males. Length 5.6–6.6 mm, width 2.8–3.1 mm. General color (Figs 73–74) yellowish brown except elytron black and shining. Antenna (Fig. 82) filiform, antennomere I not enlarged, III–V rather stout; ratio of length of antennomeres III to XI about 1.0 : 1.0 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 1.1; ratio of length to width from antennomere III to XI about 2.6 : 2.6 : 2.3 : 2.7 : 2.5 : 2.6 : 3.0 : 3.0 : 4.7. Apex of abdominal tergite VIII forming one pair of wide processes (Fig. 89), apex of process rectangular; weakly emarginate at middle; base weakly sclerotized. Median lobe of abdominal ventrite V rectangular, with longitudinal groove from base to apex, apically widened. Penis (Figs 84–85) slender, apically tapering, apex pointed; almost straight in lateral view; tectum well sclerotized, apex pointed, disc ventrally covered with two longitudinal rows of fine setae; endophallus with two longitudinal rows of stout setae at base of tectum, and two longitudinal rows of tiny setae above stout setae, and with one longitudinal sclerite, apex curved and rounded, basally widened.

Females. Length 6.5–7.2 mm, width 3.2–3.6 mm. Similar to male (Figs 75–76), but antennomeres III–V slender (Fig. 83); ratio of length of antennomeres III to XI about 1.0 : 1.0 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 1.1; ratio of length to width from antennomere III to XI about 3.2 : 3.1 : 2.7 : 2.8 : 3.0 : 3.1 : 3.1 : 3.2 : 4.4. Apical margin of abdominal ventrite V (Fig. 88) sinuate. Gonocoxae (Fig. 86) slender, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base widened. Ventrite VIII (Fig. 87) weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with dense long setae along apical margin, spiculum short. Spermathecal receptaculum (Fig. 90) a little swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plants. Cucurbitaceae: including cultivated species.

Distribution. Bhutan, Cambodia, China, India, Indonesia, Japan, Laos, Taiwan, Thailand, Vietnam.

Aulacophora nigripennis Motschulsky, 1857

(Figs 77–79, 91–99)

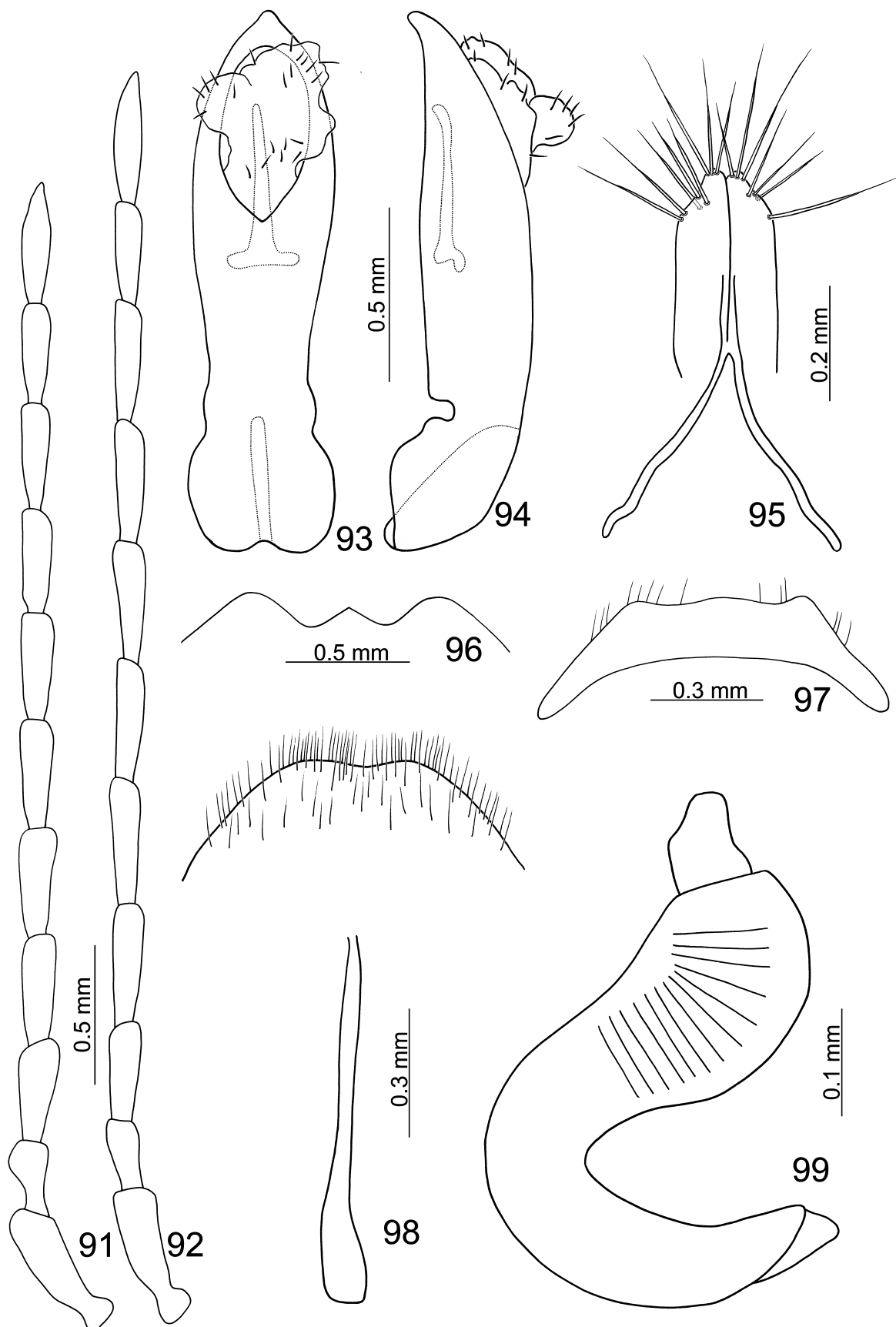
Aulacophora nigripennis Motschulsky, 1857: 38; Baly, 1886: 5 (China, Japan); Schönfeldt, 1890: 174 (Japan: Ryukyus); Chûjô, 1935a: 83 (Taiwan, China: Heilongjian); Ogloblin, 1936: 156 (Russia); Chen & Kung, 1959: 375 (China: Hebei, Shaanxi, Shandong, Jiangsu, Zhejiang, Fujian, Jiangxi, Sichuan); Chûjô, 1962: 91 (Taiwan); Gressitt & Kimoto, 1963: 489 (China: Hainan); Lee & An, 2001: 130 (South Korea); Aston, 2009: 14 (China: Hong Kong).

Ceratia (*Orthaulaca*) *nigripennis*: Weise, 1922: 62.

Ceratia nigripennis: Miwa, 1931: 189 (Taiwan).

Type material. Holotype ♂ (ZMUM), labeled: “*Aulacophora / nigripennis / Motsch / Japonia [y, h] // Holotypus [r, p]*”. This specimen was in bad condition. The head and thorax was lost. Only elytra, hind legs, and abdomen were attached to the pin.

Other specimens examined. **CHINA.** Fujian: 1♀, Houchai, 27.VI.2014, leg. Y.-T. Chung (TARI); 1♀, Shawu, Tachufung, 1–3.VI.1943, leg. T. C. Maa (BPBM); 1♀, same locality, 4–9.VI.1943, let. T. C. Maa (BPBM); Hong Kong: 1♂, Lantau, Tong Chung, 31.V.2008, leg. P. Aston (PAHC); Hubei: 1♂, Lichuan, Hsiaooh, 9.VIII.1948, leg. Gressitt & Djou (BPBM); 1♂, same locality, 11.VIII.1948, leg. Gressitt & Djou (BPBM); Sichuan: 1♂, Yachow to Mupin, 23–27.VI.1929, leg. D. C. Graham (BPBM); **JAPAN.** Aomori: 1♂, Fukaura, 11–13.VI.1999, leg. M. Hayashi (JBCB); **TAIWAN.** Hualien: 1♀, Huitouwan, 10.VII.207, leg. C.-F. Lee (TARI); 1♀, Juisui, 27.VI.2013, leg. Y.-T. Chung (TARI); Kaoshiung: 1♀, Maolin, 6.VII.2011, leg. M.-H. Tsou (TARI); 1♂, 1♀, Meinung, 14.XII.2012, leg. J.-C. Chen (TARI); 1♂, 28.XII.2012, leg. J.-C. Chen (TARI); 1♂, Takangshan, 9.IV.2013, leg. B.-X. Guo (TARI); Miaoli: 1♂, Tunglo, 25.III.2008, leg. H.-T. Shih (TARI); Pingtung: 1♂, Lilungshan, 2.III.2012, leg. J.-C. Chen (TARI); 1♂, same locality, 24.III.2014, leg. Y.-T. Chung (TARI); 1♂, same locality, 26.V.2014, leg. Y.-T. Chung (TARI); 1♂, 1♀, Mutan, 27.VII.2011, leg. J.-C. Chen (TARI); 1♀, Nanjenshan, 27.III–5.IV.2010, leg. M.-L. Jeng (TARI); 1♂, Peitawushan, 19.II.2014, leg. Y.-T. Chung (TARI); 1♀, Shouka, 25.II.2009, leg. C.-F. Lee (TARI); 1♀, same locality, 5.VI.2012, leg. Y.-T. Chung (TARI); 1♀, same locality, 28.II.2013, leg. B.-X. Guo (TARI); 1♂, 1♀, Tahanshan, 26.III.2013, leg. C.-F. Lee (TARI); 1♀, same locality, 25.V.2013, leg. Y.-T. Chung (TARI); 1♂, Taiwu, 27.III.2014, leg. Y.-T. Chung (TARI); 1♂, 2♀, Wutan, 5.VIII.2014, leg. Y.-T. Chung (RBCN); Tainan: 1♀, Meiling, 12.III.2011, leg. M.-L. Jeng (TARI); 1♂, same locality, 7.VI.2013, leg. B.-X. Guo (TARI); 1♀, same locality, 22.VI.2013, leg. W.-C. Liao (TARI); 1♀, Pichien trail, 22.III.2010, leg. U. Ong (TARI); Taipei: 1♀, Chinshan, 9.V.2008, leg. W.-T. Liu (TARI); 1♂, Chungchengshan, 17.II.2012, leg. S.-F. Yu (TARI); 2♀, Chuwei, 2006, leg. H.-T. Cheng (TARI); 1♂, Erhkoshan,



FIGURES 91–99. Diagnostic characters of *Aulacophora nigripennis* Motschulsky. 91. Antenna, male; 92. Antenna, female; 93. Penis, dorsal view; 94. Penis lateral view; 95. Gonocoxae; 96. Apex of abdominal ventrite V, female; 97; Abdominal ventrite VIII, male; 98. Abdominal tergite VIII, female; 99; Spermatheca.

26.XI.2006, leg. M.-H. Tsou (TARI); 1♂, Fengkueitsui, 29.VI.2007, leg. S.-F. Yu (TARI); 1♀, Guandu, 27.IV.2009, leg. H.-T. Cheng (TARI); 1♀, Kungliao, 24.IX.2009, leg. H. Lee (TARI); 2♂, 1♀, Taipei City Zoo, 13.XI.2006, leg. H.-T. Cheng (TARI); 1♀, Tatungshan, 3.IV.2008, leg. S.-F. Yu (TARI); 2♂, Tienhsiyuan, 15.IV.2011, leg. H. Lee (TARI); 1♂, 1♀, Wulai, 21.X.2006, leg. S.-F. Yu (TARI); 2♀, same locality, 26.V.2009, leg. C.-F. Lee (TARI); 1♀, same locality, 15.VIII.2010, leg. S.-P. Kao (TARI); Taitung: 1♀, Liyuan, 19.VI.2013, leg. C.-F. Lee (TARI); 2♂, 2♀, Motien, 5.X.2010, leg. C.-F. Lee (MNHUB); Taoyuan: 1♀, Houtzuhu, 6.IX.2011, leg. S.-F. Yu (TARI); 1♂, Hsiaowulai, 18.X.1007, leg. S.-F. Yu (TARI); 1♂, 1♀, same locality, 19.IV.2008, leg. S.-F. Yu (RBCN); 1♀, same locality, 19.IV.2008, leg. M.-H. Tsou (TARI); 1♀, Kaioi, 19.VI.2010, leg. H.-J. Chen (TARI); 1♀, Tungyanshan, 15.V.2010, leg. H. Lee (TARI).

Diagnosis. *Aulacophora nigripennis* is similar to *A. frontalis*, *A. lewisii*, *A. opacipennis*, and *A. palliata* with the black elytron but easily recognized by its black meso- and metathoracic ventrites and legs.

Males. Length 6.0–6.8 mm, width 3.3–3.9 mm. General color (Figs 77–78) black and shining except head, prothorax, scutellum, and abdomen yellowish brown, antenna dark brown but three basal antennomeres paled. Antenna (Fig. 91) filiform, antennomere I not enlarged; II apically enlarged ratio of length of antennomeres III to XI about 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 0.9 : 1.1; ratio of length to width from antennomere III to XI about 2.6 : 2.9 : 2.9 : 3.1 : 3.2 : 3.3 : 3.6 : 3.3 : 4.1. Apex of abdominal tergite VIII forming shallow notch (Fig. 97), weakly convex at middle; with several setae scattered on apical margin; base weakly sclerotized. Median lobe of abdominal ventrite V long and rectangular, with longitudinal ridge along lateral margin. Penis (Figs 93–94) wide, widest at apical 1/3, abruptly narrowed near apex, apex narrowly rounded; almost straight in lateral view, apex curved and apical margin truncate; tectum absent; endophallus with scattered stout setae, and with one longitudinal sclerite, apex curved and rounded, basally widened.

Females. Length 6.2–7.1 mm, width 3.5–4.2 mm. Similar to male (Fig. 79), but antennomeres II not enlarged (Fig. 92), III–V slender; ratio of length of antennomeres III to XI about 1.0 : 1.2 : 1.2 : 1.2 : 1.2 : 1.2 : 1.0 : 1.3; ratio of length to width from antennomere III to XI about 3.1 : 3.8 : 4.2 : 4.0 : 4.0 : 4.1 : 4.3 : 3.6 : 5.1. Apical margin of abdominal ventrite V (Fig. 96) emarginate, convex and acute at middle. Gonocoxae (Fig. 95) wide, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 98) weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with extremely dense short setae along apical margin, some short setae scatter near apex; spiculum short. Spermathecal receptaculum (Fig. 99) a little swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plants. Cucurbitaceae: *Trichosanthes cucumeroides* (Ser.) Maxim. ex Fr. & Sav., *Lagenaria siceraria* (Mol.) Standl.; Fabaceae: *Callerya reticulata* (Benth.) Schot.

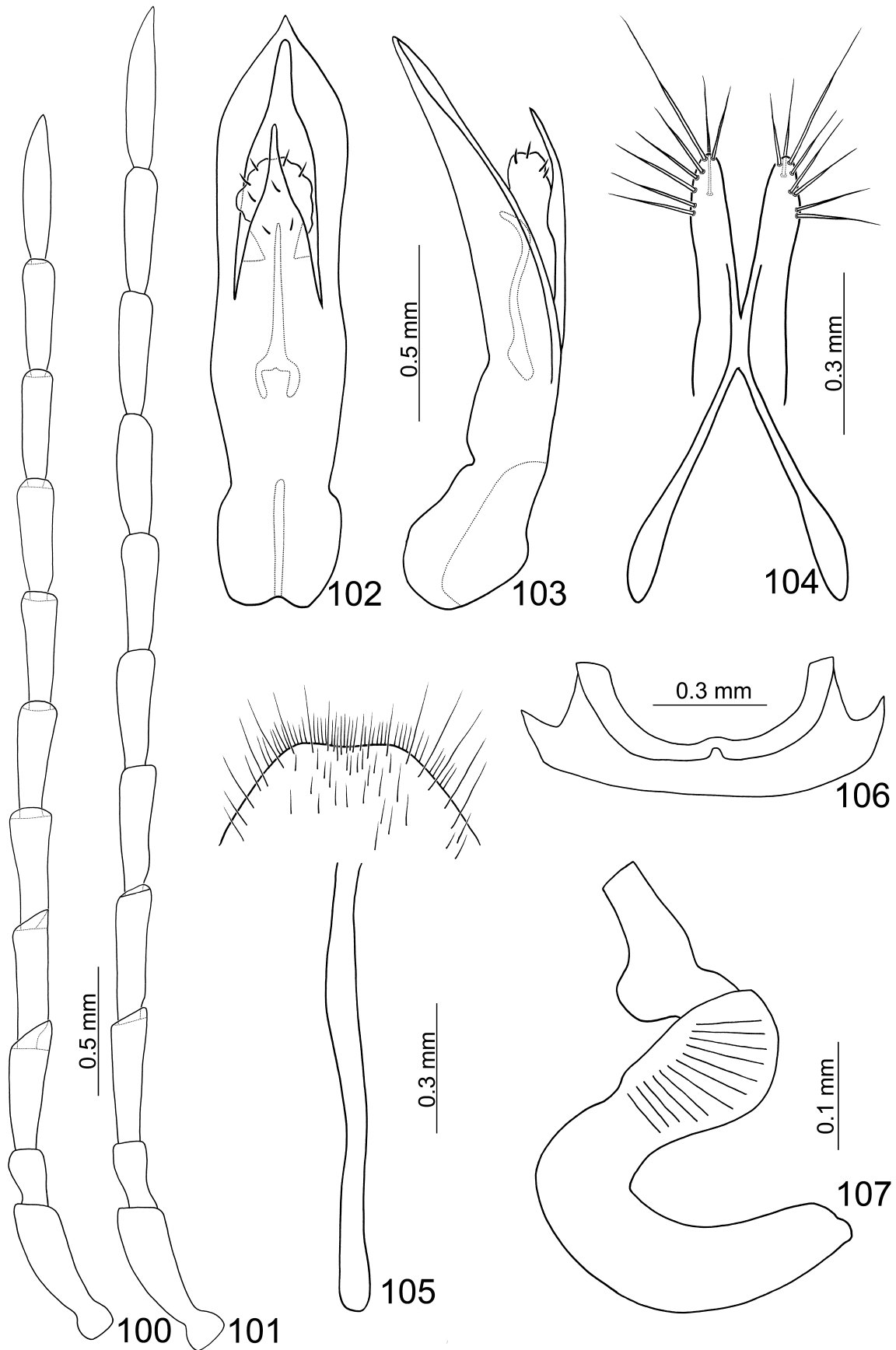
Distribution. China, Japan, South Korea, Taiwan.

Aulacophora opacipennis Chûjô, 1962

(Figs 80–81, 100–107)

Aulacophora opacipennis Chûjô, 1962: 98 (Taiwan).

Type material. Holotype ♂ (TARI), labeled: “Kuraru [= Kenting, in Pingtung] / 31-VII-1931 / Col. T. Shiraki // Ho / Type [w, p, round label, red letters and border, but faded out] // *Aulacophora* / *opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 2312 [w, p]”. Paratypes: 1♀ (TARI), labeled: “Kuraru / 31-VII-1931 / Col. T. Shiraki [w, p] // ALLO / Type [w, p, round label, gray letters and border] // *Aulacophora* / *opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 2312 [w, p]”; 3♂, 2♀ (TARI), labeled: “Kuraru / 31-VII-1931 / Col. T. Shiraki [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora* / *opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1463-1467 [w, p]”; 1♂, 1♀ (TARI), labeled: “KUARU (sic!) [h] / FORMOSA [p] / 20.VI.1937 [h] / COL. M. CHUJO [w, p] // Para / Type [w, p, round label, green letters and border] // *Aulacophora* / *opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1468 & 1470 [w, p]”; 1♀ (TARI), labeled: “Shiigo [= Maopu] Chikuto [= Chutung] / SHINCHIKU [= Hsinchu] / -27-30.VI.1930 / Col. M. CHUJO [w, p] // Para / Type [w, p, round label, green letters and border] // *Aulacophora* / *opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1469 [w, p]”; 1♂ (TARI), labeled: “Shizyukei (= Suchungchi, in Pingtung) / 1-VIII-1931 / Col. T. Shiraki [w, p] // Para / Type (w, p, round label,



FIGURES 100–107. Diagnostic characters of *Aulacophora opacipennis* Chûjô. 100. Antenna, male; 101. Antenna, female; 102. Penis, dorsal view; 103. Penis lateral view; 104. Gonocoxae; 105. Abdominal ventrite VIII, female; 106. Abdominal tergite VIII, male; 107. Spermatheca.

green letters and border) // *Aulacophora opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1462 [w, p]"; 1♀ (TARI), labeled: "HEITOU [= Pingtung City] / 22.V.1939 / Y.MIWA [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1461 [w, p]"; 1♀ (TARI), labeled: "Formosa / Shinchiku (= Hsinchu), -18. / VII 1-30. / J. Sonan, [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1460 [w, p]"; 1♂ (TARI), labeled: "7.VI.1914 / Taitô (= Taitung) [h] / Col. I. Nitobe [w, p] // Para / Type (w, p, round label, green letters and border) // *Aulacophora opacipennis* / Chûjô [h] / DET. M. CHUJO [w, p] // 1460 [w, p]".

Other specimens examined. TAIWAN. Hsinchu: 2♂, 3♀, Wufeng, 14–16.VII.1982, leg. K. C. Chou & C. C. Pan (TARI, BMNH); Ilan: 1♂, Mt. Taiheizan (= Taipingshan), 23.VII.1940, leg. M. Chujo (TARI); Pingtung: 1♀, Sheting, 4.XI.2009, leg. M.-H. Tsou (RBCN); 1♂, Suchunghsi, 13.V.2013, leg. Y.-T. Chung (RBCN).

Diagnosis. *Aulacophora opacipennis* is similar to *A. apicipes* with yellowish brown body, and black and opaque elytron but *A. opacipennis* is easily separated from *A. apicipes* by the yellowish brown legs and black elytron (black tibia and tarsi, yellow apical margin of elytron in *A. apicipes*).

Males. Length 6.2 mm, width 3.1 mm. General color (Figs 80–81) yellowish brown except elytron black and opaque. Antenna (Fig. 100) filiform, antennomere I not enlarged, apico-lateral angles of antennomeres III–IV produced anteriorly; ratio of length of antennomeres III to XI about 1.0 : 1.2 : 1.1 : 1.1 : 1.1 : 1.1 : 1.1 : 1.1 : 1.5; ratio of length to width from antennomere III to XI about 2.7 : 3.3 : 2.7 : 2.7 : 2.9 : 3.2 : 3.5 : 3.7 : 5.4. Abdominal tergite forming notch (Fig. 106), weakly convex at middle; base weakly sclerotized. Median lobe of fifth abdominal ventrite rectangular, with median longitudinal ridge represented from middle extending beyond base, median longitudinal internal ridge well developed; disc depressed at apical area. Penis (Figs 102–103) wide, abruptly narrowed from apical 1/6 to apex, apex pointed, less widened at basal 2/5; curved in lateral view; tectum well sclerotized, apex pointed, abruptly widened at basal 1/3, lateral margin with triangular sclerite recurved at basal 1/3; endophallus with several stout setae scattered, and with one longitudinal sclerite, apex recurved and rounded, basally widened.

Females. Length 7.5–7.9 mm, width 3.9–4.3 mm. Similar to male, but antenna more slender (Fig. 101), and apico-lateral angles of antennomeres III–IV less produced anterior; ratio of length of antennomeres III to XI about 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 0.9 : 0.9 : 0.9 : 1.0; ratio of length to width from antennomere III to XI about 3.7 : 3.8 : 4.2 : 4.2 : 4.2 : 4.2 : 4.4 : 4.2 : 5.5. Apical margin of abdominal ventrite V truncate. Gonocoxae (Fig. 104) slender, apex of each gonocoxa with eight setae from apical 1/6 to apex; gonocoxae connected at middle, base widened. Ventrite VIII (Fig. 105) weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with dense short setae inside and along apical margin, and with extremely long setae near apical margin; spiculum short. Spermathecal receptaculum (Fig. 107) a little swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, and strongly curved, shallowly projecting into receptaculum.

Host plant. Unknown.

Distribution. Endemic to Taiwan.

Aulacophora palliata (Schaller, 1783)

(Figs 108–110, 112–120)

Chrysomela palliata Schaller, 1783: 279 (India: Malayalam).

Crioceris palliata: Fabricius, 1787: 87.

Cryptocephalus palliatus: Gmelin, 1890: 1718.

Galleruca palliata: Fabricius, 1792: 22.

Galeruca palliata: Olivier, 1808: 625.

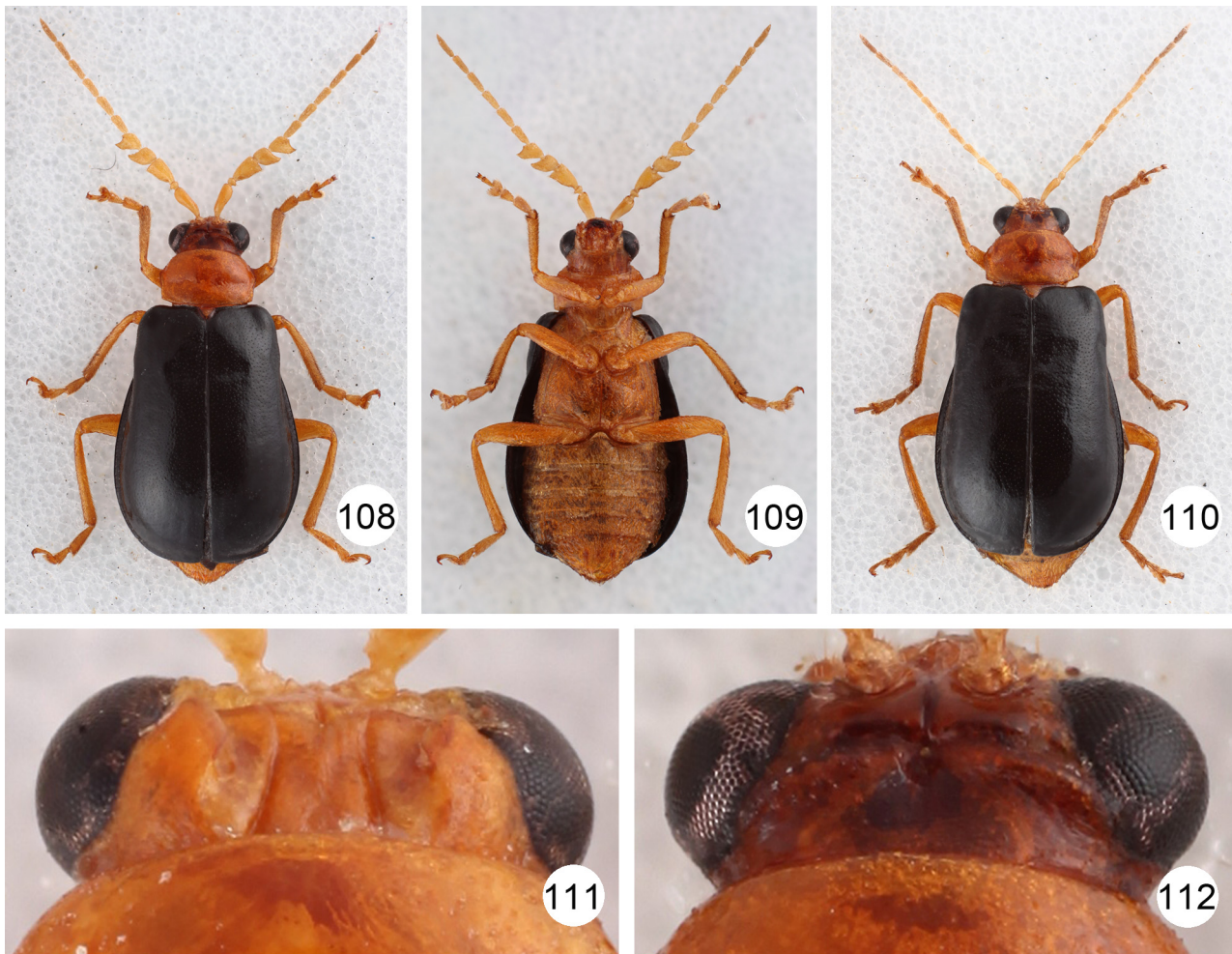
Aulacophora palliata: Jacoby, 1884: 41; Baly, 1888: 180 (India, Malaysia); Jacoby, 1889: 206 (Burma); Duvivier, 1892: 430 (India: Konbir); Weise, 1892: 398 (Sunda islands); Maulik, 1936: 182 (redescription); Chen & Kung, 1959: 375 (China: Yunnan, Hainan); Chûjô, 1962: 94 (Taiwan); Gressitt & Kimoto, 1963: 490 (China: Hainan, Guangdong; Vietnam); Barroga & Mohamedsaid, 2002: 138 (Indonesia: Buru island); Aston, 2009: 13 (China: Hong Kong).

Orthaulaca (Ceratia) palliata: Weise, 1892: 398.

Aulacophora (Ceratia) palliata: Laboissière, 1929: 258 (Vietnam); Chûjô, 1935c: 160 (Taiwan).

Ceratia palliata: Miwa, 1931: 189 (Taiwan).

Type material. Schaller's collection does no longer exist. It was lost in "Waisenhaus Halle".

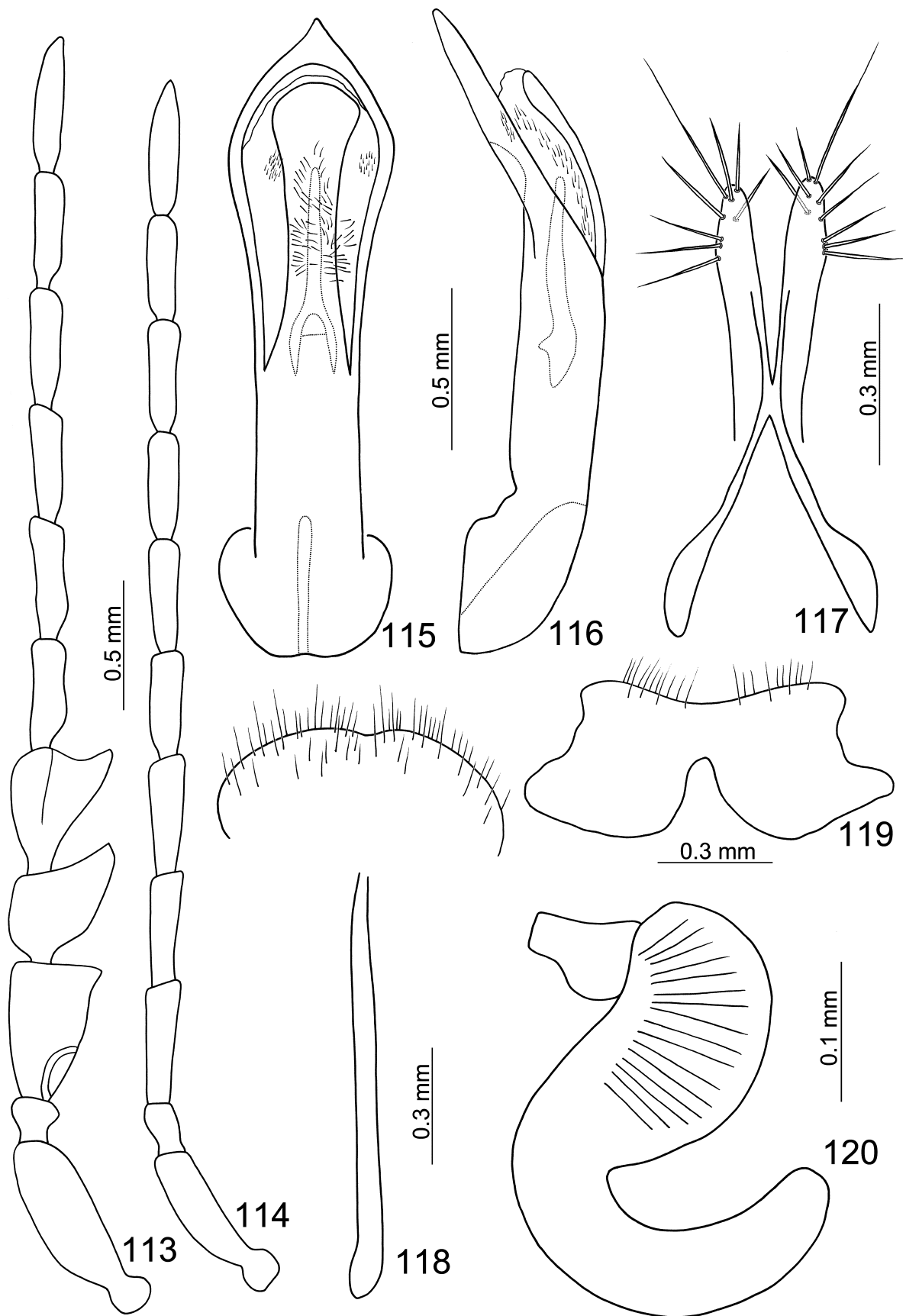


FIGURES 108–112. Habitus of *Aulacophora* species. 108. *A. palliata*, male, dorsal view; 109. Ditto, ventral view; 110. *A. palliata*, female, dorsal view; 111. Head of *A. frontalis*, male; 112. Head of *A. palliata*, male.

Other specimens examined. CHINA. Guandong: 1♂, V.–VII.1911, leg. S. V. Mell (BPBM); Hong Kong: 1♂, 1♀, Lantau, Pui O., 27.V.2008, leg. P. Aston (PAHC); INDONESIA. Java: 2♂, 2♀, leg. Harsfield, 60-15 (BMNH); 2♂, 2♀, Noesa Kembangan, leg. Drescher (MNHUB); TAIWAN. Miaoli: 1♂, Sanyi, 6.VII.2013, Y.-T. Chung (TARI); Kaoshiung: 1♂, Meinung, 14.XII.2012, leg. J.-C. Chen (TARI); 1♂, Tengchih, 4.VIII.2012, leg. J.-C. Chen (TARI); Pingtung: 1♂, Lilungshan, 15.VIII.2009, leg. S.-F. Yu (TARI); 1♂, same locality, 23.XII.2009, leg. J.-C. Chen (TARI); 1♂, Nanjenhu, 15.III.2010, leg. M.-H. Tsou (TARI); 1♂, Peitawushan, 18.VI.2012, leg. J.-C. Chen (TARI); 1♂, 13.VIII.2013, leg. Y.-T. Chung (TARI); 1♂, same locality, 28.V.2014, leg. Y.-T. Chung (TARI); 1♂, Shouka, 13.VI.2013, Y.-T. Chung (TARI); 1♂, Shuangliu, 19.VII.2007, leg. S.-F. Yu (TARI); 4♂, 1♀, Tahanshan, 19.XI.2012, leg. J.-C. Chen (TARI); 5♂, 1♀, same locality, 15.XI.2013, leg. Y.-T. Chung (TARI); 5♂, 4♀, Wutan, 5.VIII.2014, leg. Y.-T. Chung (BMNH, RBCN); Tainan: 1♂, Tanei, 25.VI.2007, leg. Y.-C. Chang (TARI); 1♂, Tungshan, 14.III.2010, leg. M.-H. Tsou (TARI); Taipei: 1♂, Chungchengshan, 16.IX.2011, leg. S.-F. Yu (TARI); 1♀, same locality, 9.X.2011, leg. M.-H. Tsou (TARI); Taitung: 5♂, 2♀, Yanping logging trail, 19.X.2012, leg. J.-C. Chen (MNHUB).

Diagnosis. See diagnosis of *Aulacophora frontalis*.

Males. Length 6.0–6.6 mm, width 3.1–3.5 mm. General color (Figs 108–108) yellowish brown except elytron black and shining. Vertical area of head with a strongly thickened transverse ridge on each side (Fig. 112). Antenna (Fig. 113) filiform, antennomere I a little swollen; III triangular, with semicircle groove at outer baso-lateral angles; IV and V extremely widened; V with longitudinal groove on lateral expansion, groove without setae; ratio of length of antennomeres III to XI about 1.0 : 0.8 : 0.9 : 0.8 : 0.9 : 0.8 : 0.9 : 0.8 : 1.0; ratio of length to width from antennomere III to XI about 1.6 : 0.9 : 1.2 : 3.1 : 3.5 : 3.3 : 3.4 : 3.8 : 4.8. Apex of abdominal tergite VIII weakly emarginate at middle (Fig. 119), apical margin with several setae; base weakly sclerotized. Median lobe of fifth



FIGURES 113–120. Diagnostic characters of *Aulacophora palliata* (Schaller). 113. Antenna, male; 114. Antenna, female; 115. Penis, dorsal view; 116. Penis lateral view; 117. Gonocoxae; 118. Abdominal ventrite VIII, female; 119. Abdominal tergite VIII, male; 120. Spermatheca.

abdominal ventrite short and rectangular, disc flat and without longitudinal grooves, apical margin weakly emarginate at middle. Penis (Figs 115–116) abruptly widened at apical 1/5, apex pointed; almost straight in lateral view but curved at apical 1/5; ventral surface depressed at middle of apical 1/5; tectum well sclerotized, apex widened; endophallus with dense, irregularly arranged setae, and with one longitudinal sclerite, apex rounded, basally widened and bifurcate.

Females. Length 6.8–7.7 mm, width 3.2–4.4 mm. Similar to male (Fig. 110), but transverse ridge on vertical area absent; antenna filiform and not modified (Fig. 114), ratio of length of antennomeres III to XI about 1.0 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 0.9 : 1.1; ratio of length to width from antennomere III to XI about 3.2 : 3.2 : 3.3 : 3.0 : 3.7 : 3.6 : 3.7 : 3.5 : 4.5. Apical margin of abdominal ventrite V not modified, rounded. Gonocoxae (Fig. 117) slender, apex of each gonocoxa with eight or nine setae from apical 1/6 to apex; gonocoxae connected at middle, base widened. Ventrite VIII (Fig. 118) weakly sclerotized; apex wide, apical margin a little emarginate at middle, surface with dense short setae along apical margin, and several long setae scattered at apical area; spiculum short. Spermathecal receptaculum (Fig. 120) swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plants. Cucurbitaceae: *Trichosanthes cucumeroides* (Ser.) Maxim. ex Fr. & Sav., and *T. ovigera* Bl. (present study).

Distribution. Burma, China, India, Indonesia, Malaysia, Taiwan, Vietnam.

***Aulacophora tibialis* Chapuis, 1876**

(Figs 121–126, 129–136)

Galleruca bicolor Weber, 1801: 56 (part).

Aulacophora tibialis Chapuis, 1876: 99 (Philippines: Mindoro, Luzon); Barroga and Mohamedsaid, 2002: 147 (as synonym of *ritsemae*); Barroga, 2002b: 185 (corrected as valid name).

Aulacophora ritsemae Duvivier, 1884: 121 (Borneo; Indonesia: Java, Sumatra); Barroga & Mohamedsaid, 2002: 147 (Malaysia).

Aulacophora semifusca Jacoby, 1892: 942 (Burma); Maulik, 1936: 192 (redescription); Kimoto, 1989: 62 (Thailand, Laos, Vietnam); Mohamedsaid, 1994: 385 (Malaysia); Mohamedsaid, 2000: 349 (Malaysia); Barroga & Mohamedsaid, 2002: 147 (as synonym of *ritsemae*); Mohamedsaid & Constan 2007: 166 (Thailand); Barroga & Mohamedsaid, 2002: 147 (as synonym of *ritsemae*).

Aulacophora terminata Jacoby, 1899: 284 (Indonesia: Sumatra); Barroga & Mohamedsaid, 2002: 147 (as synonym of *ritsemae*).

Aulacophora dohrni Jacoby, 1899: 285 (Indonesia: Sumatra); Barroga & Mohamedsaid, 2002: 147 (as synonym of *ritsemae*).

Aulacophora almora Maulik, 1936: 170 (India); Kimoto, 1989: 62 (as synonym of *semifusca*).

Aulacophora similis: Chen & Kung, 1959: 376 (misidentification; China: Zhejiang, Fujian, Sichuan, Yunnan); Gressitt & Kimoto, 1963: 484 (as synonym of *almora*; China: Guandong, Hainan).

Aulacophora simplex Chûjô, 1962: 78 (Taiwan); Kimoto, 1966: 28 (as synonym of *almora*).

Type material. *Galleruca bicolor*: one paralectotype ♂ (KIEL), here designated, labeled: “Weber / bicolor. / 1723 [w, h] // bico / lor [w, h] // *Aulacophora ritsemae* Duviv. / det. by G.F. Barroga, 1999. [w, p]”. This specimen is similar to the lectotype of *A. bicolor* in dorsal view with yellow apex on the black elytron. However, its yellow meso- and metathoracic and abdominal ventrites differs from *A. bicolor* with black meso- and metathoracic and abdominal ventrites. It is no doubt attributed to specimens of *A. ritsemae* collected from Java.

Aulacophora ritsemae: holotype ♀ (RMNH), labeled: “Dr. B. Hagen. / Tandjong Morawa. / Serdang / (N. O. Sumatra). [w, p] // *Aulacophora / ritsemae*, Duv. / type [w, h] // ♀ [w, p] // Type [r, p]”.

Aulacophora semifusca: lectotype ♀ (BMNH), here designated, labeled: “Type / H. T. [w, p, round label with red border] // Carin Chebà / 900–1100 m / L. Fea V VII-88 [w, p] // Jacoby Coll. / 1909-28a [w, p] // *Aulacoph. / semifusca* / Jac. [b, h] // SYN- / TYPE [w, p, round label with blue border]”. Paralectotypes: 1 ♂ (MCSN), labeled: “Carin Chebà / 900–1100 m / L. Fea V VII-88 [w, p] // *semifusca* / Jac. [w, h] // *Aulacophora / semifusca* / Jac. [b, h] // SYNTYPUS [p] / *Aulacophora / semifusca* / Jacoby, 1892 [r, h] // Museo Civico / di Genova [w, p]”; 1 ♀ (MCSN): “Carin Chebà / 900–1100 m / L. Fea V VII-88 [w, p] // SYNTYPUS [p] / *Aulacophora / semifusca* / Jacoby, 1892 [r, h] // Museo Civico / di Genova [w, p]”.

Aulacophora terminata: lectotype ♂ (BMNH), designated by Barroga and Mohamedsaid (2002), labeled: “Dohrn / Sumatra / Soekaranda [w, p] // H. T. [w, p, round label with red border] // Jacoby Coll. / 1909-28a [w, p] //

/ *Aulacophora* / *terminata* / Jac. [b, h] // Syntype. / *A. terminata* / Jac [w, h] // LECTOTYPE [p] / *Aulacophora* / *terminata* Jacoby [h] / des. G. Barroga, 2000 [w, p]". Paralectotype: 1♀ (BMNH), labeled: "Dohrn / Sumatra/ Soekaranda [w, p] // Jacoby Coll. / 1909-28a [w, p] // Syntype. / *A. terminata* / Jac [w, h] // PARALECTOTYPE / *Aulacophora* / *terminata* Jacoby [h] / des. G. Barroga, 2000 [w, p]".

Aulacophora dohrni: lectotype ♂ (BMNH), here designated, labeled: "Dohrn / Sumatra/ Soekaranda [w, p] // Jacoby Coll. / 1909-28a [w, p] // *Aulacophora* [p] / dohrni Jac. [h] / det. G. Barroga, 2001 [w, p] // SYN- / TYPE [w, p, round label with blue border]". Paralectotypes: 1 (BMNH, abdomen lost, sex undetermined), labeled: "Dohrn / Sumatra/ Soekaranda [w, p] // Type / H. T. [w, p, round label with red border] // Jacoby Coll. / 1909-28a [w, p] // *Aulacophora*. / *Dohrni* Jac. [b, h] // Syntype / *A. dohrni* / Jacoby [w, h] // SYN- / TYPE [w, p, round label with blue border]".

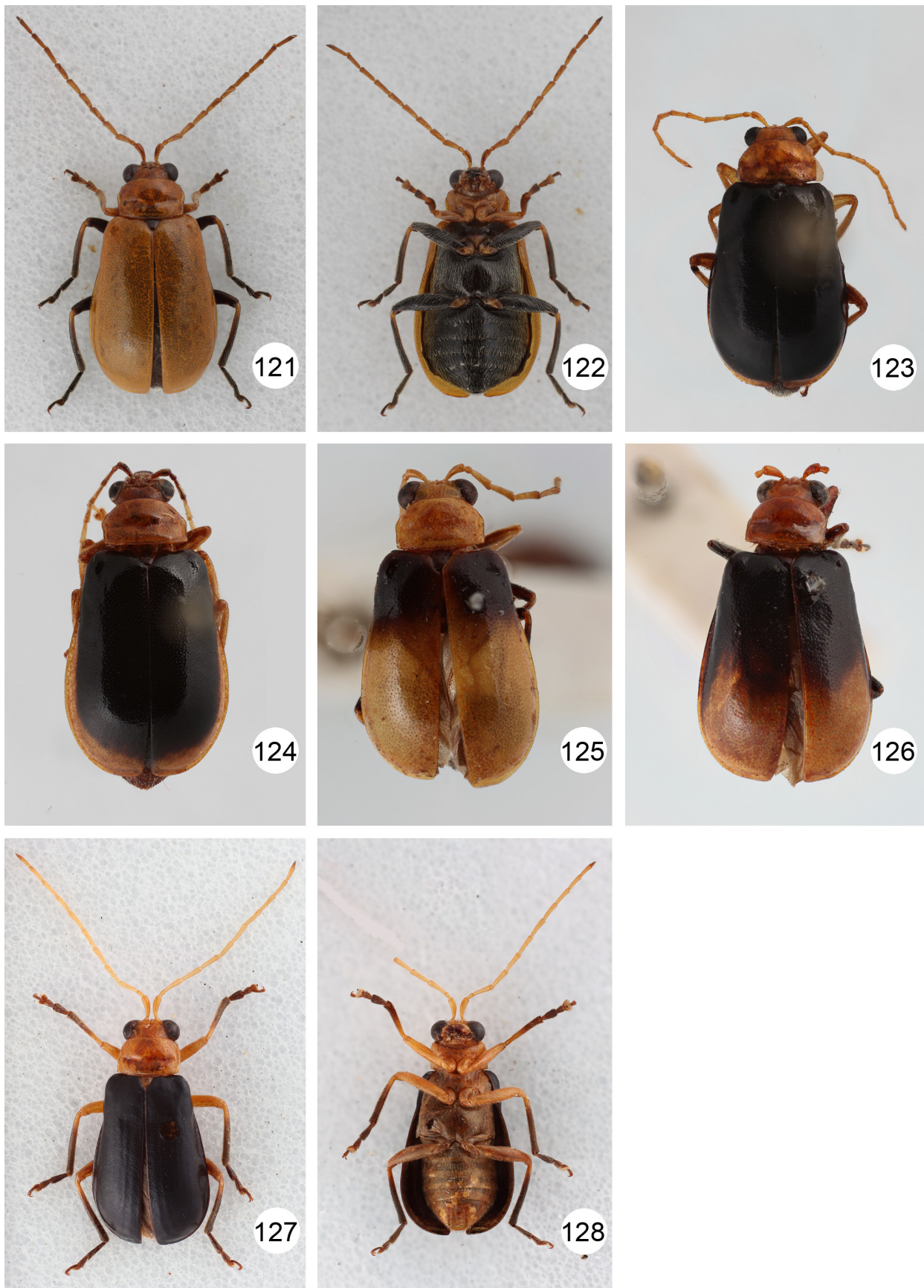
Aulacophora tibialis: Chapuis's types were originally deposited at the IRSB. They were studied and borrowed by Barroga and Mohamdsaid (2002), and lost during return of the specimens (Limbourg personal communication).

Aulacophora almora: lectotype ♀ (BMNH), here designated, labeled: "W. Almora / Kumaon / India. H.G.C. [w, h] // Type [w, p, round label with red border] // *Aulacophora* / *almora* Maulik [h] / des. S. Maulik 1933. [w, p] / Brit. Mus. / 1939-[p] 149 [w, h] // SYN- / TYPE [w, p, round label with blue border]". Paralectotypes: 1♀ (BMNH), labeled: "Ranikhet, / Kumaon, / India. H.G.C. [w, p] // *Aulacophora* / *almora* Mlk [h] / S. Maulik det. [p] / paratype 1936. [w, h] // SYN- / TYPE [w, p, round label with blue border]"; 1♂ (BMNH), labeled: "Haldwani Dist. / Kumaon, / India. H.G.C. [w, p] // *Aulacophora* / *almora* Mlk [h] / S. Maulik det. [p] / paratype 1936. [w, h] / SYN- / TYPE [w, p, round label with blue border]"; 1♂ (BMNH), labeled: "Sarju Valley, / Kumaon, 4000ft. / India. H.G.C. / *Aulacophora* / *almora* Mlk [h] / S. Maulik det. [p] / paratype 1936. [w, h] // SYN- / TYPE [w, p, round label with blue border]".

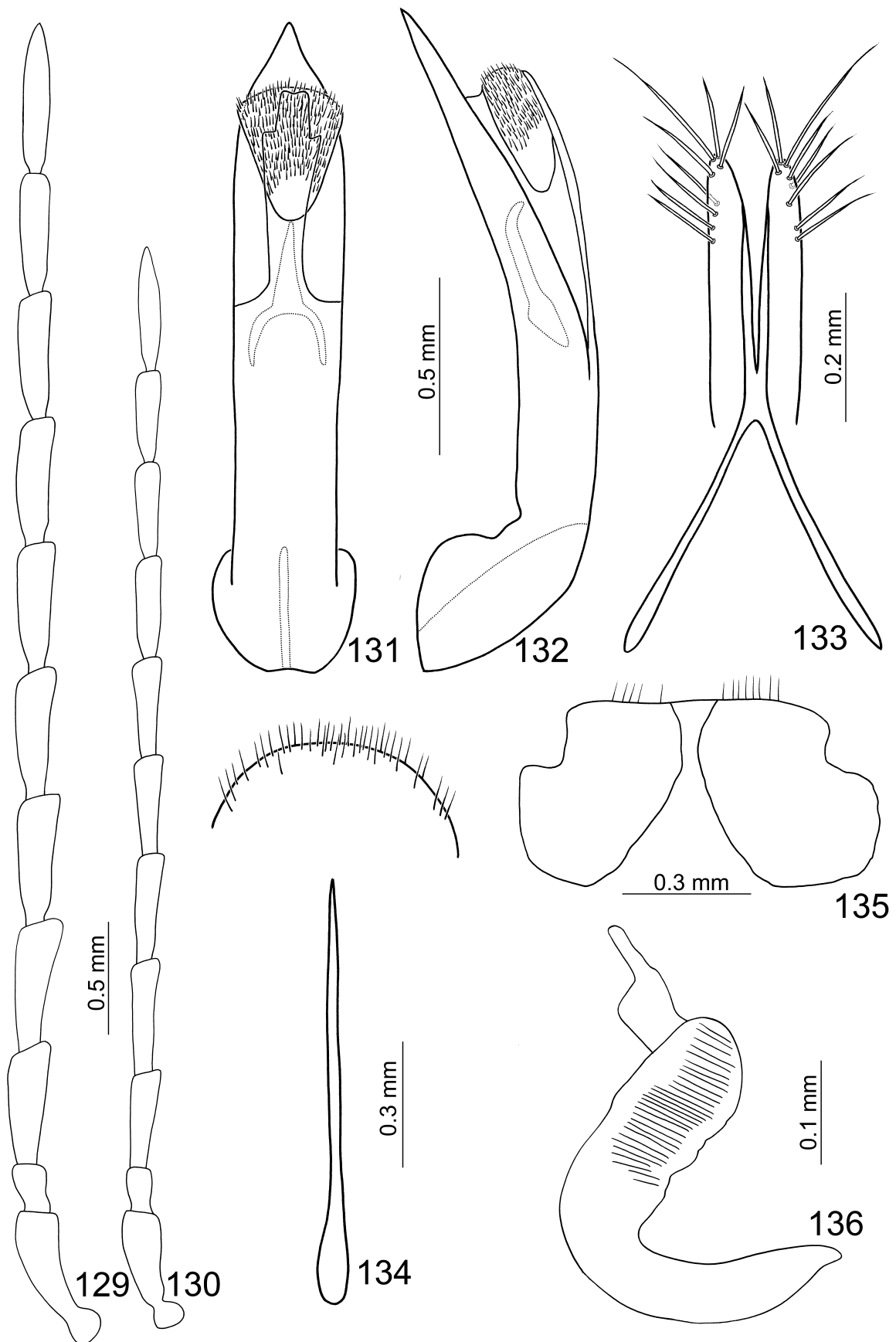
Aulacophora simplex: holotype ♂ (TARI), labeled: "URAI [h] [= Wulai, in Taipei] / FORMOSA [p] / 20.IV.1930 [h] / COL. M. CHUJO [w, p] // Ho / Type [w, p, round label, red letters and border, but faded out] // *Aulacophora* / *simplex* / CHÛJÔ [h] / DET. M. CHUJO [w, p] // 2371 [w, p]". Paratypes: 1♀ (TARI), labeled: "URAI [h] [= Wulai, in Taipei] / FORMOSA [p] / 18.IX.1932 [h] / COL. M. CHUJO [w, p] // ALLO / Type [w, p, round label, gray letters and border] // *Aulacophora* / *simplex* / CHÛJÔ [h] / DET. M. CHUJO [w, p] // 2370 [w, p]"; 1♀ (TARI), labeled: "Formosa / Miwa [w, p] // Fushan [written in Japan] / 22.7.1929 [w, h] [on the back] // Para / Type [w, p, round label, green letters and border] // *Aulacophora* / *simplex* / CHÛJÔ [h] / DET. M. CHUJO [w, p] // 1428 [w, p]"; 1♀ (TARI), labeled: "Formosa / Karenko [= Hualien], -19. / VII 20–VIII 4. / T. Okuni, [w, p] // Para / Type [w, p, round label, green letters and border] // *Aulacophora* / *simplex* / CHÛJÔ [h] / DET. M. CHUJO [w, p] // 1427 [w, p]".

Other specimens examined. CHINA. Fujian: 1♀, Chishui, 20.VI.2014, leg. Y.-T. Chung (TARI); 3♀, Houchai, 25–27.VI.2014, Y.-T. Chung (TARI); 1♀, Shangzhai, 1.VII.2014, leg. Y.-T. Chung (TARI); 1♀, Shaowu, Tachulan, 10.VI.1942, leg. T. Maa (BPBM); 1♂, same locality, 18.VI.1942, leg. T. Maa (BPBM); 1♂, same locality, 9.XI.1942, leg. T. Maa (BPBM); **INDIA.** Meghalaya: 4♂, 2♀, 3 km E of Tura, 15–22.IV.1999, leg. J. Rolčík (JBCB); **INDONESIA.** Sumatra: 2♂, 3♀, Lampung prov., Bukit Barisan Selatan N. P., 5 km SW of Liwa, 7–17.II.2000, leg. J. Bezdě, (JBCB); 11♂, 1♀, Noesa Kembangan, leg. Drescher (MNHUB); Java: 2♂, 1♀, 1909-28a, leg. Jacoby (BMNH); 1♂, 2♀, leg. Haus. (MNHUB); 1♀, leg. Horsfield (BMNH); 1♂, Malang (MNHUB); **LAOS.** 1♂, Ban Van Eue, SE of Phou Kow Kuei, 13.IV.1965, leg. J. L. Gressitt (BPBM); 2♀, same locality, 1–15.V.1965, leg. J. A. Rondon (BPBM), 1♀, same locality, 15–31.V.1965, leg. native collector (BPBM); 1♂, Phongsaly prov., 10 km SE of Boun Tai, 16–25.V.2004, leg. native collector (JBCB); 1♂, Sayaboury, 15.IV.1965, leg. J. L. Gressitt (BPBM); 1♂, Uekinak, nr. PakKading, 22.IV.1965, leg. J. L. Gressitt (BPBM); **MALAYSIA.** Pahang: 1♂, 1902-220, (Craddock), leg. Bingham (BMNH); **TAIWAN.** Taipei: 3♂, 2♀, Wulai, 7.VIII.2009, leg. M.-H. Tsou (RBCN, TARI); 1♂, same locality, 6.IX.2014, leg. M.-H. Tsou (TARI); Taoyuan: 1♂, Fuhsing, 15.VII.2009, leg. H.-J. Chen (TARI); **THAILAND.** Chiangmai: 1♂, Doi Suthep, 28–31.III.1958, leg. T. C. Maa (BPBM); Mae Hong Son: 1♂, San Huai Po, 9–16.V.1991, leg. L. Dembický (JBCB); **VIETNAM.** 1♀, BanMeThaot, 16–18.V.1960, L. W. Quate (BPBM); 1♀, Blao (Balao), 14–21.X.1960, leg. C. M. Yoshimoto (BPBM).

Diagnosis. Specimens of *Aulacophora tibialis* with the yellow elytra are similar to *A. abdominalis* and *A. indica* but without sexually secondary characters and scutellum blackish brown. Those with the black base of the elytron are similar to *A. bicolor* but lack the pair of small yellow spots at base.



FIGURES 121–128. Habitus of *Aulacophora* species. 121. *A. tibialis*, Taiwan, male, dorsal view; 122. Ditto, ventral view; 123. *A. tibialis*, Vietnam, female, dorsal view; 124. *A. tibialis*, Java, female, dorsal view; 125. Lectotype of *A. dohrni*, dorsal view; 126. Paralectotype of *A. dohrni*, dorsal view; 127. *A. apicipes*, male, dorsal view; 128. Ditto, ventral view.



FIGURES 129–136. Diagnostic characters of *Aulacophora tibialis* Duvivier. 129. Antenna, male; 130. Antenna, female; 131. Penis, dorsal view; 132. Penis lateral view; 133. Gonocoxae; 134. Abdominal ventrite VIII, female; 135. Abdominal tergite VIII, male; 136. Spermatheca.

Males. Length 6.3–7.0 mm, width 3.3–3.6 mm. General color (Figs 121–122) yellowish brown but meso- and metathoracic and abdominal ventrites black or blackish brown, middle and hind legs blackish brown but base of tibia yellowish brown; outer margins of tibia, and tarsi of front legs dark brown; scutellum and labrum black; antenna dark brown except two basal antennomeres yellowish brown. Antenna (Fig. 129) filiform and slender, antennomere I not enlarged; ratio of length of antennomeres III to XI about 1.0 : 1.0 : 1.1 : 1.1 : 1.1 : 1.1 : 1.0 : 1.3; ratio of length to width from antennomere III to XI about 2.8 : 2.9 : 3.1 : 3.2 : 3.3 : 3.4 : 3.7 : 3.9 : 5.5. Apex of abdominal tergite VIII truncate (Fig. 135), with several short setae along apical margin; base weakly sclerotized. Median lobe of fifth abdominal ventrite small and rectangular, disc flat. Penis (Figs 131–132) slender, parallel-sided, abruptly narrowed at apical 1/7 and apically tapering, apex pointed; moderately curved from middle to apex in lateral view; tectum well sclerotized, apex weakly emarginate, sides parallel from apex to apical 1/4, with angular process at apical 1/4; endophallus with dense setae on endophallic sac, and with one longitudinal sclerite, apically tapering, curved at apical 1/3 in lateral view, basally widened.

Females. Length 6.5–6.8 mm, width 3.5–3.7 mm. Similar to male, but antennomeres III–V more slender (Fig. 130); ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.1 : 1.0 : 1.0 : 1.0 : 1.0 : 0.9 : 1.3; ratio of length to width from antennomere III to XI about 3.2 : 3.6 : 3.8 : 3.4 : 3.4 : 3.7 : 3.5 : 3.6 : 5.5. Apical margin of abdominal ventrite V rounded. Gonocoxae (Fig. 133) slender, apex of each gonocoxa with eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII (Fig. 134) weakly sclerotized; apex narrow, apical margin widely rounded, with dense short setae along apical margin; spiculum short. Spermathecal receptaculum (Fig. 136) a little swollen; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Variation. Specimens with yellow elytra occur in Taiwan, China, and Indochina, of which all but Fujian (China) and Taiwan have yellow legs. Few specimens of Indochina have blackish brown elytra with narrow yellow apical margin (Fig. 123). Most of specimens collected from Indonesia have black elytra with yellow apical margin and extending into middle or basal 1/3 (Fig. 124), and thoracic and abdominal ventrite yellowish brown. Few specimens have yellow elytra with basal 1/3 (Fig. 125) or half black (Fig. 126), thoracic and abdominal ventrites blackish brown.

Host plants. Flowers of *Lablab purpureus* (L.) Sweet (Fabaceae) and *Cucurbita moschata* (Duch.) Poir. (Cucurbitaceae) (present study).

Distribution. Myanmar, China, India, Indonesia, Laos, Malaysia, Philippines, Taiwan, Thailand, Vietnam.

Species excluded from Taiwan fauna

Aulacophora apicipes Jacoby, 1896

(Figs 127–128, 137–144)

Aulacophora apicipes Jacoby, 1896: 138 (Indonesia: Mentawai islands); Barroga & Mohamedsaid, 2002: 46 (Malaysia, Indonesia: Sumatra, Java).

Aulacophora tenuicincta Jacoby, 1897: 406 (Indonesia: Batu islands); Barroga & Mohamedsaid, 2002: 46 (as synonym of *apicipes*).

Aulacophora nigripalpis Chen & Kung, 1959: 378 (China: Yunnan). **New synonym**

Aulacophora opacipennis: Kimoto, 1989: 61 (Thailand, Laos). **Misidentification**

Type material. *Aulacophora apicipes*: lectotype ♂ (MCSN), here designated, labeled: “Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // SYNTYPUS [p] / *Aulacophora apicipes* / Jacoby, 1896 [r, h] // Museo Civico / di Genova [w, p]”. Paralectotypes: 2♀ (MCSN), labeled: “Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // SYNTYPUS [p] / *Aulacophora apicipes* / Jacoby, 1896 [r, h] // Museo Civico / di Genova [w, p]”; ♂ (BMNH), labeled: “Type / H. T. [w, p, round label with red border] // Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // Jacoby Coll. / 1909-28a [w, p] // *A. apicipes* / Jac. [b, h] // SYN- / TYPE [w, p, round label with blue border]”; 1♀ (BMNH), labeled: “Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // Museo Civ. / Genova [y, p] // Jacoby Coll. / 1909-28a [w, p] // SYN- / TYPE [w, p, round label with blue border]”; 1♂, 1♀ [still mating and glued on the same card] (MCSN), labeled: “Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // Typus [w, p, red letter, with red border] // *apicipes* / Jac. [w, h] // *Aulacophora apicipes* Jac [b, h] // SYNTYPUS [p] / *Aulacophora apicipes* /

Jacoby, 1896 [r, h] // Museo Civico / di Genova [w, p]"; 1♂ (MNHUB), labeled: "Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // *apicipes* / Jac. / Type. [w, h] // SYNTYPUS / Aulacophora / apicipes Jacoby, 1896 / labelled by MNHUB 2014 [r, p]"; 1♂ (MNHUB), labeled: "Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // SYNTYPUS / Aulacophora / apicipes Jacoby, 1896 / labelled by MNHUB 2014 [r, p]"; 1♂ (MCZC), labeled: "Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // 209 [w, p] // Aul. / apicipes / n. sp. Jac. [w, h] // Type [p] / 17554 [r, h]".

Aulacophora tenuicincta: lectotype ♂ (BMNH), here designated, labeled: "SOLE BATU / 1896-97 / H. Raap [w, p] // Jacoby Coll. / 1909-28a [w, p] // Syntype. / *A. tenuicincta* / Jac. [w, h] // ♂ [w, p] // MCZ [y, h] // SYN- / TYPE [w, p, round label with blue border]". Paralectotypes: 1♂ (BMNH), labeled: "Mentawai / Sipora / Sereinu V–VI, 94 / Modigliani [w, p] // Jacoby Coll. / 1909-28a [w, p] // Syntype. / *A. tenuicincta* / Jac. [w, h] // SYN- / TYPE [w, p, round label with blue border]"; 1♀ (BMNH), labeled: "Mentawai / Si Oban IV–VIII / Modigliani 94 [w, p] // Jacoby Coll. / 1909-28a [w, p] // Syntype. / *A. tenuicincta* / Jac. [w, h] // SYN- / TYPE [w, p, round label with blue border]"; 1♂ (MCZC), labeled: "Is. Nias / Bawolovalani / Maggio 1886 / Modigliani [w, p] // 1st Jacoby / Coll. [w, p] // ♂ [w, p] // Type [p] / 17556 [w, h]".

Aulacophora nigripalpis: holotype ♂ (IZAS), labeled: "云南 : 西双版纳 勐腊 [= Yunnan: Xishuangbanna Mengla] / 620–650 公尺 (= 620–650 m) / 中國科學院 [= Academia Sinica] [w, p] // 1959.v.31 [h] / 采集者 張發財 (= collector Zhang Fa-Cai) [w, p] // HOLOTYPE [r, p] // Aulacophora / nigripalpis / 陳龔 [= Chen Kung] [h] / 鑑定者 : 陳世驥 [= determined by Sicien H. Chen] [w, p]".

Other specimens examined. **LAOS.** Vientiane: 3♂, 2♀, Ban van Eue, 30.XI.1965, leg. native collector (BPBM); 1♀, same locality, 15.I.1966, leg. native collector (BPBM); **MALAYSIA.** Penang, 1♂, leg. Pascoe (BMNH); **THAILAND.** 1♂, Khao Yai, 10.IV.1963 (BPBM); 1♂, same locality, 12.II.1964 (BPBM); Trang: 1♂, 1♀, Khaophappa Khaochang, 10–11.I.1964, G. A. Samuelson (BPBM); 1♂, Loei prov., Phu Krudung N. P., 1000 m, 17.V.1999, leg M. Řiha (JBCB); **VIETNAM.** 1♂, Hoa-Binh, leg. A. Cooman (BPBM).

Diagnosis. See diagnosis of *Aulacophora opacipennis*.

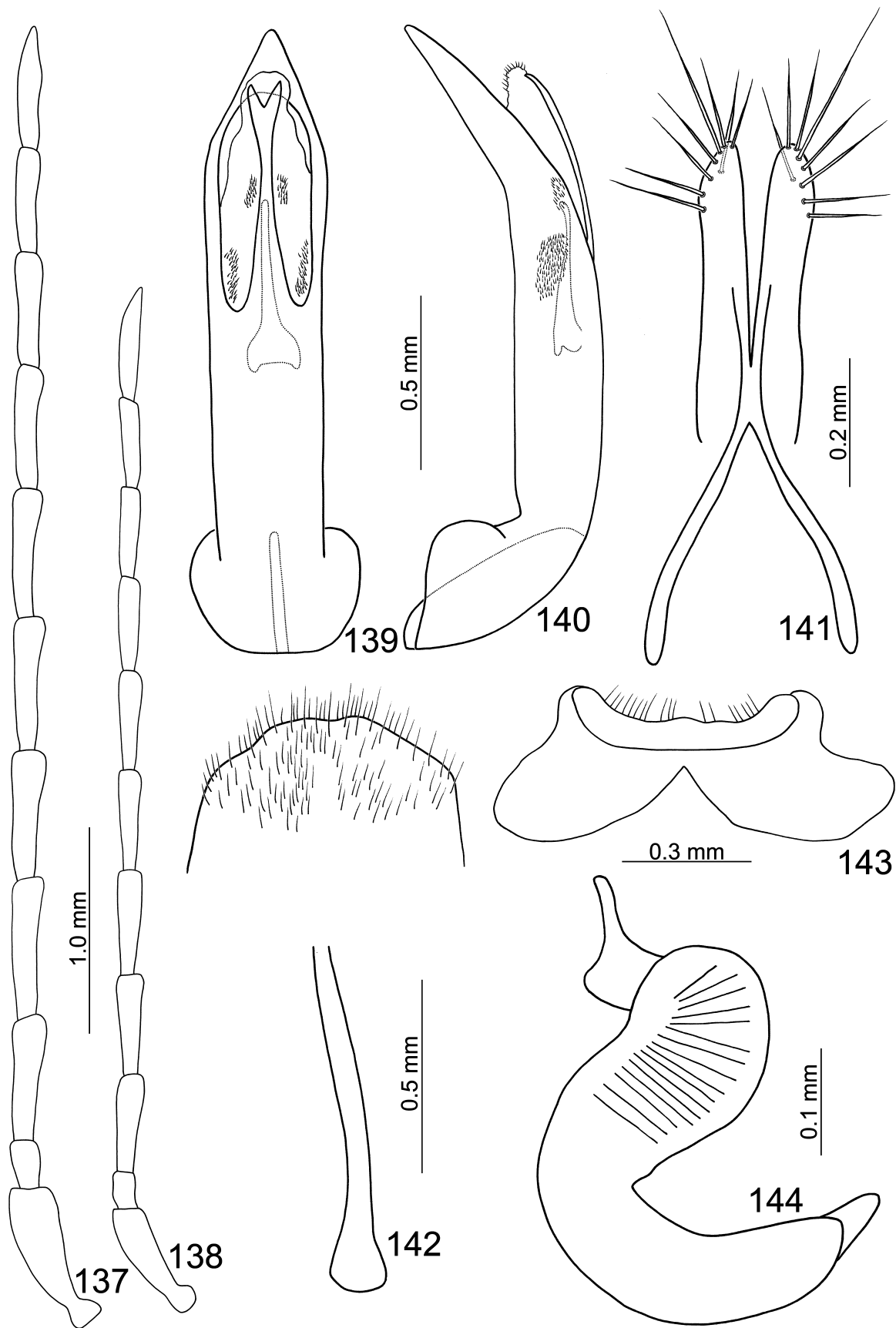
Males. Length 6.3–7.0 mm, width 2.9–3.4 mm. General color (Figs 127–128) yellowish brown except elytron black and opaque, tibia and tarsi darkened except base of tibia; apical margin of elytron yellowish brown. Antenna (Fig. 137) filiform and extremely slender, antennomere I not enlarged; ratio of length of antennomeres III to XI about 1.0 : 1.1 : 1.0 : 1.1 : 1.0 : 1.0 : 0.9 : 0.8 : 1.0; ratio of length to width from antennomere III to XI about 3.7 : 4.2 : 3.7 : 4.3 : 4.1 : 4.4 : 4.3 : 4.4 : 5.2. Apex of abdominal tergite VIII forming notch (Fig. 143), weakly convex at middle, with several long setae along apical margin; base weakly sclerotized. Median lobe of fifth abdominal ventrite rectangular, disc weakly depressed. Penis (Figs 139–140) slender, parallel-sided, abruptly narrowed from apical 1/6 to apex, apex pointed; almost straight in lateral view, curved at apical 1/6; tectum well sclerotized, extremely slender, apically widened, apex bifurcate; endophallus with clusters of dense stout setae, and with one longitudinal sclerite, apex weakly recurved and rounded, basally widened.

Females. Length 6.7–7.5 mm, width 3.7–3.8 mm. Similar to male, but antenna shorter (Fig. 138), ratio of length of antennomeres III to XI about 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 1.0 : 1.3; ratio of length to width from antennomere III to XI about 3.5 : 3.8 : 3.7 : 3.5 : 3.3 : 3.5 : 3.6 : 3.8 : 5.6. Apical margin of abdominal ventrite V truncate. Gonocoxae (Fig. 141) slender, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base widened. Ventrite VIII (Fig. 142) weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with dense short setae inside and along apical margin, and with extremely long setae near apical margin; spiculum short. Spermathecal receptaculum (Fig. 144) a little swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Host plant. Unknown.

Remarks. Kimoto (1989) misidentified specimens of this species collected from Southeast Asia as *Aulacophora opacipennis*.

Distribution. China, Indonesia, Laos, Malaysia, Thailand, Vietnam.



FIGURES 137–144. Diagnostic characters of *Aulacophora apicipes* Jacoby. 137. Antenna, male; 138. Antenna, female; 139. Penis, dorsal view; 140. Penis lateral view; 141. Gonocoxae; 142. Abdominal ventrite VIII, female; 143. Abdominal tergite VIII, male; 144. Spermatheca.

Discussion

Although some species of *Aulacophora* display variable color patterns, the morphology of genitalia is constant and in most cases largely different between the species. However, taxonomic problems still exist among species with yellow elytra and pubescent humera in males, such as *A. abdominalis*, *A. kotoensis* and *A. indica*. The recent descriptions of *A. fauveli* Beenen, 2008 and *A. sulaksonoi* Mohamedsaid, 2009 support the view that among species with a wide distribution within the genus *Aulacophora* also species occur with very restricted ranges. Characters hitherto not used might help to reveal more species. Secondary sexually characters, for example, the presence or absence of paired tubercles on the males pronotum, as used in the present study, are suggested to be investigated in other species too. Male specimens of *A. foveicollis* (Lucas, 1849) from Somalia showed paired tubercles, while specimens for example from India do not, although the external morphology of the aedeagus is identical. Study of the internal sac might reveal that more species are involved. Examination of large collection and applying other characters seems necessary.

Acknowledgements

We would like to thank all curators listed above for giving us the opportunity to study the material from their collections. We thank the Taiwan Chrysomelid Research Team for assistance in collecting material, including Jung-Chang Chen, Hou-Jay Chen, Yi-Ting Chung, Bo-Xin Guo, Hsueh Lee, Ta-Hsiang Lee, Wen-Chuan Liao, Weiting Liu, Mei-Hua Tsou, and Su-Fang Yu. We especially thank Ta-Hsiang Lee for photos of specimens, and Chih-Kai Yang for identification of host plants. We acknowledge the help of Jan Bezděk (Brno) in providing some literature and for discussion. This study was also supported by the Ministry of Science and Technology MOST 103-2313-B-055-001.

References

- Allard, E. (1888) Synopsis des galerucines à corselet sillonné transversalement, 1e partie. *Annales de la Société Entomologique de France*, Series 6, 8, 305–332.
- Allard, E. (1889) Contributions à la faune indo-chinoise, 5e mémoire, galérucides et alticides. *Annales de la Société Entomologique de France*, Series 6, 9, 303–312.
- Allard, E. (1891) Collection d'insectes formée dans l'Indo-chine par M. Pavie consul de France au Cambodge. Coléoptères. Phytophages. *Nouvelles Archives du Muséum d'Histoire Naturelle*, Series 3, 3, 229–234.
- Anand, R.K. & Cox, M.L. (1986) Taxonomic revision of the genus *Aulacophora* Chev. I. Species with yellow elytra (Coleoptera, Chrysomelidae, Galerucinae). *Entomologische Abhandlungen Staatliches Museum für Tierkunde Dresden*, 50, 81–91.
- Aston, P. (2009) Chrysomelidae of Hong Kong Part 3 subfamily Galerucinae. *Hong Kong Entomological Bulletin*, 1, 6–25.
- Baly, J.S. (1879) List of the phytophagous Coleoptera collected in Assam by A. W. Chennell, Esq., with notes and descriptions of the uncharacterized genera and species. *Cistula Entomologica*, 2, 435–465.
- Baly, J.S. (1886) Descriptions of a new genus and some new species of Galerucinae, also diagnostic notes on some of the older described species of *Aulacophora*. *The Journal of the Linnean Society, Zoology*, 20, 1–27.
<http://dx.doi.org/10.1111/j.1096-3642.1886.tb01432.x>
- Baly, J.S. (1887) Notes on Galerucinae, and descriptions of two new species of Hispididae. *The Entomologist's Monthly Magazine*, 23, 268–270.
- Baly, J.S. (1888) Descriptions of some genera and species of Galerucinae. *The Journal of the Linnean Society (Zoology)*, 20, 156–188.
<http://dx.doi.org/10.1111/j.1096-3642.1888.tb01444.x>
- Barroga, G.F. (2001) The genus *Aulacophora* Chevrolat (Coleoptera: Chrysomelidae: Galerucinae) from Bali, Indonesia, with description of a new species. *Serangga*, 6, 37–50.
- Barroga, G.F. (2002a) *Aulacophora indica* (Gemelin), the correct name for the squash beetle in the Philippines (Coleoptera: Chrysomelidae: Galerucinae). *Philippine Entomologist*, 16, 25–32.
- Barroga, G.F. (2002b) Corrections to the article “Revision of the genus *Aulacophora* Chevrolat (Coleoptera: Chrysomelidae: Galerucinae) in Sundaland. *Philippine Entomologist*, 16, 185–194.
- Barroga, G.F. & Mohamedsaid, M.S. (2002) Revision of the genus *Aulacophora* Chevrolat (Coleoptera: Chrysomelidae: Galerucinae) in Sundaland. *Serangga*, 7, 15–194.
- Beenen, R. (2008) Contribution to the knowledge of Galerucinae (Coleoptera, Chrysomelidae) of New Caledonia. *Genus*, 19, 65–

- Chapuis, F. (1876) Diagnoses des espèces du genre *Aulacophora* recueillies aux îles Philippines par le Dr Semper. *Comptes-Rendus des Séances de la Société Entomologique de Belgique*, 19, 98–101.
- Chen, S.H. & Kung, Y.T. (1959) Notes on Chinese cucumber beetles of the genus *Aulacophora* Chevrolat. *Acta entomologica Sinica*, 9, 373–387.
- Chûjô, M. (1935a) Chrysomelidae of Loo-Choo Archipelago (I). *Transactions of the Natural History Society of Formosa*, 25, 69–90.
- Chûjô, M. (1935b) Chrysomelidae of Loo-Choo Archipelago (III). *Transactions of the Natural History Society of Formosa*, 25, 203–211.
- Chûjô, M. (1935c) H. Sauter's. Formosa-Ausbeute: Subfamily Galerucinae (Coleoptera: Chrysomelidae). *Arbeiten über Morphologische und Taxonomische Entomologie*, 2, 160–174.
- Chûjô, M. (1938) H. Sauter's Formosa-collection: Subfamily Galerucinae (Coleoptera: Chrysomelidae). Second part. *Arbeiten über Morphologische und Taxonomische Entomologie*, 5, 135–152.
- Chûjô, M. (1941) Chrysomelid-beetles from Kore (IV). *Transactions of the Natural History Society of Formosa*, 31, 155–174.
- Chûjô, M. (1962) A taxonomic study on the Chrysomelidae from Formosa Part XI. Galerucinae. *The Philippine Journal of Science*, 91, 1–239.
- Chûjô, M. (1963) Chrysomelid-beetles from Formosa, preserved in the Hungarian Natural History Museum, Budapest. *Annales Historico-Naturales Musei Nationalis Hungarici*, 55, 379–402.
- Dejean, P.F.M.A. (1837) *Catalogue des coléoptères de la collection de le M. le Comte Dejean*. Troisième édition, revue, corrigée et augmentée. Livraisons 5. Méquignon-Marvis père et fils, Paris, pp. 385–503.
- Duvivier, A. (1884) Cinq espèces nouvelles du genre *Aulacophora*, Chev. (Coléoptères Phytophages). *Notes from the Leyden Museum*, 6, 119–125.
- Duvivier, A. (1891) Les phytophages du Chota-Nagpore (1e note). *Bulletin ou Comptes-Rendus des Séances de la Société Entomologique de Belgique*, 1891, 145–156.
- Duvivier, A. (1892) Les phytophages du Chota-Nagpore (2e note). *Annales de la Société Entomologique de Belgique*, 36, 396–449.
- Fabricius, J.C. (1781) *Species insectorum exhibens eorum differentias specificas, synonyma auctorum, loca natalia, metamorphosis, adiectis observationibus*. Tome I. Carol Ernest Bohni, Hamburgi et Kilonii, 552 pp.
- Fabricius, J.C. (1787) *Mantissa insectorum, sistens eorum species nuper detectas adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus*. Tomus I. C. G. Proft, Hafniae, 348 pp.
<http://dx.doi.org/10.5962/bhl.title.36471>
- Fabricius, J.C. (1792) *Entomologia systematica emendate et aucta, secundum classes, ordines, genera, species, adjectis, synonymis, locis observationibus, descriptionibus*. Tomus I. Pars II. Hafniae, 538 pp.
<http://dx.doi.org/10.5962/bhl.title.36532>
- Fabricius, J.C. (1801) *Systema Eleutheratorum secundum ordines, genera, species adiectis synonymis, locis, observationibus, descriptionibus*. Tomus I. Bibliopolii Academici, Kiliae, 506 pp.
- Fabricius, J.C. (1803) [new taxa]. In: Illiger, K. (Ed.), *Abänderungen der in Fabricii Systema Eleutheratorum doppelt vorkommenden Namen*. *Magazin für Insektenkunde*, 2, 292–293.
- Fairmaire, L. (1883) Essai sur les coléoptères de l'Archipel de la Nouvelle-Bretagne. *Annales de la Société Entomologique de Belgique*, 27, 1–58.
- Gistel, J.N.F.X. (1857) *Achthundert und zwanzig neue oder unbeschriebene wirbellose Thiere*. Verlag der Schorner'schen Buchhandlung, Straubing, 92 pp.
- Gmelin, J.F. (1790) *Caroli a Linné systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio decimal tertia, aucta, reformata. Tom I. Pars IV. Classis V. Insecta. Georg Enmanuel Beer, Lipsiae, 708 pp. [pp. 1517–2224]
- Gressitt, J.L. (1955) Insects of Micronesia Coleoptera: Chrysomelidae. *Insects of Micronesia*, 17 (1), 1–60.
- Gressitt, J.L. & Kimoto, S. (1963) The Chrysomelidae (Coleopt.) of China and Korea. Part 2. *Pacific Insects Monograph*, 1B, 301–1026.
- Jacoby, M. (1883) On some new species of phytophagous Coleoptera from the island of Saleyer. *Notes from the Leyden Museum*, 5, 197–203.
- Jacoby, M. (1884a) Descriptions of new genera and species of phytophagous coleopteran from Sumatra. *Notes from the Leyden Museum*, 6, 9–70.
- Jacoby, M. (1884b) Descriptions of new genera and species of phytophagous Coleoptera collected by Dr. B. Hagen at Serdang (East Sumatra). *Notes from the Leyden Museum*, 6, 201–232.
- Jacoby, M. (1886) Descriptions of new genera and species of phytophagous Coleoptera from the Indo-Malayan and Austral-Malayan subregions, contained in the Genova Civic Museum. Third Part. *Annali del Museo Civico di Storia Naturale di Genova*, 24, 41–121.
- Jacoby, M. (1889) Viaggio di Leonardo Fea in Birmania e regioni vicine.—List of the phytophagous Coleoptera obtained by Signor L. Fea at Burmah and Tenasserim, with descriptions of the new species. *Annali del Museo Civico di Storia Naturale di Genova*, 27, 147–237.
- Jacoby, M. (1892) Description of the new genera and species of the phytophagous Coleoptera obtained by Sign. L. Fea in

- Burma. *Annali del Museo Civico di Storia Naturale di Genova*, 32, 869–999.
- Jacoby, M. (1896) List and descriptions of the phytophagous Coleoptera obtained by Dr. Modigliani from Mentawai islands. *Annali del Museo Civico di Storia Naturale di Genova*, 37, 126–148.
- Jacoby, M. (1897) List of the phytophagous Coleoptera obtained by Mr. H. Raap in the Batu Islands with descriptions of the new species. *Annali del Museo Civico di Storia Naturale di Genova*, 38, 405–411.
- Jacoby, M. (1899) Descriptions of the new species of phytophagous Coleoptera obtained by Dr. Dohrn in Sumatra. *Entomologische Zeitung* (Stettin), 60, 259–313.
- Kimoto, S. (1964) The Chrysomelidae of Japan and the Ryukyu Islands. VI. Subfamily Galerucinae I. *Journal of the Faculty of Agriculture, Kyukyu University*, 13, 287–308.
- Kimoto, S. (1966) A list of the chrysomelid specimens of Taiwan preserved in the Zoological Museum, Berlin. *Esakia*, 5, 21–38.
- Kimoto, S. (1970) A list of the Nepalese chrysomelid specimens preserved in the Zoologische Sammlung des Bayerischen Staates, München. *Khumbu Himail*, 3, 412–421.
- Kimoto, S. (1977) Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Coleoptera: Fam. Chrysomelidae. Subfam. Galerucinae. *Entomologica Basiliensia*, 2, 351–392.
- Kimoto, S. (1989) Chrysomelidae (Coleoptera) of Thailand, Cambodia, Laos and Vietnam. IV. Galerucinae. *Esakia*, 27, 1–241.
- Laboissière, V. (1929) Observations sur les Galerucini asiatiques principalement du Tonkin de du Yunnan et descriptions de nouveaux genres et espèces. *Annales de la Société Entomologique de France*, 98, 251–288.
- Laboissière, V. (1932) Galerucinae. *Mémoires du Musée Royal d'Histoire Naturelle de Belgique Hors Série*, 4 (4), 143–184.
- Laboissière, V. (1935) Rectifications au mémoire de E. Allard. Contribution à la faune indo-chinoise. Galérucides et alitcides. *Annales de l'Association des Naturalistes de Levallois-Perret*, 21, 139–145.
- Laboissière, V. (1940) Observations sur les galerucinae des collections du Musée royal d'Histoire naturelle de Belgique et descriptions d'espèces nouvelles. 2e note. *Bulletin du Musée Royal d'Histoire Naturelle de Belgique*, 16 (3), 1–31.
- Lee, J.E. & An, S.L. (2001) Family Chrysomelidae. Economic Insects of Korea 14. *Insecta Koreana Supplement*, 21, 1–231.
- Maulik, S. (1936) *The Fauna of British India, including Ceylon and Burma. Coleoptera. Chrysomelidae (Galerucinae)*. Taylor & Francis, London, 648 pp.
- Miwa, Y. (1931) *A systematic catalogue of Formosan Coleoptera*. Department of Agriculture, Government Research Institute, Rep. No. 55, Taihoku, 359 pp.
- Mohamedsaid, M.S. (1994) The genus *Aulacophora* Chevrolat from Peninsular Malaysia (Coleoptera: Chrysomelidae: Galerucinae). *Malayan Nature Journal*, 47, 375–392.
- Mohamedsaid, M.S. (2000) List of Malaysian Chrysomelidae (Coleoptera) in the collections of UKM. *Serangga*, 5, 343–360.
- Mohamedsaid, M.S. (2009) *Aulacophora sulaksonoi*, a new species of chrysomelid beetle from Sumba, Indonesia (Coleoptera: Chrysomelidae: Galerucinae). *Genus*, 20, 335–339.
- Mohamedsaid, M.S. & Contant, J. (2007) Chrysomelid beetles of the subfamily Galerucinae from Thailand and Cambodia in the collections of the Royal Belgian Institute of Natural Sciences (Coleoptera: Chrysomelidae). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique*, 77, 163–177.
- Monrós, F. & Bechyně, J. (1956) Über einige verkannte Chrysomeliden-Namen. *Entomologischen Arbeiten aus dem Museum G. Frey*, 7, 1118–1137.
- Motschulsky, V. de (1858) Insectes du Japon. *Études Entomologiques*, 6, 25–41.
- Ogloblin, D.A. (1936) *Listoedy, Galerucinae. Fauna SSSR. Nasekomye Zhestkokrylye [Chrysomelidae, Galerucinae. Faune de l'URSS, Insectes Coléoptères]*, s. s. 8, 26 (1). Moskva-Leningrad, Izdatel'stvo Akademii Nauk SSSR, 455 pp.
- Olivier, A.G. (1791) *Encyclopédie méthodique, ou par ordre de matières; par une société de gens de letters, de savans et d'artistes; precede d'un vocabulaire universel, servant de table pour tout l'ouvrage, ornée des portraits de Mm. Diderot et d'Alembert, premiers éditeurs de l'Encyclopédie. Histoire Naturelle. Insectes. Tome sixième. Pars I.* Panckoucke, Paris, 704 pp.
- Olivier, A.G. (1808) *Entomologie, ou histoire naturelle des insects, avec leurs caractères génériques et spécifiques, leur description, leur synonymie et leur figure enluminée, Coléiotères. Tome sixième. [4].* Desray, Paris, 492 pp. [pp. 613–1104]
- Schaller, J.G. (1783) Neue Insecten. *Abhandlungen der Hallischen Naturforschenden Gesellschaft*, 1, 217–318.
- Schönfeldt, H. (1890) Ein Beitrag zur Coleopterenfauna der Liu-Kiu-inseln. *Entomologische Nachrichten*, 16, 168–175.
- Weber, F. (1801) *Observationes entomologicae, continens novorum quae condidit generum characters, et nuper detectarum specierum descriptiones*. Bibliopoli Academici Novi, Kiliae, 116 pp.
- Weise, J. (1892) Chrysomeliden und Coccinelliden von der Insel Nias, nebst Bemerkungen über andere, meistens südostasiatischen Arten. *Deutsche Entomologische Zeitschrift*, 1892, 385–400.
- Weise, J. (1922) Chrysomeliden der indo-malayischen Region. *Tijdschrift voor Entomologie*, 65, 39–130.
- Wilcox, J.A. (1972) Chrysomelidae: Galerucinae (Luperini: Aulacophorina, Diabroticina). In: Wilcox, J.A. (Ed.), *Coleopterorum Catalogus Supplementa. Pars 78(2). 2nd Edition*. W. Junk, 's-Gravenhang, pp. 221–431.
- Zimsen, E. (1964) *The type material of J. C. Fabricius*. Munksaard, Copenhagen, 656 pp.