Two new species of the genus *Airapus* Stebnicka & Howden, 1996 (Coleoptera: Scarabaeidae: Aphodiinae)

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Two new species of the genus *Airapus* Stebnicka & Howden, 1996 - *A. rudolphi* sp. nov. from Indonesia and *A. yunnanensis* sp. nov. from China - are described and illustrated. A brief discussion of the boundaries of the genus *Airapus* is given.

Key words: taxonomy, new species, Eupariini, *Airapus*, China, Indonesia

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INTRODUCTION

The first Author, while identifying material from the Naturkundemuseum Erfurt (Erfurt, Germany) and from Horst Rudolph (Quedlinburg, Germany), found two still undescribed species of the genus *Airapus* Stebnicka & Howden, 1996. The two new species come from rather distant localities: Sumatra Island and China (Yunnan Province), but are very similar to each other. In addition both are quite easily distinguishable from all other hitherto known species. Furthermore, both have an atypical abdominal structure for *Airapus* and for this reason the taxonomic position of the genus *Airapus* has yet to be discussed. The manuscript is one of a series of works that are slowly moving towards clarifying the knowledge of the correlation of the different genera within the tribe Eupariini from the regions of Southeast-Asia, Australia, Oceania and the Oriental.

MATERIAL AND METHODS

The specimens were observed with a Nikon SMZ-U stereoscopic microscope. The photos published here were taken by the use of the Canon EOS 5D Mark III connected with Canon MP-E 65mm macro lens. Photos were edited in the Helicon Focus 7 and Adobe Photoshop Elements 2018 programs.

For morphological terms used in the description of specimens we follow Dellacasa et. al. (2010) and Stebnicka (2007).

The type specimens of the newly described species are indicated by a red, printed labels bearing the status of the specimen, sex, its name, name of the author, year and month of the designation.
The type specimens are deposited in the following institution and collection:

Holotype of ***Airapus rudolphi*** sp. nov. - in the private collection of first author,
Holotype of ***Airapus yunnanensis*** sp. nov. - in Naturkundemuseum Erfurt (Erfurt, Germany).

TAXONOMY

Airapus rudolphisp. nov.

(Figs 1-3; 7-8)

Figs 1-3. *Airapus rudolphi*sp. nov., ♀, holotype: 1- dorsal view; 2- ventral view; 3- lateral view. Figs 1-3: scale lines: 1.0 mm.

Type locality. Indonesia, N-Sumatra, Aceh province, Kutacane / Ketambe.

Type material. Holotype (♀): "Indonesien N.Sumatra | Aceh-Prov. Umg. von | Kutacane | Ketambe | 02.-07. Dezember 2013 | leg. Horst Rudolph ||".

Description. Dorsum (Fig. 1). Body length 3.6 mm, elongate, shiny, light brownish, sides and apex of elytra with indistinct macrosetation.

Head (Fig. 7) relatively large, trapezoidal, convex, shiny, without microreticulation. Clypeus gently bordered, widely triangularly sinuate anteriorly, denticulate on sides, widely rounded laterally, not notched before genae, clypeal border without macrosetae. Genae obtuse, very distinctly exceeding eyes, with few very short, thin macrosetae. Frontal suture noticeable on sides, without gibbosities. Punctation simple: basally very dense, quite coarse, with variable in size, punctures rounded; in the middle very dense, coarse, with somewhat variable in size, longitudinal punctures; anteriorly with moderately dense, fine, regular in size, somewhat elevated punctures; anterior border of clypeus (with fine punctures) divided from the middle part by quite convex transverse tubercle, which is somewhat lower in the middle.

Epipharynx (Fig. 8) transverse, with sides broadly rounded, anterior margin of pedia concavely arcuate, corypha above of margin of pedia, distinct, with two very short, thick celtes. Mesoepitorma shortened basally, somewhat pear-shaped. Chaetopariae with dense belt of thick, long chaetae; adelochaetae similar to chaetopariae, but thicker and shorter; chaetopediae with only one very short and thin chaeta on each side; angustofenestrae dense, short and thick. Tormae long.

Pronotum transverse, as wide as base of elytra, widest in the middle, convex, shiny, without microreticulation, with double punctation: larger punctures moderately coarse, dense, regularly distributes, somewhat irregular in size, smaller punctures not fine, not so dense, irregularly distributed. Base quite distinctly bordered by a thin and shallow groove, sides bordered quite widely and somewhat more deeply than base; anteriorly not bordered. Sides and base with moderately long, quite thick macrosetae. Anterior angles distinctly

rounded. Base before hind angles widely rounded.

Scutellum small, triangular, with widely rounded sides, with a few small punctures, moderately shiny, without microreticulation.

Elytra elongate, convex, parallel, shiny, without microreticulation, with short and thin, barely noticeable macrosetae on sides and before apex; with small but distinct humeral denticles; with ten striae and ten intervals. Intervals shiny, convex, with row of not fine punctures on external half and with row of moderately coarse punctures on internal half, which are connected with punctures of rows; due to this the striae seem to indent the margins of the intervals margins very distinctly. Striae distinctly, quite densely punctate, with medium sized punctures; punctures distinctly indenting margins of intervals. All striae joined together before apex.

Pygidium with similar structure to ventrites.

Legs. Femora shiny, without microreticulation, not coarsely and sparsely punctate; profemora basally and apically bordered, meso- and metafemora bordered only apically. Mesofemora Widely separated from each other. Protibiae distinctly tridentate laterally, proximally not serrulate; somewhat inwardly sinuate; dorsal side smooth, shiny, with few very fine punctures; apical spur long, moderately broad, gently downwardly and outwardly bent, with apex acute. Meso- and metatibiae fimbriate apically with row of short spinules of equal length. Apex of metatibiae without accessory spine. Metatibiae superior apical spur equal length as basimetatarsomere, latter approximately as long as following three metatarsomeres combined. Claws short, very thin, distinctly arcuate.

Macropterous.

Venter (Fig. 2). Meso-metaventral plate shiny, weakly convex, with distinct, quite deep, quite narrow longitudinal furrow in the middle; surface with moderately coarse, somewhat variable in size, sparse punctures. Process of meso-metaventral plate without any groove or recess, below of base there is no additional modifications. Abdominal ventrites shiny, anteriorly weakly fluted, without microreticulation, with moderately dense, moderately coarsely, quite regularly spaced punctures.

Etymology. Patronymic; an adjective derived from the name of holotype collector: Horst Rudolph.

Variability. Unknown.

Sexual dimorphism. Unknown.

Affinity. See discussion part.

Airapus yunnanensis sp. nov.

(Figs 4-6; 9-10)

Type locality. China: Yunnan, Honghe, Gulingin.

Type material. Holotype (♀): “CHINA, Yunnan: Honghe | Gulingin, 520m, LFF, | 11.VI.2019, 22°43’7’’N | 103°59’56’’E, primary | forest, leg. A. Weigel ||”.

Description. Dorsum (Fig. 4).Body length 3.9 mm, elongate, shiny, blackish, sides and apex of elytra with indistinct macrosetation.

Head (Fig. 9) relatively large, trapezoidal, convex, shiny, without microreticulation. Clypeus gently bordered, widely, triangularly sinuate anteriorly, denticulate on sides, widely rounded laterally, not

notched before genae, clypeal border without macrosetae. Genae obtuse, very distinctly exceeding eyes, with few very short, thin macrosetae. Frontal suture noticeable on sides, without gibbosities. Punctation simple: basally very dense, quite coarse, with variable in size, rounded punctures; in the middle very dense, coarse, with somewhat variable in size, longitudinal punctures; anteriorly moderately dense, fine, regular in size, with somewhat elevated punctures; anterior border of clypeus (with fine punctures) divided from the middle part by distinctly convex transverse tubercle, which is somewhat lower in the middle.

Figs 4-6. *Airapus yunnanensis*sp. nov., ♀, holotype: 1- dorsal view; 2- ventral view; 3- lateral view. Figs 1-3: scale lines: 1.0 mm.

Epipharynx (Fig. 10) transverse, with sides broadly rounded, anterior margin of pedia concavely arcuate, corypha above margin of pedia, distinct, with two very short, thick celtes. Mesoepitorma shortened basally, somewhat pear-shaped. Chaetopariae with dense belt of thick, long chaetae; adelochaetae similar to chaetopariae, but thicker and shorter; chaetopediae with only one very short and thin chaeta on each side; angustofenestrae dense, short and thick. Tormae long.

Pronotum transverse, somewhat wider than base of elytra, widest in the middle, convex, shiny, without microreticulation, with double punctation: larger punctures moderately coarse, dense, regularly distributes, somewhat irregular in size, smaller punctures fine, dense, regularly distributed. Base indistinctly bordered by a thin and shallow groove, sides bordered quite widely and somewhat more deeply than base; anteriorly not bordered. Sides and base with moderately long, quite thick macrosetae. Anterior angles quite distinctly rounded. Base before hind angles widely rounded.

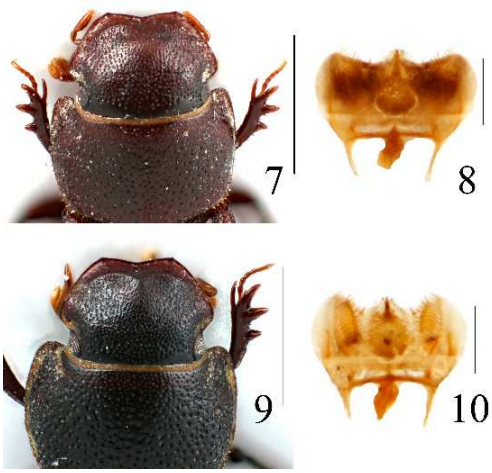
Scutellum small, triangular, with ogival sides, with few small punctures, moderately shiny, without microreticulation.

Elytra elongate, convex, parallel, shiny, without microreticulation, with short and thin, barely noticeable macrosetae on sides and before apex; with small but distinct humeral denticles; with ten striae and ten intervals. Intervals shiny, convex, with row of not fine punctures on external half and with row of moderately coarse punctures on internal half, which are connected with punctures of rows; due to this thestriae seem to indent intervals margins here very distinctly. Striae distinctly, quite densely punctate, with medium sized punctures; punctures distinctly indenting margins of intervals. All striae joined together before apex.

Pygidium with similar structure to ventrites.

Legs. Femora shiny, without microreticulation, moderately coarsely and quite densely punctate; profemora basally and apically bordered, meso- and metafemora bordered only apically. Mesofemora are in moderately large distance between each other. Protibiae distinctly tridentate

laterally, proximally not serrulate; somewhat inwardly sinuate; dorsal side smooth, shiny, with few very fine punctures; apical spur long, moderately broad, gently downwardly and outwardly bent, with apex acute. Meso- and metatibiae fimbriate apically with row of short spinules of equal length. Apex of metatibiae without accessory spine. Metatibiae superior apical spur slightly shorter than basimetatarsomere, latter approximately as long as following three and half metatarsomeres combined. Claws short, very thin, distinctly arcuate.



Figs 7-10. Heads and epipharyngi: 7- *A. rudolphi*sp. nov., ♀, holotype, head; 8- *A. yunnanensis* sp. nov., ♀, holotype, head; 9- *A. rudolphi*sp. nov., ♀, holotype, epipharynx; 10- *A. yunnanensis* sp. nov., ♀, holotype, epipharynx. Figs 7, 9: scale lines: 1.0 mm. Figs 8, 10: scale lines: 0.2 mm.

Macropterous.

Venter (Fig. 5). Meso-metaventral plate shiny, weakly convex, with distinct, quite deep, quite narrow longitudinal furrowin the middle; surface with moderately coarse, somewhat variable in size, moderately dense punctures. Process of meso-metaventral plate without any groove or recess, below of base there is no additional modifications. Abdominal ventrites shiny, anteriorly weakly fluted, with out micro reticulation, with moderately dense, moderately coarsely, quite regularly spaced punctures.

Etymology. Toponymic; an adjective derived from the name of Yunnan province, where holotype of the new species was collected.

Variability. Unknown.

Sexual dimorphism. Unknown.

Affinity. See discussion part.

DISCUSSION

Due to the more or less distinct transverse tubercle (or rather shaft) dividing the anterior and medial parts of the condyle, the internally sinuous protibiae and the absence of grooves, depressions or any other modifications on and below the meso-metaventric process, the two newly described species can be distinguished from all other species of the genus *Airapus* Stebnicka & Howden, 1996 known today. The first two features are unique, the third is not commonly observed. ***Airapus yunnanensis*** sp. nov. can be distinguished from ***A. rudolphi*** sp. nov. by: darker body colouration, body slightly larger, with slightly higher transverse tubercles on the clypeus, pronotum proportionally slightly wider, with smaller punctures denser, more regularly spaced (especially on the disc), with anterior and posterior angles more broadly rounded, punctures of elytral striae thicker, and by the metatibiae superior apical spur slightly shorter than the basimetatarsomere, the latter approximately as long as following three and half metatarsomeres combined (vs. metatibiae superior apical spur of equal length as the

basimetatarsomere, the latter approximately as long as following three metatarsomeres combined).

The similarity between the two species is interesting. More interesting is that both species have features very characteristic of the genus *Airapus* along with some features previously not observed in the genus *Airapus*, more characteristic of the genus *Ataenius* Harold, 1867. The characteristic features are, for example: a distinctly denticulate clypeus on each side of the medial emargination, the punctaction of the clypeus in the medial part more or less elongate, and the anterior part of the clypeus with a much finer punctation and a much shinier surface than the median or basal part. The transverse tubercle dividing the anterior and median parts of the clypeus is unique, but a trace of this structure can be observed in some species (for example in *A. popondettae* Stebnicka, 1988, etc.). Of interest is the absence of any modifications on and below the meso-metaventral process - and while the absence of modifications below the meso-metaventral process is rare, the absence of modifications from the meso-metaventral process is even rarer. Importantly: a compilation of both features has never been observed before. A fairly normal mesocostal interval, not as wide as in other *Airapus* species, in ***A. yunnanensis*** sp. nov. has never been observed. This is a feature much more characteristic of the genus *Ataenius*. However - in the opinion of the authors, the newly described species, based on the above data, undoubtedly belongs to the genus *Airapus*.

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