SICARDIANA AUREOMARGINATA, NEW GENUS AND NEW SPECIES OF CHILOCORINI FROM NEW GUINEA (COLEOPTERA: COCCINELLIDAE)

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Abstract.— A new genus and species of *Chilocorini* (Coleoptera: Coccinellidae) from New Guinea, *Sicardiana aureomarginata* is described and illustrated based on adults. Characters concerning similarities to other Chilocorini genera are discussed. Key to New Guinean genera of Chilocorini and a checklist to the known species of the tribe from New Guinea are provided.

Key words.— Coleoptera, Cucujoidea, Coccinellidae, Chilocorini, *Sicardiana*, new genus, new species, New Guinea.

INTRODUCTION

The tribe Chilocorini Mulsant, 1846 forms a moderately large group of ladybirds, comprising about 250 species distributed worldwide (Korschefsky 1932, Chapin 1965, Kovář 1995). The group is characterized by distinctly hemispherical body, expanded clypeus and short appendages received in repose in various fossae on ventral surfaces of the body.

In a modern classification, Chilocorini is classified along with Platynaspidini and Telsimini in the subfamily Chilocorinae (Sasaji 1968) or in the tribe Chilocorini in the subfamily Coccinellinae, as proposed by Ślipiński (2007).

Apart from a paper by Chapin (1965) who reviewed genera of Chilocorini, based on a study of only type species for each genus, there were no more recent publications about the group until Ślipiński and Giorgi (2006) revised Australian species of Chilocorini and provided detailed diagnosis of the tribe.

Although Chilocorini seems to be reasonably well defined, the classification on a generic level within the tribe is still questionable and requires additional work. A cladistic study is in progress by one of us (PŁ) based on the adult characters. It will include detailed morphological analysis and cladistic classification of the entire tribe. Here we describe a new genus and species based on adults, collected in Papua New Guinea, found during an examination of the Oriental and Australian Coccinellidae borrowed from the Natural History Museum in London. The new genus described here brings the total number of known genera of Chilocorini up to 23.

The discovery of a new chilocorine genus in New Guinea suggests the group is quite diverse in the Oriental and Australian Regions, and adds some new morphological features to this still poorly known group of beetles.

The present paper summarizes the knowledge of New Guinean Chilocorini, providing key to known genera and a checklist of all known species from this area.

MATERIAL AND METHODS

Acronyms for depositories of specimens are:

NHM – Natural History Museum, London, England;
MIZ – Museum and Institute of Zoology PAS, Warszawa, Poland.

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Measurements were made using an ocular micrometer attached to Olympus (SZH 10) dissecting microscope as follows: (TL) total length, from apical margin of clypeaus to apex of elytra; (PL) pronotal length, from the middle of anterior margin to base of pronotum; (PW) pronotal width at widest part; (EL) elytral length along suture including scutellum; (EW) elytral width across both elytra at widest part.

Male and female genitalia were dissected, cleared in 10% solution of KOH and placed in glycerine on slides for further study. The structural illustrations were made from slide preparations using a camera lucida attached to Leica dissecting microscope.

The SEM photographs were made using HITACHI S-3400N and photographic images were made using a digital camera and enhanced using AUTO MONTAGE software, in the laboratory of the MIZ.

SYSTEMATICS

Sicardiana gen. nov.
(Figs 1–24)

Type species. *Sicardiana aureomarginata* sp. nov.

Etymology. The generic name is dedicated to memory of Dr. Andre Sicard, a French coleopterist, who devoted many years of his life to study ladybird beetles. Gender feminine.

Diagnosis. *Sicardiana* is most similar to *Chilocorus* Leach but can be easily distinguished from it in having 10-segmented antenna with very long antennomere 9, stout labial palps and the penis guide with characteristic wing-like projections.

Diagnostic combination. Dorsum glabrous. Clypeus large, moderately emarginate anteriorly; expanding laterally into eye; below clypeus two rows of facets visible. Antenna 10-segmented; scape bent in the middle; antennomere 9 as long as antennomeres 5–8 combined, parallel sided; terminal antennomere very short, somewhat embedded in penultimate one. Mentum strongly transverse, about 4.5 times broader than long and 4 times shorter than prementum; labial palps stout. Pronotal base unbordered; hypomeral foveae absent; prosternal process narrow without carinae, prosternum in front of coxae nearly as long as longitudinal procoxal diameter. Mid and hind tibiae with weak angulation near apex; tibial spurs absent; tarsal claws appendiculate. Elytral margin weakly reflexed with bead indistinct; epipleural foveae absent. Abdominal postcoxal lines separated at middle, nearly complete laterally. Penis guide with wing-shaped, lateral projections. Female genitalia with coxites elongate and styli absent; proper infundibulum absent but bursal appendix present in form of sclerotized spur.

Description. Body (Fig. 24) rounded and convex. Dorsum predominantly black, without metallic sheen. Punctures shallow about as large as eye facets.

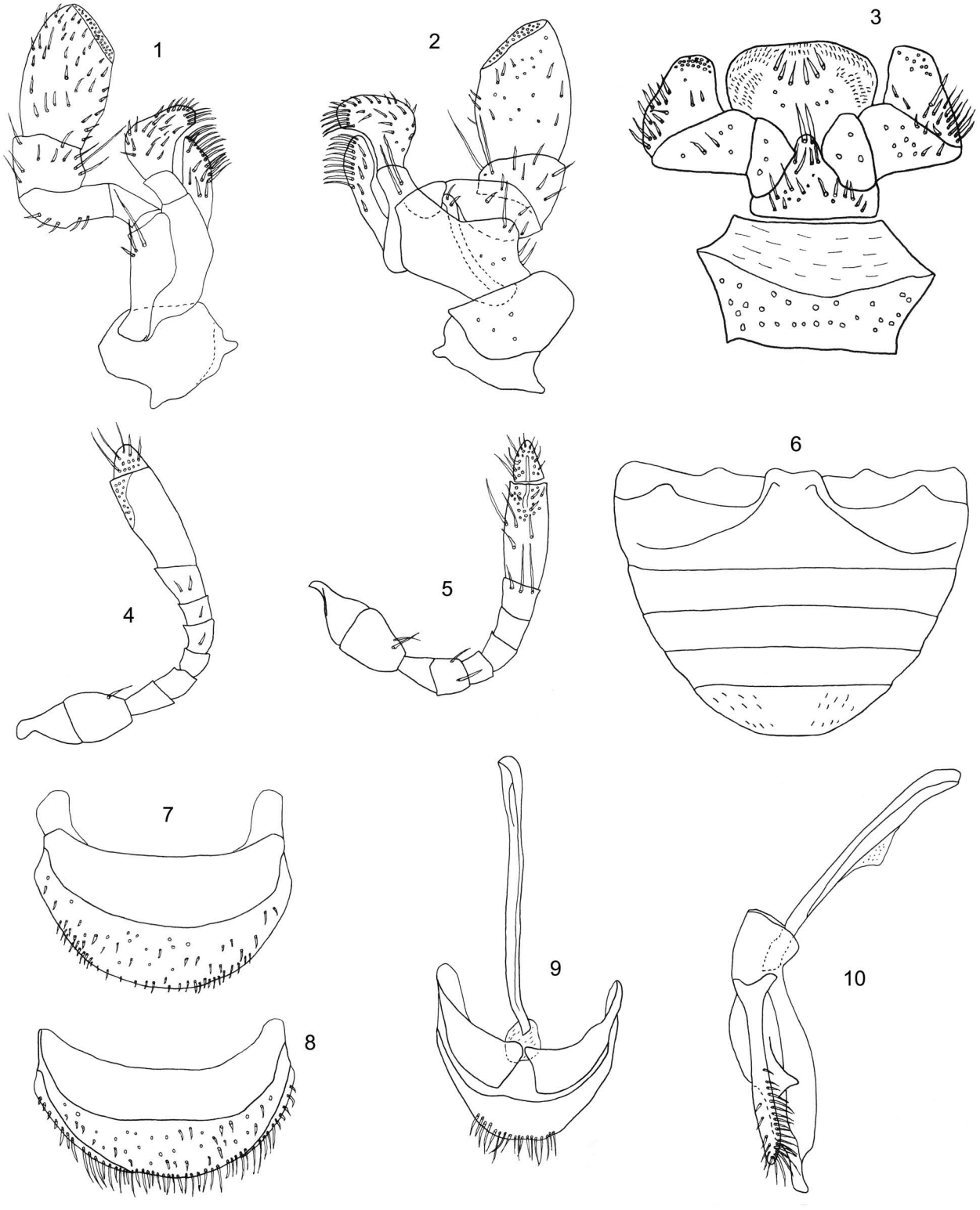
Head transverse; ventral antennal grooves shallow but long, extending along first four antennomeres (when antenna in repose) (Fig. 17). Eye finely faceted. Clypeus expanded laterally into eye, clypeal shelf divides eye in two parts; part below clypeus consists of two rows of eye facets (Fig. 17). Antenna (Figs 4, 5, 17) 10-segmented; scape and pedicel entirely hidden under clypeal shelf; antennomere 9 very long, covered with setae and sensillae at inner side; antennomere 10 very short, also covered with hairs and sensillae. Labium (Figs 3, 20) with mentum trapezoidal, covered with sparse long hairs; prementum elongate, narrow between labial palps and with few long setae; ligula reduced; labial palps ventral on prementum, 3-segmented, stout; terminal palpomere asymmetrical with several rows of stout setae on outer margin. Maxilla (Figs 1, 2) with 4-segmented palp; penultimate palpomere short, barrel-shaped with two long setae placed on inner margin. Mandible with strong, acute apical tooth. Labrum visible from above (Fig. 23); covered with short and sparse hairs.

Prothorax (Figs 20, 23) strongly descending anteriorly; anterior margin deeply emarginate with anterior angles and lateral margins rounded; pronotal base without bordering carina; hypomeron without visible foveae; prosternal process rounded apically, without carinae.

Meso-metaventral junction weakly arcuate anteriorly; discrimen complete; metaventral postcoxal lines straight, joined medially in form of "V" (Fig. 18); metaepimeron indistinct; outer margin of metaepisternum with small tooth interlocking with fovea on elytron. Scutellum triangular, very small, without setae. Elytra strongly convex, with weakly explanate lateral margins, without clear bead; humeral callus weakly visible; epipleuron (Fig. 22) broad, complete to apex, without foveae.

Legs moderately stout; trochanters angulately produced (Figs 20, 22); mid and hind tibiae with very weak triangular tooth (this one on hind tibiae slightly larger); tarsal claws with distinct subquadrate basal tooth (Fig. 19); empodium without setae.

Abdomen with five ventrites in female and sixth ventrite in male at least partly visible (Fig. 21); postcoxal lines (Figs 6, 21) separated at middle, posteriorly running almost parallel to posterior margin of ventrite I, laterally arcuately recurving anteriorly and nearly complete; intercoxal process weakly swollen at anterior border; ventrite V truncate in male, weakly rounded in female; sternite VIII rounded apically in both sexes (Figs 7, 8); male genital segment (Fig. 9) with long apophysis, at base slightly swollen and submembranous, narrow and simple to apex.



Figures 1–10. *Sicardiana aureomarginata* sp. nov. (1) Maxilla, dorsal; (2) maxilla, ventral; (3) labium, ventral; (4) antenna, ventral; (5) antenna, inner view; (6) abdomen, female, ventral; (7) abdominal segment VIII, male, ventral; (8) abdominal segment VIII, female, ventral; (9) male genital segment, ventral; (10) tegmen, lateral.

Male genitalia. Penis slender of uniform diameter throughout most of its length with well developed basal capsule and apical part of penis with long thin straight apex; penis guide about 1.15 times as long as parameres, lanceolate, widening in half length with additional wing-like projections on outer side; parameres slender, covered with long setae along distal half.

Female genitalia. Coxites elongate, well sclerotized without styli, only with long setae; proper infundibulum absent but bursal appendix present in form of sclerotized spur; sperm duct long of same diameter throughout; spermatheca bean-shaped with elongate cornu.

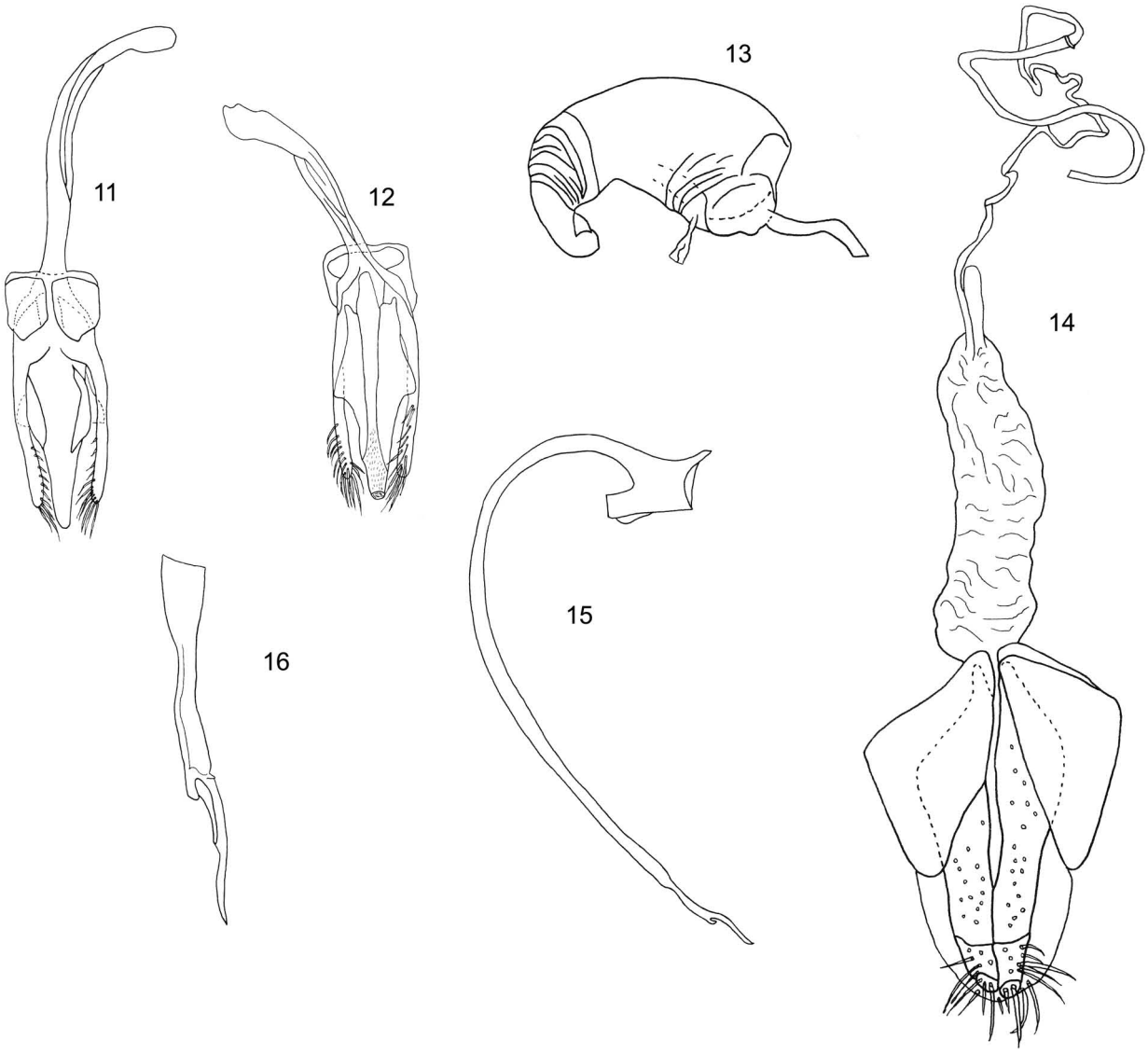
Sicardiana aureomarginata sp. nov.

Etymology. The specific epithet refers to orange coloration of lateral margins of elytra.

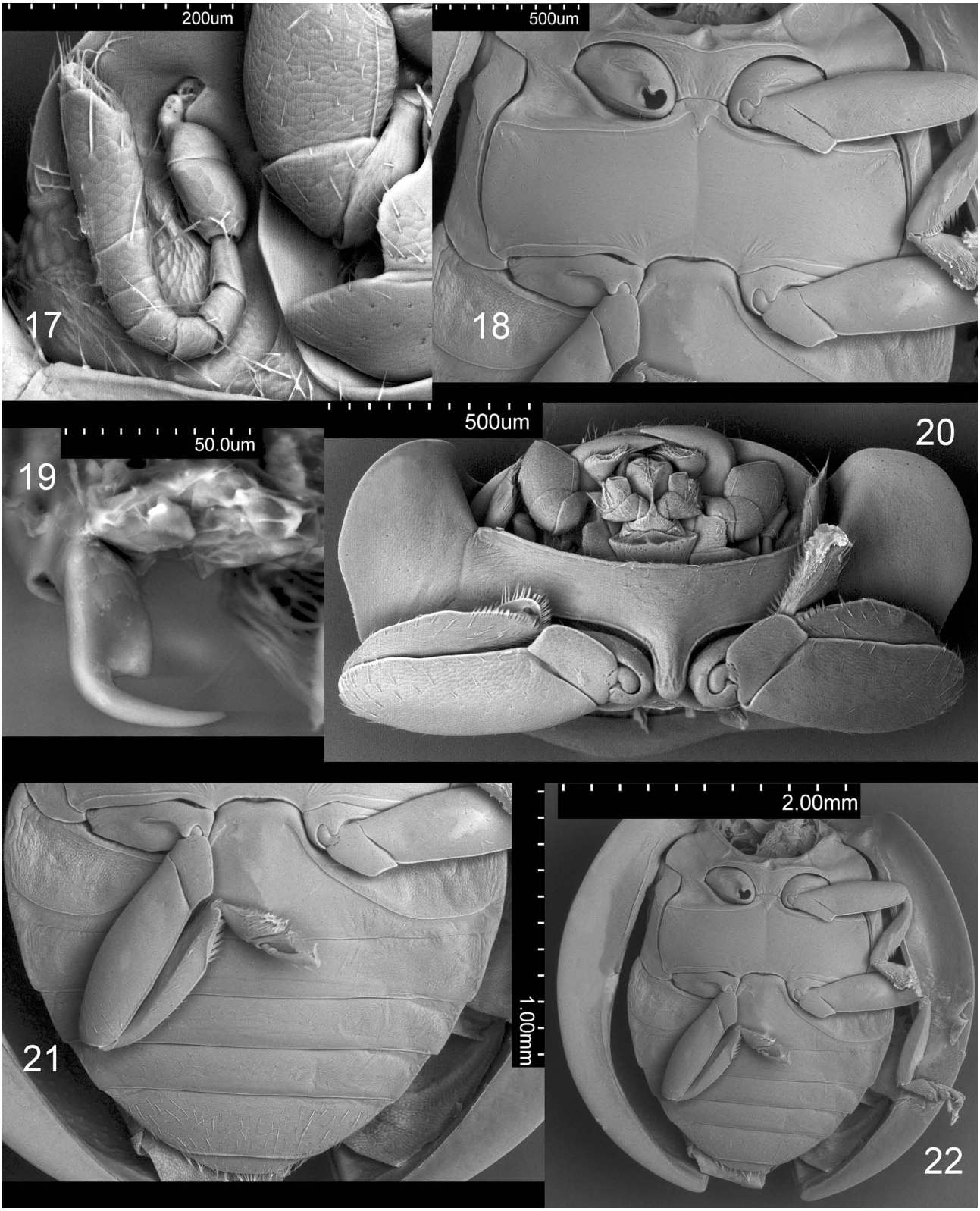
Description. Length 2.8–3.0 mm; TL/EW = 1.07–1.15; PL/PW = 0.43–0.53; EL/EW = 0.92–0.93.

Pronotum black with orange anterior angles; elytra black with lateral and apical margins orange. Venter dark brownish to black except for brownish legs and abdomen.

Head and pronotum with visible microreticulation between punctures; punctation shallow about as large as eye facets, 2–3 diameters apart, on elytra slightly larger; interocular distance about 0.4 times as wide as



Figures 11–16. *Sicardiana aureomarginata* sp. nov. (11) Tegmen, outer; (12) tegmen, inner; (13) spermatheca; (14) female genitalia, ventral; (15) penis, lateral; (16) apex of penis, lateral.



Figures 17–22. *Sicardiana aureomarginata* sp. nov. (17) Antenna, ventral; (18) meso- and metathorax, ventral; (19) tarsal claw; (20) head and prothorax, ventral; (21) abdomen, male, ventral; (22) habitus, ventral (head and prothorax removed).

head width; inner margins of eyes nearly parallel. Clypeus about 0.22 times as long as head length across the middle, anterior clypeal margin moderately emarginate. Labrum about 0.3 times as wide as head capsule. Antenna about 0.55 times as long as width of head capsule, sparsely covered with long hairs; scape bent in the middle, obconical in shape; pedicel barrel-shaped as long as pedicel, tapering to apex; antennomere 3 obconical, at base about 0.55 times as wide as at apex; antennomere 4 barrel shaped almost parallel sided; antennomeres 5–8 similar in shape; antennomere 9 as long as antennomeres 5–8 combined, parallel sided, weakly sclerotized and covered with setae and sensillae at inner side; antennomere 10 covered with hairs and sensillae, very short, at most 0.2 times as long as penultimate segment. Labium with palpomere 1 thick and oval in shape; palpomere 2 thick, obconical in shape; terminal palpomere asymmetrical, at base as wide as penultimate and tapering to apex, at base 3 times as wide as at apex, apex weakly rounded, outer side with several rows of stout setae. Maxillary terminal palpomere about 1.25 as long as wide; apex oblique; outer margin about 1.4 times as long as inner; ventral surface of lacinia covered with row of 5 short spines; inner margin with row of stout, moderately long spines.

Prothorax about 0.8 times as wide as base of elytra; prosternal process at base about 0.35 as wide as longest coxal diameter; prosternum in front of coxae about 0.9 as long as basal width of prosternal process. Meso-metaventral process about 0.55 as wide as meso-coxal diameter.

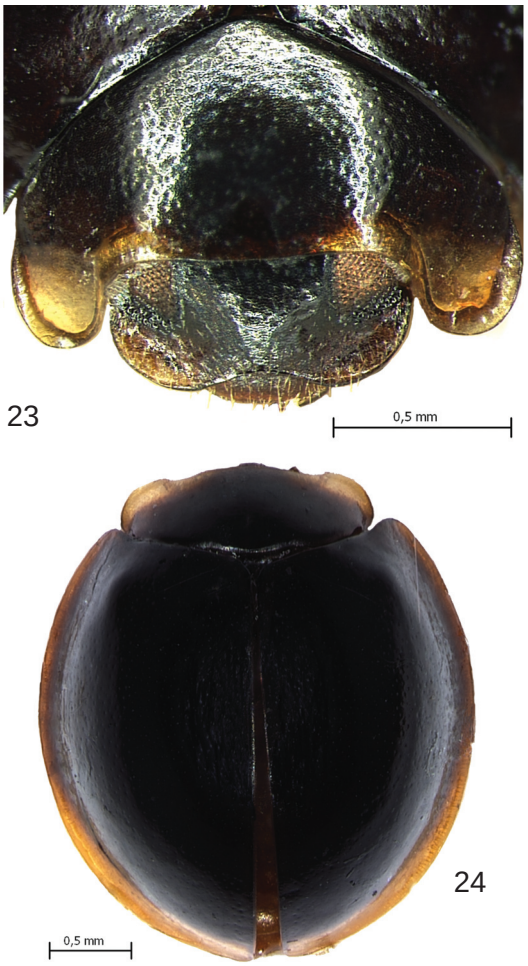
Male genitalia as in Figs 10, 11, 12, 15, 16.

Female genitalia as in Figs 13, 14.

Type material. Holotype, male: "NEW GUINEA, Morobe Dist., Herzog Mts., Vagau, C. 4,000 ft., 4–17.I. 1965/Stn. No. 138./M.E. Bacchus, B. M. 1965-120" (NHM).

Paratypes: same data as holotype (10: NHM), (3: dissected on slide – MIZ).

Distribution. Papua New Guinea.



Figures 23–24. *Sicardiana aureomarginata* sp. nov. (23) Head and pronotum, antero-dorsal view; (24) habitus, dorsal.

Discussion

Among Oriental and Australian Chilocorini, *Sicardiana* combines many characters of *Chilocorus*, *Exochomus* Redtenbacher, *Orcus* Mulsant, *Halmus* Mulsant and *Anisorcus* Crotch. With *Chilocorus* it shares similar length and emargination of the clypeus, shape of the terminal maxillary palpomere, absence of hypomeral and epipleural foveae and moderately stout legs provided with small triangular tooth on outer margin of mid and hind tibiae (although both teeth are much smaller in *Sicardiana*). Trapezoidal mentum found in *Sicardiana* occurs also in *Chilocorus*, *Exochomus* and some species of *Orcus,* but in *Sicardiana* the mentum is distinctly shorter than in these taxa. Peculiar, 10-segmented antenna with terminal antennomere distinctly shorter than penultimate antennomere is similar to that in *Exochomus*. Similar, 10-segmented antenna also is found in *Trichorcus* Blackburn but the terminal antennomere in *Trichorcus* is distinctly larger than penultimate one. The asymmetrical and bent in the middle antennal scape that bears no spines or setae is similar to that in *Anisorcus*. The metaventral postcoxal lines in *Sicardiana* are joined medially and recurving posteriorly, and are similar to many species of *Orcus* and some species of *Halmus*. Similarly, the abdominal postcoxal lines that are not joined medially and recurving posterio-laterally resemble those in *Chilocorus*, *Anisorcus, Phaenochilus* Weise and African *Endochilus* Weise. The tarsal claw with moderately large and subquadrate basal tooth are similar to those in *Chilocorus* and *Exochomus*.

Some external characters of *Sicardiana* are shared also with Neotropical Chilocorini. Abdominal

postcoxal lines arcuate and weakly recurving anteriorly in *Sicardiana*, resembles those in *Egius* Mulsant, *Curinus* Mulsant, *Cladis* Mulsant and *Harpasus* Mulsant; the narrow prosternal process and prosternum in front of procoxa long (about 0.9 length of basal width of prosternal process) occur also in *Cladis*, *Curinus*, *Harpasus* and *Zagreus* Chapin.

All these features make the mosaic of relationships and only the thorough phylogenetical analysis of the tribe should answer the question about close relationship of this new genus.

Despite of characters shared with other Chilocorini, *Sicardiana* differs from all of them by having the antennomere 9 long in a form of parallel-sided cylinder comprising almost $^1/_4$ total length of antenna, with weakly sclerotized slit on inner side covered with setae and poorly visible sensillae; the labial palps large and stout with the terminal palpomere subconical and asymmetrical, and covered with several rows of setae on outer margin; the prementum between palpigers very narrow, convex and covered with long setae; the eye below clypeal shelf consisting of two rows of facets (while in other Chilocorini there are three or more rows visible, or there are none in *Halmus*); and the penis guide with two pairs of wing-shaped projections on lateral and outer margins.

Key to the New Guinean genera of Chilocorini

1. Antenna 10-segmented; labial palps stout, weakly tapering to apex . . . . . ***Sicardiana*** gen. nov.
–. Antenna 7, 8 or 9-segmented, labial palps slender, strongly tapering to apex **2**
2. All tibiae dentate on outer margins, pronotal base not margined . . . . . ***Chilocorus*** Leach
–. Tibiae not dentate along outer margins, pronotal base at least medially with carina **3**
3. Antenna 9 or rarely 8-segmented; pronotum with carina along base distinctly separated from posterior edge, continuing laterally, forming arch posterio-laterally separated from fine lateral, marginal line; coxites well developed . . . . . ***Orcus*** Mulsant
–. Antenna 7-segmented; pronotum with carina along base very close to posterior edge, continuing closely along lateral edges; coxites reduced . . . . . ***Halmus*** Mulsant

Checklist of the New Guinean species of Chilocorini

Chilocorus malasiae Crotch

Chilocorus malasiae Crotch, 1874: 187.
Chilocorus australasiae Gadeau de Kerville, 1884: 71.
Chilocorus baileyi Blackburn, 1890: 1275.
Chilocorus flavidus Blackburn, 1892: 239.
Chilocorus diadema Weise, 1898: 229.
Chilocorus meijerei Weise, 1913: 442.
Chilocorus nasicornis Korschefsky, 1944: 52.

Distribution. Australia, New Guinea.

Halmus coelestris (Blackburn)

Orcus coelestris Blackburn, 1891: 153.
Orcus ovalis Blackburn, 1892: 241.
Orcus splendens Blackburn, 1892: 240.
Orcus clypeatus Weise, 1923: 133.

Distribution. Australia, New Guinea.

Orcus biroi Weise

Orcus biroi Weise, 1902: 507.
Orcus biroi var. *ruficollis* Weise, 1902: 507.

Distribution. New Guinea.

Orcus cinctus Weise

Orcus cinctus Weise, 1902: 508.

Distribution. New Guinea.

Orcus cordiformis Łączyński et Tomaszewska

Orcus cordiformis Łączyński et Tomaszewska, 2009: 599.

Distribution. New Guinea.

Orcus cyanocephalus Mulsant

Orcus cyanocephalus Mulsant, 1850: 467.
Orcus lecanii Blackburn, 1895: 239.
Orcus purpureotinctus Lea, 1902: 490.

Distribution. Australia, New Guinea.

Orcus janthinus Mulsant

Orcus janthinus Mulsant, 1850: 466.

Distribution. Java, Sumba, New Guinea.

Orcus nigricollis Weise

Orcus nigricollis Weise, 1902: 509.

Distribution. Key Islands, New Guinea.

Orcus punctulatus Blackburn

Orcus punctulatus Blackburn, 1892: 240.
Orcus beneficus Weise, 1913: 444.

Distribution. Australia, New Guinea.

Orcus tetrafasciatus Łączyński et Tomaszewska

Orcus tetrafasciatus Łączyński et Tomaszewska, 2009: 604.

Distribution. New Guinea.

Orcus viridulus Łączyński et Tomaszewska

Orcus viridulus Łączyński et Tomaszewska, 2009: 606.

Distribution. New Guinea.

Sicardiana aureomarginata Łączyński et Tomaszewska, sp. nov.

Distribution. New Guinea.

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