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Sundapyrochroa: A new genus of Fire-Colored Beetles (Coleoptera: Pyrochroidae: Pyrochroinae) from the Sunda Shelf, with a key to the three species

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Abstract. *Sundapyrochroa*, a **new genus** of pyrochroine Pyrochroidae, is described from three Sunda Shelf species most recently assigned to *Pseudopyrochroa* Pic: *Sundapyrochroa atricolor* (Pic), **comb. nov.**, recorded from Peninsular Malaysia, *Sundapyrochroa nigripennis* (Pic), **comb. nov.**, recorded from Peninsular Malaysia, and *Sundapyrochroa sumatrensis* (Pic), **comb. nov.**, recorded from Borneo (Malaysia: Sabah) and Sumatra (Indonesia). *Schizotus rotundicollis* Pic, **syn. nov.**, is proposed as a junior synonym of *S. sumatrensis*. No evidence could be found to support subspecific categories for *S. nigripennis*, thus, *Pseudopyrochroa nigripennis notaticeps* Pic, **syn. nov.**, is proposed as a junior synonym of *S. nigripennis*. Gross anatomy of the cranium (female, male), antennae (female, male), and genitalia (male) are both diagnostic and enigmatic, suggesting no clear relationships with other pyrochroine genera.

Key Words. *Sundapyrochroa*, new genus, species key, Pyrochroidae, Sunda Shelf, Southeast Asia

Introduction

Although Pic (1906: 29) originally assigned his new *sumatrensis* to *Schizotus*, even then he expressed misgivings regarding its generic placement: "Je classe provisoirement dans le genre *Schizotus* Newm. l'espèce suivante (*sumatrensism*.) qui mériterait peut-être d'être séparée génériquement, ce que je n'ose faire aujourd'hui n'ayant qu'un sexe sous les yeux …" [I provisionally place the following species (*sumatrensis*) in the genus *Schizotus* Newm. It might deserve to be separated generically; that I dare not do today with only one sex before me.] In February 1912, he described *Schizotus rotundicollis* from Sumatra, thus perpetuating the generic assignment. Later that year, Blair (1912) described *Pyrochroa dimidiata*, also from Sumatra. The latter was subsequently synonymized with *S. rotundicollis* when Blair (1914: 326) transferred them, along with numerous other pyrochroids to *Pseudopyrochroa*: "*P. rotundicollis*, Pic, ♀, and *P. dimidiata*, Blr., ♂, I believe to be but the sexes of one species." The Malaysian *Pseudopyrochroa nigripennis* (Pic 1932), described on the basis of the male, was said to resemble *P. sumatrensis*. In July 1943, Pic described *Pseudopyrochroa nigripennis notaticeps* as a new variation, along with *Pseudopyrochroa atricolor*, an additional species relevant to the present discussion.

As far as known, the species forming the subject of this paper are restricted to the southeastern-most extension of the continental shelf of Southeast Asia. Geologically, this specific region, the Sunda Shelf, includes the present-day land masses of the Thai-Malay Peninsula as well as Sumatra, Borneo, Java, Madura, Bali and smaller surrounding islands (e.g., Gower, et al. 2012 and references therein). Biogeographically, the region is also referred to as Sundaland, the region of southeastern-most Southeast Asia that was exposed during the last ice age.

Materials and Methods

Measurements, dissection and clearing. Each specimen was measured dorsally along the meson for total length (L); humeral width (HW) was measured transversely across the elytral bases at the apex of the scutellum and maximal width (W) across the elytra, typically in the apical quarter. Elytral

length was measured along the sutural margin from the posterior mesoscutellar margin to the elytral apex and width (W) was calculated by doubling the humeral width (HW). Total length was determined in the following manner: head, pronotum, and elytra were measured separately and recorded. Thus, a value for body length (L) was obtained by adding the three measurements (head + pronotum + elytra). This procedure has been employed when measuring specimens of pyrochroine pyrochroids due to the considerable variation observed in the distance between the posterior margin of the head and the anterior pronotal margin (i.e. cervical distention and tilting of head) as well as variation in the distention of soft tissue between the prothorax and the elytral bases.

Drawings and Digital Images. Techniques described elsewhere (e.g., Young 2000) were used to prepare specimens for genitalic analysis and associated drawings. Images were captured as ".tif" files from a JVC® KY-F75U digital camera attached to a Leica® Z16 APO dissecting microscope with apochromatic zoom objective and motor focus drive, using a Syncroscopy® Auto-Montage System and software. Multiple images for a given "figure," generally 10–20 images, were used to construct the final figure. Images were illuminated by the combination of an LED ring light attached to the end of the microscope column, with incidental light filtered to reduce glare, and a gooseneck illuminator with bifurcating fiber optics. Montaged images were edited using Adobe Photoshop® CS6 to form the final figure plates.

Anatomical Terminology. Terms are largely those in common use for Coleoptera. Some terms specific to pyrochroine Pyrochroidae such as **cranial pits** and **cranial apparatus** have been defined and reviewed elsewhere (e.g., Young 2013). The elytra of many Asian pyrochroines including those of male and female *Sundapyrochroa* have a longitudinally **ribbed** or **costate** appearance. In some cases, there are slightly elevated, longitudinal striae producing this appearance, at least in part. Commonly, however, it is the elytral vestiture that vividly enhances this manifestation (e.g., Fig. 1, 3, 9). Blair (1914: 318) described the phenomenon as follows: "The term "striped," as applied to the elytra, may, perhaps, require explanation. Various authors use the term "costate" for the same effect; but, though true costae may, in some cases at any rate, be present, the effect is produced by the pubescence sloping in different directions in alternate longitudinal bands, very much like the grass in a lawn that has recently been rolled." Unlike a vittate or striped appearance that generally refers to color, the ribbed or costate appearance is enhanced by the structural configuration of the dense array of elytral setae.

Etymology. Although no new specific epithets are proposed, herein, I have attempted to provide etymologies for each of the valid epithets and synonyms. Being "old" names, no etymologies have ever been provided, historically, and I find consideration of the names provides possible insights into the minds of the original authors. For both reasons, they seem informative.

Specimen Label Data. Label data are presented verbatim. Line breaks on labels are denoted by a double slash (//); metadata I added in interpreting the data (i.e., not written on the labels themselves) are presented in brackets ([]). Scientific names are uniformly presented in *italics*.

Collection acronyms. For the most part, the 4-letter entomological collection acronyms proposed by Arnett and Samuelson (1969) and Heppner and Lamas (1982) were followed. Most of these are identified in the acknowledgments. My collection (DYCC) houses material as noted in the text, but it is not identified in the acknowledgments. Acronyms and collections pertinent to this study include:

BMNH — The Natural History Museum, London, England, UK
BPBM — The Bernice P. Bishop Museum, Honolulu, HI, USA
CASC — California Academy of Sciences, San Francisco, CA, USA
MNHP — Museum National d'Histoire Naturelle, Paris, France
NHRS — Naturhistoriska Riksmuseet, Stockholm, Sweden
NMNH — U. S. National Museum of Natural History, Washington, DC, USA
SKCC — Sergey Kasantsev Collection of Coleoptera, Moscow, Russia

Systematics

Sundapyrochroa Young, genus novum

(Figures 1–21)
Type species: *Schizotus sumatrensis* Pic, 1906, by present designation.

Description of adult male. (habitus, Fig. 1, 4–5, 9–10) With general characters of Coleoptera: Polyphaga: Cucujoidea (sensu Crowson 1955). Heteromerous (sensu Crowson 1955): maxillae 2-lobed; tarsal formula 5–5–4; prothoracic coxae conical, prominent and projecting, trochanters of heteromeroid type (sensu Crowson 1955: fig. 106); genitalia of heteromeroid type, with tegmen (= parameres + basal piece) oriented dorsad median lobe.

Head. Cranium (Fig. 7, 11) with genae well developed, subrectangular behind compound eyes, thence abruptly constricted, forming conspicuous cranial "neck"; frontoclypeal suture present, at least as well defined ridge; labrum moderately-sized, transversely rectangulate, bearing marginal setal fringe; anterior margin nearly straight to feebly emarginate mesally. Compound eyes (Fig. 7) emarginate for accommodation of antennal insertions, finely faceted, devoid of setae between the ommatidia. Antennae 11-segmented; antennomeres 1–2 (e.g., Fig. 8–9, 11) distally swollen, antennomere 1 approximately 3X length of antennomere 2, antennomeres 3–10 strongly, finely pectinate, the ramus of each antennomere densely setose; each antenna inserted in a slightly swollen prominence on frons between base of mandible and compound eye. Mandibles (Fig. 11) elongate, symmetrical, conspicuously flattened dorsoventrally, apices bidentate, dorsal surface of each subglabrous, lateral face bearing sparse, short to moderately elongate, antrorsely directed setae. Maxillae each with cardo well developed, articulating distally with triangular basistipes; mediostipes arising from distal adoral aspect of basistipes, giving rise to galea and lacinia, apex of distigalea and adoral surface of lacinia densely tufted with moderately elongate, coarse setae. Maxillary palpifer subglabrous except for several apicoventral, stout, moderately elongate setae and aboral setal fringe. Maxillary palpus (Fig. 9) consisting of 4 segments arising from membranous apex of palpifer, palpomere 1 small, glabrous, palpomere 2 twice the length of 3, palpomere 4 subcultriform, subequal to length of 2; palpomeres 2–4 setose, anterior marginal setal fringe of palpomere 2 especially well developed. Labium: submentum confluent with gular region, surface glabrous posteriorly, isodiametrically microsculptured to rugulose anteriorly; gular sutures and posterior tentorial pits conspicuous, well impressed; mentum distinct, weakly trapezoidal; ligula well sclerotized basally between palpigers, apex setose; labial palpi each consisting of 3 segments, subequal in length, palpomeres 1–2 filiform, palpomere 3 filiform or slightly expanded distally.

Thorax. Prothorax with pronotum (Fig. 1, 4–5, 9–10) subquadrate, slightly narrower anteriorly, about as broad as head, disk shallowly, sparsely to moderately coarsely, densely punctulate, densely setose, sides rounded and lacking lateral margins, lacking modified margin anteriorly, posterior margin well developed, deeply impressed, mesal canaliculus present or not; prosternum transverse, surface glabrous to transversely rugulose, sparsely setose; prosternal process short, acute; prothoracic coxal cavities completely open externally and internally. Mesothorax with scutellum small, widest basally, shield-shaped, longer than wide; mesothoracic coxal cavities not closed outwardly by sterna; mesothoracic episterna narrowly contiguous anterad acuminate anterior margin of mesosternum. Metathorax with sternum well developed, convex, longer than wide. Thoracic venter sparsely punctate; vestiture consisting of short to moderately long, mostly retrorse setae. Legs ambulatorial; prothoracic legs with trochantins partially exposed; internal keel of metathoracic coxae elongate; tibial spurs short, stout, simple; tarsi with penultimate segment lobed ventrally; pretarsi consisting of paired claws, each swollen basally, forming an obtusely rounded to weakly dentiform process; empodium strongly reduced. Elytra well developed, covering metathorax and abdomen, subparallel to slightly wider posteriorly; base of elytra distinctly wider than base of pronotum; elytral vestiture consisting of short, dense, semierect setae, elytral setae generally more erect along either side of the nearly obsolete longitudinal costae, thereby slightly enhancing the illusion of longitudinal costae.

Abdomen. Tergites 1–2 essentially lost, 3–6 poorly sclerotized, 7–8 setose and lightly clerotized. Sternites 1–2 absent, 3–8 sclerotized, setose, last visible sternite (= 8^{th}) widest basally, apex moderately (Fig. 19) to rather deeply (Fig. 13, 16) emarginate mesally, bearing numerous, moderately elongate marginal setae.

Male abdominal terminalia. Sclerites derived from abdominal segments 9–10 retracted within 8^{th} abdominal segment; 9^{th} sternite produced ventroanteriorly, forming sclerotized, V-shaped spiculum gastrale; distal margin of tergite 10 broadly rounded. Tegmen (Fig. 14, 17, 20) oriented dorsad median lobe, consisting of stout, well developed, subrectangular basal piece broadly joined to parameres distally. Parameres fused along basal 2/3, thence abruptly, widely separated; distal parameres narrow and subparallel (Fig. 14, 17) or divergent (Fig. 20). Median lobe (Fig. 15, 18, 20) elongate, produced basally

into two short (Fig. 18) to elongate (Fig. 15, 21) median struts.

Female. Grossly similar to the male in general habitus (Fig. 3, 6, 12). Antennae shorter, far more robust, densely setose, "velvety" in appearance; antennomeres 3–11 pectinate, rami considerably less produced than those of male; elytra slightly wider posteriorly; terminal abdominal sternite with distal margin rounded.

Etymology. *Sundapyrochroa* is derived from *Sunda*- in reference to the Sunda Shelf of the Asian continental plate, the Greek root *pyro*-, meaning fire, and the Greek, -*chroa*, meaning the skin. The name refers both to the type localities in southeast Asia as well as to the "fire-colored" elytra that typify so many species of pyrochroine Pyrochroidae. The gender of *Sundapyrochroa* is feminine.

Generic Diagnosis and Remarks. Pyrochroidae: Pyrochroinae - head nearly prognathous, abruptly constricted behind the eyes, forming a conspicuous cranial "neck"; eyes emarginate; antennal flagellum of the male strongly pectinate to flabellate; base of pronotum narrower than basal width of elytra; prothoracic coxal cavities widely open externally and internally; tarsal formula 5–5–4.

The combination of relatively small, dorsally well separated compound eyes (e.g., Fig. 7) and lack of visible cranial modifications in males (e.g. Fig. 7, 11), well developed genae posterad the compound eyes, small antennal pedicel, and delicately pectinate antennal antennomeres 3–10 in the males are diagnostic for *Sundapyrochroa*. Other pyrochroine genera wherein males lack conspicuous cranial modifications include *Dendroides* Latreille, *Pogonocerus* Fischer, and *Sinodendroides* Young. Like *Sundapyrochroa*, males of these genera also exhibit finely pectinate antennae. Males of *Dendroides* (Fig. 22) possess compound eyes that are nearly holoptic dorsally; they are well separated dorsally in males of *Sinodendroides* (Fig. 23) and *Sundapyrochroa* (Fig. 1, 4–5, 7, 9–11). Males of *Pogonocerus* have the first antennal flagellomere (= 3rd antennomere) small, like the pedicel, with antennomeres 4–10 delicately pectinate; the first flagellomere is pectinate in males of *Sinodendroides* and *Sundapyrochroa*. Both males and females of *Sundapyrochroa* exhibit "ribbed" or slightly costate elytra whereas those of *Sinodendroides* (Fig. 23) have a densely, confusedly punctate or rugulose surface.

The diagnostic male genitalia provide putative synapomorphies for the three known species of *Sundapyrochroa* (Fig. 14, 17, 20): the parameres are abruptly and widely separated distally, and each is rounded apically. The parameres of *Himalapyrochroa* Young, *Neopyrochroa* Blair, *Phyllocladus* Blair, and *Pseudodendroides* Blair are also abruptly and widely separated distally. However, in these genera each paramere is produced into an anteriorly directed subapical tooth.

Key to the Species of *Sundapyrochroa*

1. Antennae finely pectinate beyond second antennomere (Fig. 1, 4–5, 8–10); terminal abdominal sternite emarginate (Fig. 13, 16, 19) (males). **2**
– Antennae stoutly pectinate beyond second antennomere (Fig. 3, 6, 12); terminal abdominal sternite entire (females). **4**

2. Ramus of antennomere 3 very long, nearly 3X length of the antennomere (Fig. 8). ..... ***Sundapyrochroa nigripennis* (Pic)**
– Ramus of antennomere 3 much shorter, less than the length of the antennomere (Fig. 2, 11). **3**

3. Elytra unicolorous black; distal parameres subparallel (Fig. 14). ..... ***Sundapyrochroa atricolor* (Pic)**
– Elytra yellowish-orange in basal 1/3 to 4/5, brownish-black to black apically; distal parameres divergent (Fig. 20). ..... ***Sundapyrochroa sumatrensis* (Pic)**

4. Terminal antennomere creamy whitish, remainder of antenna black (Fig. 6). ..... ***Sundapyrochroa nigripennis* (Pic)**
– Antennae unicolorous, black (Fig. 3, 12). **5**

5. Elytra unicolorous black (Fig. 3). .....***Sundapyrochroa atricolor* (Pic)**
– Elytra yellowish-orange in basal 1/3 to 4/5, brownish-black to black apically (Fig. 12). .... ***Sundapyrochroa sumatrensis* (Pic)**

Species Redescriptions

***Sundapyrochroa atricolor* (Pic), comb. nov.**
(Figures 1–3, 13–15)

Sundapyrochroa atricolor (Pic)
Pseudopyrochroa atricolor Pic, 1943

Male. (habitus, Fig. 1) Mean length from anterior margin of labrum (head slightly deflexed) to apex of elytra 9.2 mm (n = 2). Color largely brownish-black to black; legs and venter rufopiceous to black.

Head. Cranium unmodified, lacking cranial pits; surface of cranial "neck" coarsely, moderately densely punctate. Third antennomere (Fig. 2) with its ramus stout, well developed, but clearly less than length of the antennomere, itself.

Thorax. Pronotum (Fig. 1) subquadrate, slightly narrower anteriorly; anterior margin nearly straight; mesal canaliculus present. Elytral surface irregularly, coarsely, shallowly rugulose; vestiture consisting of dense, short, dark setae; each elytron ribbed, bearing 4, subtle costae.

Abdomen. Sternite 8 widest basally, apex (Fig. 13) rather deeply emarginate mesally, bearing numerous, moderately elongate marginal setae.

Male abdominal terminalia. Tegmen (Fig. 14) with basal piece subrectangular, its length nearly 2X its width, broadly joined to parameres distally. Parameres fused along basal 5/7, thence abruptly, widely separated, produced into a collar-like lip mesally at point of separation, the lip shallowly emarginate mesally; distal parameres narrow and subparallel, each rounded apically. Median lobe (Fig. 15) elongate, produced basally into two, elongate median struts, apex acutely narrowed.

Female. (habitus, Fig. 3) Similar to male, though a little larger. Mean length from anterior margin of labrum (head slightly deflexed) to apex of elytra 13.3 mm (n = 13). Antennae stout, antennomeres 3–10 notably pectinate (Fig. 3), but rami much shorter and more stout than those of male; last abdominal sternite entire, broadly rounded.

Larva. Unknown.

Etymology. The species epithet is derived from the Latin *atri-*, meaning black, and the Latin, *-color*, meaning "color". The name likely refers to the uniformly black color of this species.

Type Information. Pic (1943) listed the type locality as "Malacca," a seaside city 150 km south of Kuala Lumpur, Malaysia. During a visit to the Paris Museum, I was unable to locate any specimens under this name in the Pic material or any other area of the collection. If a type series exists, I am unaware of its location. As noted below, all material of *S. atricolor* I have examined comes from the Cameron Highlands, in the northwestern corner of peninsular Malaysia's largest state, Pahang. The second label associated with the female in the CASC (see below) is a pink rectangular label stating "co-type" - presumably in Pic's handwriting. In his original description, Pic (1943: 9) made specific reference to the female: "… antennis depressis et pectinatis ♀ …" but mentioned neither the male nor the number of specimens before him. Given these facts and the stated type locality, it seems unlikely that the female in the CASC is actually a syntype. It is from the Cameron Highlands, not Malacca. Also, several additional specimens bear nearly the same data as the CASC "co-type" - none of them are labeled as part of the type series and included in the series are two males: the male was not noted in the description.

Specimens Examined. (2 ♂♂, 13 ♀♀): 1♂ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5565 ft. // 19 - 5 - [19]39.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (BMNH); 1♀ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5565 ft. // 20 - 5 - [19]39.; [underside 1st label]: H. M.

Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (BMNH); 1♀ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5000 ft. // 22 - 5 - [19]39.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (BMNH); 2♀♀ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5000 ft. // 26 - 5 - [19]39.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (BMNH); 1♀ [Malaysia]: PAHANG, F.M.S. // Cameron's High-, lands. // [looks like] Ginling Kial 4500-4800 ft. // 16 - 6 - [19]35.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (BMNH); 1♀ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 4800 ft. // 31. Jan. [19]'24.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (BMNH); 1♀ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5000 ft., 5200' // 27 - 7 - 1938.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label – pink rectangular]: co-type; [3rd label – folded label, presumably in Pic's hand]: *Pseudopyrochroa* // *nigricolor* Pic; [4th label]: Rec'd from // Maurice Pic // Jan. 1950 (CASC); 1♂ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands. // [looks like] Ginling Kial 5000 ft: // 22 - 5 - 1939.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (DYCC); 1♀ [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] G. Pardah 5100 ft. // May 13th 1939.; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S. // Museum. // B.M. 1955-354. (DYCC); 1♀ Malaysia // BRINCHANG // 1550 m. öh // 20.1.1981 // T-E. Leiler; [2nd label]: Swedish Museum // of Natural History // Stockholm // NHRS (DYCC); 1♀ Malaysia // BRINCHANG // 1550 m. öh // 21.1.1981 // T-E. Leiler; [2nd label]: Swedish Museum // of Natural History // Stockholm // NHRS (DYCC); 1♀ MALAYSIA, Pahang // Tanah Rata, Cameron H. // 3-20 Feb 2005, 1600m // P. Čechovský lgt. (DYCC); 1♀ Malaysia // BRINCHANG // 1550 m. öh // 22.1.1981 // T-E. Leiler; [2nd label]: Swedish Museum // of Natural History // Stockholm // NHRS (NHRS); 1♀ Malaysia // BRINCHANG // 1550 m. öh // 6.2.1984 [NOTE: the preprinted date is written over in pen: the day and month are ambiguous] // T-E. Leiler; [2nd label]: Swedish Museum // of Natural History // Stockholm // NHRS (NHRS).

Distribution. As noted above, the only series of *S. atricolor* examined was collected in the Cameron Highlands of peninsular Malaysia at elevations of 4500–5565 feet, from early January to late July. Six specimens were collected between January and February while nine were collected between May and late July. Although only 15 specimens were available for examination, the dates might possibly suggest a bivoltine developmental pattern for *S. atricolor*.

Diagnosis and Remarks. Both sexes of *S. atricolor* are unicolorous brownish-black to black. *Sundapyrochroa nigripennis* and *S. sumatrensis* are usually in part yellowish-orange to orange. The melanic (all dark) male of *S. nigripennis* can readily be distinguished from the other species by the very long, delicate ramus borne by the third antennomere.

In his original description of *S. atricolor*, Pic indicated this species was very similar to *Pseudopyrochroa nigricolor* Pic. Both species are brownish-black to black, but in other respects the latter species conforms more closely to *Pseudopyrochroa*. While the head of male *P. nigricolor* lacks any obvious cranial pit apparatus, the frons is conspicuously gibbose between the compound eyes. The antennae of male *P. nigricolor* are strongly serrate-pectinate, with the serrations very large and broadly rounded. The male genital anatomy of *P. nigricolor* is also typical for *Pseudopyrochroa* and very unlike that of *Sundapyrochroa* males.

***Sundapyrochroa nigripennis* (Pic), comb. nov.**
(Figures 4–8, 16–18)

Sundapyrochroa nigripennis (Pic)
Pseudopyrochroa nigripennis Pic, 1932
Pseudopyrochroa nigripennis v. *notaticeps* Pic, 1943
Pseudopyrochroa nigripennis notaticeps Pic; Young (1996); **syn. nov.**

Male. (habitus, Fig. 4–5) Mean length from anterior margin of labrum (head slightly deflexed) to apex of elytra 10.7 mm (n = 6). Color largely brownish-black to black; head, prothorax, and basal portions of ventral mesothorax usually orange (Fig. 4), sometimes entirely dark in color (Fig. 5); legs and venter rufopiceous to black.

Head. Cranium (Fig. 7) lacking cranial pits, but with paired, subtle gibbosities: one on either side of meson juxtaposed to anterior emarginations of compound eyes; cranial surface densely, shallowly punctate, more coarsely so on surface of cranial "neck." Third antennomere with ramus nearly 3X length of the antennomere, itself.

Thorax. Pronotum (Fig. 4–5) subquadrate, densely, shallowly punctate; anterior margin nearly straight; mesal canaliculus lacking. Elytral surface irregularly, coarsely, shallowly rugulose; vestiture consisting of short, dark setae; ribbing of each elytron evident but poorly defined.

Abdomen. Sternite 8 widest basally, apex (Fig. 16) rather deeply emarginate mesally, bearing numerous, moderately elongate marginal setae.

Male abdominal terminalia. Tegmen (Fig. 17) with basal piece widest distally, its length slightly more than 2X its width, broadly joined to parameres distally. Parameres fused along basal 2/3, thence abruptly, widely separated, produced into a collar-like lip mesally at point of separation, the lip very feebly emarginate mesally; distal parameres narrow and subparallel, each obtusely rounded apically. Median lobe (Fig. 18) elongate, laterally bisinuate, produced basally into two, short median struts, apex rather broadly rounded.

Female. (habitus, Fig. 6) Similar to male, though a little larger. Mean length from anterior margin of labrum (head slightly deflexed) to apex of elytra 12.7 mm (n = 6). Antennae stout, antennomeres 3 –10 notably pectinate (Fig. 6), but rami much shorter and more stout than those of male; antennomeres 1–10 black, 11 creamy whitish; last abdominal sternite entire, broadly rounded.

Larva. Unknown.

Etymology. The species epithet is derived from the Latin root *nigri-*, meaning dark or black, and the Latin, *-penni*, meaning "a wing". The name likely refers to the uniformly black elytra of all known specimens of *S. nigripennis*.

Type Information. Pic (1932) based the species description on an unspecified number of males; the description also lists the following: "Iles Cameron, Pahang (Pendlebury, in British Museum)." Two of the four males examined, one each in DYCC and MNHP, predate the publication date; these two males bear very nearly identical data and likely represent syntypes of *P. nigripennis*. A single female (BMNH) also predates the publication date, but as the original description clearly referred to the male only, this female may not be definitively considered part of the *P. nigripennis* syntype series. An additional two males and single female in the MNHP also bear very similar "Cameron Highlands" labels, but they were collected in 1939. Thus, they can not be part of the *P. nigripennis* syntype series.

In his 1943 paper, Pic commented on *P. nigripennis* and then made reference to "*v. n. notaticeps*." In keeping with the International Code of Zoological Nomenclature (ICZN) (1985: Article 45(g)(ii)), Young (1996) considered Pic's "*variation novum*" as implying subspecific rank. Of the four specimens of *P. nigripennis* in the Pic collection (MNHP), Young (1996) considered the males to represent the syntype series of *P. nigripennis notaticeps*. He excluded the female under the mistaken belief that only the male was described. In fact, Pic (1943:9) referred specifically to the female: "J'attribue comme ♀ à ces ♂ des exemplaires à coloration semblable, mais ayant les antennes simples avec leur article terminal blanc." [I attribute these as females; males have similar coloration, but [the female] has simple antennae with the terminal article white.] Thus, the female Young referred to (1996: 227) should also be considered a paralectotype of *P. nigripennis notaticeps*.

In summary, there appear to be at least two male syntypes of *P. nigripennis* and a lectotype male, as well as at least three paralectotypes (2♂♂, 1♀) of *P. nigripennis notaticeps*. Moreover, the MNHP male syntype of *P. nigripennis* is also one of the paralectotypes of *P. nigripennis notaticeps*, as is provided for in the ICZN (1999: Article 72.6.).

Having examined all the specimens in question, *P. nigripennis notaticeps* does not conform to the standard definition of a subspecies as a geographically defined aggregate of local populations. Thus, the subspecific epithet is proposed to represent no more than a **NEW SYNONYM** of *S. nigripennis*.

Specimens Examined. (6♂♂, 6♀♀): 1♀, [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5000 ft. // 26.5.1939; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: Ex F.M.S., Museum. // B.M. 1955-354. [3rd label]: *Pseudopyrochroa* // *nigripennis* Pic ♀ // det. Daniel K. Young (BMNH); 1♀, [Malaysia]: PAHANG, F.M.S. // "Cameron's High-, lands." // Sunga Parang, path 4850 ft. // May 25th 1931 // H. M. Pendlebury; [underside 1st label]: EX COLL // F.M.S., MUSEUM; [2nd label]: Pres. by // Imp. Inst. Ent. // Brit. Mus. // 1932-66.; [3rd label]: *Pseudopyrochroa* // *nigripennis* Pic // det. Daniel K. Young (BMNH); 1♂, MALAYSIA W., PERAK // 40km SE of IPOH, 900 m // Banjaran Titi Wangsa, RINGLET, 29.iii.- 15.iv. // 2004 Čechovsky Petrlgt.; [2nd label – reversed] BMNH{E} // 2005-104 // MVL Barclay (BMNH) [all black melanic specimen]; SYNTYPE ♂, [Malaysia]: PAHANG, F.M.S. // "Cameron's High- // lands." Tanah Rata to // Padang 4500 ft. // May 29th 1931 // H. M. Pendlebury.; [underside 1st label]: EX COLL // F.M.S., MUSEUM.; [2nd label]: Pres. by // Imp. Inst. Ent. // Brit. Mus. // 1932-66.; [3rd label]: [handwritten, presumably Pic's hand] désiré; [4th label]: [handwritten, Pic's hand] *Pseudopyrochroa* // *nigripennis* // mihi (DYCC); 1♀, MALAYSIA-PAHANG // Cameron Highlands // MARDI Research Station // Malaise Trap, 2001 // BMNH{E} 2005-151 // D. J. Quick [2nd label]: Retained by Permission // 24.I.2007 // ex: BMNH (DYCC); 1♂, Malaysia CH // BRINCHANG // 1550 möh // 12.4.1987 // T-E. Leiler; [2nd label]: Swedish Museum // of Natural History // Stockholm // NHRS (DYCC) [NOTE: ♂ has uniformly dark head and prothorax unlike "typical" specimens.]; SYNTYPE ♂ [of *nigripennis*]/ PARALECTOTYPE ♂ [of *nigripennis notaticeps*]:, [Malaysia]: PAHANG, F.M.S. // "Cameron's High-, lands." // Tanah Rata to, Padang 4500 ft. // May 29th 1931 // H. M. Pendlebury; [underside 1st label]: EX COLL // F.M.S., MUSEUM; [2nd label]: *Pseudopyrochroa* // *nigripennis* // Pic var. à tete u partie rembrunir; [3rd label]: v. *notaticeps* // mihi; [4th label]: PARALECTOTYPE: ♂// *Pseudopyrochroa* // *nigripennis* // *notaticeps* Pic // Daniel K. Young (MNHP); LECTOTYPE ♂ [of *nigripennis notaticeps*]: [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // 4700-5000 ft. // May 15th 1939; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: *nigripennis* // V; [3rd label]: LECTOTYPE: ♂, *Pseudopyrochroa* // *nigripennis* // *notaticeps* Pic // Daniel K. Young (MNHP); PARALECTOTYPE ♂ [of *nigripennis notaticeps*]:, [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] G. Beumbun 6036 ft. // December 1939; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: PARALECTOTYPE: ♂, *Pseudopyrochroa* // *nigripennis* // *notaticeps* Pic // Daniel K. Young (MNHP); PARALECTOTYPE ♀ [of *nigripennis notaticeps*]:, [Malaysia]: PAHANG, F.M.S. // Cameron Highlands // [looks like] Ginling Kial 5000 ft. // May 25th 1939; [underside 1st label]: H. M. Pendlebury // Coll: // F.M.S., Museums; [2nd label]: *Pseudopyrochroa* // *nigripennis* ♀; [3rd label]: PARALECTOTYPE: ♀// *Pseudopyrochroa* // *nigripennis* // *notaticeps* Pic // Daniel K. Young (MNHP); 1♀, Malaysia CH // BRINCHANG // 1550 möh // 12.4.1987 // T-E. Leiler; [2nd label]: Swedish Museum // of Natural History // Stockholm // NHRS (NHRS); 1♀, Malaysia, Cameron // Highlands, Brinchang, Mt. 1700-1800 m. 10.VI., [19]'95 // leg. S. Kazantsev (SKCC).

Distribution. As noted above, all specimens of *S. nigripennis* were collected in peninsular Malaysia's Cameron Highlands, at elevations of 4500–6036 feet. Ten specimens were collected between late March and early June; six were taken during the month of May. Two specimens came from December and late January. These data could possibly suggest at least a bivoltine, if not multivoltine developmental pathway for *S. nigripennis*.

Diagnosis and Remarks. The antennae are diagnostic in both sexes of *S. nigripennis*. Males have the ramus of antennomere three nearly three times as long as the entire length of the antennomere, itself (Fig. 8). In males of *S. atricolor* (Fig. 2) and *S. sumatrensis* (Fig. 11), the ramus of antennomere three is clearly less than the length of the antennomere. Females of *S. nigripennis* have antennomeres 1–10 black, while the terminal (11th) antennomere is creamy yellowish-white to whitish (Fig. 6). Antennomeres 1–11 are black in females of both *S. atricolor* (Fig. 3) and *S. sumatrensis* (Fig. 12), as well as males of all three species.

***Sundapyrochroa sumatrensis* (Pic), comb. nov.**
(Figures 9–12, 19–21)

Sundapyrochroa sumatrensis (Pic)
Schizotus sumatrensis Pic, 1906
Schizotus rotundicollis Pic, 1912, **syn. nov.**
Pyrochroa dimidiata Blair, 1912
Pseudopyrochroa dimidiata (Blair); Blair (1914)
Pseudopyrochroa sumatrensis (Pic); Blair (1914, 1928); Young (1996)

Male. (habitus, Fig. 9–10) Mean length from anterior margin of labrum (head slightly deflexed) to apex of elytra 9.4–13.5 mm (n = 5). Color variable: head, including mouthparts and antennae, thorax, abdomen, and legs usually rufopiceous to black (Fig. 9); head, including mandibles, maxillae and labium, thorax, and legs, especially tarsi, may be yellowish-orange, at least in part (Fig. 11); elytra most commonly yellowish-orange in basal 1/2 to 4/5, brownish-black to black apically, with the darker pigmentation typically advancing along the lateral and sutural margins.

Head. Cranium (Fig. 11) lacking cranial pits, but with paired, very subtle gibbosities: one on either side of meson juxtaposed the anterior emarginations of compound eyes; cranial surface densely, shallowly punctate anteriorly, finely, sparsely punctate between eyes posterad antennal insertions, thence more coarsely and densely punctate on surface of cranial "neck." Third antennomere with its ramus stout, well developed but clearly shorter than length of antennomere, itself.

Thorax. Pronotum (Fig. 9–10) subquadrate, very slightly narrower anteriorly; anterior margin nearly straight; mesal canaliculus present. Elytral surface irregularly, coarsely, shallowly rugulose; vestiture consisting of dense, short setae, the color of which match the underlying elytral color; each elytron ribbed, bearing 4 costae.

Abdomen. Sternite 8 widest basally, apex (Fig. 19) relatively shallowly emarginate mesally, bearing numerous, moderately elongate marginal setae.

Male abdominal terminalia. Tegmen (Fig. 20) with basal piece subrectangular, its length nearly 2X its width, broadly joined to parameres distally. Parameres fused along basal 2/3, thence abruptly, widely separated, meson shallowly emarginate between diverging parameres at point of separation; parameres divergent, distally, each rounded apically . Median lobe (Fig. 21) elongate, produced basally into two, elongate median struts, apex acutely narrowed.

Female. (habitus, Fig. 12) Similar to male. Mean length from anterior margin of labrum (head slightly deflexed) to apex of elytra 10.5–11.3 mm (n = 8). Antennae stout, antennomeres 3–10 notably pectinate, but rami much shorter and more stout than those of male; last abdominal sternite entire, broadly rounded.

Larva. Unknown.

Etymology. The species epithet, *sumatrensis*, combines the geographical location, the Indonesian island of Sumatra, with the Latin, *-ensis*, meaning "of" or "belonging to". The epithet *rotundicollis* comes from the Latin, *-rotund*, meaning "round" and the Latin *colli-*, meaning "the neck". This epithet refers to the distinctly rounded lateral aspects of the pronotum. Finally, *dimidiata* comes from the Latin *dimidi-*, meaning "half" or "to halve" - most likely in reference to the elytral color of some specimens (e.g., Fig 10).

Type Information. The type series for *Schizotus rotundicollis* Pic and *Schizotus sumatrensis* Pic were discussed by Young (1996).

Specimens Examined. (5♂♂, 8♀♀): SYNTYPE ♀ [of *dimidiata*]: [Indonesia]: SUMATRA // SI-RAMBÉ // XII.90 - III.91 // E. MODIGLIANI; [2nd label]: type [circular label with red boarder]; [3rd label]: *Pyrochroa* // *dimidiata* // Blair // Type.; [4th label]: 1912.136 (BMNH); 1♀, [Indonesia]: SUMATRA // SI-RAMBÉ // XII.90 - III.91 // E. MODIGLIANI; [2nd label]: *P. sumatrensis* // Pic // K.G. Blair det.; [3rd label]: 1912.136 (BMNH); 1♀, SABAH: Mt. Kinabalu // Mesilau // 13.ii.1964. J. Smart. // Royal Soc. Exped. // B. M. 1964-250 (BMNH); 1♂, [Malaysia]: BRITISH N. BORNEO // Tenompok // 15.II.1959; [2nd label]: T. C. Maa // Collector // BISHOP (BPBM); 1♂, [Malaysia]: BRITISH N. BORNEO // Tenompok, 1460 m. // Jesselton, 48 km // E., 26-31.I.1959; [2nd label]: T. C. Maa // Collector // BISHOP (BPBM); 1♀, [Malaysia]: BRITISH N. BORNEO // Tenompok, 1460m. // Jesselton, 30 mi. // E., I - 26-31 - 1959; [2nd label]: T. C. Maa // Collector (DYCC); 1♂ [Malaysia]: BRITISH N. BORNEO // Bundu Tukan // 18.II.1959; [2nd label]: T.

C. Maa // Collector // BISHOP (DYCC); 1♂, [Indonesia]: Takengon // Sumatra; [2nd label]: NGS SI Exp // 1937 Mann (DYCC); 1♀, [Indonesia]: SUMATRA Utara // Brastagi, Gn Sibayak // 26. Jan.-1.Feb 2005 // 1600-2200m, Bolm lgt. (DYCC); 1♀, [Malaysia]: BORNEO: Sabah // Mt Kinabalu N.P. // Headquarters, 1558m // VIII/3-12/1988;[2nd label]: Beating foliage // D.E. Bright // Collector (NMNH); 1♂, MALAYSIA: Sabah; // 1 km S. Kundasang // el. 1530m, 10 Sept. 1983 // G. F. Hevel & W. E. Steiner (NMNH); LECTOTYPE ♀ [of *sumatrensis*]: [Indonesia]: [first card has dried glue only; perhaps once held distal part of left antenna]; [2nd label]: Padang, // (Sumatra); [3rd label]: *sumatrensis* // Pic; [4th label]: communiqué // eu angleterre // d. Blair du // B. Museum; [5th label]: type [handwritten]; [6th label]: TYPE [red label]; [7th label]: *sumatrensis* // Pic; [8th label]: LECTOTYPE: // *Schizotus* // *sumatrensis* ♀ // Pic // Daniel K. Young (MNHP); LECTOTYPE ♀ [of *rotundicollis*]: [Indonesia]: SUMATRA // SI-RAMBÉ // XII.90 - III.91 // E. MODIGLIANI; [2nd label]: 348; [3rd label]: type [handwritten]; [4th label]: TYPE [red label]; [5th label]: "*Schizotus*"// *rotundicollis* // Pic; [6th label]: LECTOTYPE: ♀, *Schizotus* // *rotundicollis* // Pic // Daniel K. Young (MNHP).

Distribution. To date, *S. sumatrensis* is the most widely distributed member of the genus, with records from Indonesia (Sumatra) and Malaysia (Borneo: Sabah). Elevations, where recorded, were 4672–4986 feet. Eleven of the 13 specimens have labels with specific phenological records; nine of these were collected between December and March, while one female was collected in early August and one male was collected on 10 September. These collection data might suggest at least a bivoltine, if not multivoltine developmental pattern for *S. sumatrensis*.

Diagnosis and Remarks. Like males of *S. atricolor*, those of *S. sumatrensis* have the ramus of antennomere three well developed, but clearly less than the length of the antennomere, itself. The ramus of the third antennomere in males of *S. nigripennis* is nearly three times as long as the entire length of the antennomere. The elytra of *S. atricolor* are black while those of *S. sumatrensis* are yellowish-orange in the basal third to four-fifths and black distally.

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I am grateful to several colleagues and curators over a number of years for assistance extended during my visits or for loans of material that consolidated suspicions dating from Pic's observation more than 100 years ago relative to generic position of this interesting new taxon. From the Natural History Museum, London, England, I thank Max Barclay, Martin Brendell (retired), and Malcolm Kerley; from the Bernice P. Bishop Museum, Honolulu, Hawaii, G. Al Samuelson (retired); Claude Girard (retired) at the Museum National d'Histoire Naturelle, Paris; from U. S. National Museum of Natural History, Washington, D. C., David Furth and the late Nancy Adams; David Kavanaugh from the California Academy of Sciences; Bernt Viklund of the Naturhistoriska Riksmuseet, Stockholm, Sweden. I also thank Sergey Kasantsev, Moscow, Russia, for a specimen loan. I am grateful to Paul Johnson, South Dakota State University, and Daren Pollock, Eastern New Mexico University, for their time and care in reviewing the manuscript.

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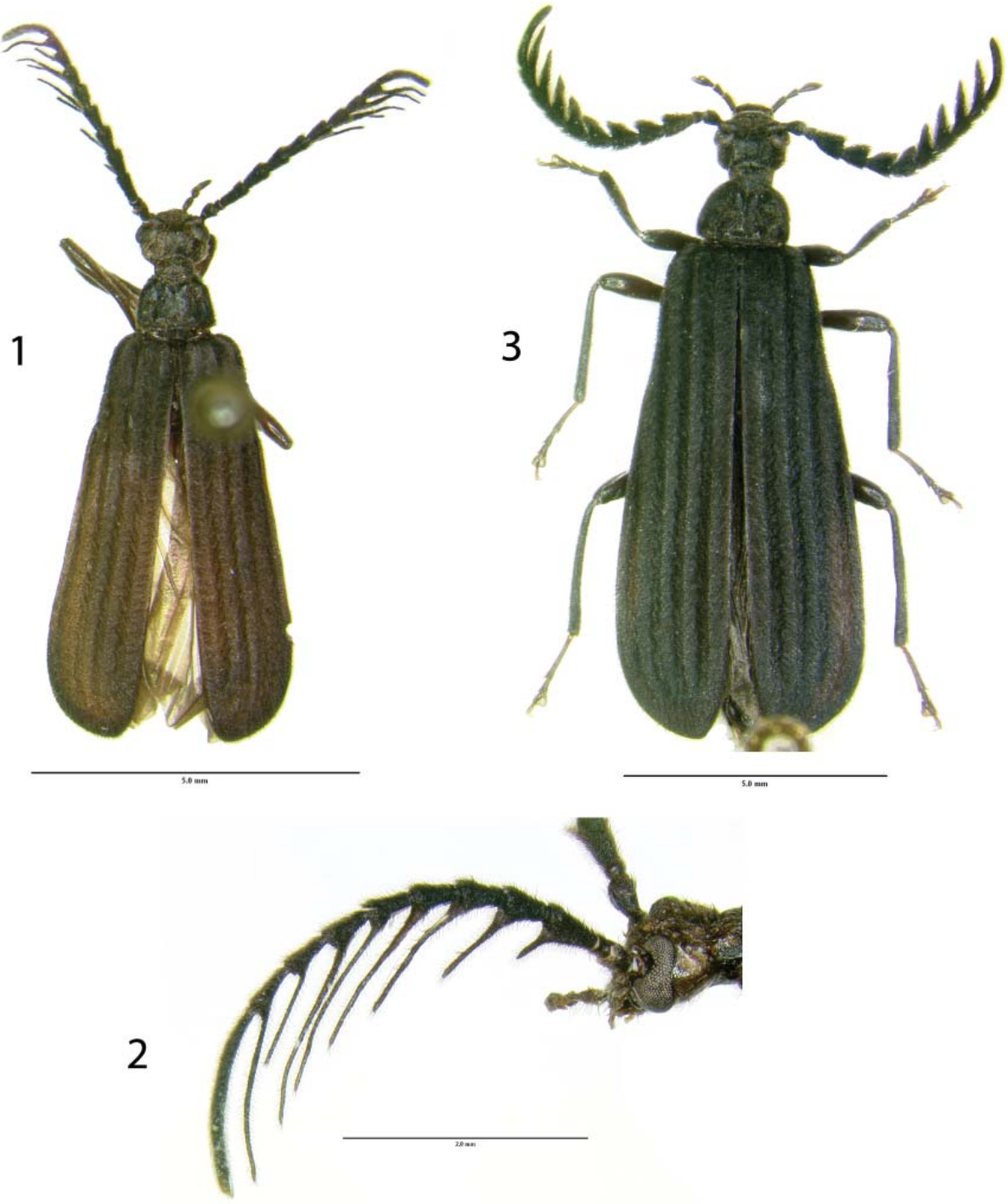
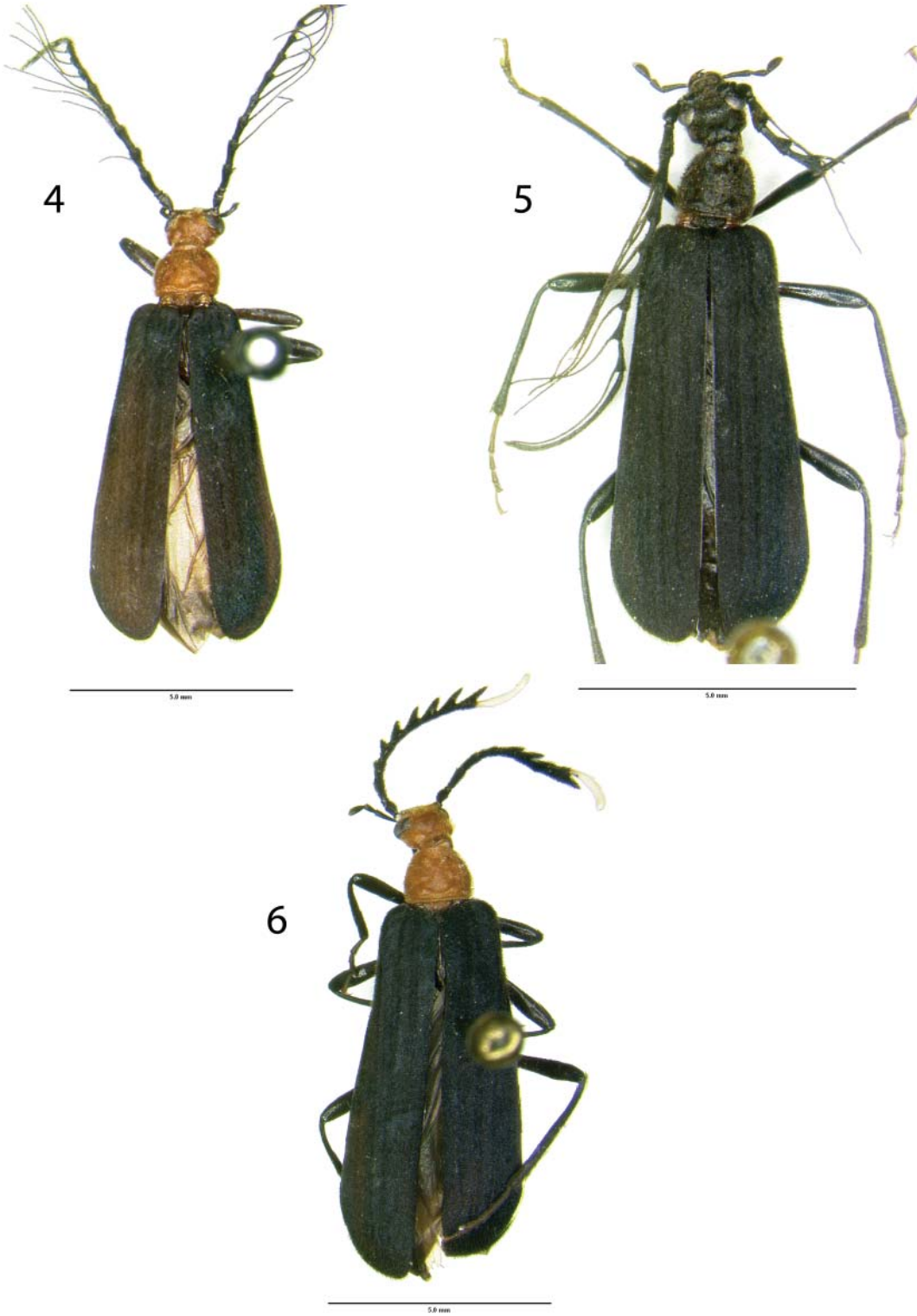
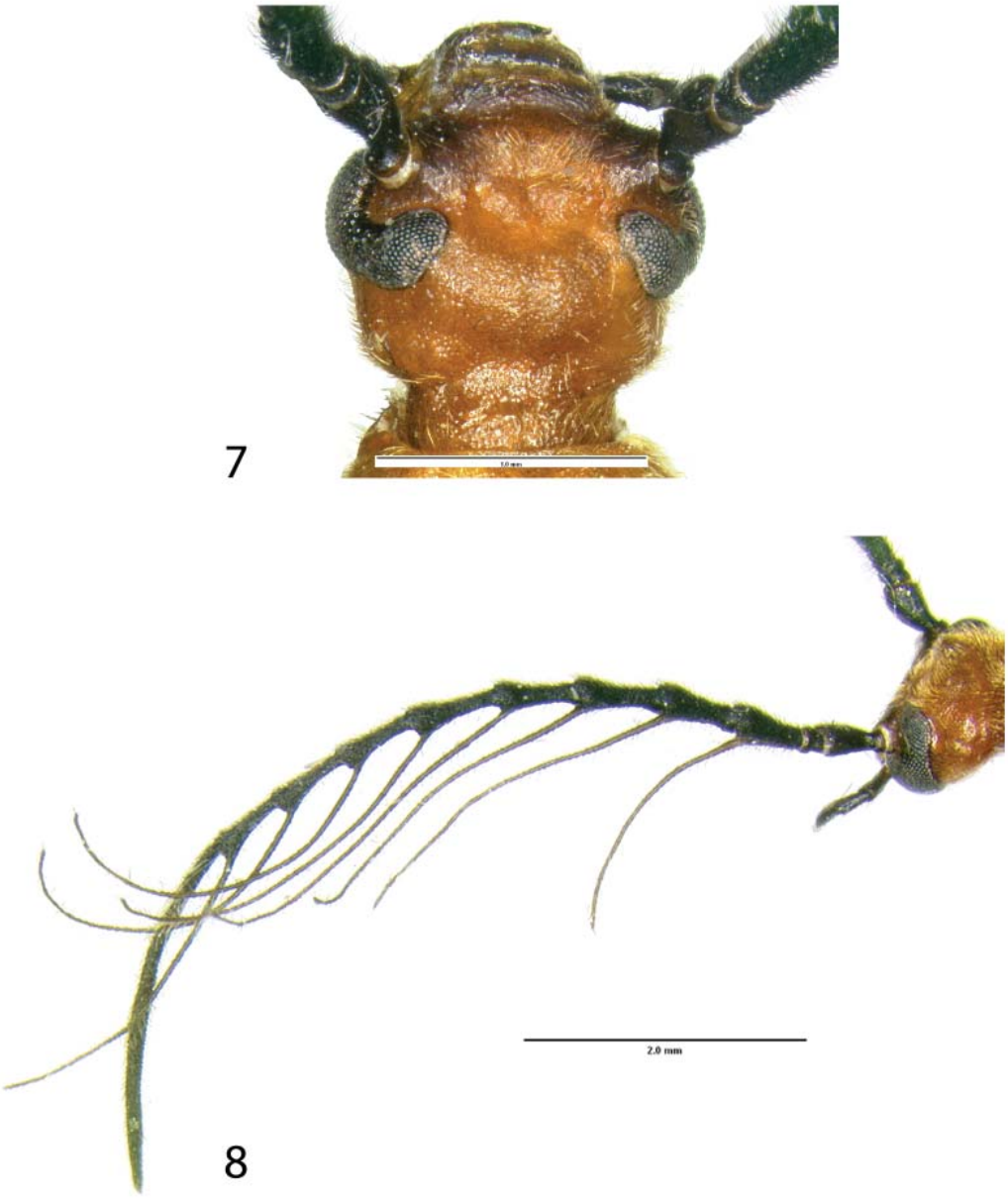


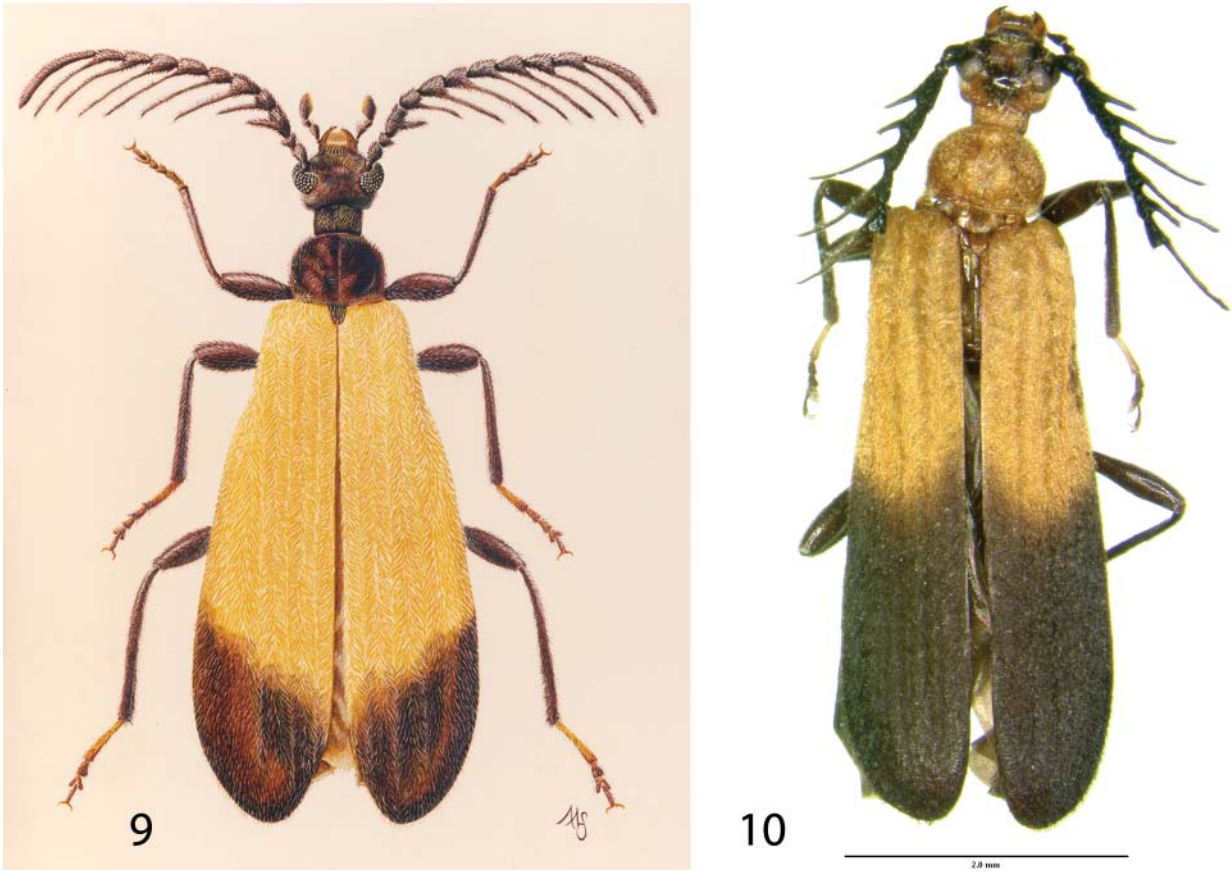
Figures 1–3. *Sundapyrochroa atricolor* (Pic). **1)** Habitus, adult male, dorsal. **2)** Left antenna, lateroventral. **3)** Habitus, adult female, dorsal.



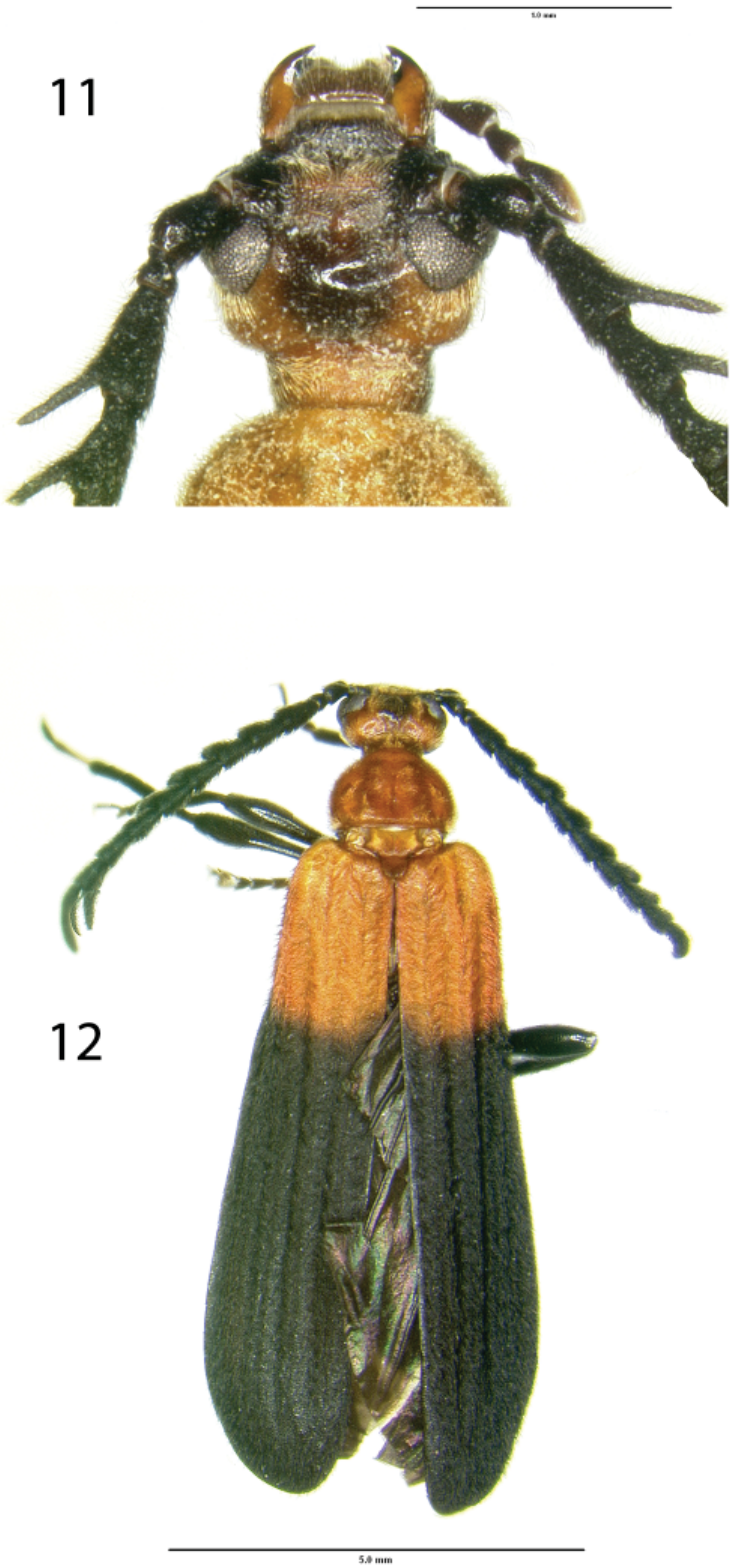
Figures 4–6. *Sundapyrochroa nigripennis* (Pic). **4)** Habitus, adult male, dorsal. **5)** Habitus, melanic adult male, dorsal. **6)** Habitus, adult female, dorsal.



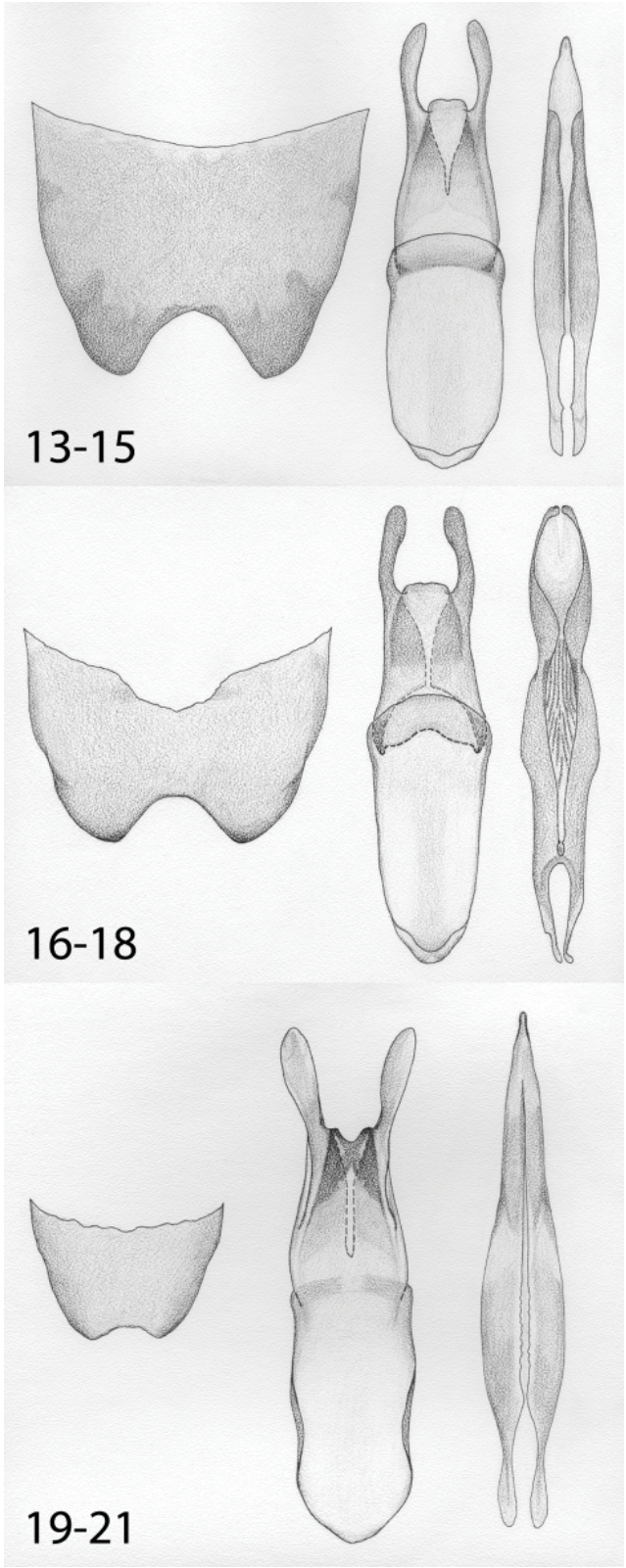
Figures 7–8. *Sundapyrochroa nigripennis* (Pic). **7)** Head, adult male, dorsal. **8)** Left antenna, dorsolateral.



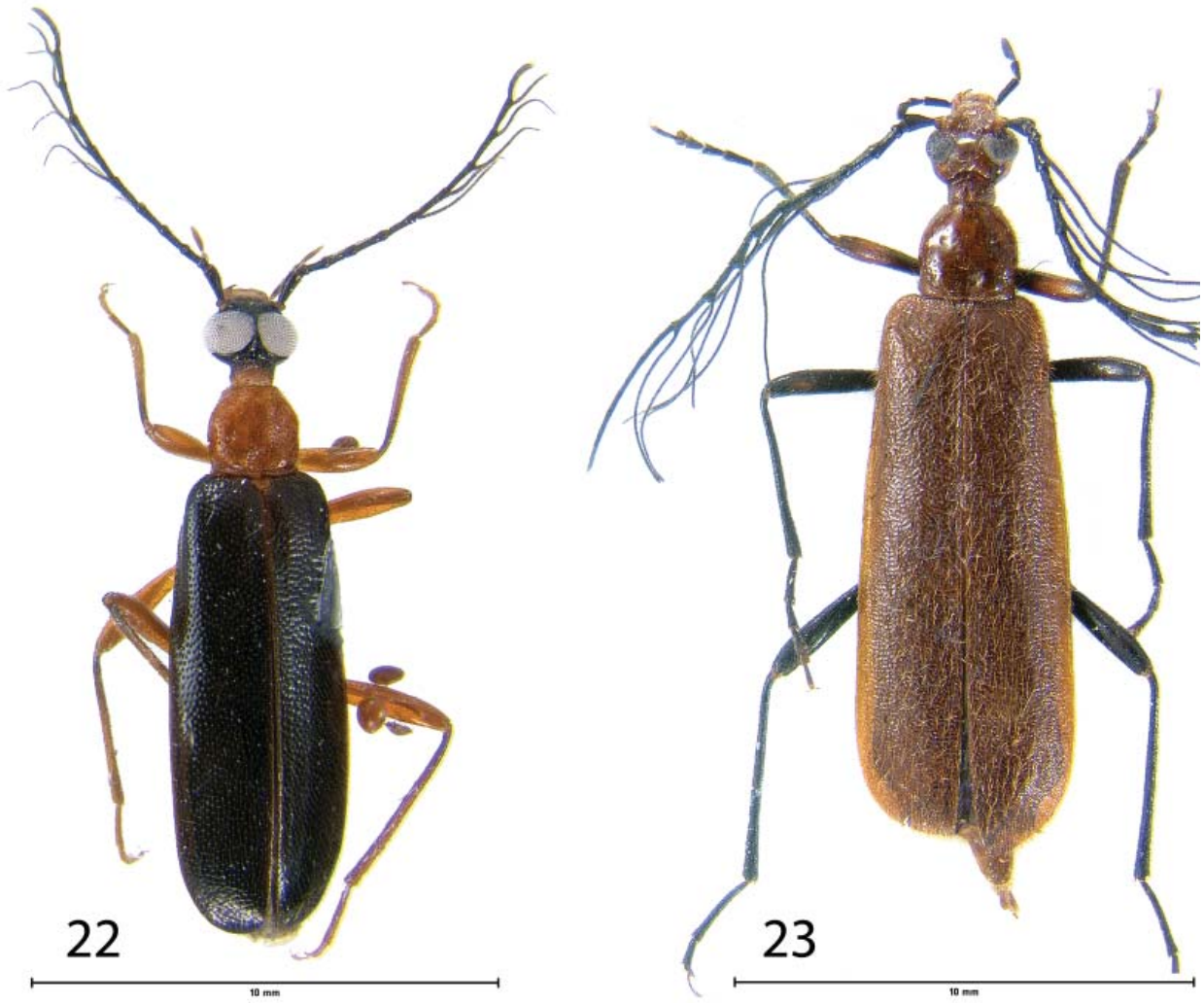
Figures 9-10. *Sundapyrochroa sumatrensis* (Pic), habitus adult male illustrating color variations.



Figures 11–12. *Sundapyrochroa sumatrensis* (Pic). **11)** Head, adult male, dorsal. **12)** Habitus, adult female, dorsal.



Figures 13–21. Three species of *Sundapyrochroa*. **13)** *S. atricolor* (Pic), abdominal sternite eight. **14)** *S. atricolor* (Pic), tegmen, dorsal. **15)** *S. atricolor* (Pic), penis, dorsal. **16)** *S. nigripennis* (Pic), abdominal sternite eight. **17)** *S. nigripennis* (Pic), tegmen, dorsal. **18)** *S. nigripennis* (Pic), penis, dorsal. **19)** *S. sumatrensis* (Pic), abdominal sternite eight. **20)** *S. sumatrensis* (Pic), tegmen, dorsal. **21)** *S. sumatrensis* (Pic), penis, dorsal.



Figures 22–23. Two species of Pyrochroidae. **22)** *Dendroides canadensis* Latreille, habitus adult male, dorsal. **23)** *Sinodendroides chinensis* Young, habitus adult male, dorsal.