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A new species of *Piaroa* (Schizomida: Hubbardiidae) from Venezuela, with taxonomic notes on the genus

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Abstract

A new species belonging to the schizomid genus *Piaroa* Villarreal, Giupponi and Tourinho, 2008 is described from north-western Venezuela. A complementary description of *Piaroa guipongai* Villarreal and Garcia, 2012 is provided including SEM pictures of relevant structures of both sexes. A key for males of *Piaroa* and *Colombiazomus* Armas and Delgado-Santa, 2012 is included. The presence of Dm3 setae on Hubbardiidae is discussed.

Key words: Chaetotaxy, Colombia, Hubbardiinae, schizomids, taxonomy, Venezuela

Introduction

The South American schizomids turned a matter of great interest during the last years. The increasing knowledge of the the taxonomy of this group has lead to the discovery and descriptions of new genera such as *Wayuuzomus* Armas and Colmenares, 2006; *Calima* Moreno-González and Villarreal, 2012; *Colombiazomus* Armas and Delgado-Santa, 2012 and *Piaroa* Villarreal, Giupponi and Tourinho, 2008. The latter, was created to include an Amazonian species, where the male flagellum resembled the same structure of some *Stenochrus* Chamberlin, 1922 species of the group *goodnightorum* from Guatemala and Mexico. In spite of the flagellum similarities, species of *Piaroa* can be distinguished from *Stenochrus* by sharing some putative apomorphies in the spermathecae, *i.e.,* reduction of numbers of lobules (only the lateral pair is present), and the shape of those lobes (Villarreal *et al*. 2008; Armas and Víquez 2009; Armas 2010). Some additional traits like the four segmented flagellum present in *Piaroa* females also differ from *Stenochrus.*

Initially, *Piaroa* was considered as a monotypic group. Nevertheless, the number of described species increased dramatically during the last years, with six species described so far. The genus has been reported from Costa Rica, Colombia and Venezuela (Villarreal *et al.* 2008; Armas and Víquez 2009, 2010; Villarreal and García 2012; Armas and Delgado-Santa 2012). In spite of the increasing knowledge in this group, there is missing information on the spermathecae structure of some species like *Piaroa guipongai* Villarreal and García, 2012 which difficulties the comparison with other species. Other difficulties include the lack of studies which describe in detail the schizomid structure, like those provided by SEM approaches.

In this contribution we describe a new species of *Piaroa* from north-western Venezuela and provide a complementary description of *P. guipongai,* including the spermathecae and additional SEM detailed images of other relevant structures. The presence of Dm3 setae on the male flagellum of Hubbardiidae is discussed. Finally, we include a key for the males of *Piaroa.*

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genera of Hubbardiinae but since they are small, these and other setae might have been overlooked previously. Only some descriptions on the genera *Bamazomus* Harvey, 1992; *Paradraculoides* Harvey, Berry, Edward and Humphreys, 2008; *Draculoides* Harvey, 1992 and *Calima* for example, illustrate the full set of setae present on flagellum including microseate (Harvey and Humphreys 1995, Harvey 2001, Harvey *et al*. 2008, Moreno-González and Villarreal 2012). According to this, detailed observations on chaetotaxy like those provided by SEM images should be used on the descriptions of new schizomid species. The microsetae pair Dm3 can also be observed in both species of the genus *Calima* (see Moreno-González and Villarreal 2012: figs 4, 7, 8, 24, 27, 28) and at least in *Rowlandius potiguar* (see Santos *et al*. 2013: fig. 5a), *Surazomus uarini* (see Santos and Pinto-da-Rocha 2009: fig. 7) and *S. arboreus* (see Cokendolpher and Reddell 2000: figs. 10–15).

Brignoli (1973) was the first author who suggested the importance of spermathecae as a valuable taxonomic trait to distinguish schizomids species. Since then, their morphology has become widely accepted and included in schizomid taxonomy (Reddell and Cokendolpher, 1995). The importance of this structure in schizomid identification has been shown on some genera like *Calima* and *Piaroa*, where other characters like the male flagellum were not conclusive to define the genus (Villarreal *et al*. 2008; Moreno and Villarreal 2012). In the case of *P. guipongai*, the presence of only two enlarged lobes and the shape of the chitinous arc, besides other characters like the male flagellum and cheliceral setation, confirm its position inside this genus. The absence of two lobes in *Piaroa* is also shared by other neotropical genera, *Calima* and *Adisomus* Cokendolpher and Reddell, 2000 (Cokendolpher and Reddell 2000; Moreno-González and Villarreal 2012).

Although the spermathecae of *Piaroa* differ on lobe number with *Colombiazomus*, it shares several traits like the bulb and chitinized arc shape which are remarkably similar (Armas and Delgado-Santa 2012). If the number of lobes, the spermathecae shape or a combination of both characters should be used to define schizomids genera has still to be examined through a phylogenetic approach which includes additional characters. Future studies should focus on clarify the evolutive relationships among South American schizomids and the value of the traits used to define the different genera.

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