

First record of *Parakosa flexipes* (Acari: Chirodiscidae) parasitizing a free-tailed bat (Chiroptera: Molossidae) in Brazil

Primeiro registro de *Parakosa flexipes* (Acari: Chirodiscidae) parasitando um morcego-de-cauda-livre (Chiroptera: Molossidae) no Brasil

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Abstract

The present study reports the occurrence of *Parakosa flexipes* (Pinichpongse) (Chirodiscidae) for the first time in Brazil, along with its infection sites on *Molossus rufus* E. Geoffroy. Thirty-eight bats were caught using mist nets that were placed near a house at the Mars Center for Cocoa Science in the state of Bahia, of which 14 (37%) were parasitized by *P. flexipes*. *Parakosa flexipes* was observed parasitizing *M. rufus* on hairs that were evidently longer than others distributed over the bat's body, where up to three parasites could be spotted on a single hair.

Keywords: Mite, distribution, ectoparasite, Atlantic Forest, *Molossus rufus*.

Resumo

O presente estudo registra a ocorrência de *Parakosa flexipes* (Pinichpongse) pela primeira vez no Brasil, bem como seus sítios de infecção em *Molossus rufus* E. Geoffroy. Foram capturados 38 morcegos com redes-de-neblina, dispostas próximas a uma residência da “Mars Center for Cocoa Science” no Sul da Bahia, dos quais 14 (37%) estavam parasitados por *P. flexipes*. *Parakosa flexipes* foi observada parasitando *M. rufus* em pelos evidentemente maiores que os demais distribuídos pelo corpo do morcego, onde se pôde observar até três parasitos em um único pelo.

Palavras-chave: Ácaro, distribuição, ectoparasita, Mata Atlântica, *Molossus rufus*.

Chirodiscidae (Acari: Astigmata) are characterized by having the idiosoma subcylindrical or laterally compressed and legs I and II modified to clasp the host's fur (WHITAKER JUNIOR et al., 2007). The hosts might be bats and rodents (FONSECA et al., 2005; LABRZYCKA, 2006; BOCHKOV; DUBININA, 2011). These mites are viviparous and their complete life cycle occurs on the host. It is divided between a larval stage, with hexapod larva, and an adult stage (dioecious), apart from a copulatory nymph of obscure origin (PINICHPONGSE, 1963).

Parakosa flexipes (Pinichpongse), as well as other congeners, is normally found on molossid bats (McDANIEL, 1972; GUERRERO, 1992). This mite species is different from others because of its two pairs of hairs located directly over the posterior edge of the propodosomal plate, and also because one of the tarsus IV claws is hook-shapes (CRUZ, 1969).

Molossus rufus E. Geoffroy is an insectivorous bat widely distributed in the Neotropical region (FABIAN; GREGORIN, 2007). This species is normally observed around anthropogenic constructions (PACHECO et al., 2010), and its ectoparasites

include insects (VALIM et al., 2002; LUZ et al., 2009) and mites (PINICHPONGSE, 1963; FONSECA et al., 2005).

Mites are the least investigated bat ectoparasites in Brazil (ALMEIDA et al., 2011). The vast majority of published data available in this country is related to the order Diptera (GRACIOLLI; LINARDI, 2002; GRACIOLLI; BIANCONI, 2007; SANTOS et al., 2009). Thus, the present study had the aim of reporting the first occurrence of a chirodiscid mite in molossid bats in Brazil, determining infection sites on the host.

This study was conducted at the Mars Center for Cocoa Science (MCCS; 14° 43' 02" S and 39° 22' 06" W), which is located in the municipality of Barro Preto, in the southern region of the state of Bahia, Brazil, at an altitude of 71 meters. The MCCS is located in the Atlantic Forest biome and is a farm that focuses on research and plantation cocoa trees and some intercrops that grow with these plants (banana and palm trees).

A colony of *M. rufus* was found in a site of 80 m² between a ceiling liner and the roof of a house at the MCCS. Three campaigns were conducted during March 2011, in which specimens were caught using two mist nets (12 per 2.5 m) that had been placed near a hole that gave access to the ceiling liner of the house. The bats were caught under a license granted by the Brazilian environmental control agency (SISBIO/ICMbio, # 28638-1).

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The mites were stored in Eppendorf tubes filled with 70% alcohol solution and later on were mounted on microscope slides (FLECHTMANN, 1990), been identified in accordance with the identification key of Guerrero (1992). The mites were deposited in the reference collection of the Tick Morphophysiology and Ixodology Laboratory of the Federal Rural University of Rio de Janeiro, Seropédica, RJ. The sites where the ectoparasites were captured on the host were recorded. The bat specimens can be found in the Alexandre Rodrigues Ferreira Mammal Collection, Santa Cruz State University, Ilhéus, BA.

This is the first study to record occurrences of *Parakosa* McDaniel & Lawrence parasitizing *M. rufus* in Brazil, and the fifth to record the family Chirodiscidae parasitizing bats in this country. The first and second records were made by Fain (1973) (FAIN, 1976 apud GUERRERO, 1992), who found *Paralabidocarpus tonatae* Fain parasitizing *Sturnira lilium* (E. Geoffroy) in Amazonas and *Labidocarpellus chrotopterus* Fain parasitizing *Chrotopterus auritus* Peters in Santa Catarina States. The third record was made by Azevedo et al. (2002), who recorded *Paralabidocarpus* sp. parasitizing *Phyllostomus hastatus* Pallas in Minas Gerais State. The most recent account of this family was provided by Fonseca et al. (2005), who

observed *Dentocarpus silvai silvai* Dusbabek and Cruz parasitizing *Molossus molossus* (Pallas) and *M. rufus* in the state of Rio de Janeiro.

Fourteen (37%) *M. rufus* specimens, all females, were observed to be parasitized by *P. flexipes* out of the total of 38 bats analyzed. Among the mites caught there were six free larvae, a copulatory nymph, six adult males and five adult females, two of which containing visible larvae inside their idiosoma (Figure 1). The larvae inside the females' idiosoma showed the gnathosoma arranged to the posterior side, as observed by Fonseca et al. (2005) in *D. silvai silvai*, which corroborates the hypothesis of viviparity among chirodiscid mites (GUERRERO, 1992). For five mites, the development stage could not be identified because of damage that occurred during the bleaching process.

Four *M. molossus* bats (Molossidae) and one *Myotis* sp. (Vespertilionidae) were also observed cohabiting with *M. rufus* in the same ceiling liner, but were not parasitized. Interspecies cohabitation between bats may occur without interaction between the species. However, this interaction might be more intimate during non-reproductive periods (KUNZ, 1982) or in small shelters with only one access (COSTA et al., 2010).

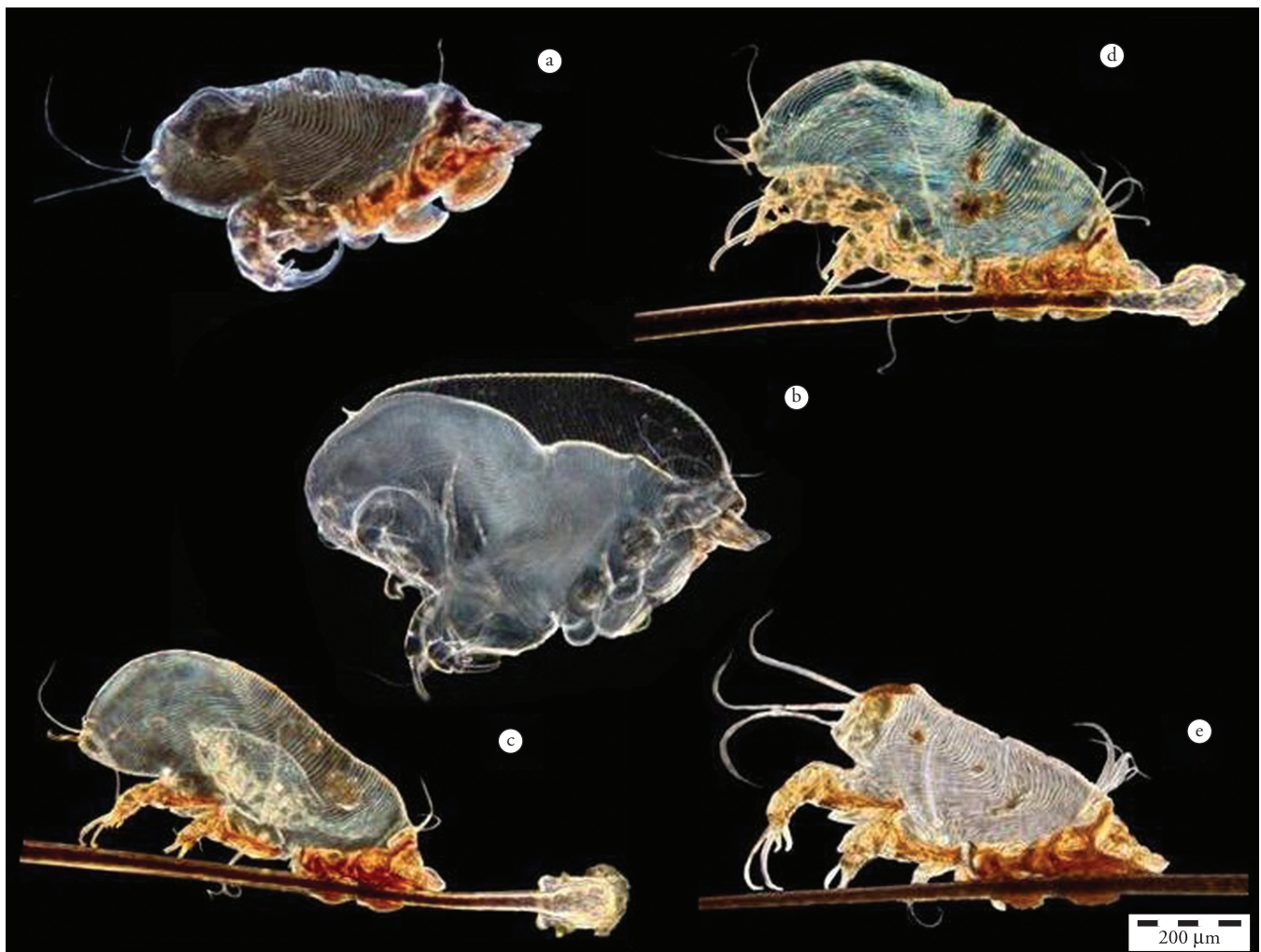


Figure 1. Development stages of *Parakosa flexipes*: a) free larva; b) copulatory nymph; c) female adult with larva in its interior; d) female adult; and e) male adult. Photos: Vinícius da Rocha Miranda.

Parakosa flexipes was observed parasitizing *M. rufus* on hairs that were evidently longer than others, distributed over the bat's body, where up to three parasites could be spotted on a single hair. These hairs were found on the dorsal extremity with an approximate distance of three centimeters from the uropatagium on the right and/or left side of the host. Dusbabek & Cruz (1966) also observed *P. flexipes* parasitizing long hairs between the uropatagium and the dorsal part of the body of *M. molossus* in Cuba. According analysis realized by Labrzycka (2006) about morphology and biological adaptation of fur mites in Poland, it was also observed that chirodiscids are commonly found on the hair of the posterior area of bats and rarely on the head or near the ears. Remaining on the longer hairs located on the bats' back may be a way in which the parasites avoid removal through licking, as a cleaning method used by the hosts (FONSECA et al., 2005). These hairs are thicker than the others, thus allowing better lift provided by the two pairs of legs that are modified to clasp the host's hair. Characteristics such as the thickness and texture of the fur, as well as differences between the skin secretion levels in certain parts of the host's body, might have an influence on the choice of microhabitat (FAIN; LUKOSCHUS, 1985).

These data extend the geographical distribution of the genus *Parakosa* and the species *P. flexipes* to one more country. One reason for the scarceness of studies about chirodiscid ectoparasites may be the fact that the dimensions of these parasites are measured in millimeters and, thus, they are often not perceived by the researchers in the field, which precludes their capture. Detailed verification of the bats' fur, focusing on the hosts' long dorsal hair could increase the records of *P. flexipes* and even of other species of the family Chirodiscidae in Brazil.

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