








Pupipara (Diptera, Hippoboscidae) in wild birds attended at a rehabilitation center in southern Brazil

Pupíparas (Diptera, Hippoboscidae) em Aves Silvestres Atendidas em Centro de Reabilitação no Sul do Brasil

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Abstract

The hippoboscids are cosmopolitan permanent obligate hematophagous ectoparasites of birds, domestic and wild mammals and, occasionally, humans. Some species may act as vectors or hosts of etiological pathogenic agents. The aims of this study were to report on the first cases of Hippoboscidae in *Crax blumenbachii* and *Parabuteo unicinctus*; to provide new reports from Brazil on *Tyto furcata* and *Asio stygius* parasitized by *Icosta americana*; to report on individuals of *Bubo virginianus*, *Falco sparverius* and *Accipiter striatus* parasitized by genera *Ornithoctona*; and to provide new reports on parasitism of *O. erythrocephala* in the state of Rio Grande do Sul. The birds of prey and *C. blumenbachii* were attended at a rehabilitation center in Porto Alegre and at a veterinary hospital in Cruz Alta. These new records demonstrate the huge gap that exists regarding studies on avian ectoparasites and highlight potential vectors of hemoparasites for the bird species studied.

Keywords: Hematophagous ectoparasites, flies, birds of prey, cracids, hippoboscidae, Southern Brazil.

Resumo

Os hipoboboscídeos são ectoparasitos hematófagos obrigatórios, permanentes e cosmopolitas de aves, mamíferos domésticos e silvestres e, ocasionalmente, humanos. Algumas espécies podem atuar como vetores ou hospedeiros de agentes patogênicos etiológicos. Os objetivos deste estudo foram relatar os primeiros casos de Hippoboscidae em *Crax blumenbachii* e *Parabuteo unicinctus*; fornecer novo relato do Brasil sobre *Tyto furcata* e *Asio stygius* parasitados por *Icosta americana*; relatar indivíduos de *Bubo virginianus*, *Falco sparverius* e *Accipiter striatus* parasitados pelo gênero *Ornithoctona*; e fornecer novos relatos sobre parasitismo de *O. erythrocephala* no estado do Rio Grande do Sul. As aves de rapina e *C. blumenbachii* foram atendidas em um centro de reabilitação em Porto Alegre e em um hospital veterinário em Cruz Alta. Esses novos registros demonstram a enorme lacuna que existe em relação aos estudos sobre ectoparasitas aviários e destacam potenciais vetores de hemoparasitos para as espécies de aves estudadas.

Palavras-chave: Ectoparasitos hematófagos, moscas, aves de rapina, cracídeos, hippoboscidae, Sul do Brasil.

Introduction

Hippoboscid flies are cosmopolitan permanent obligate hematophagous ectoparasites of birds, domestic and wild mammals and, occasionally, humans (RODHAIN, 2015). The females of these flies do not lay eggs, but grow larvae internally; when fully developed, the larvae are released and pupated immediately

(HUTSON, 1971). Some species may act as vectors or hosts of etiological agents such as bacteria, helminths and protozoa. Among these, *Pseudolynchia canariensis* is frequently found in pigeons, causing damage to these birds, and is the only known vector of *Haemoproteus columbae* (SERRA-FREIRE & MELLO, 2006; RAHOLA et al., 2011; RODHAIN, 2015).

Farajollahi et al. (2005) detected RNA of the West Nile virus in specimens of *Icosta americana* that were parasitizing birds of prey. The *Rickettsia raoultii* has been detected molecularly in

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Melophagus ovinus (LIU et al., 2016), although Rickettsiae do not have any significant impact on birds.

Parabuteo unicinctus, *Falco sparverius*, *Bubo virginianus*, *Tyto furcata*, *Asio stygius*, *Rupornis magnirostris*, *Caracara plancus* and *Accipiter striatus* are predatory birds with strong presence in Latin America. They balance biodiversity by controlling the populations of rodents, lizards, snakes and bats. *Crax blumenbachii* is endemic to the Atlantic Forest of southeastern Brazil, but destruction of the biome and hunting have led to significant decline in this species, which is now endangered (STRAHL et al., 1995; BIRDLIFE INTERNATIONAL, 2016).

The aims of this study were to report on the first cases of Hippoboscidae in *C. blumenbachii* and *P. unicinctus*; to provide new reports from Brazil on *T. furcata* and *A. stygius* parasitized by *I. americana*; to report on individuals of *B. virginianus*, *F. sparverius* and *A. striatus* parasitized by genera *Ornithoctona*; and to provide new reports on the distribution and parasitism of *O. erythrocephala* in the state of Rio Grande do Sul.

Material and Methods

The birds evaluated here were received for veterinary medical care at the Conservation and Rehabilitation Center for Wild Animals (PRESERVAS) of the Federal University of Rio Grande do Sul (UFRGS), in Porto Alegre, except for a specimen of *T. furcata*, which was attended at the Veterinary Hospital of Cruz Alta, between August 2015 and August 2018. Any ectoparasites that were observed on these birds were removed from them, preserved in 70% ethanol and sent for identification. The parasites were identified using the keys published by Hutson (1984) and Graciolli & Carvalho (2003), and species were photographed as exemplified in Figure 1.

Results

In total, 12 species of Hippoboscidae were identified on nine birds. These birds were all free-living, with the exception of one individual of *C. blumenbachii*, which was kept in captivity. The results, places of origin and living conditions (free-living or in captivity) of these birds are presented in Table 1.

Discussion

From a bibliographical survey that we conducted, this is the first report of parasitism by Hippoboscidae in *C. blumenbachii* and *P. unicinctus*. These birds were parasitized by *O. erythrocephala*. In cracids, Vaz & Teixeira (2016) observed *O. erythrocephala* parasitizing *Penelope obscura* in the state of Paraná, Brazil. Also in Brazil, the genus *Ornithoctona* was found in birds of prey in the states of Mato Grosso, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul. Two females of *O. erythrocephala* were observed parasitizing *Milvago chimango* in the southern part of Rio Grande do Sul (LAMBRECHT et al., 2015).

Gregor et al. (1973) found that *F. sparverius* was parasitized by *O. erythrocephala* in Cuba and cited a report by Maa (1969),

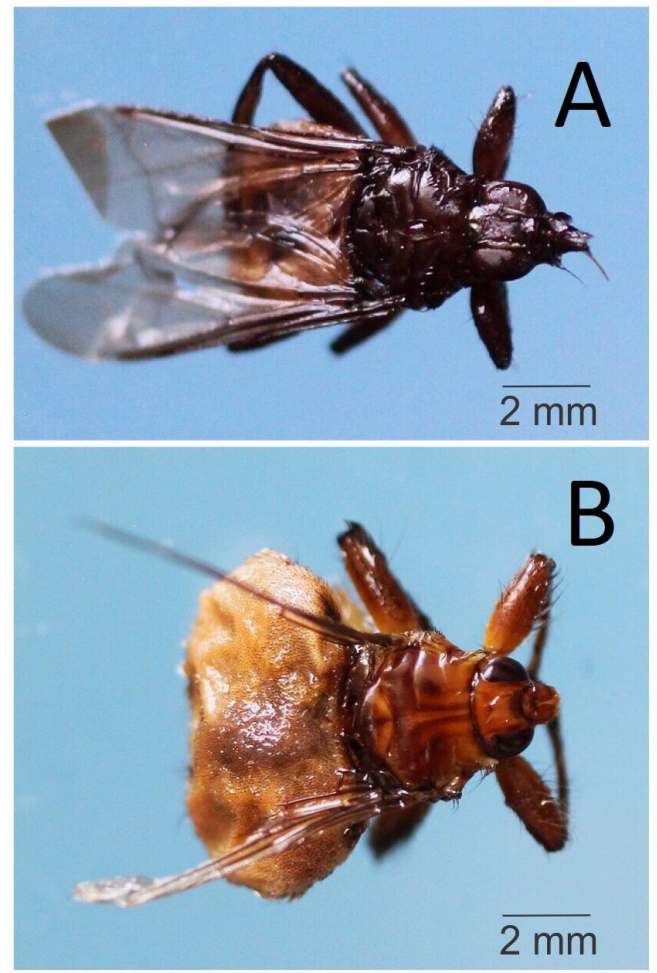


Figure 1. Specimens identified of Hippoboscidae. A = *Icosta Americana*; B = *Ornithoctona erythrocephala*.

who had found that it was parasitized by *Ornithoctona* sp., *Ornithoica* sp., *Ornithophila metallica*, *Ornithophila gestroi*, *Ornithomya* sp. and *Phthona modesta*. However, the present study is the first report from Brazil.

Vaz & Teixeira (2016) observed *O. erythrocephala* parasitizing newly captured free-living individuals of the species *R. magnirostris* and *C. plancus* in Paraná. However, the present study provides a new record of this parasitism in Rio Grande do Sul. Mueller et al. (1969) reported *O. erythrocephala* in *B. virginianus* and *A. striatus* in Wisconsin, USA. The genus *Ornithoctona* in *B. virginianus* and *A. striatus* was observed in the present study for the first time in Brazil.

Icosta is the largest genus of the family Hippoboscidae, with about 65 species (KEIRANS, 1975). It has already been discovered in Paraná and Santa Catarina. *I. americana* and *I. rufiventris* have been reported from the owls *Megascops atricapilla*, *M. sanctaetatarinae*, *M. choliba*, *Athene cunicularia*, *Ciccaba virgata*, *Otus choliba* and *Strix hylophila* in Brazil (GRACIOLLI & CARVALHO, 2003; GRACIOLLI & BISPO, 2005). The *I. rufiventris* and *Ornithoica vicina* complete their life cycle in owls (MAA, 1969).

Table 1. Places of origin of the hosts and numbers of flies found.

Hosts	Species (Hippoboscidae)	N*	Place of origin in RS*	Living condition
<i>Parabuteo unicinctus</i>	<i>Ornithoctona erythrocephala</i>	1	Imbé	Free-living
<i>Falco sparverius</i>	<i>Ornithoctona erythrocephala</i>	2	Viamão	Free-living
<i>Bubo virginianus</i>	<i>Ornithoctona erythrocephala</i>	1	Porto Alegre	Free-living
<i>Crax blumenbachii</i>	<i>Ornithoctona erythrocephala</i>	1	Gravataí	Captivity
<i>Tyto furcata</i>	<i>Icosta americana</i>	1	Cruz Alta	Free-living
<i>Rupornis magnirostris</i>	<i>Ornithoctona erythrocephala</i>	2	Porto Alegre	Free-living
<i>Asio stygius</i>	<i>Icosta americana</i>	2	Porto Alegre	Free-living
<i>Caracara plancus</i>	<i>Ornithoctona erythrocephala</i>	1	Estrela	Free-living
<i>Accipiter striatus</i>	<i>Ornithoctona</i> spp.	1	Igrejinha	Free-living

N* = number of specimens of Hippoboscidae; RS* = state of Rio Grande do Sul.

The present study provides the first records of *Icosta americana* in *T. furcata* and *A. stygius* in Brazil.

Thus, this is the first report of parasitism by Hippoboscidae in *C. blumenbachii* and *P. unicinctus*. This report also describes new occurrences of the genera *Ornithoctona* and *Icosta* parasitizing birds of prey in Rio Grande do Sul and some other parts of Brazil.

Knowledge of the ectoparasite fauna in wild birds is of paramount importance, especially among birds threatened with extinction, because these pupipara have vector potential. In these birds, hemoparasites may be harmful to the population balance and may be especially pathogenic towards birds that are under stress through captivity.

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