

# A case of phoresy of *Semeiochernes armiger* Balzan, 1892 (Pseudoscorpiones: Chernetidae) on the giant tropical fly *Pantophthalmus tabaninus* Thunberg, 1819 (Diptera: Pantophthalmidae) in an Amazonian rain forest, Pará

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## Abstract

Pseudoscorpions have the ability to attach themselves to a wide variety of more mobile arthropods. This interaction has been termed phoresy. We report on a phoretic interaction of *Semeiochernes armiger* with a giant tropical fly *Pantophthalmus tabaninus* in an Amazonian rain forest. Two males and two females of *S. armiger* were found attached to the right posterior leg of the fly. In addition, more than two hundred mites were found on the thorax of the host fly. Long term and detailed studies on the phoretic associations of pseudoscorpions and hosts in the neotropical rain forest would contribute to a better understanding of these interactions.

**Keywords:** Diptera, Phoresy, Pseudoscorpions, Porto Trombetas, Rain forest.

Pseudoscorpions have the ability to attach themselves to a wide variety of other more mobile arthropods. This interaction has been termed phoresy. It has been argued that in this phoretic interaction, the primary benefits to the pseudoscorpions are the colonization of new habitats with adequate food supply and an increased spatial distribution (Poinar et al., 1998).

The pseudoscorpions phoretic association with arthropods includes at least 44 families of insects and three families of arachnids (reviewed by Poinar et al., 1998). In Brazil, pseudoscorpion phoresy has also been recorded on three species of Cerambycidae (Coleoptera) (Aguiar & Bührnheim, 1992) and on *Zelandotipula* (Diptera: Tipulidae) (Matthiesen & Hahn, 1981). Notwithstanding, records of phoresy on other insect taxa and/or on the different distribution area of the host is urgently needed in an attempt to better understand the biology and evolution of this interaction.

We report a case of phoresy by *Semeiochernes armiger* Balzan, 1892 (Pseudoscorpiones: Chernetidae) on the giant tropical fly *Pantophthalmus tabaninus* Thunberg, 1819 (Diptera: Pantophthalmidae) in an Amazonian rain forest. Zeh & Zeh (1992a) and Zeh & Zeh (1992) previously described this phoretic interaction between the same pair in Central America. Species in the genus *Pantophthalmus* are considered the largest flies in the world (Val, 1976). Our observation was performed in Porto Trombetas, Oriximiná - PA, northern Brazil, on the 22<sup>nd</sup> November 2003. The host fly flew spontaneously from the adjacent primary rain forest to a street light where we collected it at approximately 19:00 h. The pseudoscorpion and fly were then placed in a jar with 70% alcohol and sent to the Museu de Zoologia, Universidade de São Paulo (MZUSP), São Paulo - Brazil for identification. Voucher specimens were deposited at the insect collection of the Universidade Federal de Minas Gerais, Belo Horizonte - Brazil.

The captured fly, a female, was 3.79 cm long and weighed 1.412 g (dry weight). Two males and two females of *S. armiger* [length of males = 3.2, 3.2 mm; length of females = 4.0, 3.4 mm (average length = 3.54 ± 0.38 mm, n = 4)] were found attached to the right posterior leg of the fly. The total dry weight of the four

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pseudoscorpions was 0.003g. Comparatively, the fly was 107 times larger and 470 times heavier than the pseudoscorpions (combined). In addition, more than two hundred mites (n= 228) of an undetermined species were found on diverse points of the thorax of the host fly. These mites are also phoretic on the fly (Zeh & Zeh 1992a) and could also be parasitic (McGarry et al., 1992).

Due to the small size of both pseudoscorpions and mites, the phoretic interaction may not disturb the flying capability of the host. Zeh & Zeh (1992b) suggested the dispersal hypothesis to explain the phoresy in pseudoscorpions. Those authors reported on the results of an experiment in which the pseudoscorpions were found attached to the legs of newly emerged (and therefore vulnerable) *Odontoloxosus longicornis* flies rather than feeding on it.

The fact that both male and female phoretic pseudoscorpions were found on a single host, indicates that the phoretic behavior may not be restricted to males searching for reproductive females. Instead, both males and females of *S. armiger* disperse, perhaps in an attempt to search for new and better habitats, and/or, mating and reproductive conditions (Zeh & Zeh, 1992c,d). Previous research suggests that phoresy by *S. armiger* on *P. tabaninus* is restricted to female flies and that this is adaptive since only females come to newly dead host trees to lay their eggs. Mating in flies appears to occur elsewhere and pseudoscorpions attached to male flies would therefore not reach fresh habitats (Zeh & Zeh, 1992a). Otherwise, long term and detailed studies on the phoretic associations of pseudoscorpions and their hosts would contribute to better understanding of the evolution of these interactions, as well as of the biology and ecology of related taxa in a complex ecosystem, such as the Neotropical rain forest.

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