



Three new species of *Mesophleps* Hübner, 1825 from Namibia and Kenya (Lepidoptera: Gelechiidae)

Authors: Bidzilya, Oleksiy V., and Rajaei, Hossein

Source: Integrative Systematics: Stuttgart Contributions to Natural History, 7(2) : 95-102

Published By: Stuttgart State Museum of Natural History

URL: <https://doi.org/10.18476/2024.970064>

RESEARCH ARTICLE

Three new species of *Mesophleps* Hübner, 1825 from Namibia and Kenya (Lepidoptera: Gelechiidae)

OLEKSIY V. BIDZILYA^{1,2} & HOSSEIN RAJAEI²

Abstract

Three new Afrotropical species of the genus *Mesophleps* Hübner, 1825 are described: *M. albicostella* sp. n. from Namibia, and *M. furcatella* sp. n. and *M. kenyensis* sp. n. from Kenya. The adults and genitalia of the new species are illustrated, and their diagnostic characters are discussed.

Key words: Africa, Afrotropical Region, Anacampsinae, taxonomy.

Zusammenfassung

Mit *M. albicostella* sp. n. aus Namibia sowie *M. furcatella* sp. n. und *M. kenyensis* sp. n. aus Kenia werden drei neue afrotropische Arten der Gattung *Mesophleps* Hübner, 1825 beschrieben. Die Imagines und Genitalien der neuen Arten werden abgebildet und ihre diagnostischen Merkmale diskutiert.

Introduction

Following the taxonomic revision of the genus *Mesophleps* Hübner, 1825, 54 species were recognized as valid globally, seven of which from the Afrotropical Region (LI & SATTLER 2012). Recently, an additional species was described from South Africa and Namibia (BIDZILYA 2021).

The genus *Mesophleps* can be recognized by the following characters: anterior margins of terga IV–VII/VIII in both sexes with transverse band of densely-set, posteriorly-directed microtrichia. In the male genitalia, gnathos composed of an evenly curved transverse band bearing a pair of very strongly sclerotized posterior hooks; arms of vinculum narrow, distally broad, with distal margin strongly sclerotized and turned ventrad, area beneath exit hole of phallus often notched or excavated. In the female genitalia, segment VIII simple, evenly sclerotized; ductus bursae thin, straight; corpus bursae oval to pyriform, delicately membranous, usually without a signum (LI & SATTLER 2012).

In this paper, we describe three additional species from Namibia and Kenya that are well distinct in external and genital morphology from other species in the genus.

Material and methods

The present paper is based on material from the collections of Museum für Naturkunde, Berlin, Germany (MfN), Natural History Museum, University of Oslo, Norway (NHMO), the Royal Museum for Central Africa, Tervuren, Belgium (RMCA),

and from the research collection of DAVID AGASSIZ (DA; to be deposited in the Natural History Museum, London, UK).

Prior to or after the genitalia dissections, the wing patterns and details of the external morphology were photographed using a 5DSR DSLR EOS-Canon digital camera. The male and female genitalia were dissected and mounted as permanent slides following HUEMER & KARSHOLT (2010). Mounted genitalia were photographed using a D850 Nikon digital camera attached to a Zeiss Axioplan microscope. Final images were edited and the figure plates compiled in Adobe Photoshop (CS5). For images of the male genitalia to be comparable to those in the recent revision of the genus by LI & SATTLER (2012), we did not use the “unrolling technique” (PITKIN 1986) when dissecting the male genitalia of *Mesophleps*.

Terminology of the genitalia structures generally follows LI & SATTLER (2012).

Taxonomy

Mesophleps albicostella sp. n.

(Fig. 1)

Type material

Holotype ♂: Namibia, Solitaire, Tsauchab, camp, 9.III.2014, LF, leg. W. MEY (gen. slide 428/14, O. BIDZILYA) (MfN). **Paratype**: 1♀, same data as for holotype (gen. slide 104/24, O. BIDZILYA) (MfN).

Diagnosis

The new species is easily recognizable based on its forewing with distal half of costal margin white (brown in the large majority of other species). Additionally,



Fig. 1. *Mesophleps albicostella* sp. n. **a.** Dorsal view, holotype, male. **b.** Head, lateral view, paratype, female. **c.** Head, dorsal view, holotype, male. **d.** Male genitalia, holotype (gen. slide 428/14, O. BIDZILYA). **e.** Phallus, holotype (gen. slide 428/14, O. BIDZILYA). **f.** Female genitalia, paratype (gen. slide 104/24, O. BIDZILYA).

M. albicostella sp. n. has forewing with two large, elongate brown spots merged with white along fold and in discal cell and white transverse subapical fasciae (in other species, these spots are small and uniformly brown and the transverse subapical fascia is absent). Based on the presence of a narrow transverse microtrichial band on terga IV–VII, the gnathos hooks separated and thickened at the base and the elongate uncus of the male genitalia, the new species can be placed in the *trinitella* group (LI & SATTler 2012), where it is most similar to *M. trinitella* (Herrich-Schäffer, 1856). However, in the new species, the gnathos hooks are tapered in the distal 1/2, the posterior margin of the tegumen is subrectangular, the narrow apical part of the phallus is 1/3 of length of its basal swollen part (in *M. trinitella* the gnathos hooks are tapered in the distal 1/3, the posterior margin of the tegumen has a broadly triangular notch and the narrow apical part of phallus is 1/2 of length of its basal swollen part). Female genitalia show clear differences, as in the new species the apophyses are longer than the papillae anales and the corpus bursae is 1/3 of length of ductus bursae (in *M. trinitella* the apophyses are equal in length to the papillae anales and the corpus bursae is longer than the ductus bursae). Moreover, the forewing patterns of the two species are totally different.

Description

Wingspan 12.0 mm. Head (Fig. 1c) white to yellowish-white; labial palpus (Fig. 1b) porrect, segment 2 with triangular dorsal brush of brown scales tipped with white on outer surface and with uniformly white scales on inner surface, segment 3 white, sparsely mixed with brown, about 1/6 length of segment 2, partially hidden by raised apical scales of segment 2; antennal scape pale; flagellum light brown to yellowish-brown, in male slightly thicker than in female. Thorax and tegulae yellow; forewing (Fig. 1a) yellow, costal margin brown at base, white in apical half, with elongate brown spots surrounded by white along fold and in discal cell, an oblique transverse white subapical fascia with brown spot in the middle from 4/5 of costal margin to brown tornal spot at 3/4 of dorsal margin, fringe white, irregularly mixed with brown at base; hindwing light brown, fringe yellowish-brown.

Pregenital abdomen. Anterior margins of terga IV–VII with narrow transverse band of densely-set, posteriorly-directed microtrichia; sternum II with pair of venulae and pair of moderately long apodemes; male segment VIII twice as broad as long, tergum unmodified, sternum with posterior margin weakly emarginated; female segment VII slightly elongate; sternum subrectangular with posterior margin weakly emarginated; tergum trapezoidal, distinctly narrowed, posterior margin about 1/4 length of anterior margin.

Male genitalia (Fig. 1d, e). Uncus sub-ovate, twice as long as broad at base; gnathos hooks wide in basal half,

then tapered, extending almost to top of uncus, transverse band thin; tegumen broad at middle, gradually narrowed to base and apex; anteromedial emargination triangular; pedunculus slender, moderately elongate; valva uniform in width, gradually bent, reaching to 1/2 length of uncus, apex rounded; vinculum band-shaped, narrow at base, widened posteriorly, posterior margin with broad rectangular notch. Phallus strongly swollen at base, apex narrow, pointed, strongly sclerotized; bulbus ejaculatorius long, strip-shaped.

Female genitalia (Fig. 1f). Papillae anales broad, subtriangular; apophyses posteriores twice the length of papillae anales, nearly straight; segment VIII twice as wide as long, subrectangular, tergum unmodified posteriorly, subostial plate subtrapezoidal, about twice as broad at base as long; apophyses anteriores slightly shorter than apophyses posteriores and about 2.5 times as long as segment VIII, extending to 2/3 length of ductus bursae; ductus bursae uniform in width; corpus bursae ovate, about 1/3 length of ductus bursae; ductus seminalis arising from posterior end of ductus bursae; signum absent.

Biology

Host plant unknown. Adults were collected in March.

Distribution

Namibia.

Etymology

The specific name derives from the Latin word “*albus*” meaning white, in reference to the white costal margin of the forewing that is characteristic for the new species.

Mesophleps furcatella sp. n.

(Fig. 2)

Type material

Holotype: ♂, Kenya, Rift Valley, Lake Baringo, 3000ft, 1.VII.2000, leg. D.J.L. AGASSIZ (gen. slide 292/24, O. BIDZILYA) (DA).

Paratypes: 1♀, same data as for holotype (gen. slide 387/23, O. BIDZILYA); 1♀, same data as for holotype but 4.VI.1999 (gen. slide 447/14, O. BIDZILYA); 1♂, Kenya, Rift Valley, Lake Bogoria, 0°21'N 36°03'E, 12.XI.2005, leg. D.J.L. AGASSIZ (gen. slide 386/23, O. BIDZILYA) (all DA); 2♂, 3♀, Kenya, Taita Discovery Centre, Garawa Tank, 03°38'S, 38°46'E (E6), 28.iii.2000, leg. UGO DALL'ASTA (RMCA); 1♂, Kenya, Taita Discovery Centre, Makaranga Tank, 03°40'S, 38°46'E (L7), 3.xii.2000, leg. UGO DALL'ASTA (RMCA).

Diagnosis

The new species is externally characterized by the cream ground colour of the forewing, with distinct brown suffusion. The other species of *Mesophleps* are predominantly yellow, light brown or nearly uniformly grey. Based on the narrow transverse microtrichial band on terga IV–VII, the gnathos hooks separated and thickened at base

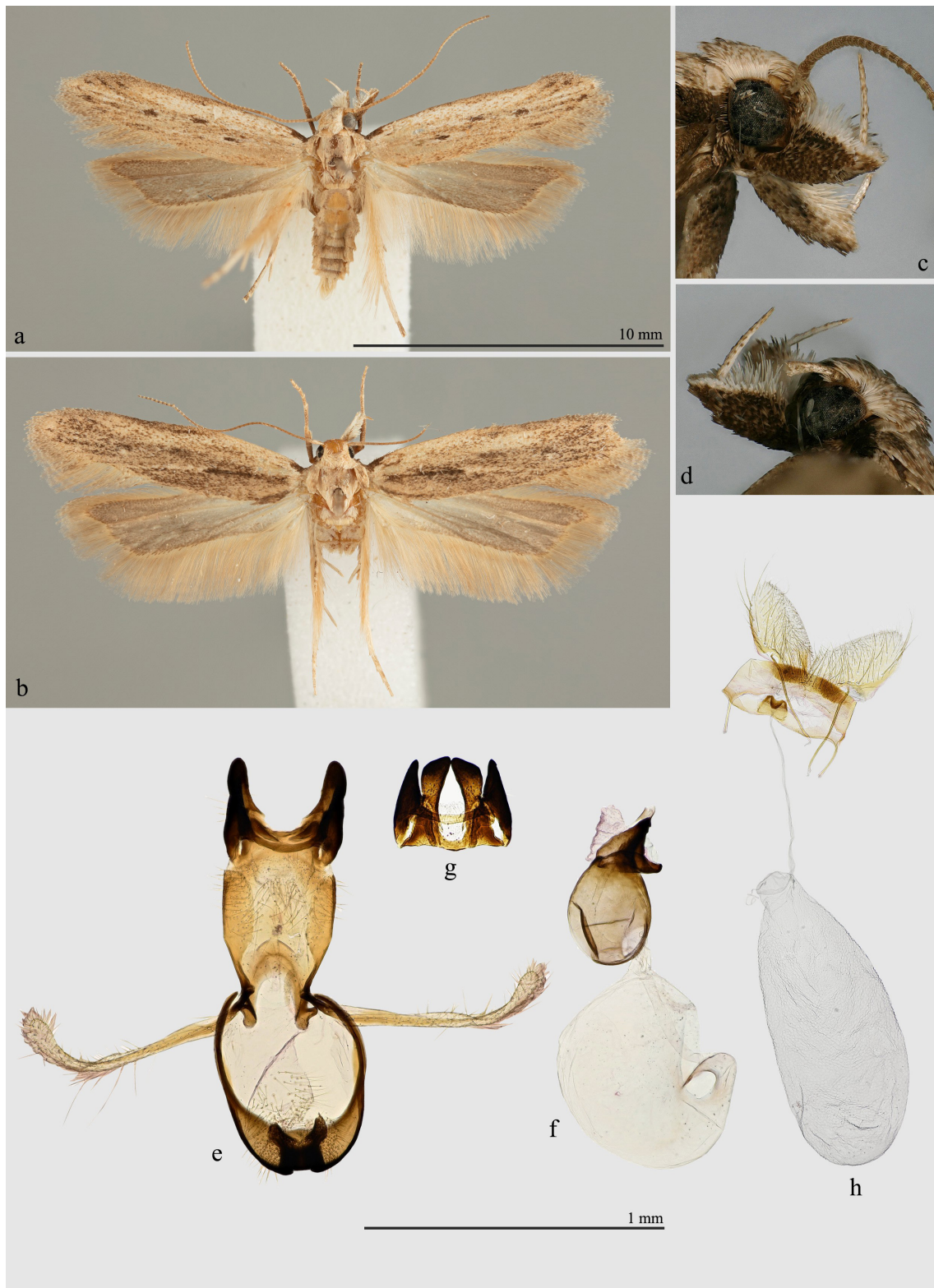


Fig. 2. *Mesophleps furcatella* sp. n. **a.** Dorsal view, holotype, male. **b.** Dorsal view, paratype, female. **c.** Head, lateral view, holotype, male. **d.** Head, lateral view, paratype, female. **e.** Male genitalia, holotype (gen. slide 292/24, O. BIDZILYA). **f.** Phallus, holotype (gen. slide 292/24, O. BIDZILYA). **g.** Uncus and gnathos, paratype (strongly pressed by coverslip; gen. slide 386/23, O. BIDZILYA). **h.** Female genitalia, paratype (gen. slide 387/23, O. BIDZILYA).

and the elongate uncus in the male genitalia, the new species can be placed in the *trinotella* group (LI & SATTler 2012), but it is fully different from all other species of this group due to its bifid uncus. *Mesophleps bifidella* Lee & Sattler, 2012 also has a bifid uncus, but this species belongs to the *palpigera* group, which has clearly different diagnostic characters in the male genitalia. The presence of paired patches filled with microtrichia on the posterior margin of tergum VIII of the female would assign the new species to the *truncatella* group, which would be inconsistent with the affinity of the species to *trinotella* group, as indicated by the male genitalia. Within the *truncatella* group, *M. furcatella* sp. n. resembles *M. truncatella* Lee & Sattler, 2012 but differs in the broader ostial sclerite, apophyses anteriores shorter than sternum VIII, very slender ductus bursae, distinctly elongate, narrow corpus bursae (in *M. truncatella* the apophyses anteriores are longer than segment VIII, the ductus bursae is moderately slender and the corpus bursae is egg-shaped).

Description

Wingspan 15.0–20.2 mm. Head (Fig. 2c, d) light brown to greyish-brown, segment 2 of labial palpus almost straight, with triangular dorsal brush of brown scales on outer surface except extreme dorsal margin, which is white with a brush of dorsally-raised scales, inner surface light grey, densely mixed with brown in ventral half and light grey to nearly white in dorsal half; segment 3 straight, very slender, about 2/3 length of segment 2, pale with brown suffusion on outer surface, directed dorsally at a right angle to segment 2; antennal scape light brown, flagellum light brown with indistinct dark brown rings. Thorax and tegulae greyish-brown; forewing ground colour cream to light brown (Fig. 2a, b), with brown irroration mainly in distal part of costal margin, along veins and in dorsal part of forewing, costal 1/3 lighter, pale, sparsely mixed with brown, costal margin brown at base, brown spot or streak along fold, two brown spots in cell; fringes grey, tipped with brown; hindwing dark, greyish-brown, fringe grey to light brown, dark yellow at extreme base.

Pregenital abdomen. Anterior margins of terga IV–VII with a narrow transverse band of densely-set, posteriorly-directed microtrichia; sternum II with a pair of venulae and a pair of moderately long apodemes; male segment VIII 3 times as broad as long, tergum unmodified, sternum with posterior margin weakly emarginated and with elongate patches of scales bases; female segment VII subquadrate, twice the length of segments I–VI.

Male genitalia (Fig. 2e–g). Uncus slightly elongate, deeply divided by U-shaped emargination into two digitate lobes with strongly sclerotized and weakly pointed apex; gnathos hooks wide in basal half, then tapered, extending nearly to top of uncus, transverse band thin, weakly bent; tegumen narrow at base, then weakly wid-

ened, almost parallel-sided in posterior 2/3, anteromedial emargination reverse U-shaped; pedunculus short, with a posteriorly-directed process; valva weakly sclerotized, gradually widened apically, reaching top of uncus, apex rounded, densely haired in distal half; vinculum band-shaped, narrow at base, widened posteriorly, posterior margin with subrectangular medial sclerite with deep medial emargination and broad posteriorly-directed lobes; phallus strongly swollen at base, apex narrow, dorsally toothed, pointed; bulbos ejaculatorius large, rounded, with curved and pointed anterolateral projection.

Female genitalia (Fig. 2h). Papillae anales broad, subovate; apophyses posteriores slightly longer than papillae anales and 2.5–3.0 times as long as apophyses anteriores; segment VIII 3 times as wide as long, subrectangular, posterior margin of tergum VIII with large subrectangular patches filled with microtrichia; sternum evenly sclerotized, subostial plate subtrapezoidal with cup-shaped posteromedial sclerite; apophyses anteriores slightly shorter than segment VIII; ductus bursae extremely slender; corpus bursae slightly more than twice as long as wide at middle, about twice the length of ductus bursae; ductus seminalis very slender, arising from posterior end of ductus bursae; signum absent.

Biology

Host plant unknown. Adults were collected in late March, April, June and November.

Distribution

Kenya.

Etymology

The specific name derives from the Latin word “*furcus*” meaning fork, in reference to the two-lobed uncus, that is characteristic for the new species.

Mesophleps kenyensis sp. n.

(Fig. 3)

Type material

Holotype: ♂, Kenya, Rift Valley, Gilgil, 22–24.XI.2008, leg. L. AARVIK, D. AGASSIZ, A. KINGSTON (gen. slide NHMO 2307, O. BIDZILYA) (NHMO).

Paratypes: 1♀, same data as for holotype (gen. slide NHMO 2312, O. BIDZILYA) (NHMO); 1♂, Kenya, Rift Valley, Naro Moru, 1–5.XII.2008, leg. L. AARVIK, D. AGASSIZ, A. KINGSTON (NHMO); 1♂, Kenya, Central, Naro Moru, 28.XII.1999, 6500ft, leg. D. AGASSIZ (DA); 1♂, 1♀, Kenya, Central, Naro Moru, 0°9'5"S, 37°0'38"E, 4–6.XI.2013, 1960 m, leg. D. AGASSIZ, S. BEAVAN, R. HECKFORD, K. LARSEN & M. NGUGI (gen. slide DJLA No.1414♂, 1415♀, O. BIDZILYA) (DA); 1♀, Kenya, Rift Valley, Mpala Res., 0°17'N, 36°54'E, 12.IX.2009, 1720 m, leg. D. AGASSIZ (gen. slide DJLA No. 1409, O. BIDZILYA) (DA).

Diagnosis

The new species is characterized by the overall yellow colour of the forewing, which contrasts with the brown



Fig. 3. *Mesophleps kenyensis* sp. n. **a.** Dorsal view, paratype, male. **b.** Dorsal view, paratype, female (gen. slide DJLA No. 1409, O. BIDZILYA). **c.** Male genitalia, holotype (gen. slide NMHO 2307, O. BIDZILYA). **d.** Phallus, holotype (gen. slide NMHO 2307, O. BIDZILYA). **e.** Female genitalia, paratype (gen. slide NMHO 3212, O. BIDZILYA).

costal margin, the presence of 2–3 small brown spots pin the cell, the two small brown terminal spots as well as its large wingspan (22.1–22.3 mm). *Mesophleps gigantella* Li & Sattler, 2012 has a similar forewing pattern, but with a dark irroration along dorsum of the forewing (absent in *M. kenyensis* sp. n.). Based on the following characters, the new species can be placed in the *trinotella* group (LI & SATTLE 2012), being most similar to *M. ungulella* Li & Sattler, 2012: narrow transverse microtrichial band on terga IV–VII; in the male genitalia, gnathos hooks separated and thickened at base; uncus elongate. However, in the new species, the uncus is distinctly widened and the apical part of phallus is distinctly narrowed with a pointed tip (in *M. ungulella* the uncus is weakly widened apically and the apical part of the phallus is nearly of even width). In the female genitalia, the new species has a straight posterior margin of tergum VIII, sternum VIII is 1.5–2.0 times as wide as long and distinctly projecting anteriorly and the corpus bursae is 2 times as long as wide (in *M. ungulella* the posterior margin of tergum VIII is medially convex, sternum VIII is 3 times as wide as long and weakly projecting anteriorly and the corpus bursae is slightly longer than wide).

Description

Wingspan 22.1–22.3 mm. Head yellow to yellowish-white, frons white; segment 2 of labial palpus weakly curved, outer surface dark yellow to light brown, inner surface white, dorsal margin with brush of white, raised scales, segment 3 white, recurved, slender, about 2/3 of length of segment 2; antennal scape dark yellow to light brown, mixed with white, flagellum light brown. Thorax and tegulae yellow; forewing (Fig. 3a, b) yellow, costal margin with a brown stripe slightly widened at base, narrow at middle then distinctly widened in distal half; small brown spot along fold, 1–2 brown points in cell, two brown terminal spots at apex; fringe yellow; hindwing light grey in basal part and darker, dark grey to light brown, in dorsal part, fringe grey.

Pregenital abdomen. Anterior margins of terga IV–VII with narrow transverse band of densely-set, posteriorly-directed microtrichia; sternum II with a pair of venulae and a pair of moderately long apodemes; male segment VIII 3 times as broad as long, tergum unmodified, sternum with posterior margin weakly emarginated and with elongate patches of scales bases; female segment VII subquadrate, twice the length of segments I–VI.

Male genitalia (Fig. 3c, d). Uncus apically spatulate, its posterior margin rounded; gnathos hooks weakly widened at base then tapered, apex rounded or weakly pointed, strongly sclerotized, extending to 4/5 of length of uncus; tegumen medially broad, gradually narrowing towards base and apex, anteromedial emargination triangular; pedunculus moderately large, subtriangular; valva

uniform in width, gradually bent, reaching to about 1/2 of length of uncus, apex rounded; vinculum band-shaped, narrow at base, widened posteriorly, posterior margin rounded, shortly notched at middle; phallus strongly swollen at base, its apical part narrowing, weakly curved, with pointed tip, bulbus ejaculatorius slender at base then distinctly widened, rounded.

Female genitalia (Fig. 3e). Papillae anales broad, subovate; apophyses posteriores slightly longer than papillae anales and twice the length of apophyses anteriores; segment VIII 1.5–2.0 times as wide as long, subrectangular, posterior margin of tergum VIII straight, anterior margin broadly emarginated; sternum evenly sclerotized, with a deep V-shaped posteromedial emargination, anterior margin distinctly or moderately protruded anteriorly, subostial plate weakly sclerotized, with U-shaped posteromedial sclerite; apophyses anteriores slightly shorter than segment VIII; ductus bursae moderately wide, slightly widened anteriorly; corpus bursae 2 times as long as wide at middle, about twice the length of ductus bursae; ductus seminalis arising from posterior end of ductus bursae; no signum.

Biology

Host plant unknown. Adults were collected from late November to early December at an altitude of about 2,000 m.

Distribution

Kenya.

Etymology

The specific name refers to the broad distribution of the new species in Kenya.

Discussion

The genus *Mesophleps* is represented in the Afrotropics by eleven species distributed from northern Africa (i.e., Niger) to South Africa, with one species recorded from Madagascar (LI & SATTLE 2012; DE PRINS & DE PRINS 2024). Additional new species are expected to be discovered from eastern Africa after the extensive material from the *gigantella* group of species has been revised with the inclusion of molecular data.

Acknowledgements

The authors thank DAVID AGASSIZ (Weston-super-Mare, UK) for providing material from his collection for study, and LEIF AARVIK (NHMO) who helped the first author in various ways during with a visit to the the collection under his care. The first author received funding from the Philipp Schwartz Initiative of the Alexander von Humboldt Foundation and the Ukrainian

State Budget Program “Support for the Development of Priority Areas of Scientific Research” (Code: 6541230). A visit of the first author to DMSA in 2015 was supported by an Ernst Mayr Travel Grant from the Museum of Comparative Zoology, Harvard University (USA), and two visits to the MfN in 2014 and 2017 were funded by the Deutscher Akademischer Austauschdienst (DAAD).

References

- BIDZILYA, O. (2021): New host-plants records of Afrotropical Gelechiidae (Lepidoptera), with description of three new species. – *Zootaxa* **4952** (3): 495–522.
<https://doi.org/10.11646/zootaxa.4952.3.4>
- DE PRINS, J. & DE PRINS, W. (2024): Afromoths, online database of Afrotropical moth species (Lepidoptera). World Wide Web electronic publication. Available from: <http://www.afromoths.net> (accessed 3 June 2024)
- HUEMER, P. & KARSHOLT, O. (2010): Gelechiidae II (Gelechiinae: Gnorimoschemini). – In: HUEMER, P., KARSHOLT, O. & NUSS, M. (eds.): *Microlepidoptera of Europe*. Vol. 6: 586 pp. Stenstrup (Apollo Books).
https://doi.org/10.1163/9789004260986_002
- LI, H.H. & SATTTLER, K. (2012): A taxonomic revision of the genus *Mesophleps* Hübner, 1825 (Lepidoptera: Gelechiidae). – *Zootaxa* **3373** (1): 1–82.
<https://doi.org/10.11646/zootaxa.3373.1.1>
- PITKIN, L. M. (1986) A technique for the preparation of complex male genitalia in Microlepidoptera. – *Entomologist's Gazette* **37**: 173–179.

Authors' addresses:

¹Institute for Evolutionary Ecology of the National Academy of Sciences of Ukraine, 37 Academician Lebediev str., 03143 Kyiv, Ukraine; e-mail: olexbid@gmail.com (corresponding author);  <https://orcid.org/0000-0001-9243-2481>

²Staatliches Museum für Naturkunde Stuttgart, Rosenstein 1, 70191 Stuttgart, Germany; e-mail: hossein.rajaei@smns-bw.de;  <https://orcid.org/0000-0002-3940-3734>

ZooBank registration: <https://zoobank.org/References/25BDF814-D314-4B29-85C7-AE7AAAF2374C4>

Manuscript received: 06.VI.2024; accepted: 07.XII.2024.