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Description and host interactions of a new species of *Exetasis* Walker (Diptera: Acroceridae), with a key to species of the genus

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Abstract

Exetasis jujuyensis Gillung **sp. nov.** (Acroceridae) is described from Argentina and a dichotomous key to species of *Exetasis* Walker is provided. Detailed observations are presented on the effect of fly larval development on the behavior of the host spider (*Acanthoscurria sternalis* Pocock (Theraphosidae)).

Key words: *Acanthoscurria*, Argentina, small-headed flies, spider parasitoid, Theraphosidae

Introduction

Spider flies (Acroceridae) are a small yet morphologically diverse group of infrequently collected insects. This lower brachyceran group of flies is widespread geographically with species found in all biogeographical regions, despite being rarely seen in nature. Species are very diverse in size, shape and coloration, but they typically present a small head, greatly enlarged lower calypter and swollen abdomen (Schlinger 1981; 1987). In several genera, the proboscis is very long, even longer than body length, and is used for feeding on floral nectar (i.e. Borkent & Schlinger 2008), but many species have reduced mouthparts and apparently do not feed.

Acroceridae comprise approximately 530 species in 55 genera (Gillung & Winterton 2011; Pape & Thompson 2011; Winterton & Gillung 2012; Schlinger *et al.* 2013). The group is presently classified into three extant subfamilies based on adult morphology and host specificity: Acrocerinae, Panopinae and Philopotinae (Schlinger 1981; 1987). Recent phylogenetic analyses using DNA sequence data, however, do not corroborate this subfamilial arrangement and suggest that Acrocerinae are polyphyletic (Winterton *et al.* 2007).

Acrocerid larvae are typically internal parasitoids of spiders, with a hypermetamorphic life cycle consisting of four instars (Schlinger 1981; 1987; 2009). The highly sclerotized first instar larva (i.e. planidium) is extremely active, especially during the night (Cole 1919). Acrocerid planidia locate a host either by actively searching, or sitting and waiting for the spider to pass by (e.g. questing). After finding a host, the planidium enters the spider's body through the membranous articulations of the legs or abdomen. The larva then embeds in the host's opisthosoma and may enter a diapause period that can last up to several years before completing development, respiring by attaching its posterior spiracles within the book-lungs of the host (Cole 1919; Schlinger 1987). The mature fourth instar larva feeds voraciously on the internal tissues of the host, consuming almost all internal content (Schlinger 1987). Because this process is so prejudicial for the host, generally only one larva is found within a spider, although there are some records of several larvae parasitizing a spider (Eickstedt 1971; Schlinger 1972; 1987; Cady *et al.* 1993). The mature fourth instar larva emerges from the dead host before pupating (Schlinger 1987). The only known exception to this completely endoparasitic existence is the Chilean species *Sphaerops appendiculata* Philippi, which develops as an external parasitoid (Schlinger 1987). The fidelity of