

Archipsocus michamwiensis n. sp. – a new species of Psocoptera (Insecta) from Zanzibar (Tanzania)

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Abstract: This paper describes *Archipsocus michamwiensis* n. sp., a new species from the family Archipsocidae collected in Zanzibar, Tanzania. The single female (holotype) is macropterous and exhibits distinct reddish-brown colouration, and equal-length tarsal segments. Morphological measurements highlight features such as short antennae and a V-shaped pigmented area on the subgenital plate.

Keywords: *Archipsocus*, Tanzania, Zanzibar

Introduction

The understanding of Psocoptera fauna in equatorial and tropical Africa remains limited. While recent efforts have focused on the exploration of Zanzibar, Kenya and Uganda (Georgiev, 2021, 2022a, b, c, 2023a, b, c, d), comprehensive studies in East Africa have been scarce since the work conducted by Broadhead & Richards in 1982, nearly four decades ago. Numerous areas along the east coast of the continent and its inland regions continue to be understudied, leaving significant gaps in our knowledge of psocid species diversity.

One of the less-explored families in Africa is Archipsocidae (Lienhard, 2016). It comprises numerous intriguing species that stand out morphologically, anatomically, and ecologically from other psocopterans (Smithers, 1972, 1990). For instance, Archipsocidae are colonial, and their colonies are characterised by sections covered in a self-produced silk. In this article, I describe a new species for science, a representative of the genus

Archipsocus, collected from the island of Unguja (Zanzibar, Tanzania).

Material and methods

Psocoptera specimens were collected from Unguja Island, Zanzibar, Tanzania, between 28 February and 6 March, 2021. The specimens were preserved in 96% ethanol. Photographs of the specimens in glycerin were captured using a Canon PowerShot SX500IS camera through the eyepiece of an Optika light microscope. The collected material has been deposited at the National Museum of Natural History, Sofia, Bulgaria (NMNHS). The identification of species in this paper is based on original descriptions, and measurements were conducted following the methodology outlined by Lienhard (1998).

Measurements abbreviations (all in mm in the text): LC – body length; A – antenna length (antennal segments: Sc – scape, P – pedicel, F1-Fn – flagellar segments), F+tr – hind femur and trochanter length; T

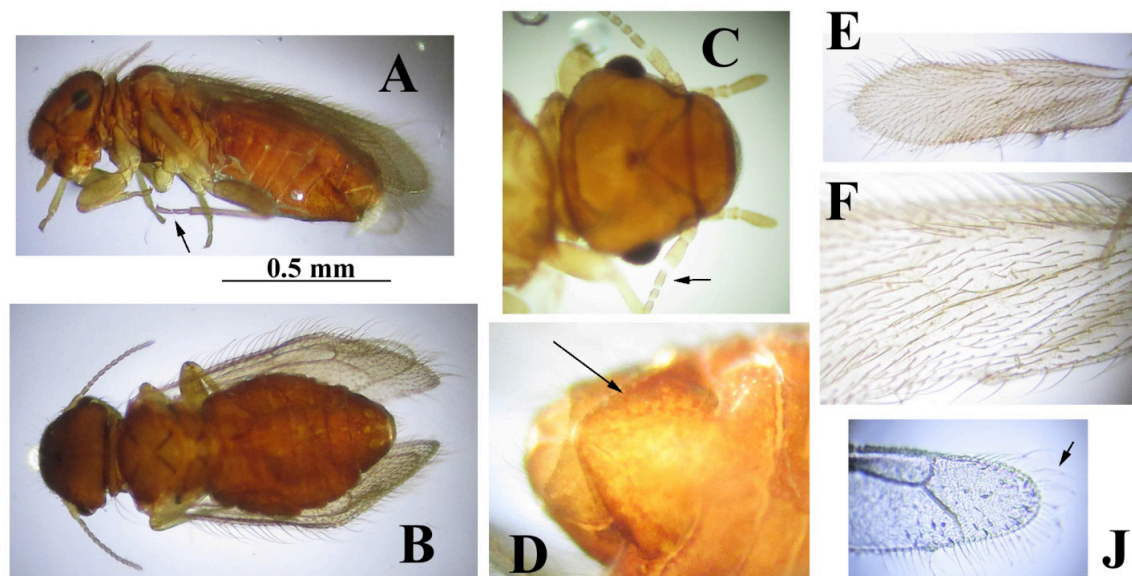


Fig. 1. *A. michamwiensis* n. sp., holotype, female: A – lateral view (the equal in length t1 and t2 pointed by an arrow), B – dorsal view, C – head (the shorter than Sc and P, F1 pointed by an arrow), D – subgenital plate (V-shaped pigmentation pointed by an arrow) E, F – forewing, J – apical area of the hind wing (the very long setae pointed by an arrow) (C, D, F and J not to scale).

– 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 and discussion

Family Archipsocidae Pearman, 1936

First described by Pearman (1936), Archipsocidae has garnered attention for its taxonomic significance within the Psocoptera order. This family falls under the suborder Psocomorpha. Key features include 2-segmented tarsi, often reduced or absent gonapophyses in viviparous species, and a simple subgenital plate and hypandrium. Notably, the phallosome lacks complex penial bulb sclerifications and external parameres, manifesting as a relatively simple, ring-like, or elongated structure (Smithers 1972, 1990).

Genus *Archipsocus* Hagen, 1882

The gonapophyses are characterised by a slender dorsal valve and a broad external valve. Additionally,

antennal segments 6 to 10 exhibit discoidal sensilla, each bearing an elongated filament (Smithers 1990).

Archipsocus michamwiensis n. sp.

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Material examined: holotype ♀, 2.03.2021, Tanzania, Zanzibar, Unguja Island, Michamwi Peninsula, bushes at the periphery of the tidal zone, collected by beating branches of bushes, S06°07'39.4" E39°29'28.2", 2 m a.s.l., deposited in NMNH – Sofia, Bulgaria (Fig. 1), Dilian Georgiev leg.

Type locality: Tanzania, Zanzibar, Unguja Island, Michamwi Peninsula, bushes at the periphery of the tidal zone, S06°07'39.4" E39°29'28.2", 2 m a.s.l.

Description: Female: Colouration: The entire body is reddish-brown, except for legs, palps, and antennae, which are paler and greyish. Ocelli are pale, surrounded by dark brown pigment. Compound eyes are blackish-brown. Wings are hyaline, pale blackish-brown. Pigmented area of the subgenital plate is V-shaped.

Morphology: Macropterous (fully winged). Three ocelli present. Antennae are short, approximately one-



Fig. 2. Habitat view of the type locality of *A. michamwiensis* n. sp.: coastal bushes at the tidal zone of the Indian Ocean.

third of the body length. Antennal segments: F1 shorter than Sc and P; F2 and F3 much shorter; F4 to F11 of equal length. Subgenital plate is triangular with a rounded apex. Gonapophyses, epiproct, and paraprocts have long setae. Tarsal segments are of equal length. Wings have dense long setae.

Measurements (in mm): holotype (female): LC = 1.20; F+tr = 0.34; T = 0.30; t1 = 0.06, t2 = 0.06, FW = 0.88, HW = 0.80, D = 0.08, IO = 0.40, IO/D = 5.00, P4 = 0.08, A = 0.39 (Sc = 0.050, P = 0.065, F1 = 0.045, F2 = 0.025, F3 = 0.028, F4-F11 = 0.033, F12 = 0.055).

Male: Unknown.

Diagnosis: The family Archipsocidae comprises species exhibiting distinct ecology and morphology compared to the rest of the Psocoptera (Smithers, 1990). These species are differentiated primarily by subtle characteristics, with body parts such as lacinia, wing venation, and genital structures considered to have relatively low taxonomic significance (New, 1963). A combination of the following characters, as outlined by New (1973) and Mockford (1977), is

considered for species delimitation: (1) body size and colouration, (2) absolute lengths of antennal segments and their relative proportions, (3) ciliation of the wings, (4) extent and shape of the sclerotised region of the subgenital plate, along with the pilosity and shape of its posterior border (rounded or tapered), (5) relative lengths of the tarsal segments.

The new species was previously misidentified as *A. textor* Enderlein, 1911 by Georgiev (2021). However, it differs significantly from it due to the absence of pterostigma on the forewing and a less densely setose abdomen. Instead, this species bears a closer resemblance to *A. recens* Enderlein, 1903 (Enderlein, 1903, 1907), known in South-East Asia: Singapore, China, India, Indonesia, and Taiwan. The specimen from Unguja is characterised with notably long setae on both fore and hind wings, as well as longer antennae in comparison to body length. Despite the lower taxonomic importance attributed to wing venation, it's worth noting that the basal cell of the hind wing in the new species is smaller, compared to the wing length, than that of *A. recens*.

A. michamwiensis n. sp. shares some similarities with *A. gurneyi* Mockford, 1953 (North America), characterised also by reddish-brown body colouration, a triangular subgenital plate, and long setae on the wings and gonapophyses. However, the latter species differs in that its tarsal segments are not of equal length (t1 shorter than t2), and the pigmented area of the subgenital plate is not V-shaped (Mockford, 1953).

Etymology: Named after Michamwi Peninsula where the species was found.

Habitat: The species was collected from coastal bushes near the tidal zone of the Indian Ocean (Fig. 2).

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