










## Scientific Note

# Unusual association between *Ornithonyssus bursa* (Berlese, 1888) (Mesostigmata: Macronyssidae) and *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) in Paraíba State, Brazil

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**Abstract.** *Ornithonyssus bursa* (Berlese, 1888), known as the tropical fowl mite, is a hematophagous mite of domestic and wild birds. This mite can bite humans accidentally, causing “gamasoidosis,” “avian-mite dermatitis,” or “bird-mite dermatitis” in tropical and subtropical regions of the world. In Brazil, *O. bursa* was previously recorded parasitizing birds of the orders Charadriiformes Huxley, 1867, Columbiformes Latham, 1790, Galliformes Temminck, 1820, Passeriformes Linnaeus, 1758, Strigiformes Wagler, 1830, and Tinamiformes Huxley, 1872. Here, we provide a new association of *O. bursa* with Harris’s hawk, *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) and the first record of this mite species in the Paraíba State, Brazil.

**Keywords:** Macronyssid, ectoparasites, Brazilian Northeast, Birds of prey.

Macronyssidae comprise approximately 240 species, organized in 34 genera. The mites included in this family are ectoparasites of reptiles, birds, and mammals (Radovsky 2010). One of these species, *Ornithonyssus bursa* (Berlese, 1888), known as “tropical fowl mite”, is a hematophagous mite of domestic and wild birds, and can bite humans accidentally, causing “gamasoidosis”, “avian-mite dermatitis”, or “bird-mite dermatitis” in tropical and subtropical regions of the world (Bassini-Silva et al. 2019; Lima-Barbero et al. 2019).

In Brazil, *O. bursa* is found parasitizing birds of the orders Charadriiformes Huxley, 1867, Columbiformes Latham, 1790, Galliformes Temminck, 1820, Passeriformes Linnaeus, 1758, Strigiformes Wagler, 1830, and Tinamiformes Huxley, 1872 (Vaz 1935; Reis 1939; Ribeiro et al. 1992; Mascarenhas et al. 2009; Goulart et al. 2011; Moraes et al. 2011; Coimbra et al. 2012; Oliveira et al. 2012; Wambier & Wambier 2012; Mentz et al. 2015; Silva et al. 2018; Bassini-Silva et al. 2019; Mesquita-Sousa et al. 2020). To plot the distribution map of *O. bursa* in Brazil, we used the occurrence locations provided in the previous records, including the new record of this study (Tab. 1, Fig. 1). To search for geographic coordinates not provided in the original records, we use the “GeoLoc” online tool, from the speciesLink project, for the georeferencing of zoological collections (CRIA 2021).

Here, we are providing a new association of *O. bursa* with Harris’s hawk, *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) in Paraíba State, Brazil. The material was collected on September 18th, 2020, from a captive adult female Harris’s Hawk (Fig. 2). The animal is legally kept and used by a professional falconer to control pigeons in the João Pessoa Municipality, Paraíba State. During a demonstration of falconry techniques held at the Arruda Câmara Zoo-Botanical Park, João Pessoa, Paraíba State, an ectoparasite was noticed walking on the animal’s legs. Because of this, in this short communication we prefer to use the term “mite/

bird of prey association”. The ectoparasite was collected with a piece of tape and placed in a tube containing 70° alcohol. This material was slide-mounted with Hoyer’s medium according to Barros-Battesti et al. (2021) and deposited in the Acarological Collection of Butantan Institute (IBSP) under the access number IBSP 16533. The specimen was imaged using a Leica DFC 500 digital camera coupled to an optical microscope Leica DM4000B, in the Zoological Collection Laboratory, Butantan Institute, São Paulo. All images were prepared with Adobe Photoshop v. 13.0. According to Bassini-Silva et al. (2019), we confirm the main set of morphological characters, and the details of the sternal and distal opisthosoma shields are shown in (Fig. 3).

The Harris’s Hawk is widely distributed in the America’s and can be found in the open lands of the southwestern region of the United States of America to the south of Argentina (Patagonia region) (Brown & Amadon 1968; Bednarz 1995; Couve & Vidal 2003). This hawk preys mainly on small birds and mammals, such as wild and synanthropic doves, passerines, quails, small herons, rodents, and marsupials (Whaley 1986; Jiménez & Jaksic 1993; Bednarz 1995).

In Brazil, the only record of *O. bursa* parasitizing birds of prey was made by Mascarenhas et al. (2009), who found a lot of this mite on the offspring of *Megascops choliba* (Vieillot, 1817) (Strigiformes: Strigidae), in Pelotas Municipality, Rio Grande do Sul State. This is the first report of *O. bursa* on *P. unicinctus*. The presence of this association can be important for the bird’s health since the presence of this mite can cause lesions with intense pruritus, or even host mortality when population numbers are large (Coimbra et al. 2012; Mascarenhas et al. 2009).

Although this bird of prey species is considered as Least Concern (LC) on the Red List (IUCN 2021), and not threatened with extinction, its population has been declining in recent years. In addition, this kind of mite/bird of prey association may be related to this bird feeding

**Table 1.** Locality and avian host-association records for *Ornithonyssus bursa* (Berlese, 1888) in Brazil.

Hosts	Common names	Localities	Coordinates	References
<b>ACCIPITRIFORMES</b>				
<b>Accipitridae</b>				
<i>Parabuteo unicinctus</i> (Temminck, 1824)	Harris's hawk	João Pessoa/PB	7°06'54"S; 34°51'47"W	This study
<b>CHARADRIIFORMES</b>				
<b>Charadriidae</b>				
<i>Vanellus chilensis</i> (Molina, 1782)	Southern lapwing	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>Scolopacidae</b>				
<i>Gallinago paraguaiæ</i> (Vieillot, 1816)	South American snipe	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>COLUMBIFORMES</b>				
<b>Columbidae</b>				
<i>Columba livia</i> Gmelin, 1789	Rock dove	São Paulo/SP	23°32'52"S; 46°38'10"W	Wambier & Wambier 2012; Mesquita-Souza et al. 2020
<i>Columbina picui</i> (Temminck, 1813)	Picui dove	Pelotas/RS São Sepé/RS	31°46'19"S; 52°20'32"W 30°09'39"S; 53°33'54"W	Coimbra et al. 2012; Silva et al. 2018
<i>Columbina talpacoti</i> (Temminck, 1809)	Ruddy Ground-dove	São Paulo/SP São Sepé/RS Dois Vizinhos/PR Piracicaba/SP	23°32'52"S; 46°38'10"W 30°09'39"S; 53°33'54"W 25°44'01"S; 53°03'25"W 22°43'32"S; 47°38'56"W	Moraes et al. 2011; Silva et al. 2018; Bassini-Silva et al. 2019; Mesquita-Souza et al. 2020
<i>Leptotila verreauxi</i> Bonaparte, 1855	White-tipped dove	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Zenaida auriculata</i> (Des Murs, 1847)	Eared dove	São Paulo/SP Jaboticabal/SP	23°32'52"S; 46°38'10"W 21°15'18"S; 48°19'20"W	Goulart et al. 2011; Bassini-Silva et al. 2019
<b>GALLIFORMES</b>				
<b>Phasianidae</b>				
<i>Gallus gallus</i> (Linnaeus, 1758)	Red junglefowl	São Paulo/SP Viamão/RS Rio de Janeiro/RJ São José dos Campos/SP	23°32'52"S; 46°38'10"W 30°04'53"S; 51°01'24"W 22°54'11"S; 43°12'27"W 23°10'46"S; 45°53'12"W	Vaz 1935; Reis 1939; Bassini-Silva et al. 2019 Ribeiro et al. 1992 Bassini-Silva et al. 2019 Bassini-Silva et al. 2019
<b>PASSERIFORMES</b>				
<b>Furnariidae</b>				
<i>Anumbius anumbi</i> (Vieillot, 1817)	Firewood-gatherer	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Certhiaxis cinnamomeus</i> (Gmelin, 1788)	Yellow-chinned spinetail	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Furnarius rufus</i> (Gmelin, 1788)	Rufous hornero	Porto Alegre/RS	30°01'60"S; 51°13'47"W	Mentz et al. 2015
<b>Hirundinidae</b>				
<i>Progne tapera</i> (Linnaeus, 1766)	Brown-chested martin	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Pygochelidon cyanoleuca</i> (Vieillot, 1817)	Blue-and-white swallow	Mogi das Cruzes/SP	23°31'22"S; 46°11'17"W	Bassini-Silva et al. 2019
<b>Icteridae</b>				
<i>Cacicus chrysopterus</i> (Vigors, 1825)	Golden-winged cacique	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>Mimidae</b>				
<i>Mimus saturninus</i> (Lichtenstein, 1823)	Chalk-browed mockingbird	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>Parulidae</b>				
<i>Basileuterus culicivorus</i> (Deppe, 1830)	Stripe-crowned warbler	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>Passerellidae</b>				
<i>Zonotrichia capensis</i> (Müller, 1776)	Rufous-collared sparrow	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>Thraupidae</b>				
<i>Paroaria coronata</i> (Miller, 1776)	Red-crested cardinal	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Sicalis flaveola</i> (Linnaeus, 1766)	Saffron finch	São Sepé/RS Santa Maria/RS	30°09'39"S; 53°33'54"W 29°41'04"S; 53°48'25"W	Silva et al. 2018; Mesquita-Souza et al. 2020
<b>Troglodytidae</b>				
<i>Troglodytes musculus</i> Naumann, 1823	Southern house wren	Balsas/MA	7°31'57"S; 46°02'08"W	Mesquita-Souza et al. 2020
<b>Turdidae</b>				

To be continue...

Table 1. Continue...

Hosts	Common names	Localities	Coordinates	References
<i>Turdus albicollis</i> Vieillot, 1818	White-necked thrush	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Turdus leucomelas</i> Vieillot, 1818	Pale-breasted thrush	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<i>Turdus rufiventris</i> Vieillot, 1818	Rufous-bellied thrush	Balsas/MA	7°31'57"S; 46°02'08"W	Mesquita-Souza et al. 2020
<b>Tyrannidae</b>				
<i>Myiodynastes maculatus</i> (Müller, 1776)	Northern flycatcher streaked	Santa Maria/RS	29°41'04"S; 53°48'25"W	Oliveira et al. 2012
<i>Pitangus sulphuratus</i> (Linnaeus, 1766)	Great kiskadee	Pelotas/RS	31°46'19"S; 52°20'32"W	Mascarenhas et al. 2009
<i>Xolmis irupero</i> (Vieillot, 1823)	White monjita	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018
<b>STRIGIFORMES</b>				
<b>Strigidae</b>				
<i>Megascops choliba</i> (Vieillot, 1817)	Tropical screech-owl	Pelotas/RS	31°46'19"S; 52°20'32"W	Mascarenhas et al. 2009
<b>TINAMIFORMES</b>				
<b>Tinamidae</b>				
<i>Nothura maculosa</i> (Temminck, 1815)	Spotted nothura	São Sepé/RS	30°09'39"S; 53°33'54"W	Silva et al. 2018

Legend. MA= Maranhão State; PB= Paraíba State; RJ= Rio de Janeiro State; RS = Rio Grande do Sul State; SP= São Paulo State.

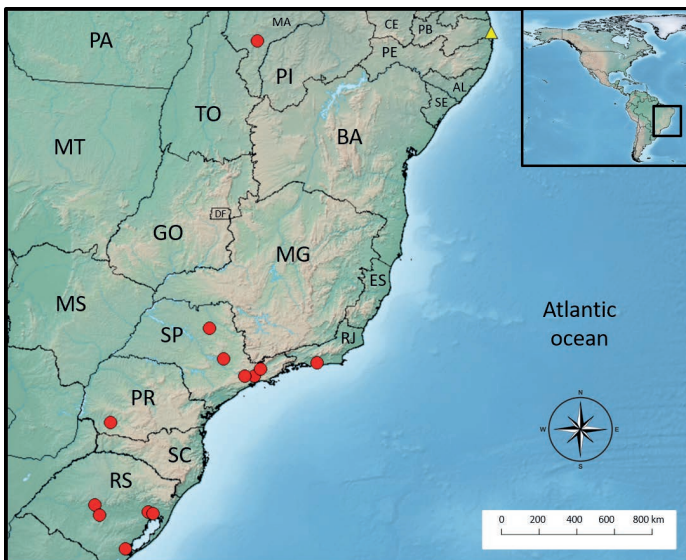


Figure 1. Distribution of *Ornithonyssus bursa* (Berlese, 1888) in Brazil. The red circles are literature records, while the yellow triangle is the new record.



Figure 2. Adult female Harris's Hawk, *Parabuteo unicinctus* (Temminck, 1824) parasitized by *Ornithonyssus bursa* (Berlese, 1888).

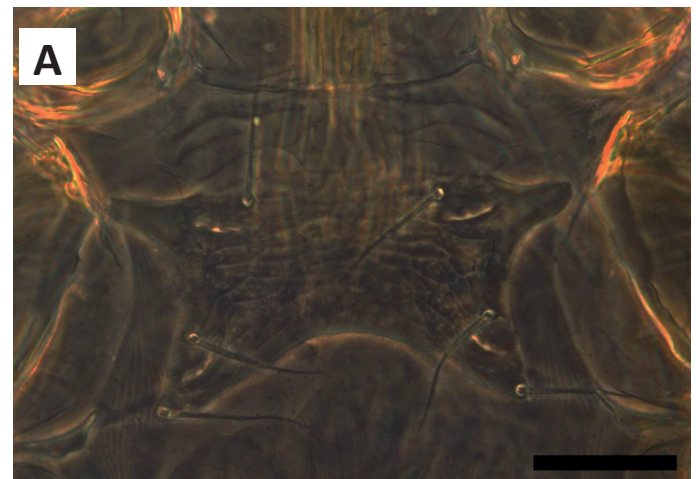


Figure 3. Female of *Ornithonyssus bursa* (Berlese, 1888). (A) sternal shield. (B) distal opisthosoma shields. Scale bars: 50µm.

habits, which include the birds listed in Tab. 1. The hawk from this report was specifically used to control *Columba livia* Gmelin, 1789 (Columbiformes: Columbidae), populations, which are common hosts of *O. bursa*. This may contribute to the maintenance of these mites on other hosts, and help in dispersing these mites throughout the America's, contributing to the increase in human bite cases.

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## Authors' Contributions

JSP, AIVB, and GFD collected the mite in association with the host and performed the record. FCJ, RB-S, and APGD performed the study and confirmed the identification of the mites. RS-R, JCT, and APM conducted the mite's preparations and wrote the manuscript with input from all authors.

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