



A new wasp-mimicking clearwing moth from Uganda (Lepidoptera: Sesiidae: Sesiini)

DANIEL BARTSCH¹ & SZABOLCS SÁFIÁN^{2,3}

¹Staatliches Museum für Naturkunde Stuttgart, Rosenstein 1, 70191 Stuttgart.

✉ daniel.bartsch@smns-bw.de; <https://orcid.org/0000-0002-3778-2187>

²Hungarian Natural Heritage Trust, H-9945 Kercaszomor, Fő út 57, Hungary.

³Hungarian National Museum Public Collection Centre—Hungarian Natural History Museum, Department of Zoology, H-1088 Budapest, Baross utca 13, Hungary.

✉ szsafian@gmail.com; <https://orcid.org/0000-0002-0614-4203>

Abstract

In this study a new genus of Sesiini, *Pseudodelta* **gen. nov.**, and its type species *Pseudodelta melas* **sp. nov.**, are described from the Ziika (Zika) Forest, Uganda. This highly mimetic species bears a striking resemblance to *Delta emarginatum* (Linnaeus, 1758), the black mud wasp widespread in Africa, which is probably its model.

Key words: Cossoidea, new species, Afrotropical region, taxonomy

Zusammenfassung

In dieser Studie wird eine neue Gattung der Sesiini, *Pseudodelta* **gen. nov.**, und ihre Typusart *Pseudodelta melas* **sp. nov.**, aus dem Ziika (Zika) Forest, Uganda beschrieben. Diese hoch mimetische Art weist eine frappierende Ähnlichkeit mit *Delta emarginatum* (Linnaeus, 1758) auf, der in Afrika weit verbreiteten schwarzen Lehmwespe, bei der es sich wahrscheinlich um ein Modell handelt.

Introduction

Sesiidae are well-known mimics of various Hymenoptera in both appearance and behaviour. In some genera the similarity is further enhanced by a wasp-waist-like constriction of the abdomen. This spectacular feature has convergently developed multiple times, as it occurs in species that are not closely related. Among the African Sesiidae, it is known in the *Similipepsini* Špatenka, Laštůvka, Gorbunov, Toševski & Arita, 1993 (Tinthiinae) (Bakowski *et al.* 2008), and the Sesiinae genera *Cinctosesia* Bartsch, 2018, *Lolibaia* Gorbunov & Gurko, 2017 and *Macrotarsipodes* Le Cerf, 1916 (Synanthedonini), as well as *Hyleina* Bartsch, 2017 (Sesiini) (Bartsch & Sáfián 2019, 2022). During our ongoing survey of African Sesiidae an outstanding large, wasp mimic Sesiini was collected in Uganda. At first glance, it gives the impression of a giant species of *Similipepsis* Le Cerf, 1911. A detailed examination revealed that this specimen belongs to an undescribed species within an equally unknown genus. Apart from the exceptionally perfect wasp mimicry and the considerable size, this genus differs from all other African Sesiidae by the unusually dark membrane of the nearly completely scaleless wings.

Material and methods

Label data are quoted verbatim, with a slash at the end of each line. The specimen was photographed using Canon EOS 5D digital SLR camera and Canon MP-E 100 mm macro-photo-lens. The genitalia were prepared by one of

us (DB) by maceration in 5–10% potassium hydroxide solution without staining. Before embedding, genitalia were photographed floating in 70% alcohol solution with opened valvae and the phallus removed with everted vesica. Morphological terminology follows Špatenka *et al.* (1999), terminology of the wing venation follows Heppner & Duckworth (1981). Genitalia photos were taken with Leica Z-Series Macroscope with Z16 APO Zoom-system, DFC 490 camera and stacked with Helicon Focus program. Sex pheromones used in the field were produced by Pherobank, Wijk bij Duurstede, The Netherlands. The holotype is deposited at the State Museum of Natural History, Stuttgart, Germany (SMNS).

Results

Taxonomic account

Pseudodelta gen. nov.

Type species: *Pseudodelta melas* sp. nov., designated here.

Etymology. The name refers to ancient Greek ψευδο [pseudo] = false, pretended, not real, and the genus *Delta* Fabricius, 1804 (Vespidae); gender is neuter.

Description. Large clearwing moths, wingspan 46 mm. Head: proboscis long, sclerotized and certainly functional; labial palpus short, slightly curved upwards, first palpomere with long, ventral scale tuft, second palpomere as long as first, covered with fairly short, ventrally roughened, partly hair-like scales; frons approximately 1.8 times as wide as a compound eye; vertex covered with short, smooth scales; pericephalic scales very short; antenna shorter than half length of forewing, clavate, in male bipectinate, ciliate, pectination distally tapering, lacking at tip. Body and legs covered with short, smooth scales. Legs: slender, hindleg shorter than abdomen; forecoxa three times longer than broad, as long as foretibia; spurs narrow, all pairs with outer spur somewhat shorter than inner. Wings: very narrow with large transparent areas; wing membrane of both wings exceptionally dark, except basal area of hindwing; discal spots small, that of forewing angled in middle; forewing veins R4/R5 stalked to about half the length, R3 to M3 almost equally spaced, CuA1 and CuA2 clearly separated; hindwing veins M3 and CuA1 with short common stalk. Abdomen: long and slender, first four segments form a pronounced waist, terminal two segments form a regular tip; anal tuft small, fitting to tip.

Male genitalia. Unusually strongly sclerotized and therefore dark blackish-brown even after maceration. Tegumen rather short and broad, with large asymmetric gnathos. Uncus short and broad, bilobed, each lobe ventrally with wide rows of broad, multiply forked setae. Valva short and broad, dorsally with a short, broad projection, ventrally rounded in middle part, distally pointed, dorsal half densely covered with broad, multiply forked, basad pointing setae, ventral half bare, some simple setae on distal margin; crista sacculi present, tapering distally towards ventral margin with a tooth-shaped, pointed projection distally. Saccus of tegumen short and broad, basally rounded. Vinculum very short and broad. Manica with numerous thorns. Phallus short, broad, straight, basal part medially somewhat enlarged; coecum penis with short lateral lobes; vesica tubular, distally tapering, basally with numerous short spines on right side.

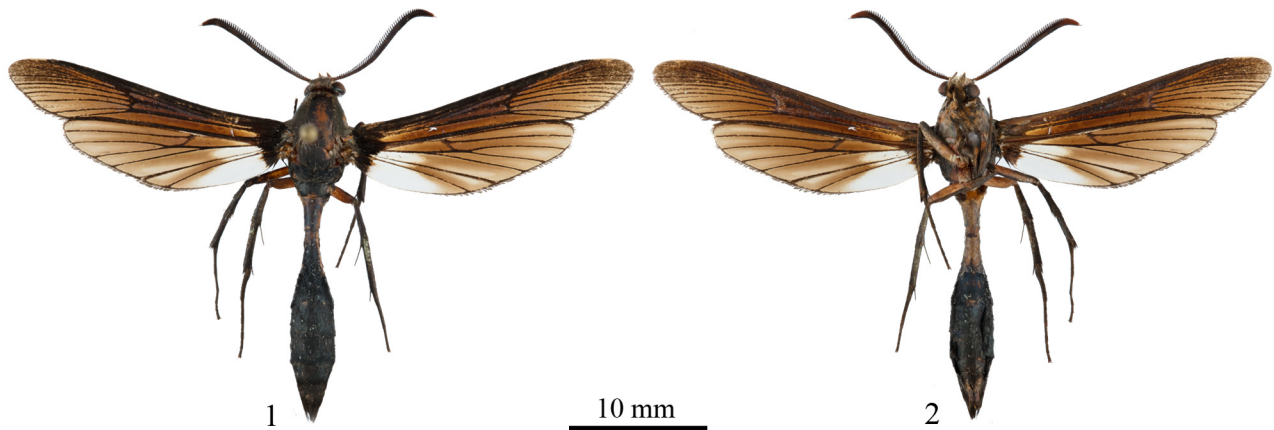
Diagnosis

Within Sesiini *Pseudodelta* gen. nov. can be defined by the unique combination of the following characters:

- (1) impressive size and strong wasp-mimicry;
- (2) antenna bipectinate (without pectination or different in other Sesiini);
- (3) abdomen very long and slender, first segments strongly waisted (shorter and thicker, rarely waisted in other Sesiini);
- (4) legs smoothly scaled (at least hindlegs with prominent scale tufts in most other Sesiini);
- (5) Wings largely without scales, membrane very dark except for basal area of hindwing (membrane crystal clear, or yellowish to light brownish in other Sesiini);
- (6) male genitalia unusually dark;
- (7) uncus and valva with broad, multiply forked setae (simple or thorn-like in most other Sesiini, rarely similar setae only on valva);
- (8) vesica asymmetric, right side with field of numerous short spines.

We consider characters 2, 5, 6 and 7 as putative apomorphies of the genus. The mentioned characters distinguish *Pseudodelta* **gen. nov.** well from all other Sesiini. Among the African genera, the most similar are *Cicinnoscelis* Holland, 1893 due to the comparable size and dark base color, and *Hyleina* Bartsch, 2017 due to the quite similar body structure and wing venation. However, both genera differ from *Pseudodelta* **gen. nov.** by the reduction of the proboscis, the absence of a ventral scale tuft of the labial palpus, the simple or uni-pectinate antennae, the clear wing membrane, and the proportionally longer hindlegs that exceed the abdomen; *Cicinnoscelis* also differs in its wings, which are densely covered with scales, its non-waisted abdomen, and its longest hind legs of all three genera, which are densely covered with tufted scales; *Hyleina*, on the other hand, has a proportionally shorter abdomen with a less pronounced waist. The wing venation of *Pseudodelta* **gen. nov.** corresponds to the tribes' standard (Heppner & Duckworth 1981, Špatenka *et al.* 1999).

Some similarities in the structure of the male genitalia can be found in several Sesiini genera from Asia and Australia. Representatives of *Lamellisphexia* Kallies & Arita 2004, *Cyanosesia* Gorbunov & Arita, 1995 or *Sphecodoptera* Hampson, [1893], have rather similar shapes of the valva and crista sacculi, but simple, bristle-like setae on valva and uncus and a completely different uncus-tegumen-complex (Kallies & Arita 2004, Kallies 2020). Those of *Hyleina* Bartsch, 2017 and *Vespanthedon* Le Cerf, 1917 from Africa or *Sphecosesia* Hampson, 1910 and *Cyanosesia leleji* Gorbunov & Arita, 2016 from Asia, have broad, multifurcate setae on valva and uncus, but very different shapes of the entire genitalia complex (Bartsch 2013, 2017, Gorbunov & Arita, 2016, Kallies 2020).



FIGURES 1–2. *Pseudodelta melas* holotype, male (1) upperside, (2) underside.

Pseudodelta Holotype: ♂, “UGANDA, Ziika (Zika) Forest, / Kisubi / 0°07’24.11”N, 32°31’33.30”E, 1143 m / 15–17.08.2024 at pheromone, / Leg.: Sáfián, Sz.” (SMNS).

Etymology. Ancient Greek μέλας [mélas] = black, dark.

Description. Holotype with alar expanse 46 mm, antenna length 10.0 mm, forewing 21.5 mm, body 26.0 mm. Head: labial palpus black-brown, second palpomere pale grey with some black-brown scales, ventro-laterally a black-brown spot, third palpomere pale grey dorsally, black-brown ventrally; frons largely rubbed off, some smooth, dark grey scales remain laterally; vertex black-brown; pericephalic scales black; antenna including rami largely black, basal part and tip ventrally dark reddish brown. Body and legs: black-brown; hindtibia dorsally with some white scales distal of mid spurs. Wings: membrane very dark, barely translucent, mostly without scales, on hindwing subbasally between discal cell and CuP and at dorsum crystal clear; base of both wings densely covered with black scales; veins, margins and discal spots with dark greyish-brown scales; forewing costal area between margin, radius stem and R3 with black-brown scales; area between R3 and M1 with semi-transparent, black-brown scales; discal cell with broad scale line indicating former position of medius vein; interspaces between M1 to CuA1 with sparse, long, basad pointing scale projections from the outer margin.

Male genitalia. Gnathos asymmetric with a blunt ventral process and a strong lateral spine on the right. Vesica asymmetric, basal portion regularly enlarged, without diverticulum, and with an area of numerous short spines on the right.

Diagnosis. Due to its external characteristics, this species is very typical and cannot be confused with any other species of the Sesiidae.

Habitat and behaviour. The only specimen was attracted to a sample of various synthetic pheromones. The specimen was netted when it directly approached the bundle of lures in sunny weather after night rain at around 11.00 a.m. on the edge of Zika Forest, Kisubi, one of the last well-preserved remnants of the once extensive Lake Victoria outlier forests on the Entebbe/Lake Victoria Peninsula. These forest pockets are still home to a rich butterfly community (Sáfián pers. obs.) and the type locality is best known for the discovery of Zika virus, which was first isolated from samples collected in Zika Forest (Dick *et al.* 1952).



FIGURE 3. *Pseudodelta melas* holotype, genitalia structure.

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