

Scientific Note

New records of avian nasal mites (Mesostigmata: Rhinonyssidae) to Southeastern Brazil

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Edited by: Jose W. S. Melo (Guest Editor)

Received: October 30, 2021. Accepted: November 10, 2021. Published: December 07, 2021.

Abstract. The avian nasal mites are a group of Mesostigmata, belonging to the family Rhinonyssidae, Trouessart, 1895, obligate endoparasites of the respiratory system of birds. In Brazil, seven of the eight genera of this family have been recorded. After examining the Acarological Collection of the Instituto Butantan, the species *Rallinyssus gallinulae* Fain, 1960 and *Rhinoecius bisetosus* Strandtmann, 1952 were identified from *Gallinula galeata* (Lichtenstein, 1818) (Gruiformes: Rallidae) and an unidentified owl, respectively. In this study, we are recording for the first time *R. gallinulae* from Brazil (Rio de Janeiro State), while *R. bisetosus* is recorded for the second time to this country (São Paulo State), however from a different specific locality.

Keywords: Avian nasal mites, endoparasites, Rio de Janeiro State, São Paulo State, Rallidae, Strigidae.

The family Rhinonyssidae Trouessart, 1895, popular known as avian nasal mites, is a group of Mesostigmata mites, obligate endoparasites of the respiratory system of birds. Currently, this family comprises about 600 species into eight genera - *Larinyssus* Strandtmann, 1948; *Ptilonyssus* Berlese & Trouessart, 1889; *Rallinyssus* Strandtmann, 1948; *Rhinoecius* Cooreman, 1946; *Rhinonyssus* Trouessart, 1894; *Ruandanyssus* Fain, 1957; *Sternostoma* Berlese & Trouessart, 1889; *Tinaminyssus* Strandtmann & Wharton, 1958 (Pence 1975). Of these genera, seven have already been recorded in Brazil, except for *Ruandanyssus*, unique to the Asia and Oceania region (Pence 1975; Mascarenhas et al. 2018).

The genus *Rallinyssus* encompasses twelve species, *Ra. amaurornis* Wilson, 1965; *Ra. caudistigmus* Strandtmann, 1948; *Ra. congolensis* Fain, 1956; *Ra. cychramus* Wilson, 1965; *Ra. gallinulae* Fain, 1960; *Ra. limnocoracis* Fain, 1956; *Ra. porzanae* Wilson, 1967; *Ra. rallinae* Wilson, 1966; *Ra. sorae* Pence & Young, 1979; *Ra. strandtmanni* Gretillat, 1961; *Ra. trappi* Amaral, 1962; and *Ra. verheyeni* Fain, 1963, which are exclusive parasites of rails (Gruiformes: Rallidae). There are only two species recorded to South America. One of these species - *R. trappi* - was described from Brazil, collected on the Blackish Rail, *Pardirallus nigricans* (Vieillot, 1819) (cited as *Ortygonax nigricans*) (Gruiformes: Rallidae) in Itaporanga Municipality, São Paulo State (Amaral 1962a). While, *Ra. caudistigmus* was collected in Neuquen province, Argentina, parasitizing the Red-gartered Coot, *Fulica armillata* Vieillot, 1817 (Gruiformes: Rallidae) (Kun & Vega 2016).

The genus *Rhinoecius* also has twelve species, all of which are exclusive parasites of owls: *Rh. aegolii* Butenko, 1971; *Rh. africanus* Zumpt & Patterson, 1951; *Rh. alifanovi* Butenko, 1976; *Rh. bisetosus* Strandtmann, 1952; *Rh. brikinboricus* Butenko, 1976; *Rh. cavannus* Wilson, 1968; *Rh. cooremani* Strandtmann, 1952; *Rh. grandis* Strandtmann, 1952; *Rh. nyctea* Butenko, 1976; *Rh. oti* Cooreman, 1946; *Rh. subbisetosus* Bregetova, 1965; and *Rh. tytonis* Fain, 1956. So far, two species have been recorded in Brazil: *Rh. bisetosus* and *Rh. grandis*, both originally described from Texas, USA (Strandtmann 1952), and later recorded in Brazil by Amaral (1962b). *Rhinoecius*

bisetosus has been reported parasitizing the Burrowing Owl, *Athene cunicularia grallaria* (Temminck, 1822) (cited as *Speotyto cunicularia grallaria*) (Strigiformes: Strigidae) in Itaporanga Municipality, São Paulo State and *R. grandis* has been reported parasitizing the Band-bellied owl, *Pulsatrix melanota* (Tschudi, 1844) (Strigiformes: Strigidae) in Boracéia Municipality, São Paulo State (Amaral 1962b). The present study provides new locality and host-association records for two species of avian nasal mites, as well as microscopy images that help in the identification of these species.

The examined material was slide-mounted and deposited in the Acarological Collection of the Instituto Butantan (IBSP) as “non-identified specimen” and belongs to a collection dated from the 1930s. We tried to retrieve, as much information as possible, from the collection records, and from the original labels for each slide. The identification of genus and species was carried out according to the dichotomous keys made by Domrow (1969) and Pence (1975), and compared with the original descriptions of the species belonging to each genus.

The specimens were identified as *Rallinyssus gallinulae* (IBSP 254) and *Rhinoecius bisetosus* (IBSP 272, IBSP 273, and IBSP 274). A general view of the second species is shown in Fig. 1A. *Rallinyssus gallinulae* can be morphologically separated from the other *Rallinyssus* species due to the different shape of the opisthosomal and sternal shields (Figs. 1C and D). This species was originally described from the common moorhen, *Gallinula chloropus* (L., 1758) (Gruiformes: Rallidae) from Zoo d'Anvers, Belgium (Fain 1960). Our new record from the IBSP collection was collected in 1933, from the Common Gallinule, *Gallinula galeata* (Lichtenstein, 1818) (Gruiformes: Rallidae) in the Rio de Janeiro Municipality, Rio de Janeiro State. Although until 2014 the common moorhen and the common gallinule were considered the same species (del Hoyo et al. 2014), the first is restricted to the Old World, while *G. galeata* is restricted to the New World.

The other species, identified as *Rh. bisetosus* was firstly described from Texas, USA, parasitizing the Burrowing Owl, *Athene cunicularia* (Temminck, 1822) (Strigiformes: Strigidae) (Strandtmann 1952), and

recorded on this same host in Itaporanga Municipality, São Paulo State, Brazil (Amaral 1962b). *Rhinoecius bisetosus* can be easily distinguished from the other species of the genus by the very elongated setae on the propodosoma (Fig. 1B). By examining the specimens deposited in the IBSP collection, we hereby record this mite species parasitizing three different owl specimens, collected in the Park of Instituto Butantan, in the city of São Paulo, São Paulo State, in 1932, 1933, and 1934. These records represent a second locality of occurrence for *Rh. bisetosus* in Brazil, and in a new locality of the São Paulo State.

Even though the label in the specimens and the collection catalog identifies the host merely as an owl, and not to the species level, it is possible to assume that the species of owl is the same for

which *R. bisetosus* has been recorded in Texas and São Paulo. Since the turn of the 20th century and until 1944, what is now the park of Instituto Butantan was part of a large farm, where the horses used in the production of antivenom serum were kept. Most of the area of the “Fazenda Butantã” became in 1941 the campus of the University of São Paulo (Prado 2005). Based on images from 1900 to 1940 it is possible to see that a large part of the area of this farm was comprised of grasslands and pasture, and even before that it was part of the so called “campos do Butantan” or fields of Butantan (Joly 1950). In that kind of habitat, the most abundant species of owl would have been the burrowing owl, *Athena cunicularia*. Therefore, it is reasonable to assume that this is the host species of the new records reported here.

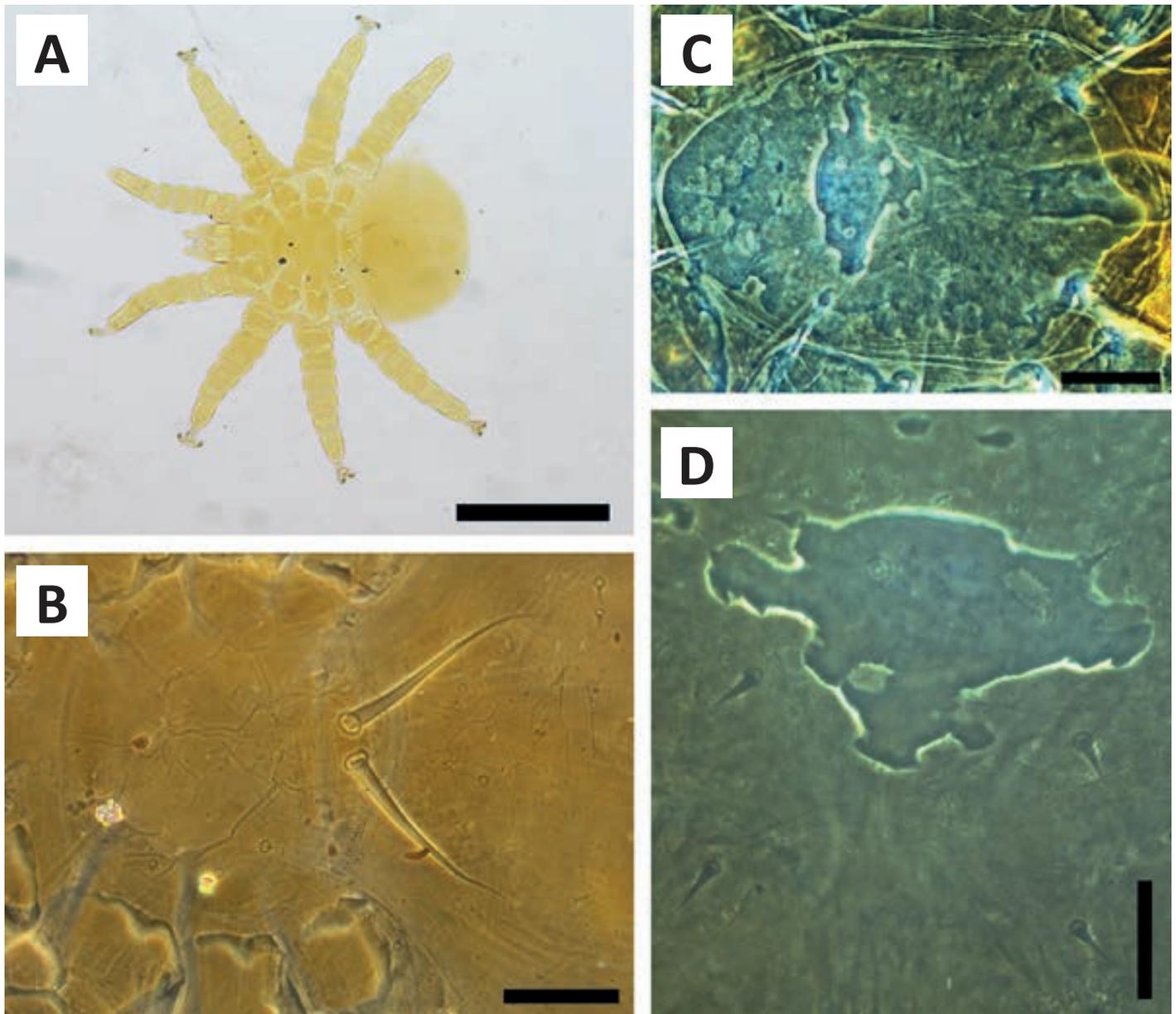


Figure 1. Microscopy images of Avian nasal mites (Rhinonyssidae). A. General view of *Rhinoecius bisetosus* Strandtmann, 1952; B. Details of the dorsal region of *Rh. bisetosus*; C. Propodosomal shield of *Rallinyssus gallinulae* Fain, 1960; D. Sternal shield *Ra. gallinulae*; Scale bars: A 500 μ , B, and C 100 μ , D 50 μ .

Acknowledgements

To Gabrielle Ribeiro de Andrade and Maria Cristina Ferreira do Rosário for technical contribution. This work was supported by the Fundação de Amparo à Pesquisa do Estado de São Paulo under the Grant FAPESP no. 2021/02295-4 (JCT), 2017/01416-7, 2018/24667-8 and 2020/11755-6 (RB-S), and 2019/19853-0 (FCJ). This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001.

Authors' Contributions

JCT and FCJ examined and remounted slides of avian nasal mites deposited in the IBSP Collection. FCJ and RB-S performed the study and confirmed the identification of the mites. EH-Z confirmed the identification of the hosts. JCT, RB-S, EH-Z, and FCJ wrote the manuscript.

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