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Three new Species of the Genus *Graphipterus* LATREILLE, 1802 from Zambia (Coleoptera: Carabidae)

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Abstract

Three new species of Carabidae from Zambia, *Graphipterus lorenzi* **sp. n.**, *Graphipterus snizeki* **sp. n.**, and *Graphipterus tichyi* **sp. n.** are described. Figures are provided for the new species and for closely related members of the genus.

Introduction

The spectacular and highly diverse ground beetle genus *Graphipterus* has been given an excellent monographic treatment by Pierre BASILEWSKY (1977). After this revision, the same author published two additional papers with descriptions of new species, updates to his keys and additional information on the distribution of species (BASILEWSKY 1981, 1986). Subsequently, LORENZ (1998a, 1998b) formally introduced some nomenclatural and synonymical changes in the context of his provisional world checklist and index of ground beetle nomenclature. The most recent taxonomic paper concerning afrotrropical members of the genus, including the description of a new species, was recently published by WERNER (2003). Together with three new species described below, the number of species currently accepted as valid is 139. BASILEWSKY (1977) divided the genus into two major sections mainly based on morphology of male front tarsomeres: the basal "*Graphipteri similatarsi*" with males having unmodified protarsi, and "*Graphipteri diversatarsi*" with males having slightly modified protarsi.

Although BASILEWSKY was able to study "quelques dizaines de milliers" specimens from all parts of Africa, some of his taxonomic decisions were based on very limited material. Given the extreme variability and often very limited geographical distribution of members of *Graphipterus*, this lack of material inevitably resulted in a number of taxonomic decisions that are in need of further in-depth studies.

In the course of many collecting trips in Africa since 1984, mainly dedicated to the study of tiger beetles (e.g., WERNER 2000a, 2000b), the present author could collect important new material which can now serve as a basis for revising some of the critical species-groups. In preparation of such major revisions, the provisional descriptions below are given in order to provide names for the new taxa which are needed for ongoing work and in communication with colleagues.

It was in a recent collecting trip to northeastern Zambia in December 2004, when the author and his expedition companion Petr SMRZ could collect an exceptional series of *Graphipterus* beetles, among which two apparently new taxa were identified by both K. WERNER and W. LORENZ. At about the same time and same region in Zambia, two Czech entomologists, Miroslav SNIZEK and Vladimir TICHY, collected a series of *Graphipterus* specimens which contained another apparently new species.

Graphipterus lorenzi **sp. n.** (Figs 1, 2)

Holotype: ♀, Zambia northeast, 30 km southeast of Mbala, 6-8.XII.2004, WERNER & SMRZ leg.; deposited in the Musée Royal de l'Afrique Centrale, Tervuren, Belgium (MRAC, Fig. 1).

Paratype: ♀, same collecting data as holotype, in the author's collection (KWC, Karl WERNER Collection, Peiting, Germany), (Fig. 2).

Diagnosis: A spectacular species, at once recognized by its strikingly bicoloured elytral vestiture reminding of *Graphipterus atrimediatus* CHAUDOIR, 1870, (Fig. 3) but easily separable from that species by different colour of pronotal vestiture.

Description: Size: 10 - 12 mm (without labrum). A species with typical habitus and size in the genus, but with striking colour pattern of dorsal vestiture; black ground colour and yellowish-white scaly pubescence on dorsal sides of elytra, pronotum, and head; pubescence broad black along the suture.

Head: shiny black. Frons and vertex not granulated. Two supraorbital setae close to each eye. Dense pubescence of yellowish-white scaly setae on frons along the eyes. Clypeus without pubescence. Labrum shiny black with six labral setae. Mandibles shiny black except for a brown section on the central inner edge. Maxillary and labial palpi shiny black with small testaceous spots at the tips of the last segments. Genae shiny black with fine granulation. Antennomeres 1-4, black except for a brown testaceous pedicel, one bristle on scape; antennomeres 5-11, dull dark, flattened and foliated.

Pronotum: shiny black, densely covered with decumbent white scaly setae and with a fine impressed median line; pronotal sides smooth. Proepisterna shiny dark-metallic with a few white bristles.

Elytra: black, punctured, densely covered with yellowish scaly setae, those turning black in the central area presenting a maculation as in Figs 1, 2.

Legs: shiny black with setae; metatibial spine angulate and canaliculated.

Underside: shiny black, abdominal sternite dorsally with white pubescence.

Systematic Position. It is difficult to place this species in one of BASILEWSKY's species-groups. With unknown males it is even impossible, at this moment, to be sure about its position in "Graphipteri similatarsi" or "diversatarsi". However, based on all known character states, e.g., smooth pronotal side margin, there is strong support for the assumption that it belongs in the "diversatarsi". Within that section, its position seems to be rather isolated. Despite its superficial similarity with *G. atrimediatus*, it has nothing to do with that species, which is rather a member of the "circumcinctus"-group, closely related to species like *G. hammondi* BASILEWSKY, 1977 and *G. erikssoni* PÉRINGUEY, 1892.

Habitat: The two female specimens were collected on sandy ground at the edges of the forest (Figs 14 - 16).

Etymology. The new species is dedicated to the specialist of carabid beetles, Wolfgang LORENZ, Tutzing, Germany, who has given his consistent and valuable support in the research on *Graphipterus*.

Graphipterus snizeki sp. n.

(Figs 4, 5)

Holotype: ♂, Zambia northeast, Isoka District, environs of Mbesuma Ranch, 09-10.XII.2004, WERNER & SMRZ leg.; deposited in the Musée Royal de l'Afrique Centrale, Tervuren, Belgium (MRAC, Fig. 4).

Paratypes: 1 ♂ 1 ♀, same collecting data as holotype, in the author's collection (KWC, Karl WERNER Collection, Peiting, Germany) (♀ Fig. 5).

Diagnosis: A *Graphipterus*-species of the *vestitus*-group in BASILEWSKY's section on „Graphipteri diversatarsi”. Similar to *G. dymorphus* ssp. *dymorphus* BURGEON, 1928 (Figs 6, 7), *G. dymorphus* ssp. *rubens* BURGEON, 1929 (Fig. 8), and *G. dymorphus* ssp. *tanganikae* BURGEON, 1929 (Fig. 9), but distinguishable by the elytrae being more narrow and having a different colour and structure of the general pubescence. *G. dymorphus*, with its three subspecies, is not known from Zambia at present.

Description: Size: 11-13 mm (without labrum).

Colour: a species with a shiny greenish-black ground colour and white scaly pubescence on the dorsal sides of the pronotum, head, and elytra;

Head: shiny greenish-black. Frons with longitudinal striae and pubescence of white scaly setae along the eyes, with the genae coarsely granulated. Clypeus without pubescence. Labrum dark brown, with six labral setae and a testaceous section along the side margins. Mandibles shiny black except for a brown section on the central inner edge. Maxillary and labial palpi shiny black. Antennomeres 1-4, black except for a brown testaceous pedicel, and one bristle on scape; antennomeres 5-11, dull dark, flattened and foliated.

Pronotum: shiny greenish-black, densely covered with decumbent white scaly setae, coarse granulation, and with an impressed median line; pronotal sides smooth. Proepisterna shiny greenish-black with a few white bristles.

Elytra: ground-colour shiny black, punctured, densely covered with yellowish scaly setae, those turning white on a narrow marginal line (Figs 4, 5).

Legs: shiny black with setae; metatibial spine angulate and canaliculated.

Underside: shiny black; white bristles around trochanters; abdominal sternite dorsally with dense yellowish pubescence.

Habitat: The three specimens were collected between grasses on dry sandy places surrounded by bushes and trees in the swampy territory of the Mbesuma Ranch (Fig. 17).

Etymology. This new species is dedicated to the enthusiastic traveller, beetle collector, and entomologist, Miroslav SNIZEK, from České Budějovice, Czech Republic.

Graphipterus tichyi sp. n.

(Figs 10, 11)

Holotype: ♂, Zambia central, Mkushi environs, 16-18.XII.2004, SNIZEK & TICHY leg.; deposited in the Musée Royal de l'Afrique Centrale, Tervuren, Belgium (MRAC, Fig. 10).

Paratypes: 1 ♂, 2 ♀♀, Zambia central, Mkushi environs, 16-18.XII.2004, SNIZEK & TICHY leg.; 4 specimens, same data; 3 ♂♂, 3 ♀♀, Zambia central, 100 km northeast of Kapiri Moshi, ATB Lodge environs, 23.XI.2004, SNIZEK & TICHY leg.; 4 paratypes are deposited in the collections of Miroslav SNIZEK and Vladimír TICHY; while the others are in the author's collection (KWC, Karl WERNER Collection, Peiting, Germany).

Diagnosis: A *Graphipterus*-species of the „*Graphipteri diversitarsi*” section similar to *G. neavei* BURGEON, 1928 (Figs 12, 13), but easily distinguishable by its pronotum with more pubescence and the elytral pubescence showing a pattern of longitudinal lines.

Description: Size: 13-15 mm (without labrum).

Colour: a species with greenish-black ground colour and whitish scaly pubescence on dorsal sides of pronotum, head, and elytra;

Head: greenish-black. Frons with fine longitudinal striae and pubescence of white scaly setae along the eyes, with some specimens having the pubescence joining close to the clypeus; clypeus with two setae; genae dull and finely punctured. Clypeus without pubescence. Labrum dark brown to dark greenish-metallic, six labral setae and a testaceous section along the side margins. Mandibles shiny black except for

a brown part on the central inner edge. Maxillary and labial palpi shiny black. Antennomeres 1 - 4, black, one bristle on scape; antennomeres 5-11, dull black, flattened and foliated.

Pronotum: shiny greenish-black, edges broadly covered with decumbent white scaly setae, with a punctured and impressed median line; pronotal sides smooth. Proepisterna shiny green-black; prosternum with white bristles.

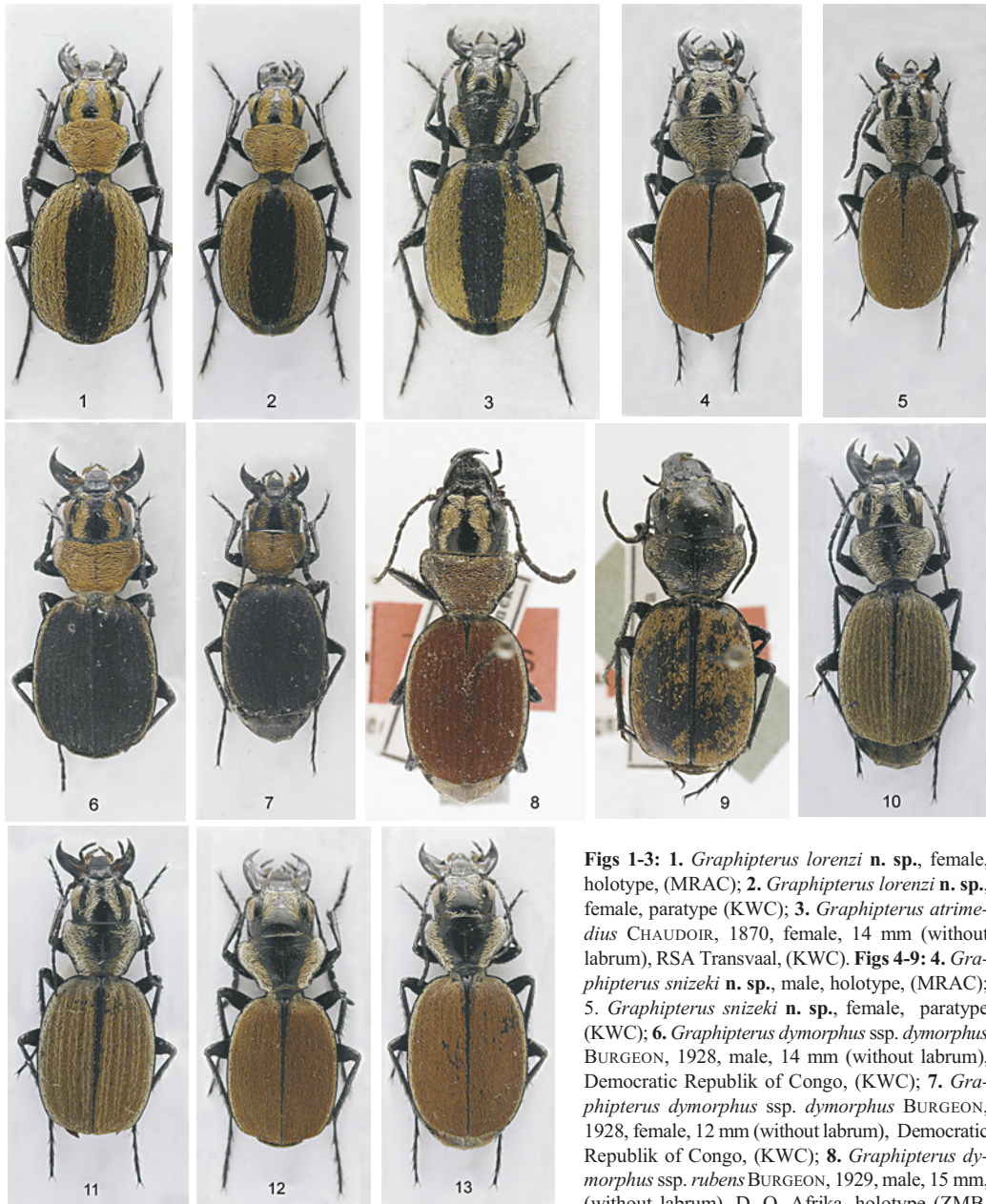
Elytra: ground-colour shiny black, finely punctured, densely covered with yellow and white scaly setae, those constituting a pattern of longitudinal lines (Figs 10, 11).

Legs: shiny black with setae; metatibial spine angulate and canaliculated.

Underside: shiny black; with a few white bristles around trochanters; last sternite dorsally with dense yellowish pubescence.

Habitat: "The beetle always lived in sandy areas, especially between small plants on sandy road sides and surrounding forests (Fig. 18). The habitat was also a collecting site of several tiger beetles species" (TICHY, pers. comm.).

Etymology: This new species is dedicated to one of its discoverers, the entomologist and beetle collector, Vladimír TICHY, from Třeboň, Czech Republic.



Figs 1-3: 1. *Graphipterus lorenzi* n. sp., female, holotype, (MRAC); 2. *Graphipterus lorenzi* n. sp., female, paratype (KWC); 3. *Graphipterus atrime-dius* CHAUDOIR, 1870, female, 14 mm (without labrum), RSA Transvaal, (KWC). **Figs 4-9:** 4. *Graphipterus snizeki* n. sp., male, holotype, (MRAC); 5. *Graphipterus snizeki* n. sp., female, paratype (KWC); 6. *Graphipterus dymorphus* ssp. *dymorphus* BURGEON, 1928, male, 14 mm (without labrum), Democratic Republik of Congo, (KWC); 7. *Graphipterus dymorphus* ssp. *dymorphus* BURGEON, 1928, female, 12 mm (without labrum), Democratic Republik of Congo, (KWC); 8. *Graphipterus dy-morphus* ssp. *rubens* BURGEON, 1929, male, 15 mm, (without labrum), D. O. Afrika, holotype (ZMB, Zoologisches Museum der Humboldt - Universität,

Berlin, Germany); 9. *Graphipterus dymorphus* ssp. *tanganikae* BURGEON, 1929, male, 14,5 mm (without labrum), D. O. Africa, holotype (ZMB, Zoologisches Museum der Humboldt - Universität, Berlin, Germany). **Fig. 10.** *Graphipterus tichyi* n. sp., male, holotype, (MRAC). **Figs 11-13:** 11. *Graphipterus tichyi* n. sp., female, paratype (KWC); 12. *Graphipterus neavei* BURGEON, 1928, female, 15 mm (without labrum), Zambia, (KWC); 13. *Graphipterus neavei* BURGEON, 1928, male, 15 mm (without labrum), Zambia (KWC).



Figs 14-16: 14. Type locality of *Graphipterus lorenzi* n. sp., in Zambia northeast, 30 km SE Mbala, 06-08.XII.2004; 15. Type locality of *Graphipterus lorenzi* n. sp., in Zambia northeast, 30 km SE Mbala, 06-08.XII.2004; 16. Type locality of *Graphipterus lorenzi* n. sp., in Zambia northeast, 30 km SE Mbala, 06-08.XII.2004. **Fig. 17.** Zambia northeast, Isoka District, near Mbesuma Ranch, 09.XII.2004. **Fig. 18.** Type locality of *Graphipterus tichyi* n. sp., in Zambia central, Mkushi environs, 17.XII.2004, (Photo: Vladimir TICHY). **Fig. 19.** From left: Vladimir TICHY, Karl WERNER, Petr SMRZ at Jan SMUTS, International Airport Johannesburg, South Africa, 21. December, 2004.

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Zusammenfassung

Drei neue Laufkäferarten aus Sambia, *Graphipterus lorenzi* **sp. n.**, *Graphipterus snizeki* **sp. n.**, und *Graphipterus tichyi* **sp. n.** werden beschrieben. Diese neu beschriebenen Arten sowie einige nah verwandte Arten werden abgebildet.

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