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A new species of the genus *Airapus* from Sulawesi (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini)

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Abstract. A new species of the genus *Airapus* Stebnicka & Howden, 1996, *A. sulawesianus* sp. nov. from Indonesia (Sulawesi), is described and illustrated. Characters important for the differentiation of the new species from all the still described species of the genus are discussed with taking into account taxa from both the Oriental as well as Australian Regions. The geographical distribution of the genus is briefly discussed.

INTRODUCTION

In the course of the identification of materials from the National Museum Prague, Czech Republic, a new species of the genus *Airapus* Stebnicka & Howden, 1996 was discovered. The genus *Airapus* was established to include *Aulonocnemis sumatrae* Fairmaire, 1896 (the type species) and five Australian species with adding the following two remarks: all the names listed by Krikken (1970) under *Euparia* Le Peletier & Serville, 1828 should be considered in *Airapus* with exception of *Euparia squamosa* Lea, 1923; and some species considered by Balthasar (1964, 1967) under *Ataenius* Harold, 1867 or *Euparia* belong to the genus *Airapus*.

Nineteen species (divided into three species groups) from New Guinea, the Bismarck Archipelago and the Solomon Islands were keyed and described in a work by Stebnicka (1998); some drawings and SEM photos are also present in that work. Five Australian species are treated in the iconography by Stebnicka (2009); from among them, one species also occurs in New Guinea.

The present authors Král et al. (2019) and Rakovič et al. (2019) described total of four species as follows: *A. cechovskyi* from Malaysia (Kelantan State), *A. jenisi* from Malaysia (Sabah State) and Indonesia (Eastern Kalimantan Province), *A. tyri* (from Thailand), and *A. wallaceanus* from Indonesia (the Raja Ampat Islands). Minkina (2020) described *A. aegialiformis* from Indonesia (Sumatra). A further *Airapus* species, *A. rakovici* Král & Lu, 2021, was quite recently described by Král et al. (2021) from China.

MATERIAL AND METHODS

The specimens were observed by using the MBS-10 and SZP 1120-T stereoscopic microscopes. The photos published here were taken with the use of the Meopta laboratory microscope, CMEX 5 digital camera and Helicon Focus programme.

The following acronym stands for the institution, in which the specimens studied here are kept (curator in parentheses):

NMPC - National Museum, Praha, Czech Republic (Jiří Hájek).

Exact label data concerning specimens of the new species described here are specified in the section Taxonomy below. Separate label lines are indicated by a slash (/), separate labels by a double slash (//).

For morphological terms used in the description of epipharyngeal structures we follow Dellacasa et al. (2010).

TAXONOMY

Airapus sulawesianus sp. nov.

(Figs. 1-21)

Type locality. Indonesia, C. Sulawesi, 20 km SE Tambarana, Camp Mauro, 650m.

Type material. Holotype (♂) (NMPC): "C. SULAWESI, 20 km SE / Tambarana, 650 m / Camp Mauro, 11.-16,Jul. / Bolm lgt., 1999 [white printed label] // 2784 / 2021, Dok. L. Mencl [pale green printed label, related to the photo-documentation system of the second author] // HOLOTYPE (♂) / *Airapus sulawesianus* / sp. nov. / M. Rakovič, L. Mencl / & D. Král det. 2021 [red printed label]". Allotype (♀) (NMPC), same data as with holotype on white label, symbol ♀ and word ALLOTYPE instead of symbol ♂ and word HOLOTYPE, respectively, on red label, number 2783 instead of 2784 on pale green label.
See also Fig. 21 for labels pinned under type specimens.

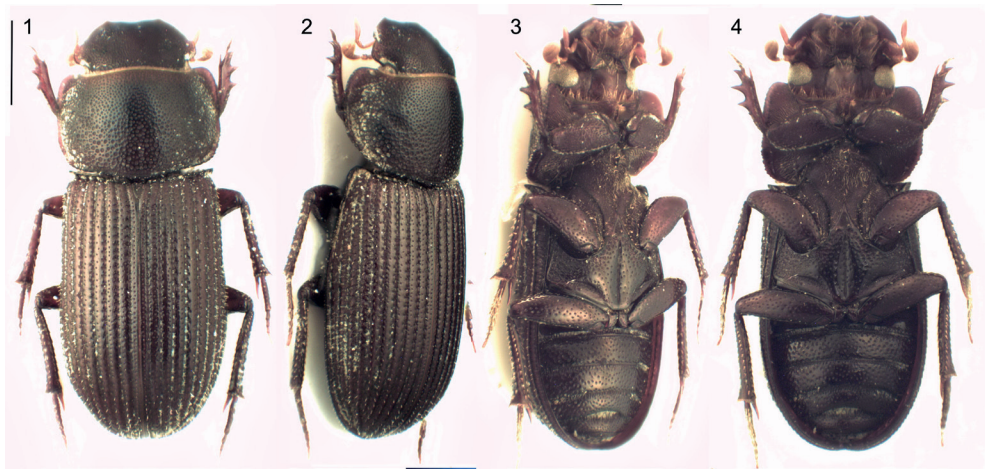
Description of holotype. Oblong oval, only moderately convex, subparallel, dorsal surfaces rather matte than shining, mostly glabrous (only sparingly and shortly macrosetaceous on elytral sides and elytral apex), mostly dark brown, body length of 4.9 mm, maximum width of 2.0 mm (Figs. 1-2), ventral surfaces as in Figs. 3-4.

Head (Figs. 5-6) only moderately convex, frontoclypeal suture nearly absent (only short lateral parts slightly visible under very high magnification; head surface with rather longitudinal punctures stepwise increasing in size from anterior clypeus margin backward. Clypeus dentate each side of very wide anteromedian emargination, clypeus lateral margins slightly excised behind anterior denticles and then considerably arcuate up to genae; genae strongly exceeding eyes posteriorly.

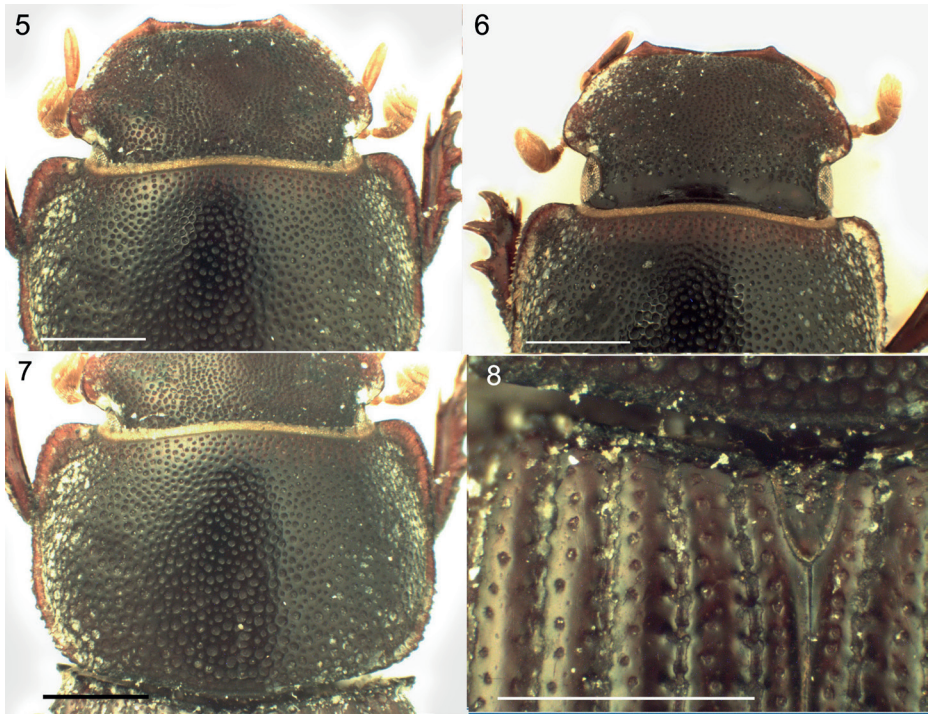
Epipharynx (Fig. 10). Transversal, anterior outline shallowly bisinuate, lateral outlines almost parallel medially; tormae and nesium well sclerotised, approximately symmetrical, apotormae missing; epitorma triangulate, well sclerotised, covered with group of distinct sensilla anteriorly and laterally and with several fine sensilla basally; corypha with two short spines; prophobae sclerotized with only one distinct spine; adelochaetae consisting of row of 13 closely spaced spines; chaetopariae with dense row of 34 long stout spines; ipophobae weakly sclerotized, covered with several macrosetae.

Figs. 1-4.
dorsal view
Photograph

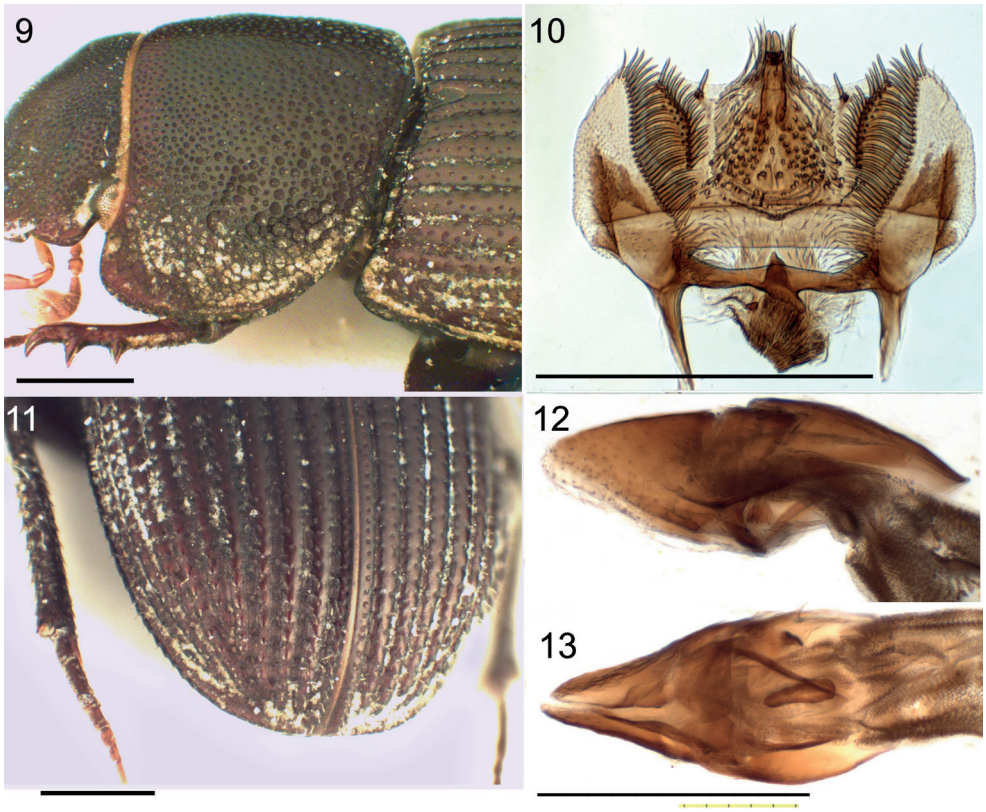
Figs. 5-8.
5- male hea
with scutel



Figs. 1-4. *Airapus sulawesianus* sp. nov., habitus, holotype, ♂ (Figs. 1-3) and allotype, ♀ (Fig. 4): 1- holotype, dorsal view; 2- holotype, dorsolateral view; 3- holotype, ventral view; 4- allotype, ventral view. Scale line 1 mm. Photographs by L. Mencl.



Figs. 5-8. *Airapus sulawesianus* sp. nov. details in dorsal view, holotype, ♂ (Figs. 5, 7-8) and allotype, ♀ (Fig. 6): 5- male head with part of pronotum; 6- female head with part of pronotum; 7- pronotum; 8- left part of elytral base with scutellum. Scale lines 0.5 mm. Photographs by L. Mencl.

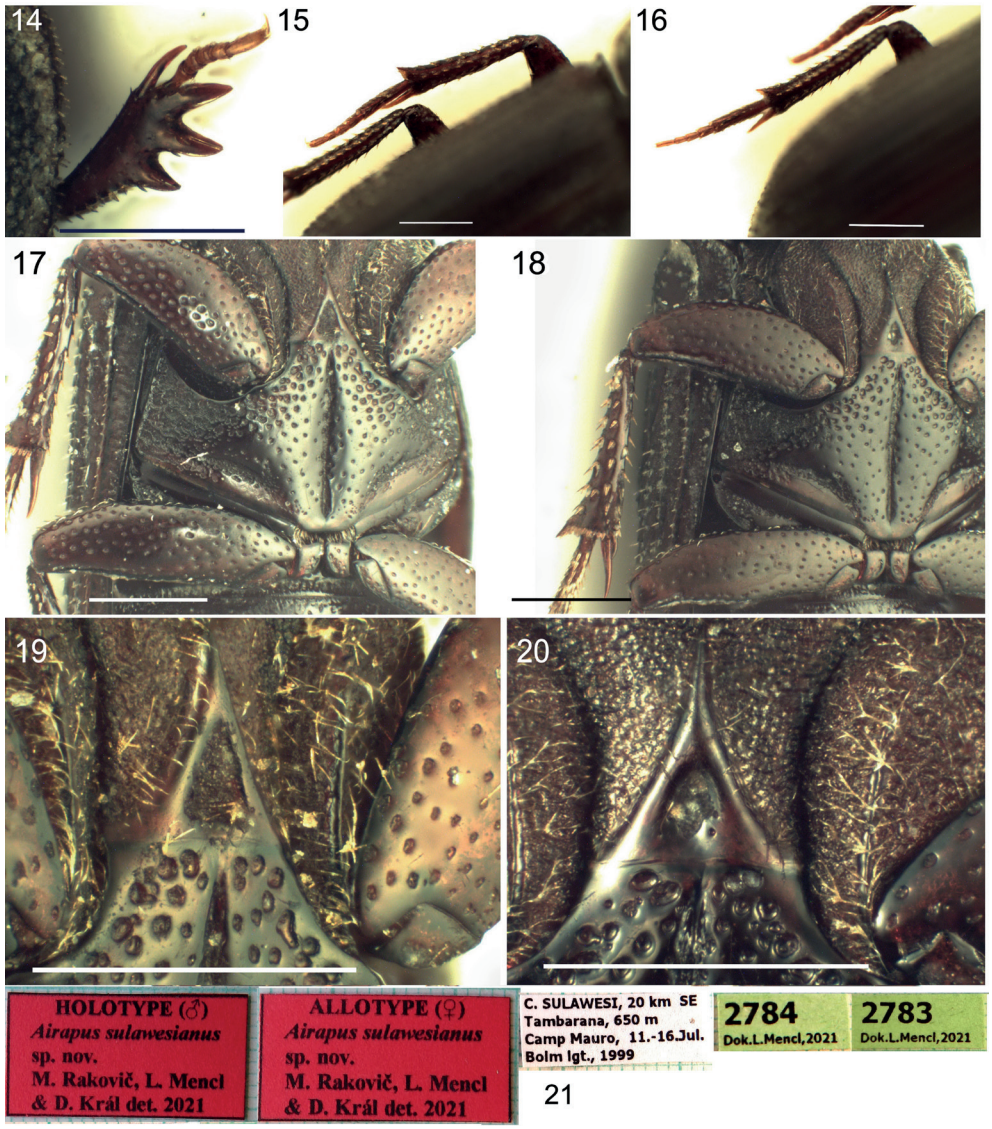


Figs. 9-13. *Airapus sulawesianus* sp. nov., pronotum in dorsolateral view, elytral apex, epipharynx and aedeagus, holotype, ♂: 9- pronotum, dorsolateral view; 10- epipharynx; 11- elytral apex; 12- aedeagus, lateral view; 13- aedeagus, ventral view. Scale lines 0.5 mm. Photographs by L. Mencl.

Pronotum (Figs. 7, 9) transversal (length-to-width ratio 0.722), wider than head. Pronotum surface with round, large and medium-sized punctures increasing in size from anterior margin to basal margin, interstices mostly larger than diameters of medium-sized punctures, but smaller than diameters of large ones. Pronotum anterior margin smooth; lateral margins smooth, moderately explanate in anterior half, rather uneven posteriorly; margins of posterior corners and basal margin also rather uneven.

Scutellum small, ogival (in shape of isosceles triangle with arcuate sides), about twice as long as wide, its surface rather uneven in anterior half due to presence of obsolete punctures, mostly smooth in posterior half (Fig. 8).

Elytra (Fig. 1) with 10 striae and 10 intervals, with distinct humeral denticles, elongate (length-to-width ratio of 1.64) subparallel, slightly broader behind (broadest point at about 0.6 elytra length from base to apex). Striae narrower than intervals, large punctures in striae rather indistinctly bounded, but considerably crenating outer sides of intervals. On elytral disc, each interval with more or less regularly arranged longitudinal row of small, but well distinct round punctures, distances between punctures being larger than puncture diameter;



Figs. 14-21. *Airapus sulawesianus* sp. nov., legs in dorsal views and details of underside, holotype, ♂ (Figs. 14-17, 19), allotype, ♀ (Figs. 18, 20) and labels): 14- protibia, dorsal view; 15- mesotibia, dorsal view; 16- metatibia, dorsal view; 17- male meso-metaventral plate; 18- female meso-metaventral plate; 19- male anterior process of meso-metaventral plate; 20- female anterior process of meso-metaventral plate; 21- labels pinned under type specimens. Scale lines 0.5 mm. Photographs by L. Mencl.

lateral intervals impunctate. Intervals on elytral disc glabrous, lateral intervals and intervals on elytral apex sparsely macrosetaceous. Detailed sculptures and presence or absence of macrosetae in different areas of elytra as in Figs. 8, 11.

Legs in dorsal view 14-16: Protibia with three large teeth in anterior part of outer margin, not denticulate in basal part (only slightly uneven in strictly dorsal view), its upper surface impunctate, apical spine about as long as basal protarsomere; basimeso- and basimetatarsomeres, nearly twice as long as superior terminal spines of mesotibia and metatibia, respectively.

Ventral surfaces (Figs. 3-4), also dark brown, matte, femora, mesometaventrum, as well as abdominal ventrites punctate. Meso-metaventral plate with considerably distinct, complete longitudinal median furrow. Abdominal ventrites 4-6 moderately fluted anteriorly, abdominal ventrite 5 also impressed anteriorly in middle area of about 1/3 ventrite width.

Pygidium surface uneven.

Aedeagus as in Figs. 12-13.

Sexual dimorphism. There are no considerable differences in external characters between the male holotype and female allotype. The area surrounding the longitudinal median furrow of the meso-metaventral plate is slightly concave in the male (Fig. 17) and rather flat in the female (Fig. 18). There are also moderate differences between male and female anterior processes of the meso-metaventrun (Figs. 19-20).

Variability. No variability in shapes, sculptures or colours can be derived from the two type specimens studied. The body length is of 4.9 mm in the holotype and 5.1 mm in the allotype.

Collection circumstances. Unknown; collected at an altitude above sea level of 650 m.

Differential diagnosis. The new species should only be compared with species, which have dentate or at least angulate (not broadly rounded) clypeus each side of anteromedian emargination, elytra not considerably setaceous throughout (at most elytral apex and/or elytral sides finely and rather sparingly setaceous). The following two species from the Sunda Islands and/or peninsular Malaysia should be thus considered for purposes of the present differential diagnosis: *A. cechovskyi* Král, Mencl & Rakovič, 2019, which has a smaller body length (3.4-3.7 mm), posterior pronotal angles truncate and elytral intervals impunctate and *A. jenisi* Král, Mencl & Rakovič, 2019, which has the clypeus obtusely angulate each side of the anteromedian emargination and discal elytral intervals with 2-3 punctures per the interval width; the new species described here has the clypeus dentate each side of the anteromedian emargination, posterior pronotal angles broadly rounded and each discal elytral interval with a longitudinal, more or less regularly arranged row of punctures.

Name derivation. Based on the Indonesian isle Sulawesi.

Distribution. Central Sulawesi (20 km southeast of Tambarana).

DISCUSSION

The still existing taxonomic literature (see References cited in the Introduction) shows that about 30 currently known species of the genus *Airapus* inhabit Asia (mostly South-East Asia with the northernmost occurrence recently discovered in the South-East Chinese Province Fujian), and the Australian Region; on the other hand, the genus is absent in Europe, in Africa and in both American continents.

The new species can be characterized by the following combination of important characters: clypeus dentate each side of the anteromedian emargination, pronotum not strongly narrowed backwards, posterior pronotal angles broadly rounded (neither truncate nor excised), elytra mostly glabrous (not remarkably setaceous throughout, only elytral sides and the elytral apex with fine, short and sparse setae). Elytral intervals convex (not costate), on disc smooth (not granulate), each interval with punctures more or less regularly arranged in a longitudinal row of punctures (neither impunctate nor with more than one puncture per interval width).

With respect to the geographic situation of Sulawesi, species from both the Oriental and Australian Regions can come in question concerning possibly similar species. Based on the literature as quoted in the present Introduction and examination of numerous species of the genus *Airapus* represented by specimens in our collections, it is to conclude that in the morphologically important characters, the species *Airapus sulawesianus* sp. nov. definitely exerts its affinity rather to species from the Oriental Region (particularly from the Sundas and peninsular Malaysia) than to species from New Guinea the Bismarck Archipelago and the Solomon Islands.

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REFERENCES

Balthasar V. 1964: *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region. Coleoptera Lamellicornia. Band 3. Aphodiidae*. Verlag der Tschechoslowakischen Akademie der Wissenschaften Prag, 652 pp., 2 pls.

Balthasar V. 1967: Neue Arten der Familie Aphodiidae (Coleoptera). 128. Beitrag zur Kenntnis der Scarabaeoidea. *Acta Entomologica Bohemoslovaca* 84: 122-139.

Dellacasa G., Dellacasa M., & Mann D. J. 2010: The morphology of the labrum (epipharynx, ikrioma and aboral surface) of adult Aphodiini (Coleoptera: Scarabaeidae: Aphodiinae), and its implications for systematics. *Insecta Mundi* 132: 1-21.

Král D., Mencl L. & Rakovič M. 2019: Three new species of the genus *Airapus* from the Oriental Region (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini). *Studies and Reports, Taxonomical Series* 15: 383-398.

Král D., Lu Y. & Bai M. 2021: *Airapus rakovici* (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini), a new species from Fujian, China. *Zootaxa* 15: 383-398.

Krikken J. 1970: New species of *Euparia* Lepeletier & Serville from New Guinea (Coleoptera: Aphodiidae). *Zoologische Mededelingen* 44: 317-327.

Minkina L. 2020: A new species of *Airapus* Stebnicka Z. T. & Howden H. F. 1996 (Coleoptera: Scarabaeidae: Eupariini). *Studies and Reports, Taxonomical Series* 16: 437-441.

Rakovič M., Mencl L. & Král D. 2019: A new species of the genus *Airapus* from the Wallacea area (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini). *Studies and Reports, Taxonomical Series* 15: 205-215.

Stebnicka Z. T. 1998: The Aphodiinae of New Guinea, the Bismarck Archipelago and the Solomon Islands (Coleoptera: Scarabaeoidea). *Invertebrate Taxonomy* 12: 833-895.

Stebnicka Z. T. 2009: *Aphodiinae of Australia (Coleoptera: Scarabaeoidea)*. *Iconography.* Institute of Systematics and Evolution of Animals, Polish Academy of Sciences Kraków, 187 pp., xxvi pls.

Stebnicka Z. T. & Howden H. F. 1996: Australian Genera and Species in the Tribes Odontolochini, Psammodiini, Rhyparini, Stereomerini and Part of the Eupariini (Coleoptera: Scarabaeoidea: Aphodiinae). *Invertebrate Taxonomy* 10: 97-170.

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