

Nonalatus epigaeus sp. n., a new apterous species of Cleridae from Tanzania (Coleoptera: Cleroidea)

Roland Gerstmeier

Technische Universität München, Department für Tierwissenschaften, Lehrstuhl für Zoologie, AG Entomologie, Hans-Carl-von-Carlowitz-Platz 2, 85350 Freising, Germany; r.gerstmeier@tum.de

ABSTRACT

Nonalatus epigaeus sp. n., a new wingless species from Mt. Hanang in Tanzania, is described, figured and briefly compared with its sister taxon *Nonalatus brevis* (Schenkling, 1908). The new species has been collected from forest litter samples and therefore seems to be epigeous.

KEY WORDS: Afrotropical, Tanzania, Cleridae, *Nonalatus*, aptery.

INTRODUCTION

The revision of the *Orthrius* group resulted in some taxonomic changes (Gerstmeier & Eberle 2011). Besides some synonymies, three new genera were described. Among these the monotypic genera *Nonalatus* Gerstmeier, 2011 (erected for *Apteroclerus brevis* Schenkling, 1908) and *Pseudoastigmus* Eberle, 2011 (erected for *Astigmus pygidialis* Pic, 1933) contain wingless species. Through the courtesy of Vasily Grebennikov, the author received some apterous specimens of a new species of *Nonalatus* from Tanzania. This species is described herein.

As already mentioned in Gerstmeier (1999), aptery in Cleridae is a relatively scarce phenomenon. Most apterous Cleridae belong to the subfamily Clerinae and, besides the Australasian and Afrotropical regions, seem to have a large number of wingless species (Gerstmeier 1999). Aptery seems to be correlated with special ecological conditions, one example being isolation on islands or mountain tops (Darlington 1943). This is the case for the new species, which has been recorded from forest litter sifting samples from the northeastern slope of Mt. Hanang (Tanzania) at about 2360 m.

MATERIAL AND METHODS

This study is based on ten specimens. The holotype and eight paratypes are deposited in the author's collection — the Roland Gerstmeier Collection (RGCM), Munich (deposited in the collection of the Technical University of Munich) — and one paratype is deposited in the collection of the KwaZulu-Natal Museum, Pietermaritzburg (NMSA). The following additional abbreviations are used: A1–A11 = antennal segments 1–11; T1–T4 = tarsomeres 1–4; l = length; w = width; NRM = Naturhistoriska riksmuseet, Stockholm, Sweden; SDEI = Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany. The description of the new species is based on morphological examination, including preparations of the male genitalia, the pygidium and the sixth ventrite. For this purpose the specimens were heated in distilled water and the genitalia removed with fine forceps through small incisions made along the sides of the terminal abdominal segments. Aedeagi were cleaned of soft tissue in 10% KOH, cleared in 70% ethyl alcohol and submerged in glycerine, and then stored in genital vials pinned below each specimen.

Measurements were taken under a stereo microscope using an ocular micrometer. Total body length is the distance measured from the apical clypeal margin to the elytral

apices. Elytral length was measured alongside the elytral suture and pronotal length was taken from the dorsal middle line. Pronotal and elytral width were measured at the broadest extreme. Scale bars are 0.5 mm.

TAXONOMY

Genus *Nonalatus* Gerstmeier, 2011

Nonalatus: Gerstmeier & Eberle 2011: 50 (Originally designated by monotypy).

Type species: *Apteroclerus brevis* Schenkling, 1908.

Nonalatus brevis (Schenkling, 1908)

figs 17, 34, 43, 53, 64 in Gerstmeier & Eberle 2011

Apteroclerus brevis Schenkling, 1908: 71.

Nonalatus brevis: Gerstmeier & Eberle 2011: 50.

Description:

Size. Body length 3.7–4.5 mm.

Head. Black, glossy; with fine punctation. Labrum yellow-brown, broadly bilobed. Head including eyes more or less as broad as anterior width of pronotum or slightly broader; vested with white setae. Eyes protruding, slightly emarginate at antennal insertion; interocular space two to three eye widths.

Thorax. Pronotum wider than long ($l=0.9\text{--}1.1$ mm, $w=1.0\text{--}1.3$ mm, length to width ratio 1:0.86), without a conspicuous transverse impression. Yellow-brown to dark red-brown, glossy, densely wrinkled; pronotal surface with white, more or less depressed, anteriorly directed setae; lower surface of prothorax red-brown.

Elytra short, ovate, strongly constricted at base and towards apex, widest in the middle or shortly behind ($l=2.3\text{--}2.8$ mm, $w=1.4\text{--}1.9$ mm, length to width ratio = 1:1.56); apices broadly rounded. Elytral ground colour yellow, sides and disc dark brown; with yellow and brown, mostly posteriorly directed setae.

Scutellum round to ovate, brown, densely vested with long, yellow setae.

Legs relatively long; base of femora yellow-brown; tibiae basally and distally yellow, in the middle brown; tarsi yellow to yellow-brown; hind tibiae slightly curved.

Abdomen. Brown; scattered with oblique, posteriorly directed, white setae. Apical margin of male ventrite 6 distinctly emarginate, pygidium long, distally straight, with a very slight emargination in the middle.

Type material: Lectotype (designated here): Kilimandj., Sjöstedt; Kiboscho, 3'–4000m; 15. febr.; Bärge. Ängarne (NRM), Paralectotype (designated here): same data (SDEI).

***Nonalatus epigaeus* sp. n.**

Figs 1–9

Etymology: From the Latin adjective *epigaeus*, referring to its presumable biology in forest litter.

Description:

Male.

Size: Body length 5.2–6.6 mm.



Fig. 1. *Nonalatus epigaeus* sp. n., habitus.

Head: Red-brown to dark brown, glossy; with dense, fine, regular punctation. Labrum brown, bilobed; anterior part of clypeus yellow, glossy; mouth parts more or less yellow-brown to light yellow, except the black mandibles; terminal labial palpomeres securiform, terminal maxillary palpomeres with sides parallel, constricted apically. Gula long, light red-brown, glossy, gular sutures apically slightly divergent, gular process of medium size. Head including eyes more or less as broad as anterior width of pronotum, vested with black and white setae, behind middle with a broadly Y-shaped pattern of white, depressed setae. Eyes small, coarsely faceted, margined, conspicuously emarginate at antennal insertion, with a brush of yellow setae; interocular space (frons) almost three eye widths. Antennae with 11 antennomeres, long, stout, reaching base of pronotum when laid back, brown, from A8 onwards becoming darker, A11 only basally narrowly dark, remainder light brown; A1 very long, slightly bent; A2 short, cylindrical; A3 twice as long as A2; A4 slightly shorter than A3, slightly dilated distally; from A5 onwards dilated distally, becoming thicker and more compact; A4–A10 progressively becoming slightly



Figs 2–8. *Nonalatus epigaeus* sp. n. (2) aedeagus ventral; (3) phallus ventral; (4) phallus lateral; (5) tegmen ventral; (6) spicular fork; (7) aedeagus tip (Scale bar 0.1 mm); (8) pygidium; (9) sixth ventrite. Scale bars = 0.5 mm.

shorter; A11 elongate, evenly pointed; antennae with long, erect, dark brown setae, from A8 onwards increasingly tomentose. Lower surface of head dark brown, glossy.

Thorax: Prothorax compact, pronotum wider than long ($l=1.31\text{--}1.58$ mm, $w=1.62\text{--}2.02$ mm, length to width ratio 1:0.81), widest in the middle, constricted conspicuously towards base; anterior transverse impression conspicuous; surface red-brown, towards sides dark brown to black; punctation conspicuous but not deep, transverse impression with slight transverse wrinkles in the middle; sides in the middle with slight, groove-like depression; procoxal cavities broadly open posteriorly, pro-intercoxal process very narrow, long. Pronotum with short, white, more or less depressed setae, sides with strong, erect, black setae. Lower surface dark brown, glossy, sides smooth, black; proepimeron broadly triangular.

Elytra compact, broad, widest in the middle or shortly behind, base not margined ($l=2.87\text{--}3.72$ mm, $w=2.05\text{--}2.52$ mm, length to width ratio=1:1.42); apices slightly dehiscent, each broadly rounded. Elytral ground colour yellow-brown (apex) to red-brown (shoulder) or more or less entirely yellow-brown, with a variable pattern

of black fasciae (Fig. 1). Elytral base, within the part of the ground colour with 10 rows of punctation, actually only row five to six conspicuous, diameter of punctation conspicuously smaller than interstices, apex with very fine punctation. In the area of the ground colour with short, white, mostly depressed setae; pilosity of the black fasciae black, partly erect, partly depressed.

Scutellum transverse ovate, yellow-brown to dark red-brown.

Mesoventrite red-brown to black-brown, with dense, coarse, shallow punctation; posterior mesoventral process long, depressed, connected with the anterior, long, slender metaventral process.

Legs stout, relatively long; basal half of femora yellow-brown, then black, distal tip narrowly red-brown; tibiae straight, basally red-brown to black-brown, then yellow-brown shortly behind the middle, distal third black-brown. Tarsi brown (T1–T3) to yellow-brown (T4, T5), pretarsus long, claws with an acute basal denticle; legs predominantly with slightly erect, short, white setae, only the outer margin of the black part of front tibiae with black setae; the black part of all tibiae with isolated black setae. Tarsal pad formula 4–4–2, T1 and T2 of front and middle tarsi with straight to slightly emarginate euplantulae, T3 and T4 deeply emarginate, hind tarsi T3 and T4 deeply emarginate; tibial spur formula 1–2–2.

Abdomen: Dark brown, glossy, posterior margin of abdominal ventrites 1–3 with a broad light-yellow margin, abdominal ventrite 4 with a narrow yellow margin; scattered with oblique posteriorly directed, short, white setae; abdominal ventrite 6 yellow-brown, pygidium brown. Male terminalia, see Figs 2–9.

Holotype: ♂ TANZANIA: Mt. Hanang, NE slope, 4.43175°S 35.41357°E, 2366 m, 15.xii.2012, sift 21. V. Grebennikov leg. (RGCM).

Paratypes: 9 specimens (not sexed), same data as holotype, (2 specimens in absolute alcohol) (8 RGCM & 1 NMSA)

Comparison:

<i>N. brevis</i>	<i>N. epigaeus</i> sp. n.
Size 3.7–4.5 mm	Size 5.2–6 mm
Head black	Head red-brown
Pronotum without a conspicuous transverse impression	Pronotum without a conspicuous transverse impression
Elytral punctation irregular	Elytral punctation arranged into striae, but only rows 5 and 6 conspicuous
Hind tibiae slightly curved	Hind tibiae straight

DISCUSSION AND CONCLUSION

Nonalatus epigaeus sp. n. is a further wingless species, which fits perfectly into the genus *Nonalatus* Gerstmeier, 2011, defined by the tarsal pad formula of 4–4–2, the tibial spur formula of 1–2–2, the broadly bent anterior mesoventral process, the compact ovate elytra, which are strongly constricted at the base and towards the apex, and the simple claws with a small, acute basal denticle.

The ecology of the new species seems to be epigeous in the forest litter at about 2360 m, whereas *N. brevis* has been recorded from the dry inflorescences of *Lobelia*

deckeni at 3000–3500 m (Schenkling 1908). Further specimens of *N. brevis* have been recorded from Bismarck Hut 2800 m, Peters Hut 3500 m, Mawenzi 3670 m and Kiboscho 3000–4000 m, all situated on Mt. Kilimanjaro, Tanzania. Both species seem to be restricted to isolated massifs, *N. epigaeus* sp. n. on Mt. Hanang and *N. brevis* on Mt. Kilimanjaro.

ACKNOWLEDGEMENTS

My sincere thanks go to Vasily Grebennikov (Ottawa, Canada), whose intensive explorations in Africa made the new species available, to my wife Marianne Müller for her help with the habitus photo and especially to my friend Justin S. Bartlett for reviewing the manuscript.

REFERENCES

- DARLINGTON, P.J. 1943. Carabidae of mountains and islands: data on the evolution of isolated faunas, and on atrophy of wings. *Ecological Monographs* **13**: 37–61.
- GERSTMEIER, R. 1999. *Aradamicula erikae* sp. nov., a second apterous New Guinean species of the genus *Aradamicula* Sedlacek & Winkler, 1975 (Coleoptera: Cleridae, Clerinae). *Acta Musei Moraviae, Scientiae biologicae* **84** (1–2): 1–5.
- GERSTMEIER, R. & EBERLE, J. 2011. Definition and revision of the *Orthrius*-group of genera (Coleoptera, Cleridae, Clerinae). *ZooKeys* **92**: 35–60.
- PIC, M. 1933. Clérides du Congo Belge et du Mozambique. *Revue de Zoologie et de Botanique Africaines* **23** (3–4): 255–258.
- SCHENKLING, S. 1908. 7. Coleoptera. 7. Cleridae, Erotylidae und Endomychidae. In: Sjöstedt, Y., *Wissenschaftliche Ergebnisse der Schwedischen zoologischen Expedition nach dem Kilimandjaro, dem Meru und den umgebenden Massaisteppeen Deutsch-Ostafrikas 1905-1906* **7** (7): 69–78.