

# Occurrence of the louse fly *Ornithoctona erythrocephala* Leach (1817) (Diptera: Hippoboscidae) on a free-living red-legged seriema (*Cariama cristata*)

Ocorrência da mosca *Ornithoctona erythrocephala* Leach, 1817 (Diptera: Hippoboscidae) em seriema (*Cariama cristata*) de vida livre

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## Abstract

The aim of this study was to report, for the first time, the occurrence of the hippoboscid fly *Ornithoctona erythrocephala* on a red-legged seriema (*Cariama cristata*). A Diptera specimen was found among the feathers of a free-living red-legged seriema, which was referred to necropsy at the Wild Animal Pathology Service, UNESP Jaboticabal. The fly was collected, stored in absolute alcohol, and shipped to the Institute of Biosciences of the Federal University of Mato Grosso do Sul for proper identification. Based on morphological characters, the specimen was identified as a female of *Ornithoctona erythrocephala*. This study provides a report on a new host for *O. erythrocephala*.

**Keywords:** *Ornithoctona erythrocephala*, Diptera, Hippoboscidae, Louse-flies, ectoparasites.

## Resumo

O objetivo deste estudo foi descrever pela primeira vez a ocorrência da mosca Hippoboscidae *Ornithoctona erythrocephala* em uma seriema (*Cariama cristata*). Um espécime de díptero foi encontrado entre as penas de dessa ave, que havia sido encaminhada para necropsia ao Serviço de Patologia de Animais Selvagens, UNESP, Jaboticabal. A mosca foi armazenada em álcool absoluto e enviada ao Instituto de Biociências da Universidade Federal do Mato Grosso do Sul para identificação por um especialista. Baseado em características morfológicas, o espécime foi identificado como fêmea de *Ornithoctona erythrocephala*. Este relato oferece a descrição de um novo hospedeiro para *O. erythrocephala*.

**Palavras-chave:** *Ornithoctona erythrocephala*, Diptera, Hippoboscidae, mosca-piolho, ectoparasitas.

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Dipterans of the family Hippoboscidae Samouelle, 1819, also known as louse flies, are hematophagous ectoparasites distributed worldwide that occur in association with birds and mammals (Graciolli, 2016). The family Hippoboscidae is subdivided into three subfamilies (Ornithomyiinae, Lipopteninae, and Hippoboscinae), containing approximately 21 genera and more than 200 species (Wood, 2010), of which 48 occur in the Americas (Maa, 1969). In Brazil, these dipterans have been scarcely studied, with a description of only 30 species from 10 genera (Bequaert, 1956).

*Ornithoctona erythrocephala* Leach (1817) belongs to the Ornithomyiinae subfamily, which comprises approximately two-thirds of the species of the entire family (Maa, 1962). Since its first description, *O. erythrocephala* has already been described in several avian species throughout the American continent (Maa, 1969; Tossas, 2001), evidencing its low host specificity (Graciolli & Carvalho, 2003). In Brazil, this species has been reported in avian species from south, central-west, and northern regions, as shown in Table 1. All hippoboscid flies are hematophagous. Owing to this behavior, these dipterans are considered important vectors for several infectious agents, such as blood protozoans (Baker, 1967).

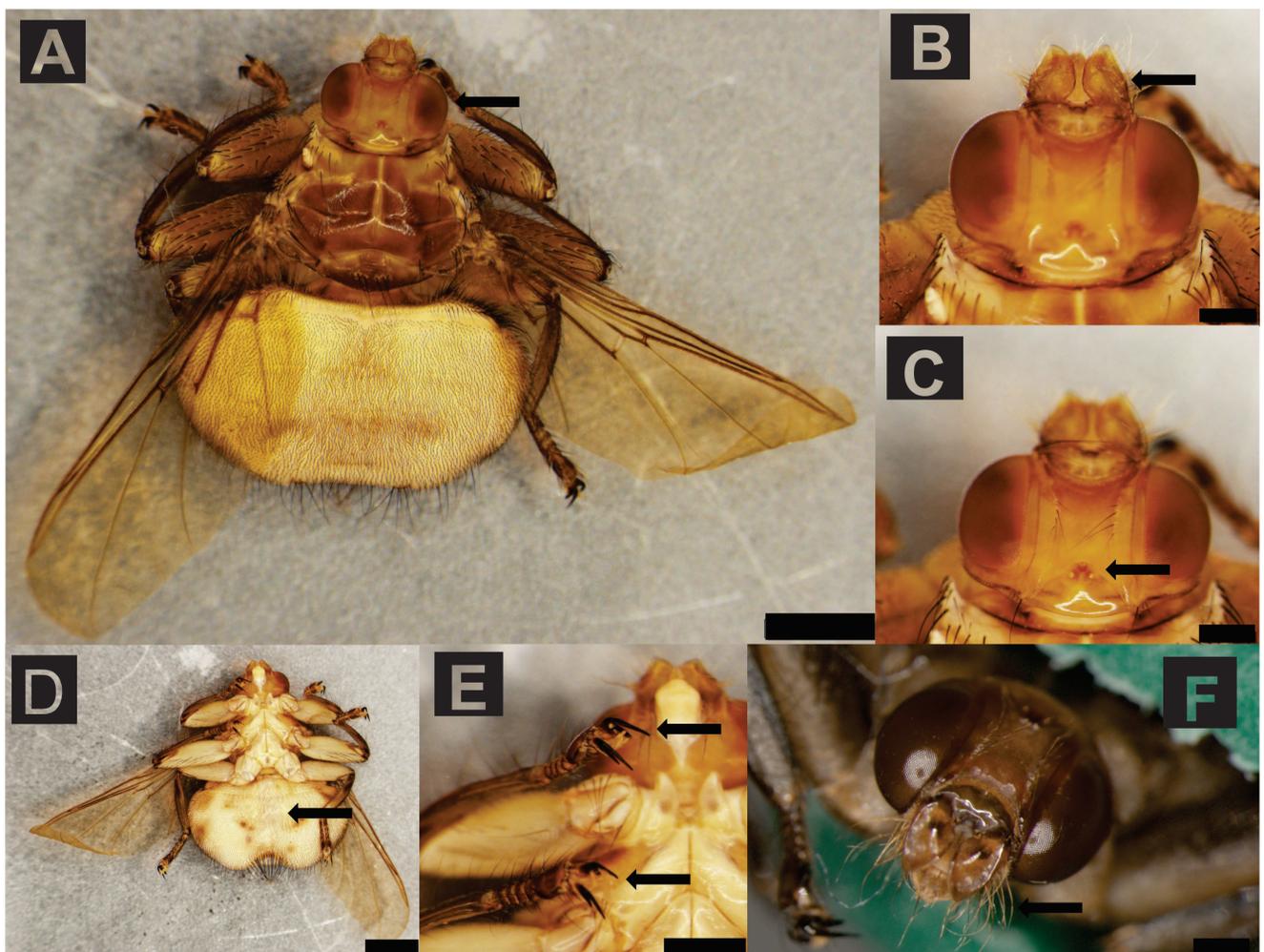
**Table 1.** Records of avian species parasitized by *Ornithoctona erythrocephala* in Brazil.

Order	Scientific name	Location (state)	Author/year
Accipitriformes	<i>Accipter striatus</i>	Paraná	Graciolli & Carvalho (2003)
	<i>Circus cinereus</i>	Santa Catarina	Bequaert (1953)
	<i>Elanus leucurus</i>	Mato Grosso do Sul	Graciolli et al. (2017)
	<i>Elanus leucurus leucurus</i>	Santa Catarina	Bequaert (1953)
	<i>Ictinia plumbea</i>	Paraná; Santa Catarina	Graciolli & Carvalho (2003), Serra-Freire et al. (2013)
	<i>Parabuteo unicinctus</i>	Rio Grande do Sul	Moreira et al. (2019)
	<i>Rupornis magnirostris</i>	Paraná; Rio Grande do Sul	Vaz & Teixeira (2016), Moreira et al. (2019)
	<i>Rupornis magnirostris magnirostris</i>	São Paulo	Bequaert (1953)
	<i>Spizaetus ornatus ornatus</i>	Rio Grande do Sul	Bequaert (1953)
	<i>Spizaetus tyrannus tyrannus</i>	Santa Catarina	Bequaert (1953)
Cariamiformes	<i>Cariama cristata</i>	São Paulo	Present work
Columbiformes	<i>Patagioenas cayennensis sylvestris</i>	Santa Catarina	Bequaert (1953)
	<i>Patagioenas picazuro</i>	Santa Catarina e Pernambuco	Serra-Freire et al. (2013)
Coraciiformes	<i>Zenaida auriculata</i>	Paraná	Graciolli & Carvalho (2003)
	<i>Baryphthengus ruficapillus</i>	Paraná	Graciolli & Carvalho (2003)
Falconiformes	<i>Caracara plancus</i>	Paraná; Rio Grande do Sul;	Vaz & Teixeira (2016), Bequaert (1953), Moreira et al. (2019)
	<i>Falco femoralis</i>	Rio Grande do Sul	Bequaert (1953)
	<i>Falco peregrinus</i>	Paraná	Vaz & Teixeira (2016)
	<i>Falco sparverius</i>	Rio Grande do Sul	Moreira et al. (2019)
	<i>Falco sparverius cearae</i>	Rio Grande do Sul	Bequaert (1953)
	<i>Ibycter americanus</i>	São Paulo	Bequaert (1953)
	<i>Micrastor ruficallis</i>	Paraná	Graciolli & Carvalho (2003)
	<i>Milvago chimachima</i>	Paraná	Graciolli & Carvalho (2003)
	<i>Milvago chimango</i>	Rio Grande do Sul	Lambrech et al. (2015)
	Galliformes	<i>Penelope obscura</i>	Paraná
<i>Crax blumenbachii</i>		Rio Grande do Sul	Moreira et al. (2019)
Pelecaniformes	<i>Nycticorax nycticorax hoactli</i>	São Paulo	Bequaert (1953)
Psittaciformes	<i>Amazona vinacea</i>	Rio Grande do Sul	Bequaert (1953)

The red-legged seriema (*Cariama cristata* Linnaeus, 1766) is an avian species from the order Cariamiformes, Cariamidae family. It is 75 to 90 cm high, with a fairly long neck, tail, and legs. These birds are capable predators, but are also opportunistic feeders with a varied diet, feeding on arthropods, lizards, snakes, small rodents, eggs, grains, and fruits (Sick, 1997). This species is found in Argentina, Uruguay, Paraguay, Bolivia, and central Brazil, where it is commonly found in the Cerrado biome (De Almeida, 1994). The aim of this study was to report, for the first time, the occurrence of the hippoboscid fly *Ornithoctona erythrocephala* on a red-legged seriema (*Cariama cristata*).

An adult free-living red-legged seriema was received for necropsy at the Veterinary Pathology Department of the School of Agricultural and Veterinarian Sciences (FCAV/Unesp), Jaboticabal, Brazil. The avian specimen died after a car incident in the city of Uchoa, São Paulo (20°57'10" S, 49°10'29" W). The bird was found still alive, and died during transportation to the institution. The necropsy was performed soon after arrival. A single Diptera specimen was found between the bird feathers. The insect was carefully recovered, conserved in absolute alcohol, and shipped to the Institute of Biosciences of the Federal University of Mato Grosso do Sul, for proper identification. Identification was performed under a stereomicroscope using the identification key proposed by Gracioli & Carvalho (2003).

The fly (Figure 1) was identified as a female specimen of *O. erythrocephala* based on morphological characters. These hippoboscids are large, flat-bodied, and small-headed flies. They present strong claws on their feet and a membranous abdomen, especially among females. Most of the species are winged with flying capacity, and a few are brachypterous (Rodhain, 2015; Gracioli, 2016). Flies belonging to the *Ornithoctona* genus are large in size, ocelli are present, antenna processes are spoon-shaped, and ribbed wings are devoid of microscopic hair (Lutz et al., 2006). *Ornithoctona erythrocephala* may be distinguished from other species of the genus by its very short antennal appendages and entirely bare wings, where a small alula is present (Lutz et al., 2006; Maa, 1962).



**Figure 1.** A female specimen of *Ornithoctona erythrocephala*. (A) Dorsal aspect. Note the small head (arrow); (B) Dorsal aspect. Note the spoon-shaped antenna processes (arrow); (C) Dorsal aspect. Note the ocelli (arrow); (D) Ventral aspect. Note the membranous abdomen (arrow); (E) Ventral aspect. Note the strong claws in the feet (arrows); (F) Cranial aspect. Note the short antennal appendages. Stereoscopic microscope. Scale bars for A, D and E = 2mm. Scale bars for B, C and F = 0.5mm.

This dipteran species occurs throughout the American continent (Maa, 1969; Tossas, 2001). Maa (1969) described 14 orders, comprising 25 families and 76 genera of birds serving as hosts for *O. erythrocephala*. Since then, several other avian species have been reported as hosts for *O. erythrocephala*, evidencing its low host specificity. In Brazil, even though *O. erythrocephala* have already been described in nine orders, Falconiformes and Accipitriformes

concentrate the majority of the reports (Table 1), suggesting that species from these orders may represent important dispersers of these hippoboscids. Hippoboscids flies have the habit of quickly darting from a host when the warmth begins to leave the body (Johnson, 1925), which may take place during prey/predator interactions. Falconiformes and Accipitriformes, according to the species, may feed on smaller birds and/or avian carcasses, allowing the fly to move from a preyed bird to a predator during its feeding.

Louse flies can be detrimental to the host's health. Under heavy infestation, Hippoboscidae flies may be responsible for weight loss and anemia (Rodhain, 2015). Tella et al. (1995) evaluated the effect of a high louse-fly (*Crataerina melbae*) infestation in Alpine swifts (*Apus melba*), and suggested that heavy infestations have a short duration, not affecting the birds' physical condition. Few reports on *O. erythrocephala* from Brazil described the number of individuals collected per bird. These reports frequently describe the presence of only one or two specimens parasitizing each bird (Tossas, 2001; Graciolli & Bispo, 2005; Moreira et al., 2019), similar to what was described in the present report, where only one specimen was recovered. The rapid flight of the Hippoboscids species may be the reason why so few individuals are recovered from infested birds (Johnson, 1925). To the best of authors' knowledge, studies on the parasite burden are not available for *O. erythrocephala*, which precluded inferences regarding this aspect of the parasitism.

Knowing the ectoparasite diversity in avian species is extremely important. It is a basic requirement in studies regarding species conservation, and helps to better understand the host-parasite interactions and the ecology of these populations (Lambrecht et al., 2015). Until now, there have been no previous reports on the Carriamidae family acting as hosts for this fly species. Thus, this work provides a new record of an avian species housing *O. erythrocephala*.

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