



## Article

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### **A new species of *Phyllocnistis* Zeller (Lepidoptera: Gracillariidae) from southern Brazil, with life-history description and genetic comparison to congeneric species**

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#### **Abstract**

Male, female and immature stages of *Phyllocnistis tethys* Moreira & Vargas sp. nov. (Lepidoptera; Gracillariidae) from the Atlantic Rain Forest, coastal mountains of southern Brazil, are described and illustrated, using both optical and scanning electron microscopy. A preliminary analysis of mitochondrial (COI) DNA sequences including putative members of congeneric species is also provided. The immature stages are associated with the passion vine *Passiflora organensis* (Passifloraceae). The hypermetamorphic, endophyllous larva has four instars; the first, second and third instars are sap-feeders, associated primarily with the spongy parenchyma, and construct a blotch mine in the lower surface of the lamina; the fourth, non-feeding (spinning) instar constructs a flimsy endophyllous cocoon at the end of the mine, where pupation occurs. This is the first species of *Phyllocnistis* Zeller described from Brazil, and the first leaf-mining gracillariid associated with Passifloraceae.

**Key words:** leaf-mining moths, gracillariids, Neotropical region, hypermetamorphosis, passion vines

#### **Introduction**

Gracillariidae is one of the largest groups of leaf-mining Lepidoptera, with 1,885 species recognized worldwide, of which 181 are recorded in the Neotropical region (De Prins & De Prins 2012). *Phyllocnistis* Zeller, 1848 is a poorly studied genus of minute moths (wingspans generally not exceeding 5 mm) that has been assigned to different families of Gracillarioidea and only lately has been included in the Gracillariidae, within the Phyllocnistinae (Davis & Miller 1984; Kawahara *et al.* 2011; Nieuwerkerken *et al.* 2011). The taxonomic history of the genus was reviewed recently by De Prins & Kawahara (2009), and information on the general biology was provided by Davis & Wagner (2011). The existence of subepidermal, sap-feeding instars early in the larval stage and a specialized, non-feeding last instar that spins an endophyllous cocoon prior to pupation are shared characteristics among all known species of *Phyllocnistis*. Adults show consistent differences in wing patterns (*e. g.*, conspicuously colored fasciae and strigulae) at the species level, but they vary little in the structure of their genitalia compared to other gracillariids and lepidopterans in general. They are, however, relatively diverse in some pupal structures, which may provide valuable species-level differences, such as in the frontal process of the head (= cocoon cutter) and in the shape and arrangement of tergal spines present on the abdomen (Davis & Wagner 2011).

A total of 126 species have been recognized for the genus *Phyllocnistis* worldwide (De Prins & De Prins 2012). Ten species were listed for the Neotropical region by Davis & Miller (1984), with type localities in