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Two new species of *Strigocossus* Houlbert, 1916 (Lepidoptera, Cossidae, Zeuzerinae) from Togo and Zambia

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Abstract

The paper contains the description of two new species of Carpenter-Moths (Lepidoptera, Cossidae, Zeuzerinae) from tropical Africa, *Strigocossus takanoi* Yakovlev & László **sp. n.** (type locality – Zambia, Hillwood, Ikelenge), and *S. sanbenai* Yakovlev & László **sp. n.** (type locality – Togo, Fazao-Malfakassa NP, Point de vue). With 8 figures.

Key words: Carpenter-Moths, taxonomy, faunistics, Afrotropics.

Introduction

Strigocossus Houlbert, 1916 (type species – *Strigocossus leucopteris* Houlbert, 1916) (Lepidoptera, Cossidae) is a genus of large Zeuzerinae moths, consisting of eleven valid species occurring in the Sub-Saharan Africa and Madagascar (Houlbert 1916; Schoorl 1990; Yakovlev 2011, 2015). The genus *Xylocossus* Houlbert, 1916 described for *Zeuzera capensis* Walker, 1856, was later synonymized with *Strigocossus* (Schoorl 1990) leaving a single genus for the large sized Afrotropical Zeuzerinae.

Data on the distribution and taxonomy of species of the genus *Strigocossus* have been published in a number of publications. Faunistical information were published for several countries: Angola (Bethune-Baker 1927; Yakovlev, Sulak & Witt 2019), Botswana (Yakovlev & Murphy 2013), Burundi (Yakovlev & Witt 2019a), Cameroon (Strand 1912; Houlbert 1916), Central African Republic (Yakovlev, László & Witt 2018), Congo (Rebel 1914; Houlbert 1916; Holland 1920; Fletcher 1968), Ethiopia (Yakovlev 2011), Gabon (Pinhey 1979; Yakovlev, László & Witt 2019a), Guinea (Fletcher 1968), Kenya (Butler 1868; Hampson 1910; Fletcher 1968; Pinhey 1979), Madagascar (Butler 1878; Houlbert 1916; Viette 1954), Malawi (Fletcher 1968; Yakovlev & Murphy 2013), Mozambique (Pinhey 1979; Yakovlev, László & Vetina 2020), Nigeria (Hampson 1910), Rwanda (Fletcher 1968; Yakovlev & Witt 2019b), Sierra Leone (Walker 1856; Hampson 1910; Yakovlev, László & Witt 2019b), Southern Africa and Namibia (Distant 1897; Pinhey 1979; Mey 2016), Swaziland (Yakovlev & Witt 2016), Tanzania (Aurivillius 1910; Le Cerf 1914; Gaede 1930;

Fletcher 1968; Yakovlev 2011; Mey 2016); Uganda (Fletcher 1968; Waring 2015), Zambia (Pinhey 1979; Yakovlev 2014), and Zimbabwe (Fletcher 1968; Pinhey 1979; Yakovlev & Lenz 2013).

Little is known about the trophic links of the genus *Strigocossus*: *S. capensis* and *S. moderata* were recorded on plants of the families Fabaceae (*Cassia* L.), Malvaceae (*Pavonia* Cav.), and Euphorbiaceae (*Ricinus communis* L.) (Forsyth 1966; Pinhey 1979; Schoorl 1990; Kroon 1999).

In the course of examination of the Cossidae material of the entomological collection of the African Natural History Research Trust (ANHRT, Leominster, Great Britain) the authors of the present paper found long series of *Strigocossus* specimens collected in Zambia and Togo. The thorough examination of the specimens and their genitalia resulted in the conclusion that both species differ in diagnostic characters from every other known species of the genus, therefore represent hitherto undescribed species. The descriptions of the two new *Strigocossus* species are provided in this paper.

Material and methods

Most of the specimens were studied in ANHRT, additional materials on the allied species were examined in the Natural History Museum (NHMUK, London, Great Britain), Royal Museum of Central Africa (RMCA, Tervuren, Belgium), and Museum Witt (MWM, Munich, Germany). The genitalia were dissected and stained with Eosin red and mounted in Euparal on microscope slides applying standard methods of preparation (Lafontaine & Mikkola 1987). The adults were photographed using a Nikon D700 camera equipped with Nikkor AF-S Micro 105 mm lens. The genitalia preparations were photographed using a Tucsen H series digital microscope camera mounted on a Nikon SMZ1500 stereomicroscope.

Taxonomic part

Strigocossus takanoi Yakovlev & László, sp. n.

Figs 1–2, 4–5, 7.

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Holotype. Male, “ZAMBIA, 1400m, Hillwood, Ikelenge, S11°16'02", E24°18'59", 25–27.xi.14, Light Trap, leg. Smith, R. & Takano, H.", ANHRT:2017.12, slide ANHRT 00058, unique number ANHRTUK 00052303 (ANHRT).

Paratypes (all in ANHRT). Zambia. 12 males, 1 female, with the same data as the holotype, unique numbers: ANHRTUK 00052304, 00007723, 00007724, 00098478-00098485, 00098487, slides ANHRT 00059 (male), LG 5193 (female); 4 males, same locality, 21–28.x.2013, leg. Smith, R., Takano, H., Chmurova, L., Smith, L., ANHRT:2017.10, unique numbers: ANHRTUK 00098486, 00098489-00098491; 3 males, same locality, 7-10.xi.2019, MV Light Trap, Bashford, M., Miles, W., Mulvaney, L. leg., ANHRT:2019.25, unique numbers: ANHRTUK 00133157-00133159; 14 males, same locality, 23–30.xi.2019, MV light trap, Bashford, M., Miles, W., Mulvaney, L., Smith, R. leg., ANHRT 2019.25, unique numbers: ANHRTUK 00133133-00133146; 4 males, Chitunta plain (Miombo / Dambo mosaic), 1396 m, S11°29'12", E24°24'18", 29.xi.–4.xii.2019, LepiLED and MV light trap, Bashford, M., Miles, W., Mulvaney, L. leg., ANHRT 2019.25, unique numbers: ANHRTUK 00133149-00133152; 3 males, Nyangombe Falls (Miombo / Riverine forest mosaic), 1300 m, S11°48'25", E24°32'12", 17–23.xi.2019, MV light trap, Bashford, M., Miles, W., Mulvaney, L., Smith, R. leg. ANHRT 2019.25, unique numbers: ANHRTUK 00133122, 00133124, 00133125; 3 males, Dambo near Kanyama (Miombo / Riverine / Dambo mosaic), 1375 m, S11°25'36" / E24°40'00", 4–7.xii.2019, MV and Actinic light trap, Bashford, M., Miles, W., Mulvaney, L. leg., ANHRT 2019.25, unique numbers: ANHRTUK 00133153-00133155; 6 males, Jiwundu Swamp, 1340 m, S11°51'54" / E 25°33'20", 21–24.xi.2014, leg. Smith, R. & Takano, H., ANHRT:2017.12, unique numbers: ANHRTUK 00098477, 00098488, 00098492-00098495; 12 males, Zambezi Rapids (Miombo / Riverine forest mosaic), 1205 m, 11°7'30"S, 24°11'6"E, 4–9.xi.2018, MV and Actinic light trap, Aristophanous, M., Deroziér, V., László, G., Oram, D. leg., ANHRT 2018.40, unique numbers ANHRTUK 00052901, 00054827-00054829, 00054834, 00054835, 00054837, 00054840, 00054871, 00054872, 00070905, 00070988.



Figures 1–3. Adult specimens of *Strigocossus* (coll. ANHRT): 1. *S. takanoi* sp. n., holotype, male; 2. *S. takanoi* sp. n., paratype, female; 3. *S. sanbenai* sp. n., holotype, male.

Description. Male (Fig. 1). Length of forewing 27 mm in holotype, 24–47 mm in paratypes. Wingspan 52–102 mm. Antenna bipectinate in proximal half, filiform in distal half. Head moderately large, palps very short and thin, slightly upcurved, blackish; frons very narrow between the large, globular compound eyes, covered in short dark brown scales; vertex blackish brown. Collar and tegulae pale brownish grey densely covered in admixture of pale brown, grey and blackish scales, thorax dark blackish brown. Forewing grey with dense, finely reticulated pattern, a short, longitudinal blackish streak in cell CuA₂–CuP (discally) and a conspicuous, rather thick, dark brown submarginal crescent; discal area pale-brown with sparse reticulated pattern, costal margin dark brown, with small blackish patches along costa. Fringe mottled, pale grey between veins, blackish at veins. Hindwing pale greyish-brown, anal angle lighter brown, with weakly expressed reticulated pattern on wing periphery, fringe mottled, light brown between veins, dark brown at veins.

Male genitalia (Fig. 4). Uncus elongate-trigonal, robust, broad at base then slightly tapered distally, apically rounded; gnathos arms very short, ribbon-like, wide basally, narrowing apically without medial plate of gnathos; valva evenly broad in its basal two-thirds with very slightly convex costal and straight ventral margins, valva margins more or less parallel, apex evenly rounded; juxta large with long narrow ribbon-like lateral processes directed ventro-distally; saccus large, semicircular; phallus robust, extremely short, thick; vesica with longitudinally rugose, largely dilated, globular basal section, smooth surfaced, inflated medial section bearing a well-developed lateral lobe and gradually tapered, tubular distal section.

Female (Fig. 2). Length of forewing 53 mm. Antenna filiform. Sexual dimorphism limited, wingpattern analogous to that of the male, forewing somewhat lighter compared to that of males.

Female genitalia (Fig. 5). Ovipositor extremely long, retractable, papillae anales very long and narrow, tubular, poorly sclerotized; apophyses posteriores heavily sclerotized, thin, anteriorly slightly dilated with rounded tip, conspicuously long, reaching ostium bursae; apophyses anteriores long, relatively thick in full length, apically rounded. 8th tergite long and narrow with a shield-like medial sclerotization and fine, but heavily sclerotized process connected with apophyses anteriores. Ostium bursae conspicuously wide, somewhat cup-shaped, weakly sclerotized; ovary globular, oviduct very thin; ductus bursae membranous, posteriorly constricted, anteriorly dilated, relatively thick and short with rugose surface, bearing a well-developed lateral diverticulum; cervix bursae extremely broad, ductus seminalis thick, rugose; corpus bursae globular, signum bursae circular, heavily sclerotized, strongly spinose marginally with less, shorter spines on its medial surface.

Diagnosis. The closest relative of the new species is the recently described *S. otti* Yakovlev, Sulak & Witt, 2019 (type locality – Angola, Prov. Cuanza Sul, 26 km E Cassongue), from which it differs in the following characters:

- the light-brown hind wing with lightened anal angle and the fine, reticulated pattern on the wing periphery whereas in *S. otti*, the hindwing is uniformly dark-brown, almost without pattern;
- the valva with straight ventral margin, while that of *S. otti* is slightly curved medially.

Distribution (Fig. 5). *S. takanoi* is hitherto known only from the North-Western Province of the Republic of Zambia. It inhabits medium high altitude (ca. 1400 m a.s.l.) Miombo woodland habitats, variegated by narrow strips of riverine forests (Muchito).

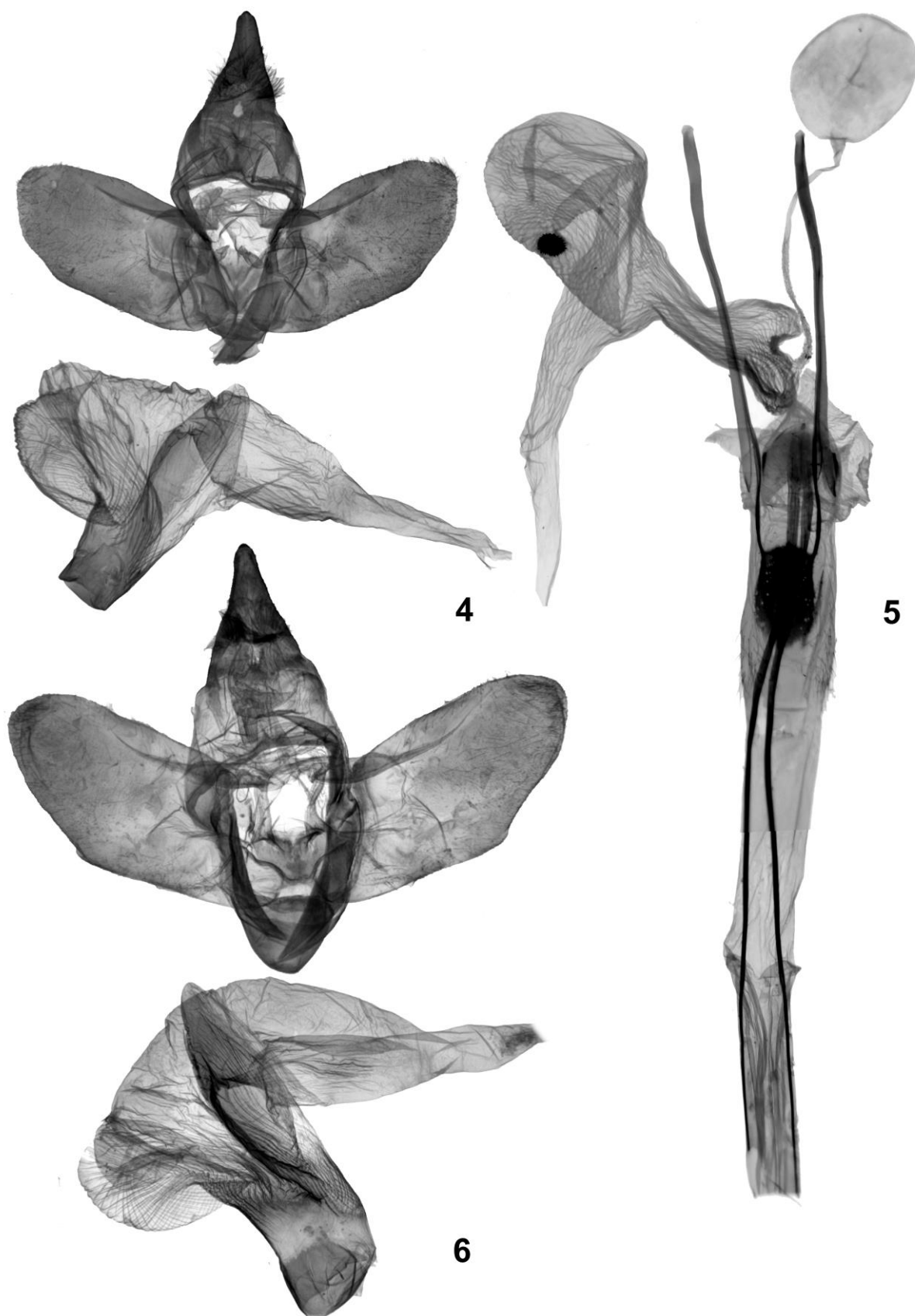
Etymology. The new species is named after the dedicated entomologist Dr Hitoshi Takano (ANHRT), specialist of *Catharsius* dung beetles, Rhopalocera and Sphingidae, organizer and participant of numerous entomological expeditions in Africa, one of the collectors of the new species.

***Strigocossus sanbenai* Yakovlev & László, sp. n.**

Figs 3, 6, 8.

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Holotype. Male, “Togo, 505m, Fazao-Malfakassa NP, Mare aux crocodiles campsite (Sudanian savannah/dry forest), 8°44'58.8"N, 0°48'51.8"E, 26.viii.-7.ix.2018, MV Light Trap, Aristophanous, M., Geiser, M., Moretto, P., Sanbena, B. leg. ANHRT:2018.31, slide ANHRT 00060, unique number ANHRTUK 00047587 (ANHRT).



Figures 4–6. Genitalia of *Strigocossus* (coll. ANHRT): 4. *S. takanoi* sp. n., holotype; 5. *S. takanoi* sp. n., paratype, female; 6. *S. sanbenai* sp. n., holotype.



Figures 7–8. Habitats of the new *Strigocossus* species: 7. Hillwood Farm, Ikelenge, NW Zambia, habitat of *S. takanoi* (photo by Lydia Mulvaney); 8. Fazao-Malfakassa National Park, Togo, habitat of *S. sanbenai* (photo by Marios Aristophanous).

Paratypes (all in ANHRT). Togo. 37 males, with the same data as the holotype, unique numbers: ANHRTUK 00046216, 00047378, 00047557-00047573, 00047577-00047586, 00047588-00047595; 8 males, Fazao-Malfakassa NP, Point de vue campsite (Sudanian savannah), 415m, 8°48'50"N, 0°49'3.2"E, 16-23.viii.2018, MV Light Trap, Aristophanous, M., Geiser, M., Moretto, P., Sanbena, B. leg. ANHRT:2018.31, unique numbers: ANHRTUK 00046219-00046226.

Description. Male (Fig. 3). Length of forewing 52 mm in holotype, 43-54 mm in paratypes. Wingspan 90-115 mm. Antenna typical of the genus: bipectinate from base to middle, rami 3–4 times longer than antenna rod diameter, shortened distally, apical half of antenna filiform.

Head moderately large, palps very short and thin, slightly upcurved, shining anthracite black; frons reversed trapezoidal; compound eyes large, globular; vertex pale brown frontally, graphite grey dorsally. Patagia pale brownish grey with admixture of shining black scales, tegulae dark brownish grey; thorax dark brown with some reddish sheen, bearing two short but conspicuous prominences posteriorly consisting of admixture of long black, creamy yellow, pale brown and off white hair scales; abdomen uniformly greyish brown, somewhat paler along anterior margins of each segments.

Forewing pale grey with dense reticulated pattern defined by numerous short, thin, undulate dark-grey transverse lines throughout the wing area with a conspicuous, short longitudinal light brown streak discally at base of cubital veins and with a relatively thick, dark brownish crescent band submarginally; costal margin pale grey, with dark brown narrow streaks of various length. Hindwing brownish grey, with dense, very fine, dark brownish reticulate pattern throughout the wing except for the anal angle.

Male genitalia (Fig. 5). Uncus elongate-trigonal, robust, relatively broad at base, gradually tapered distally, apically rounded; gnathos arms short, basally wide, apically narrowing without medial plate of gnathos; valva broad costal margin almost straight, ventral margin conspicuously angled medially, apex broadly rounded; juxta large semicircular basally, with two long narrow ribbon-like lateral processes directed ventro-distally; saccus large, semicircular; phallus robust, extremely short, thick; vesica with longitudinally rugose, largely dilated, globular basal section, smooth surfaced, inflated medial section bearing a short sack-like lateral diverticulum and gradually tapered distal section.

Female unknown.

Diagnosis. The new species' closest relative is *S. otti*, from which it differs in the following characters:

- the abdomen is covered in its whole length in paler greyish brown scales dorsally, whereas in *S. otti*, the abdomen is covered in darker brown scales, only apically in light-grey scales;
- the hindwing is paler grey, with dense reticulate brownish pattern throughout the wing surface except for the anal edge, while in *S. otti*, the hindwing is considerably darker brown almost without pattern;
- the ventral margin of the valva is strongly angled medially, while that is only slightly curved medially in *S. otti*.

Distribution (Fig. 6). *S. sanbenai* was collected in dry Sudanian Savannah habitat in the Fazao-Malfakassa National Park in Togo, during the rainy season.

Etymology. The new species is dedicated to Mr Banibéa Bassan Sanbena (Laboratoire d'Entomologie Appliquée, Département de Zoologie et de Biologie Animale, Université de Lomé, Togo) as a thank for his epic effort made during the field work organized by ANHRT in Togo.

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The Authors declare that to the best of their knowledge they conform to the national regulations and meet with the conditions and requirements of International Conventions concerning collecting/export and handling of the specimens presented in this Article.

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