

Redescription of the Genus *Paralophonotus* Schoorl, 1990 based on the morphology of male genitalia (Lepidoptera: Cossidae)

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Abstract

Based on the study of male genitalia and external habitus of *Zeuzera auroguttata* Herrich-Schäffer, 1854, type species of the genus *Paralophonotus* Schoorl, 1990, the genus *Paralophonotus* is redescribed.

KEY WORDS: Lepidoptera, Cossidae, *Paralophonotus*, fauna, Africa.

Redescripción del género *Paralophonotus* Schoorl, 1990 basada sobre la morfología de la genitalia del macho (Lepidoptera: Cossidae)

Resumen

Basándose en el estudio de la genitalia del macho y el habitus externo de *Zeuzera auroguttata* Herrich-Schäffer, 1854, especie tipo del género *Paralophonotus* Schoorl, 1990, se redescrive el género *Paralophonotus*.

PALABRAS CLAVE: Lepidoptera, Cossidae, *Paralophonotus*, fauna, África.

Introduction

The cossid moths of Africa are poorly studied. Only the faunas of Malawi (YAKOVLEV & MURPHEY, 2013), Zimbabwe (YAKOVLEV & LENZ, 2013), Swaziland (YAKOVLEV & WITT, 2016), and South Africa (MEY, 2015, 2016) have been completely listed. The systematics of Cossidae remain poorly examined, as several endemic genera of Africa still have not been revised.

The genus *Paralophonotus* Schoorl, 1990 was established to include a single species *Zeuzera auroguttata* Herrich-Schäffer, 1854 based on the peculiarities of its thorax structure (SCHOORL, 1990), but the genital structure features, which are of essential importance for the systematic of Lepidoptera as a whole, and of Cossidae have not been hitherto described.

HERRICH-SCHÄFFER (1854) described *Zeuzera auroguttata* from “Sierra leon.” [Sierra Leone] based on the type specimen (syntype ♀) deposited at the Staatliches Museum für Naturkunde, Stuttgart (HÄUSER *et al.*, 2003).

Paralophonotus auroguttata (Herrich-Schäffer, [1854]) is known only from a small number of specimens from several regions of Tropical Africa: Sierra-Leone (HERRICH-SCHÄFFER, 1854), Guinea-Bissau (AURIVILLIUS, 1910), Cameroon (AURIVILLIUS, 1925), Angola, Congo and Ghana (SCHOORL, 1990), Zambia (GOFF, 2017).

Material and methods

Previously examined material in the collections of The Natural History Museum, London, United

Kingdom (BMNH), Museum für Naturkunde, Leibniz Institut für Evolution und Biodiversitätsforschung, Berlin, Germany (MNKB), Naturhistorisches Museum Wien, Austria (NHMW), and Zoologische Sammlung des Bayerischen Staates, Munich, Germany (ZSSM) was represented only by females as listed by YAKOVLEV (2011). The present work is based on additional material deposited at the Royal Museum of Central Africa, Tervuren, Belgium (MRAC), which includes the only hitherto known male.

Male genitalia are mounted in euparal on slides following LAFONTAINE (2004) and examined with a Zeiss Stemi 2000 C microscope. Images were taken with the Olympus XC 50 camera.

Results

Paralophonotus Schoorl, 1990

Type species: *Zeuzera auroguttata* Herrich-Schäffer, 1854, by monotypy and original designation.

Description: Large. Top of head covered with orange hairs. Antenna of male very short, bipectinate from base to middle, distal half simple, filiform. Antenna of female filiform with thicker rod at base. Thorax and abdomen densely covered with dark blue scales with fatty matte shine. Tegula orange with dark blue round spot. Thorax from above with pattern of two narrow orange longitudinal stripes. Distal end of abdomen orange. Wings dark blue with orange pattern on the fore wing; hind wing without pattern.

Male genitalia: Uncus elongated, with beak-like apex and deep cut on abdominal surface; gnathos arms short, thin, not fused; valve with even edges, rounded outer edge; juxta with ribbon-like lateral processes, 4,5 shorter than valve; anellus well developed, poorly sclerotized, long; saccus small, semicircular; phallus 1,3 times shorter than valve, slightly curved, thick; longitudinal folds in lateral surfaces of vesica, long ribbon-like cornutus.

Genus monotypic.

Distribution: Tropical Africa (Angola, Cameroon, Congo, Ghana, Guinea-Bissau, Sierra-Leone and Zambia).

Notes: Based on the examination of the external characters and male genitalia it can be stated that the genus *Paralophonotus* Schoorl, 1990 is affiliated to subfamily Zeuzerinae (synapomorphies: simple valve, totally reduced gnathos, complicated structure of the vesica with a long belt-like cornutus). It has a number of apomorphic features: modified pattern on the thorax, orange top of the abdomen, specific spotty pattern on the fore wing, fatty matte shining background of the wings, development of the anellus, deep notch of the abdominal surface of the uncus.

Paralophonotus auroguttata (Herrich-Schäffer, 1854) (Figs 1-4)

Zeuzera auroguttata Herrich-Schäffer, 1850-1858: 58, fig. 173

Chalcidica auroguttata: Kirby, 1892: 873

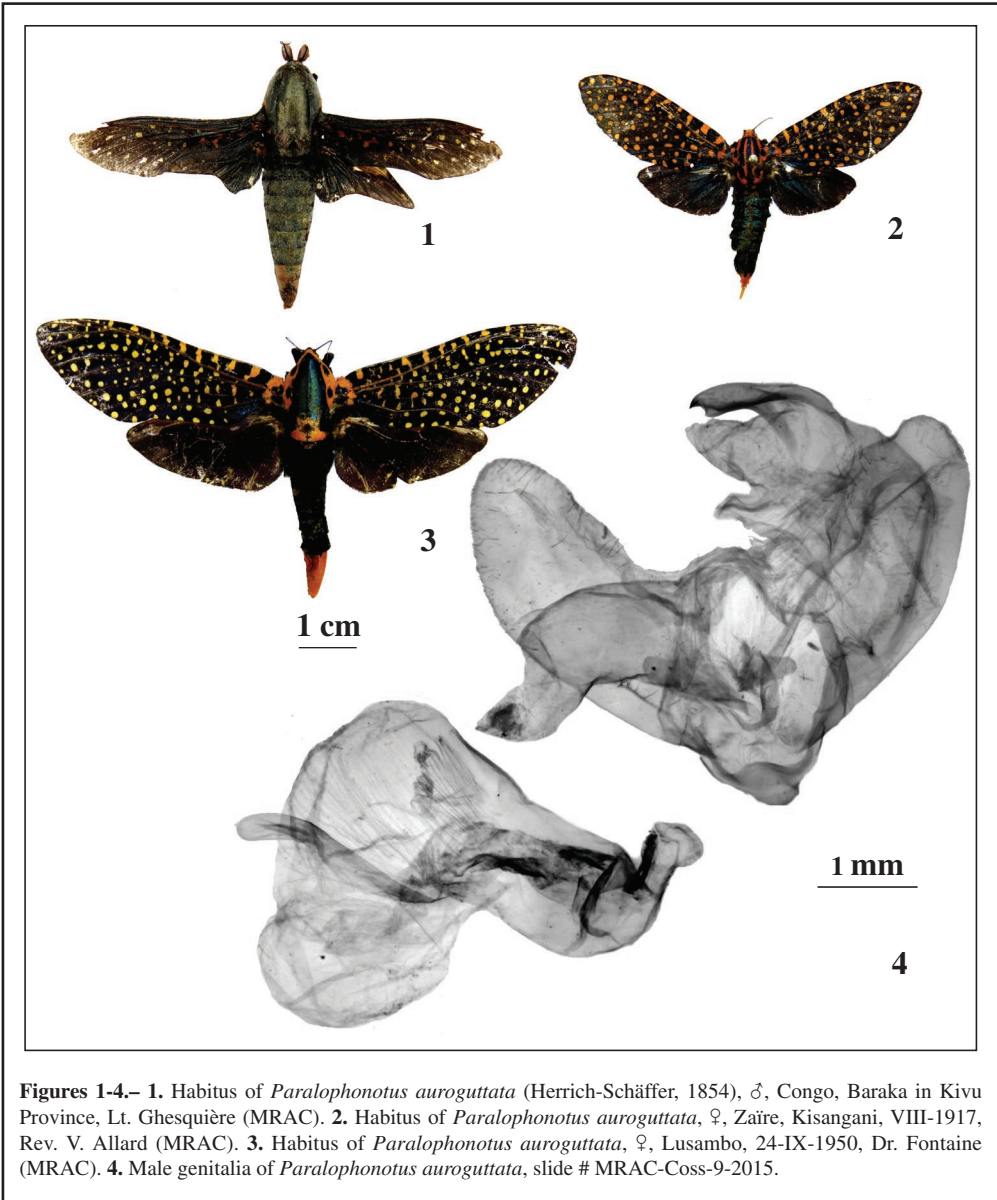
Xyleutes auroguttatus: Dalla Torre, 1923: 49.

Callocossus auroguttatus: Aurivillius, 1910: 508; 1925: 1349; Gaede, 1929: 544

Paralophonotus auroguttata: Schoorl, 1990: 143; Häuser *et al.*, 2003: 14-15; Yakovlev, 2011: 57.

Material examined: DR Congo (Zaire): Kwango, Kikwit [5° 02' 00"S, 18° 49' 00"E], 1938, 1 ♀ (Placide); Kisangani [0° 31' 00"N, 25° 12' 00" E], VIII-1917, 1 ♀ (Allard); Lulua, Kapanga [10° 42' 0"S, 22° 39' 0"E], IV-1934, 1 ♀ (Overlaet); Lusambo [4° 58' 22"S, 23° 26' 12"E], 24-IX-1950, 1 ♀, (Fontaine); Baraka in Kivu Province [4° 6' 14.84"S / 29° 5' 38.53"E], 1 ♂ (Ghesquière) (slide # MRAC-Coss-9-2015) (MRAC).

Description: Wingspan of males: 72 mm, of females: 55-120 mm. Wings dark blue with fatty matte shine. Orange pattern throughout whole fore wing. Orange strokes on costal edge, small round orange spots throughout whole wing. Spotty pattern on fore wing more intensive in females. Hind wing without pattern. Hind wing of female with semicircular outer edge, of male-with elongated sharp angle and deep notch on anal edge. Fringe dark blue, unicolorous. Male genitalia see generic description.



Figures 1-4.– 1. Habitus of *Paralophonotus auroguttata* (Herrich-Schäffer, 1854), ♂, Congo, Baraka in Kivu Province, Lt. Ghesquière (MRAC). 2. Habitus of *Paralophonotus auroguttata*, ♀, Zaïre, Kisangani, VIII-1917, Rev. V. Allard (MRAC). 3. Habitus of *Paralophonotus auroguttata*, ♀, Lusambo, 24-IX-1950, Dr. Fontaine (MRAC). 4. Male genitalia of *Paralophonotus auroguttata*, slide # MRAC-Coss-9-2015.

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BIBLIOGRAPHY

- AURIVILLIUS, C., 1910.– Schmetterlinge gesammelt in Westafrika von Leonardo Fea in den Jahren 1897-1902.– *Annali del Museo Civico di Storia Naturale di Genova (Ser. 3)*, **4**: 494-530.
- AURIVILLIUS, C., 1925.– *Wissenschaftliche Ergebnisse der zweiten Deutschen Zentralafrika-Expedition 1910-1911 unter Führung Adolf Friedrichs, Herzog zu Mecklenburg.*– Band 1 Zoologie, Lieferung 18, Lepidoptera IV, **1**(18): 1243-1359.
- DALLA TORRE, K. W. V., 1923.– Cossidae.– In E. STRAND ed. *Lepidopterorum Catalogus*, **29**: 1-63.
- GAEDE, M., 1929.– 23. Familie Cossidae.– In A. SEITZ ed. *Die Gross-Schmetterlinge der Erde. Die afrikanischen Spinner und Schwärmer*, **14**: 539-551.
- GOFF, R. 2017.– *African Moths.*– Available from <http://www.africanmoths.com/pages/COSSIDAE/ZEUZERINAE/paralophonotus%20auroguttata.html> (accessed 3 March 2017)
- HÄUSER, C. L., BARTSCH, D., HOLSTEIN, J. & STEINER, A., 2003.– The Lepidoptera type material of G. A. W. Herrich-Schäffer the Staatliches Museum für Naturkunde, Stuttgart.– *Stuttgarter Beiträge zur Naturkunde Ser. A (Biologie)*, **657**: 1-78.
- HERRICH-SCHÄFFER, G. W., 1850-1858.– *Sammlung neuer oder wenig bekannter aussereuropäischer Schmetterlinge*: 84 pp- G. J. Manz, Regensburg.
- KIRBY, W. F., 1892.– *A synonymic catalogue of Lepidoptera Heterocera. (Moths)*: XII + 951 pp. Gurney & Jackson, London, Friedlander, Berlin.
- LAFONTAINE, J. D., 2004.– Noctuoidea, Noctuidae (part), Noctuinae (part-Agroitini).– In R. W. HODGES ed. *The Moths of America North of Mexico*, **27.1**: 1-385. The Wedge Entomological Research Foundation, Washington.
- MEY, W., 2015.– Revision of the genus *Arctiocossus* Felder, 1874 and allied genera (Lepidoptera: Cossidae: Cossinae).– *Annals of the Ditsong National Museum of Natural History*, **5**: 28-55.
- MEY, W., 2016.– A taxonomic and faunistic study of the Cossidae of southwestern Africa (Lepidoptera: Cossioidea).– *Annals of the Ditsong National Museum of Natural History*, **6**: 146-198.
- SCHOORL, J. W., 1990.– A phylogenetic study on Cossidae (Lepidoptera: Ditrysia) based on external adult morphology.– *Zoologische Verhandlungen*, **263**: 1-295, 1 pl.
- YAKOVLEV, R. V. & LENZ, J., 2013.– On the Fauna of Cossidae (Lepidoptera) of Zimbabwe with description of a new species.– *Zootaxa*, **3718**(4): 387-397.
- YAKOVLEV, R. V. & MURPHY, R. J., 2013.– The Cossidae (Lepidoptera) of Malawi with descriptions of two new species.– *Zootaxa*, **3709**(4): 371-393.
- YAKOVLEV, R. V. & WITT, Th. J., 2016.– Carpenter-Moths (Lepidoptera: Cossidae) of Swaziland, South Africa.– *Far East Entomologist*, **311**: 9-12.

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