



Revision of the South American species of *Hagenulopsis* Ulmer and *Askola* Peters (Ephemeroptera: Leptophlebiidae) with description of six new species

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Abstract

The South American species of the genera *Askola* and *Hagenulopsis* are revised. Three new species of *Askola* from Brazil are described based on male imagos. *Askola emmerichi* **sp. nov.** and *A. paprockii* **sp. nov.** present spotted wings, but differ in general coloration and details of genitalia; *Askola cipoensis* **sp. nov.** is easily distinguished because the male eyes being widely separated on meson of head. Three new species of *Hagenulopsis* are also described: *H. lipeo* (from Argentina and Bolivia) and *H. zunigae* (from Colombia), both described from imagos and nymphs, can be recognized by details of coloration and male genitalia. *H. esmeralda* **sp. nov.** from Ecuador, described from imagos, shows a distinct male genitalia and translucent male abdomen. A key to species for the the male and female imagos of *Askola* and *Hagenulopsis* species is provided.

Key words: Atalophlebiinae, Neotropics, taxonomy, new species, mayflies

Introduction

Askola Peters and *Hagenulopsis* Ulmer are two of the four dipterous (with no hind wings) leptophlebiids known to South America. The monotypic *Bessierus* Thomas & Orth and *Perissophlebioides* Savage, are the two other dipterous genera, but are not closely related to the sister taxa *Askola* and *Hagenulopsis* (Domínguez, 2009).

The genus *Askola* was established by Peters (1969) from male and female imagos and nymphs for *A. froehlichii*, and no other species was described since then. We are describing here three new species, based on male imagos.

The genus *Hagenulopsis* was established by Ulmer (1920) and is currently known from all the stages. Five species have been described, three from adults and nymphs: *H. diptera* Ulmer, *H. minuta* Spieth and *H. traversae* (Peters), and two only from nymphs: *H. ingens* and *H. ramosa* Lugo-Ortiz & McCafferty.

We are describing three new species of *Hagenulopsis*, two based on male and female imagos and nymphs, and the third from male and female imagos.

We are also including a key to separate the male and female imagos of all the known species of *Askola* and *Hagenulopsis*. The aspect and coloration of the nymphs of *Hagenulopsis* is very similar, and we found it very difficult to separate them. As we did not have specimens of all the species, we prefer not to include a key to separate them.