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Nine new species of Neotropical spittlebugs (Hemiptera: Cercopidae: Ischnorhininae)

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Abstract

Nine new species of Neotropical spittlebugs (Hemiptera: Cercopidae: Ischnorhininae) are described and illustrated in the genera *Catrimania* (*C. albifascia* **sp. n.** with type locality in French Guiana, and *C. livida* **sp. n.** with type locality in Costa Rica), *Ischnorhina* (*I. amazonica* **sp. n.** with type locality in Brazil, and *I. hamiltoni* **sp. n.** with type locality in French Guiana), *Maxantonia* (*M. mimica* **sp. n.** with type locality in Peru), *Vorago* (*V. thompsoni* **sp. n.** with type locality in Ecuador), and *Zuata* (*Z. carvalhoi* **sp. n.** with type locality in Ecuador, *Z. pecki* **sp. n.** with type locality in Colombia, and *Z. tigrina* **sp. n.** with type locality in Bolivia).

Key Words: Auchenorrhyncha, Cercopoidea, Ischnorhininae, froghoppers

Introduction

The Cercopoidea (Hemiptera: Auchenorrhyncha: Cicadomorpha) includes approximately 2,500 described species classified into approximately 340 genera in five families (Cercopidae, Aphrophoridae, Clastopteridae, Machaerotidae, and Epipygidae) (Soulier-Perkins 2012). Commonly called spittlebugs or froghoppers, these insects feed on fluid contained in plant xylem tissue and many species exhibit a strong preference for nitrogen-fixing plants (Thompson 1994). Spittlebugs are characterized by the nymphal habit of covering themselves with a frothy saliva-like mass composed of air bubbles trapped in partially digested xylem fluids discharged from the insect alimentary system and supplemented by mucopolysaccharides and proteins produced by the specialized Malpighian tubules of the immatures (Rakitov 2002).

Of the five extant spittlebug families, Cercopidae is the largest in terms of both species diversity and typical body size. Many species in this family are characterized by bright, conspicuous color patterns on the adults. Available host records suggest that nymphs of Cercopidae tend to feed on herbaceous monocots (often grasses) which exhibit associative nitrogen fixation via root zone bacteria (Thompson 2004). Most Cercopidae species complete solitary nymphal development within their spittle masses on plant structures at or below ground level.

Species of Cercopidae are found in most terrestrial ecosystems worldwide, with highest species diversity occurring in the tropics. Phylogenetic analyses based on DNA sequence data (Cryan 2005; Cryan & Svenson 2010; Cryan & Urban 2012) suggest that Cercopidae originated in the Old World, with a single colonization of the New World corresponding to the monophyletic subfamily Ischnorhininae (referred to as Tomaspidinae Schmidt by Fennah 1968). Taxonomically, Ischnorhininae was further divided into four tribes (Ischnorhinini, Tomaspidini, Hyboscartini, and Naeanini; Fennah 1968); however, these tribes are not well defined by synapomorphic morphological features, leading taxonomic experts to abandon tribal classification within Ischnorhininae in a recent illustrated review and annotated checklist of Neotropical spittlebugs (Carvalho & Webb 2005; that work also provides a detailed summary of the classificatory history of Ischnorhininae). Although the monophyly of these tribes has not yet been rigorously tested, several exemplars of Ischnorhinini sampled in Cryan & Svenson's (2010) phylogenetic investigation of Cercopoidea were recovered as a monophyletic lineage. Conversely, the results of that analysis suggested the paraphyly of the tribe Tomaspidini.

The objective of this paper is to provide descriptions and illustrations of nine new species of Neotropical Cercopidae, classified in the genera *Catrimania*, *Ischnorhina*, *Maxantonia*, *Vorago*, and *Zuata*. Generic concepts

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