

A new species of *Ambunticoris* from Sulawesi (Hemiptera: Heteroptera: Miridae)

Fedor V. KONSTANTINOV¹⁾ & Aurika N. ZINOVJEVA²⁾

¹⁾Department of Entomology, Faculty of Biology, St. Petersburg State University, Universitetskaya nab. 7/9, St. Petersburg 199034, Russia; e-mail: f.konstantinov@spbu.ru

²⁾Institute of Biology, Komi Scientific Centre UB RAS, Kommunisticheskaya Str., 28, GSP-2, Syktyvkar, 167982, Russia; e-mail: aurika_z@mail.ru

Abstract. *Ambunticoris sulawesicus* sp. nov. (Hemiptera: Heteroptera: Miridae: Bryocorinae: Eccritotarsini) is described from Sulawesi, Indonesia. Diagnosis, digital habitus images, illustrations of male and female genital structures, and scanning micrographs of diagnostic morphological structures are provided for the new species. Diagnosis of the tribe Eccritotarsini and placement of the genus *Ambunticoris* Carvalho, 1981 within this tribe are briefly discussed.

Key words. Heteroptera, Miridae, Bryocorinae, Eccritotarsini, taxonomy, genitalia, Indonesia, Oriental Region

Introduction

Despite recent progress (HERNÁNDEZ & HENRY 2010; FERREIRA & HENRY 2011; MU & LIU 2012; NAMYATOVA & CASSIS 2012, 2013, 2015, 2016; KONSTANTINOV & KNYSHOV 2015; NAMYATOVA et al. 2016), Bryocorinae remains one of the most taxonomically neglected taxa of the plant bug family Miridae. This is especially the case for the tribe Eccritotarsini, the largest bryocorine clade containing ca. 640 species, which is 57% of the total subfamily diversity, with many more species awaiting description.

The eccritotarsine plant bug genus *Ambunticoris* was described by CARVALHO (1981) to accommodate two new species from Papua New Guinea. No new data on the genus has been published since the original description. Recent examination of the plant bug collection at the Natural History Museum, London revealed one new species of the genus whose description is given below.

Material and methods

Observations, measurements, and digital dorsal color images were made with a Nikon SMZ 1500 stereomicroscope equipped with a Nikon D700 digital SLR camera. Drawings and

Table 1. *Ambunticoris sulawesicus* sp. nov., USI numbers of figured specimens.

Figure	Sex	USI number
27, 28	female	AMNH_PBI 00340177
8, 14, 16	male	AMNH_PBI 00340178
1, 2, 5–7, 9–12, 13, 15, 17–25, 26	male, holotype	AMNH_PBI 00340179

images of the male and female genital structures were taken with a Leica DM2500 microscope equipped with a drawing attachment and a Leica EC3 digital camera. Scanning electron micrographs of selected structures were taken from uncoated specimens using a Quanta 200 3D scanning microscope.

Specimens examined during this study were associated with bar code labels (“unique specimen identifiers” or “USIs”), which were printed as a matrix code label that also provides an alphanumeric string, e.g. AMNH_PBI 00340179. USI numbers explicitly identify the particular specimens and are listed for each species in the “Material examined” section. Additional specimen information can be obtained from the website of the Planetary Biodiversity Project on Plant Bugs (<http://research.amnh.org/pbi/heteropteraspeciespage/>) and can also be accessed through the www.discoverlife.org website. Refer to Table 1 for USI numbers of the illustrated specimens.

Holotype and all paratypes of *A. sulawesicus* are retained at the Natural History Museum, London (BMNH). The terminology used for male genitalia follows KONSTANTINOV (2003) and for females follows DAVIS (1955).

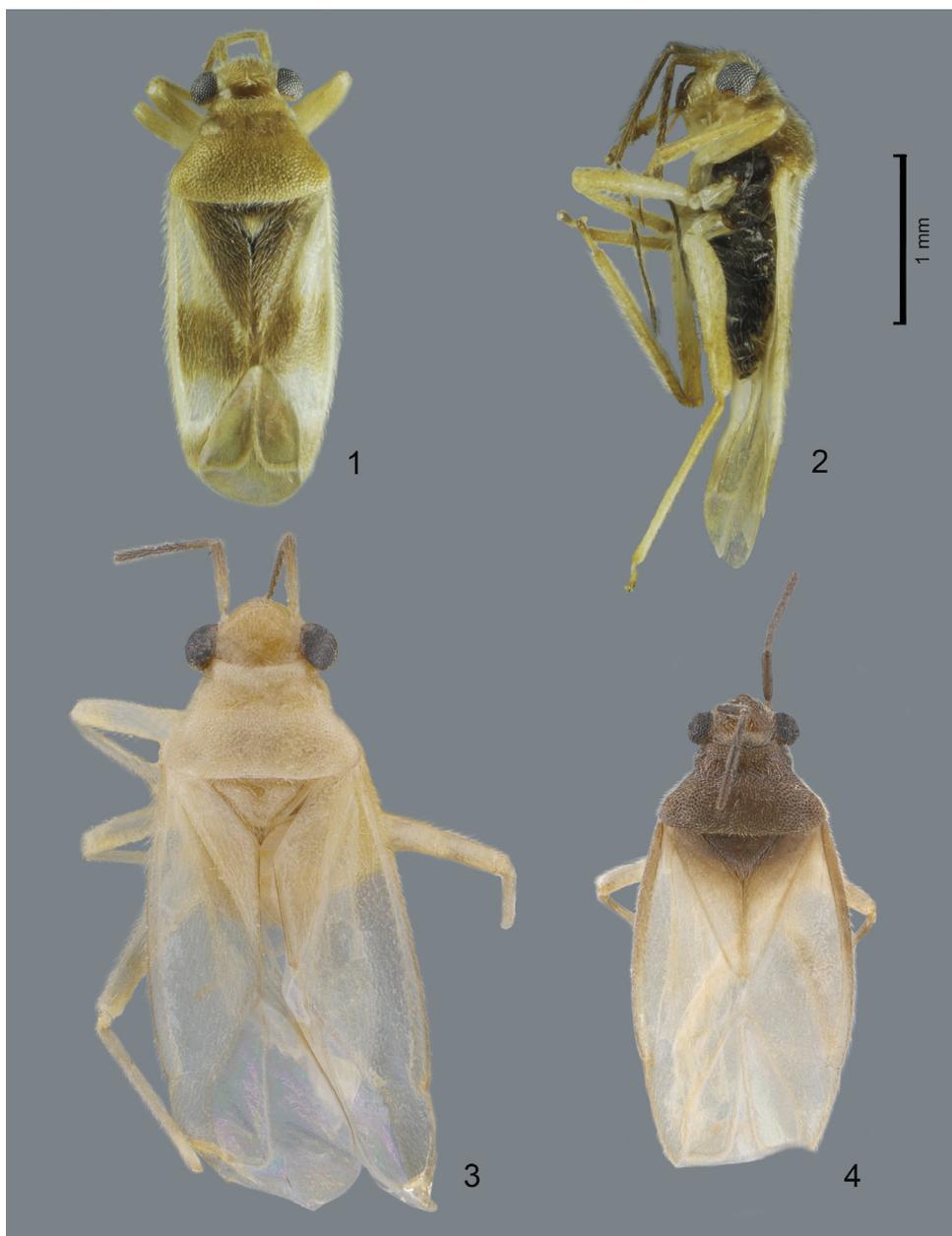
Taxonomy

Ambunticoris Carvalho, 1981

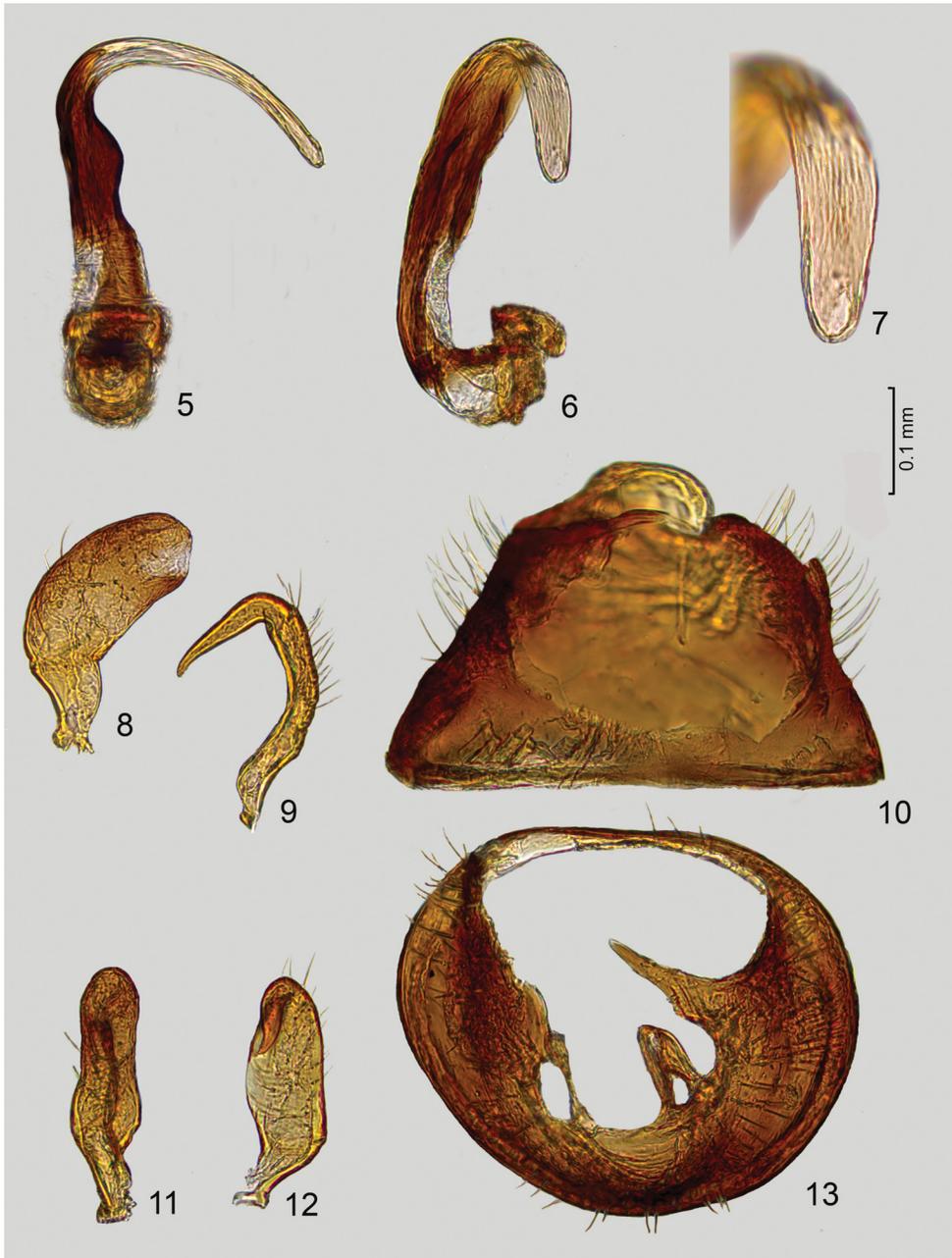
Ambunticoris Carvalho, 1981: 52. Type species: *Ambunticoris ochraceus* Carvalho, 1981, by original designation.

Comments on the taxonomic position. STONEDAHL (1988) provided a comprehensive diagnosis of the tribe Eccritotarsini and listed six synapomorphies including the characteristic structure of metafemoral trichobothria, pulvilli, parempodia, metathoracic scent gland evaporative area, and male genitalia. However, according to the results of our preliminary analysis (Konstantinov & Namyatova, in prep.) monophyly of the tribe is supported by just one unique synapomorphy, the presence of large, semicircular pulvilli attached to the entire inner surface of a claw (Fig. 25). Eccritotarsini appear to fall into two lineages; the larger one contains more than 90% of all the species, includes all Neotropical representatives and is characterized by the following features (see KONSTANTINOV & KNYSHOV 2015, NAMYATOVA et al. 2016): (1) pulvillus with a characteristic row of long setae (Fig. 24), pulvillar combs of SCHUH (1976); (2) parempodia asymmetrical, with outer parempodium distinctly longer than inner (Fig. 24); (3) scent gland evaporative area reduced, narrow and falciform (Figs 18–19); (4) peritreme lanceolate, extended posteriorly along ventral margin of metapleuron (Figs 18–19). All four characters are missing in the smaller eccritotarsine clade containing one African and nine Oriental genera.

The genus *Ambunticoris* clearly belongs to the larger clade. STONEDAHL (1988) discussed the relationships of several Old World Eccritotarsini genera and correctly pointed out the close



Figs 1–4. Habitus of *Ambunticoris* spp. 1–2 – *Ambunticoris sulawesicus* sp. nov., male. 1 – dorsal view; 2 – lateral view. 3 – *A. ochraceus* Carvalho, 1981, male, holotype; 4 – *A. nigroemboliatus* Carvalho, 1981, male, holotype. Photo 3 and 4 by © James Boone, Bernice Pauahi Bishop Museum, 2015.



Figs 5–13. *Ambunticoris sulawesicus* sp. nov., male genitalia. 5–7 – aedeagus: 5 – ventral view; 6 – lateral view; 7 – apex, magnified. 8 – right paramere, dorsal view. 9 – left paramere, dorsal view. 10 – genital capsule, dorsal view. 11 – right paramere, lateral view. 12 – left paramere, lateral view. 13 – genital capsule, caudal view.

relationships of *Ambunticoris* with a group of genera that includes *Cuneomiris* Carvalho, 1981, *Frontimiris* Carvalho, 1981, *Grossicoris* Carvalho, 1973, *Knightiola* Hsiao, 1944, *Stenopterocorisca* Carvalho, 1981, *Taricoris* Carvalho, 1981, and *Thaumastomiris* Kirkaldy, 1902. Most of these genera are exclusively or mostly known from New Guinea, with *Grossicoris* (New Caledonia, New Hebrides) and *Knightiola* (Philippines) representing an exception. The group is united by the contrastingly short and thick labial segments III and IV, with segment II being longer than segments III and IV combined, the coarsely punctate pronotum, and the characteristic structure of the aedeagus taking form of an undifferentiated simple sclerotized tube, apically equipped with membranous lobe(s). Many, but not all taxa from this group of genera possess the transverse depression behind the eyes (missing in *Ambunticoris*) and the relatively long, apically narrow cuneus (STONEDAHL 1988). Within the above mentioned group of genera, *Ambunticoris* appears to be the most closely related to *Frontimiris* but differs from that genus in the strongly convex, distinctly protruding frons and the absence of a transverse depression on vertex (see CARVALHO 1981).

Ambunticoris sulawesicus sp. nov.

(Figs 1, 2, 5–28)

Type locality. Indonesia, Sulawesi, Dumoga-Bone National Park, 0.613°N 124.089°E.

Type material. HOLOTYPE: ♂, INDONESIA: SULAWESI UTARA: Dumoga-Bone National Park, plot B, Fog 3, 0.613°N 124.089°E, 315 m, 08 Feb 1985, Royal Entomological Society of London: Project Wallace (AMNH_PBI 00340179) (BMNH). PARATYPES: INDONESIA: SULAWESI UTARA: Dumoga-Bone National Park, Toraut forest, 0.562°N 123.9038°E, 09 May 1985–16 May 1985, Royal Entomological Society of London: Project Wallace, 1 ♂ (AMNH_PBI 00340180) (BMNH). Dumoga-Bone National Park, plot B, Fog 3, 0.613°N 124.089°E, 315 m, 08 Feb 1985, Royal Entomological Society of London: Project Wallace, 1 ♀ (AMNH_PBI 00340177) (BMNH); 25 Sep 1985–09 Oct 1985, Royal Entomological Society of London: Project Wallace, 1 ♂ (AMNH_PBI 00340178) (BMNH).

Description. Male. Coloration (Figs 1–2). Dorsum sandy brown to dirty yellow. Head uniformly pale yellow, antennal segments II–IV usually somewhat darker; entire clypeus brown; eyes dark brown with reddish tinge; labium whitish yellow with darkened apex of segment IV. **Thorax:** Pronotum sandy brown; thoracic pleura and sterna uniformly dark brown; scutellum brown to dark brown with distinctly paler apex, ranging from whitish yellow to pale brown; legs pale yellow, apical halves of femora somewhat more intensely colored, dirty yellow; clavus dark brown; entire exocorium whitish; corium whitish with wide transverse brown stripe at level of claval apex; cuneus brown with whitish base; membrane uniformly pale brown, with pale brown veins. Abdomen dark brown, with somewhat paler genital segment.

Surface and vestiture. Dorsum shiny, head smooth, pronotum with dense deep punctures (Figs 15–16), hemelytron weakly rugose. Entire body with long, erect to semierect pale simple setae; femoral trichobothria deeply recessed and tuberculate (Figs 20–21); tibial spines absent; appendages with short, semierect to adpressed pale simple setae.

Structure. Body elongate-oval, macropterous, total length 2.5–2.8 mm, length from apex of clypeus to apex of cuneus 2.4–2.5 mm, body 2.7–3.0× as long as basal width of pronotum.

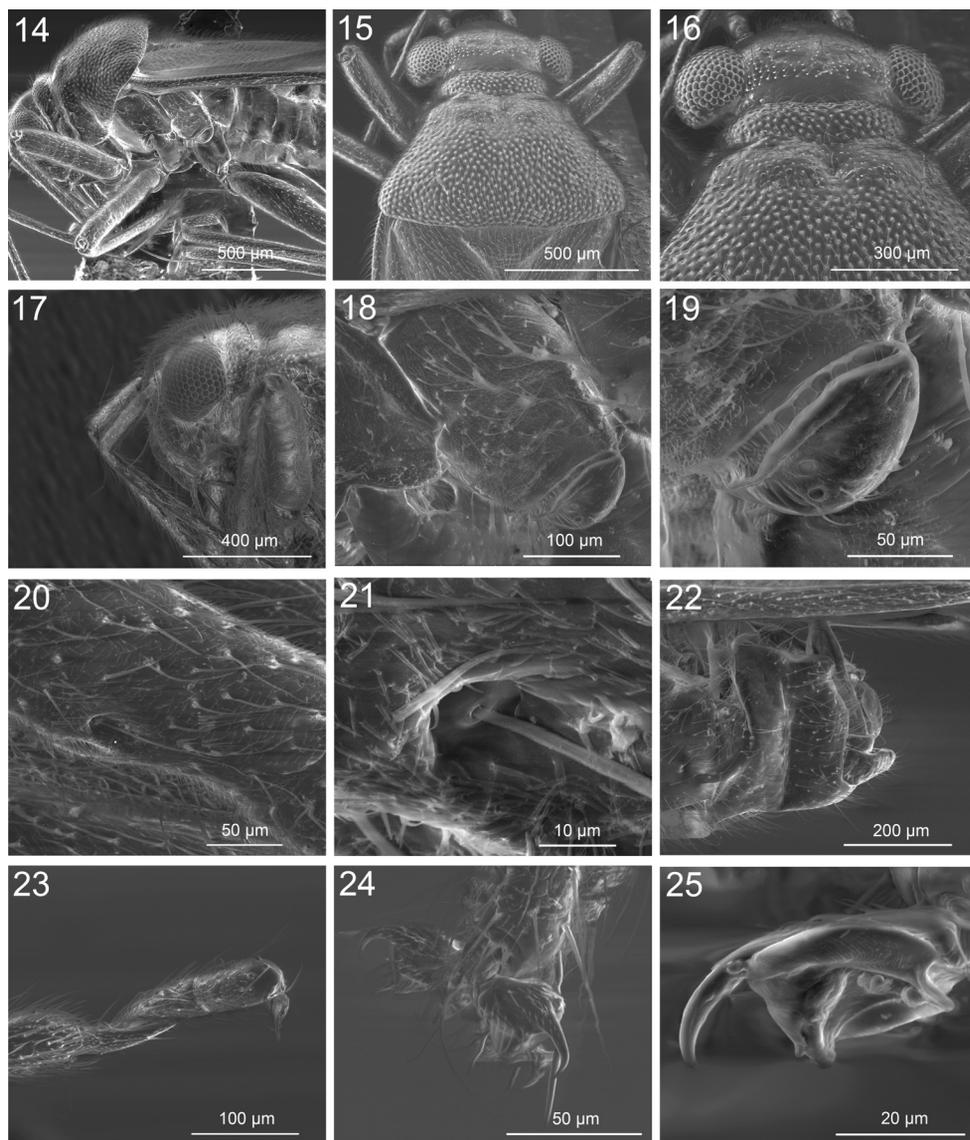
Head vertical, width across eyes 0.63–0.65 mm, nearly as wide as high, almost triangular below eyes in frontal view; frons convex, epistomal suture distinctly depressed; clypeus prominent, oriented ventro-posteriorly (Fig. 17); mandibular plate broadly triangular; maxillary plate rectangular, twice as long as high; eyes relatively small, less than half height of head

in lateral view, with posteriorly expanded dorsolateral area; vertex width 0.35 mm, vertex 2.2–2.5× as wide as dorsal width of one eye; antennal fossa located well above ventral margin of eye; antennal segment I relatively short, length 0.25–0.28 mm, slightly swollen; segment II thin, length 0.68–0.70 mm, 0.7–0.8× as long as basal width of pronotum, 1.1× as long as width of head; segments III and IV filiform; labium thick, apically blunt, reaching hind coxae, segments I and II comparatively long, reaching fore and middle coxae respectively, segments III and IV short and somewhat swollen, as long as broad at base.

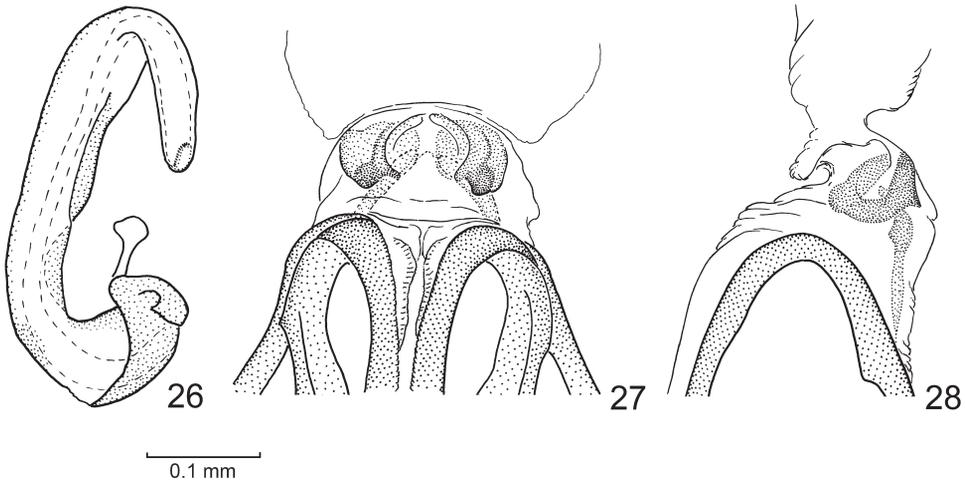
Thorax. Pronotum trapeziform, length 0.53–0.58 mm, width 0.93–0.95 mm, 1.6–1.8× as wide as long, 1.4–1.5× as wide as head; with flat collar-like expansion, posteriorly separated by shallow depression (Fig. 16); calli not delimited and only slightly raised; metathoracic spiracular opening elongate-oval, without differentiated microsculpture (Fig. 18); peritreme of metathoracic scent gland lanceolate, extended posteriorly along ventral margin of metapleuron, with several setae; evaporative area reduced to narrow falciform area along dorsal margin of peritreme and devoid of characteristic mushroom bodies (Fig. 19); entire mesonotum and usually base of scutellum covered by posterior margin of pronotum. *Hemelytron* semitransparent, corium with almost straight lateral margin, R+M vein and medial fracture well developed, reaching apex of corium; cuneus relatively long, more than twice as long as wide at base; membrane with single cell almost reaching apex of cuneus (Fig. 1). **Legs.** All femora cylindrical; tibia straight and rather short; tarsus three-segmented, distinctly swollen apically, with long guard setae; all segments almost equal in length (Fig. 23); unguitactor with three distinct columns of lamellae; claw bent close to apex, with dense claw hairs on outer surface; inner surface of claw with large semicircular pulvilli equipped with pulvillar combs; parempodia asymmetrical, with outer parempodium reduced, distinctly shorter than inner (Fig. 24).

Genitalia. *Genital capsule* about 25% of abdomen, trapeziform, distinctly wider than long in dorsal view, with reduced dorsal wall and single oriented inward spine-like process above right paramere; genital aperture large, without supragenital bridge and with closed paramere sockets (Figs 10, 13, 22). *Parameres.* Right paramere somewhat larger than left one, flattened, spoon-shaped, without sensory lobe and apical process (Figs 8, 11); left paramere U-shaped, with somewhat flattened body, undifferentiated sensory lobe and gradually tapering, almost straight apical process (Figs 9, 12). *Aedeagus* C-shaped (Figs 5–7), with endosoma in repose entirely expanded from phallosome, slightly sclerotized along entire length, simple, tube-shaped, gradually curved rightward and terminating in poorly ornamented secondary gonopore; phallosome narrow, with strongly sclerotized apical part, not delimited from endosoma; ductus seminis membranous, with hardly visible walls (Fig. 26).

Female. Coloration, surface, vestiture and structure. As in male, antennal segments I and II somewhat shorter, 0.2 mm and 0.53 mm respectively. **Genitalia:** Dorsal labiate plate reduced, entirely membranous, without sclerotized rings or any other sclerotizations; posterior wall with rod-shaped sclerites on sides; ventral labiate plate with a pair of heavily sclerotized, large, complex, semicircular and roughly U-shaped symmetric sclerotizations united with proximal parts of sclerites on posterior wall; vulva membranous, without associated sclerites; vestibulum entirely membranous (Figs 27–28).



Figs 14–25. *Ambunticoris sulawesicus* sp. nov., SEM micrographs of selected structures. 14 – head and thorax, lateral view. 15–16 – head and pronotum, dorsal view. 17 – head, lateral view. 18 – metapleuron. 19 – scent gland evaporative area. 20–21 – femoral trichobothrium. 22 – genital segment, laterally. 23 – hind tarsus. 24 – pretarsus. 25 – inner surface of one claw.



Figs 26–28. *Ambunticoris sulawesicus* sp. nov., genitalia. 26 – aedeagus, lateral view. 27–28 – female genital chamber: 27 – ventral view; 28 – lateral view.

Differential diagnosis. Unequivocally recognized from congeners by the dark brown clavus, whitish corium with subapical brown transverse stripe, uniformly pale brown membrane (Figs 1–2), spoon-shaped right paramere without apical process (Figs 8, 11), and C-shaped aedeagus with simple tube-like apex (Figs 5–7). *Ambunticoris ochraceus* Carvalho, 1981 (Fig. 3) is somewhat similar to the new species in the smooth head without punctures but clearly differs in all other respects including larger size (3.8 mm), uniformly whitish ochraceous coloration, and the male genitalia with two apical flagellate appendages of aedeagus and right paramere with distinct apical process (see Figs 57–59 in CARVALHO 1981). *Ambunticoris nigroemboliatius* Carvalho, 1981 (Fig. 4) resembles *A. sulawesicus* in the body size but differs from that species in dark brown head, pronotum and scutellum, whitish yellow hemelytron with narrowly darkened base and embolium, broadly arcuate costal margin, and the right paramere with well differentiated, large apical process (see Fig. 63 in CARVALHO 1981).

Etymology. *Sulawesicus* (*-a, -um*), adjective. The species is named after its type locality, the island of Sulawesi.

Distribution. The species is known from Dumoga-Bone National Park, Sulawesi-Utara Province, Indonesia.

Acknowledgments

Thanks are given to Mick Webb (Natural History Museum, London), for his help and access to collections, and James Boone (Bernice Pauahi Bishop Museum, Honolulu) for the photographs of the type specimens. We also thank Svetlana Janson (Center for Microscopy and Microanalysis, Research park of St. Petersburg State University) for technical support in the operation of SEM. We are grateful to Anna Namyatova (University of New South Wales,

Sydney), Frédéric Chérot (Service Public de Wallonie, Brussels) and Petr Kment (National Museum, Prague) for helpful comments on the manuscript. Funding for this study was provided by the Russian Foundation for Basic Research, project No 16-04-01682 and Saint Petersburg State University research grant 1.42.1410.2015.

References

- CARVALHO J. C. M. 1981: The Bryocorinae of Papua New Guinea (Hemiptera, Miridae). *Arquivos do Museu Nacional (Rio de Janeiro)* **56**: 35–89.
- DAVIS N. T. 1955: Morphology of the female organs of reproduction in the Miridae (Hemiptera). *Annals of the Entomological Society of America* **48**: 132–150.
- FERREIRA P. S. F. & HENRY T. J. 2011: Synopsis and keys to the tribes, genera, and species of Miridae (Hemiptera: Heteroptera) of Minas Gerais, Brazil. Part I: Bryocorinae. *Zootaxa* **2920**: 1–41.
- HERNÁNDEZ L. M. & HENRY T. J. 2010: *Plant bugs, or Miridae (Hemiptera: Heteroptera), of Cuba*. Series Faunistica. Vol. 92. Pensoft, Sofia & Moscow, 212 pp.
- KONSTANTINOV F. V. 2003: Male genitalia in Miridae (Heteroptera) and their significance for suprageneric classification of the family. Part I: general review, Isometopinae and Psallopinae. *Belgian Journal of Entomology* **5**: 3–36.
- KONSTANTINOV F. V. & KNYSHOV A. A. 2015: The tribe Bryocorini (Insecta: Heteroptera: Miridae: Bryocorinae): phylogeny, description of a new genus, and adaptive radiation on ferns. *Zoological Journal of the Linnean Society* **175**: 441–472.
- MU Y. & LIU G.-Q. 2012: New Records of the genus *Jessopocoris* Carvalho, 1981 (Hemiptera: Miridae: Bryocorinae), with descriptions of two new species found in China. *Zootaxa* **3573**: 47–54.
- NAMYATOVA A. A. & CASSIS G. 2012: *Schuhirandella fulva*, new genus and new species from Western Australia (Hemiptera: Heteroptera: Miridae: Bryocorinae: Monaloniina). *Entomologica Americana* **118**: 99–106.
- NAMYATOVA A. A. & CASSIS G. 2013: Systematics, phylogeny and host associations of the Australian endemic monaloniine genus *Rayieria* Odhiambo (Insecta: Heteroptera: Miridae: Bryocorinae). *Invertebrate Systematics* **27**: 689–726.
- NAMYATOVA A. A. & CASSIS G. 2015: Revision of the Australian endemic plant bug genus *Volkelius* Distant, 1904 (Insecta: Heteroptera: Miridae: Bryocorinae). *Austral Entomology* **54**: 180–190.
- NAMYATOVA A. A. & CASSIS G. 2016: Systematic revision and phylogeny of the plant bug tribe Monaloniini (Insecta: Heteroptera: Miridae: Bryocorinae) of the world. *Zoological Journal of the Linnean Society* **176**: 36–136.
- NAMYATOVA A. A., KONSTANTINOV F. V. & CASSIS G. 2016: Phylogeny and systematics of the subfamily Bryocorinae based on morphology with emphasis on the tribe Dicyphini sensu Schuh. *Systematic Entomology* **41**: 3–40.
- SCHUH R. T. 1976: Pretarsal structure in the Miridae (Hemiptera) with a cladistic analysis of relationships within the family. *American Museum Novitates* **2601**: 1–39.
- STONEDAHL G. M. 1988: Revisions of *Dioclerus*, *Harpedona*, *Mertila*, *Myiocapsus*, *Prodromus*, and *Thaumastomiris* (Heteroptera: Miridae, Bryocorinae, Eecritotarsini). *Bulletin of the American Museum of Natural History* **187**: 1–99.