

A new species of *Tapinella* Enderlein, 1908 (Insecta: Psocoptera), *Tapinella zirobwensis* n. sp., from Uganda

Original Article

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Abstract:

A new species of *Tapinella* Enderlein, 1908 from Uganda was described and named *Tapinella zirobwensis* n. sp. It was collected near Zirobwe town, in agricultural lands with eucalypt plantations and bushes. The type material is deposited at the National Museum of Natural History, Sofia, Bulgaria. Only a female specimen was collected and described.

Key words:

Africa, biodiversity, equatorial, insects, research

Apstrakt:

Nova vrsta *Tapinella* Enderlein, 1908 (Insecta: Psocoptera), *Tapinella zirobwensis* n. sp., iz Ugande

U radu je opisana novootkrivena vrsta iz roda *Tapinella* Enderlein, 1908, nazvana *Tapinella zirobwensis* n. sp., koja je pronađena u Ugandi. Jedinka je prikupljena u blizini grada Zirobwe, na poljoprivrednom zemljištu sa zasadom eukaliptusa i žbunastih biljaka. Tokom istraživanja pronađena je samo jedna jedinka (ženka) i deponovana u Nacionalnom muzeju prirodne istorije u Sofiji, Bugarska.

Ključne reči:

Afrika, biodiverzitet, ekvator, insekti, istraživanje

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Introduction

Faunistic and taxonomic works on the psocid fauna of Uganda are very scarce. Information about this insect group was published in the papers of Karny (1924), Pearman (1934), Smithers (1960), and Mockford (1993). Only 14 species of Psocoptera were known from this region till now (Lienhard, 2016).

In this paper a new species of *Tapinella* Enderlein, 1908 from Uganda is described. This genus contains mainly tropical species and is not studied in detail in the area of Equatorial Africa.

Materials and Methods

Psocoptera were collected from Uganda by beating the vegetation on 28.07.2022., in the area of Zirobwe town (about 40 km north of Kampala city). The specimens were stored in 96% ethanol. The photos (specimens were placed in glycerin, because of its greater transparency) were taken by the Canon PowerShot SX500IS camera through the eyepiece of a light microscope Optika. Measurements were taken by the eyepiece micrometer. The type material

was deposited at the National Museum of Natural History, Sofia, Bulgaria (NMNH). The species discussed in the paper were evaluated according to the original descriptions, redescrptions, and published identification keys. Measurements followed Lienhard (1998) methodology.

Measurements abbreviations (all in mm in the text): LC=body length; A=antenna length, P4: fourth segment of maxillary palp, F+tr=hind femur and trochanter length; T=hind tibia length; t1, t2, t3=tarsomeres of hindtarsus (lengths measured from condyle to condyle), FW=forewing, HW=hindwing, D=anteroposterior diameter of the compound eye, IO=shortest distance between compound eyes.

Results

Family: Pachytroctidae Enderlein, 1904

Tapinella zirobwensis n. sp.

Material examined: Holotype: 1 ♀, 28.07.2022, Uganda, about 40 km N of Kampala city, NE of Zirobwe town, near Dulo school, agricultural lands (fields and eucalypt plantations with bushes and single trees), N00 42 11.8 E32 42 58.2, 1061 m a.s.l., NMNH – Sofia, Bulgaria.



Type locality: Uganda, about 40 km N of Kampala city, NE of Zirobwe town, near Dulo school, agricultural lands (fields and eucalypt plantations with bushes and single trees), N00 42 11.8 E32 42 58.2, 1061 m a. s. l.

Description (after four months in 96% ethanol): Female: Coloration: Head creamy with dark brown lateral stripe at each side from the postclypeus to the antennal socket, continuing to the eye and the thorax. Vertex and frons with two symmetrical elongate darker spots at each side as shown on **Fig. 1A**, **Fig. B**. Antennae and palpi blackish brown. Compound eyes gray with a brown spot in the middle at the level of the longitudinal stripe of the head. Ocelli pale, partly surrounded by dark red-brown pigment at their inner side. Thorax and abdomen unregularly brown with lighter gaps, dirty whitish ventrally. Abdominal apex paler dorsally. Forewings blackish brown, the pigment is a little bit denser near veins, cell Cu2 paler (but not white). Hind wings are the same color, but paler.

Morphology: Macropterous. Three ocelli present. Lacinia with three cusps almost equal in length (**Fig. 1G**). Fore and hind wings slender with venation typical for the genus (**Fig. 1C, D**). Subgenital plate with T-sclerite as typical for the genus, having long slender curved arms (**Fig. 1F**). Epiproct rounded, paraprocts triangular. Both with dense setae of two size types: very long ones and such of medium size, about twice shorter (**Fig. 1E**). Measurements (in mm): Holotype (female): LC = 1.12; F+tr = 0.40; T = 0.54; t1 = 0.18, t2 = 0.05, t3 = 0.06, FW = 1.0, HW = 0.82, D = 0.06, IO = 0.26, IO/D = 4.33.

Male: Unknown.

Diagnosis: *T. zirobwensis* n. sp. has a specific combination of coloration of its body parts. All known species from the genus which have brown

abdomens are with brown head too (Pearman, 1932; Badonnel, 1977; Thornton, 1984 and other) but in the new species the head is paler with a dark pattern. Its head coloration and markings are same with those of *T. maculata* (known from Belize, Guadeloupe, Guatemala, Jamaica, Mexico, USA, Venezuela) (Mockford & Gurney, 1956) but differs by its abdomen coloration and lacinia. By its brown abdomen and slightly paler middle area of forewing cell Cu2, the new species resembles *T. fusca* Badonnel, 1977 (Angola) (Badonnel, 1977) but differs in its head and eye coloration, as well as the lack of pale areas at cells R and A of the forewing. Etymology: Named after the area of Zirobwe town, Uganda, where the species was found.

Habitat: The species was collected from an agricultural area that consists of open fields and eucalypt forest plantations. The exact microhabitat is not known but presumably dry leaves of bushes or palms.

Discussion

Psocoptera is an order of insects that is poorly studied worldwide. Many species are of unclear origin, distribution, ecology and taxonomic status. Many species are described from only one known specimen (like *T. zirobwensis* n. sp.), especially from the tropical areas, sometimes even in poor condition and with missing body parts (Badonnel, 1949, 1977; Broadhead & Richards, 1980). The paucity of genetic studies in general for the order also makes comparing the genotypes of newly described species impossible, even if they are sequenced. Sequencing for any species of the genus *Tapinella* is lacking. Concerning all these facts, the biogeographical implications of the discovery, and the conservation status of the species are quite unclear and many

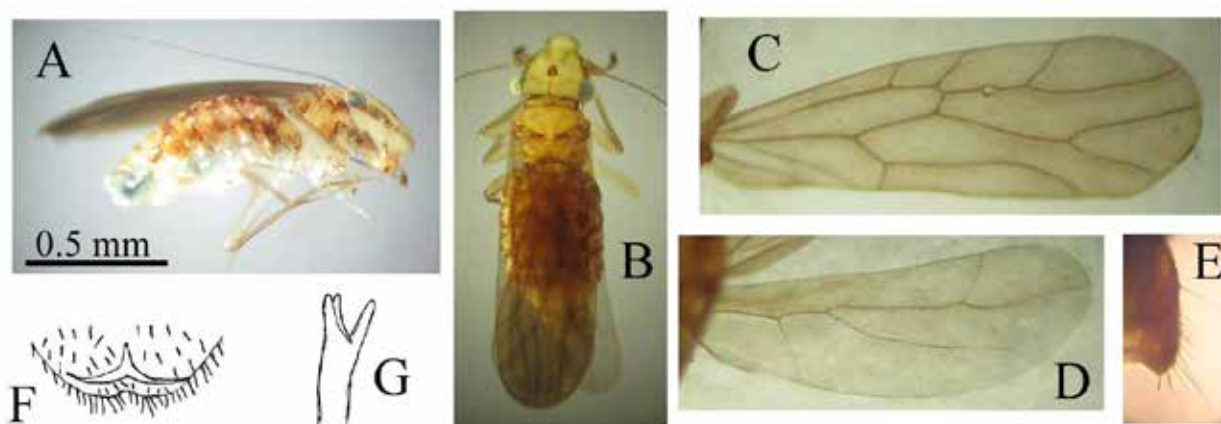


Fig. 1. *Tapinella zirobwensis* n. sp., female, holotype: **A** – lateral view, **B** – dorsal view, **C** – forewing, **D** – hindwing, **E** – paraproct, **F** – subgenital plate, **G** – lacinia (only **A** and **B** to scale). Photographs and drawings made by the author.

future studies across the tropics are needed to reach the point of making any conclusions.

The wing venation is probably a not so good taxonomic feature for *Tapinella* because of its variability and was not considered in this paper. Author's observations showed that in some genera that have both wingless and winged forms (like *Tapinella*), there are also some intermediate transitional specimens with different development and abnormalities of wing venation (for example the *Rhyopsocus* species). Badonnel (1949) and Lienhard (2008) showed different venation of the forewing of *T. curvata* Badonnel, 1949. The main characters accepted to delimit the species of *Tapinella* are body coloration and morphology of subgenital plate, paraprocts, epiproct and lacinia.

Conclusion

It is evident that many new country records and new species to science could be expected from the rich and diverse equatorial area of Uganda. Taking into consideration this publication and the previous works of Georgiev (2023a, b, c), a total of 54 species of Psocoptera are now known from this country. Further research activities on the Psocoptera are recommended for this region, as new records and species can be expected.

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