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A new genus and species of net-winged midge from Madagascar (Diptera: Blephariceridae: Blepharicerinae)

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Abstract

Larvae of a species from the subfamily Blepharicerinae were first discovered in the 1950's, but the lack of additional records prevented description of the species. A recent study of important additional specimens from the late Brian Stuckenberg has provided the basis for describing this unusual fly. This paper provides a description of larvae, pupae, and adults of *Aphromyia stuckenbergi* **gen. et sp. nov.**, and a brief discussion of its phylogenetic position within the family. The latter is confounded by marked adult colocephaly (reduction of the head) and concomitant reduction in mouthparts, and by lack of recent collections that would permit molecular analyses and further morphological study. Known from only two collections, the most recent nearly 60 years ago, this highly endemic and rare fly is arguably one of the most endangered species in Madagascar.

Key words: *Aphromyia*, Blepharicerinae, phylogeny, Apistomyiini, Paltostomatini

The flies... were collected in the midst of magnificent rainforest scenery, with a huge waterfall in the background, a fine stream plunging downward between smooth rocks, and bird and lemur calls ringing in the adjacent forest. On the lee side of many of the rocks protruding through the water was a patch of white foam, and it was over these patches that I saw those dark flies dancing up and down. It was a madly exciting moment!

Brian R. Stuckenberg (1998, personal communication)
[in reference to his 1958 collection of the species described herein]

Introduction

Net-winged midges (Diptera: Blephariceridae) are a family of lower Diptera containing approximately 325 described species in 30 genera. These flies are usually associated with cool, clear, well-oxygenated, torrential, mountain streams, and are noteworthy in their adaptations to life in and around such streams. Larvae are distinctive in their possession of six ventral suckers and a specialized cephalic division (comprising the fused head, thorax, and first abdominal segment) (Courtney 2000a). All larval instars are grazers, using highly modified mouthparts to feed exclusively on periphyton, especially diatoms (Alverson *et al.* 2001; Alverson & Courtney 2002). Pupae are comparably adapted to fast-flowing streams, being streamlined, somewhat dorsoventrally flattened, and possessing 3–4 pairs of ventrolateral adhesive discs used to attach the pupa immovably to the substrata. Adult are delicate, long-legged flies that superficially resemble crane flies. Although less intimately associated with torrential habitats, adults usually remain close to the natal stream, where they often rest on the underside of riparian vegetation, overhanging logs, or shaded rocks (Courtney 2000b).

Paulian (1949) first recorded net-winged midges from Madagascar, although the species was not named. Based on this material, Alexander (1952) described the new genus and species, *Paulianina hova* Alexander, which he placed in the subfamily Edwardsininae. Paulian (1953) later described six larval morphotypes and one pupal morphotype from the same genus. He also described the unusual larva of an aberrant member of the subfamily Blepharicerinae. Subsequently, several new species of *Paulianina* were described, culminating in Stuckenberg's