

Communication

[Comunicação]

Hippoboscid flies in wild birds rescued at the Sorocaba Zoo, São Paulo, Brazil

[Dípteros hipoboscídeos em aves selvagens resgatadas pelo Zoológico de Sorocaba, São Paulo, Brasil]

R.H.F. Teixeira^{1,2,3} , M.L. Silva¹ , M.G. Caiuffa¹ , C.R.R. Gonzaga¹ , F.N. Matos¹ ,
A.L.M. Costa^{1,2} , T.C. Santos⁴ , C.A. Sant'Anna⁴ , L.A. Barros⁴ ¹Parque Zoológico Municipal Quinzinho de Barros (PZMQB), Sorocaba, SP, Brasil²Universidade Paulista “Julio de Mesquita Filho”, Unesp/Botucatu, Botucatu, SP, Brasil³Universidade de Sorocaba (Uniso), Sorocaba, SP, Brasil⁴Universidade Federal Fluminense (UFF), Niterói, RJ, Brasil

Zoos aquarium and wildlife rescue centers are excellent sources for studies on parasites identification and parasite-host interaction due to the great number and diversity of animals received. Sorocaba Zoo receives and rescues approximately 700 wild animals per year, mainly birds (62%), from Sorocaba Metropolitan Region, which covers 27 municipalities, reaching a total area of 11,611.34km², that has an intense anthropogenic pressure on environment.

Commonly, many animals arrive in poor health conditions and after proper treatment and quarantine period are released in nature. Although recommended by veterinarians and health authorities, the quarantine period is eventually neglected by some wildlife-maintaining institutions. This procedure must be respected to avoid parasite and other diseases transmission (Fraga *et al.*, 2011).

Hippoboscids flies are parasites usually associated with birds of prey (Accipitriformes, Cathartiformes, Falconiformes and Strigiformes) and pigeons (Columbiformes). Although less frequent, in Brazil hippoboscids were also collected on Passeriformes, Piciformes and Galliformes (Moreira *et al.*, 2019, Vélez *et al.*, 2020; Gomes *et al.*, 2021), corroborating other studies (Murgas *et al.*, 2014; Barino *et al.* 2021; Graciolli, Bispo, 2005; Graciolli and Oak, 2003; Liébana *et al.*, 2011).

The objective of this study was to determine the occurrence and identification of hippoboscid

flies in wild avian species. The hippoboscids were collected during triage examination of birds received or rescued at Sorocaba Zoo, São Paulo state, in Brazil.

MATERIAL AND METHODS

From January/2021 to June/2022, 597 birds were received and rescued at Sorocaba Zoo and 2.34% (14/597) had ectoparasites. The avian hosts were identified using external morphological characteristics, according to the Brazilian Committee of Ornithological Records (Pacheco *et al.*, 2021).

Hippoboscid flies collected during clinical examinations were stored in 70° GL alcohol and sent to the Laboratory of Diagnostic Support in Parasitic Diseases of the Fluminense Federal University (UFF), in labeled vials, informing the scientific and common names of the hosts, place and date of collection. At the laboratory, the fly species identification was made by microscopic analysis of morphological characteristics, using the keys proposed by Graciolli and Carvalho (2003).

RESULTS

The specimens of hippoboscids examined were diagnosed as to the following species: *Icosta american*, *Ornithoctona erythrocephala*, *Pseudolynchia canariensis* and *Stilbometopa podopostyla* (Fig. 1). The avian host species belonged to the families Accipitridae, Ardeidae, Cathartidae, Columbidae, Falconidae, Ramphastidae and Strigidae. (Table 1).

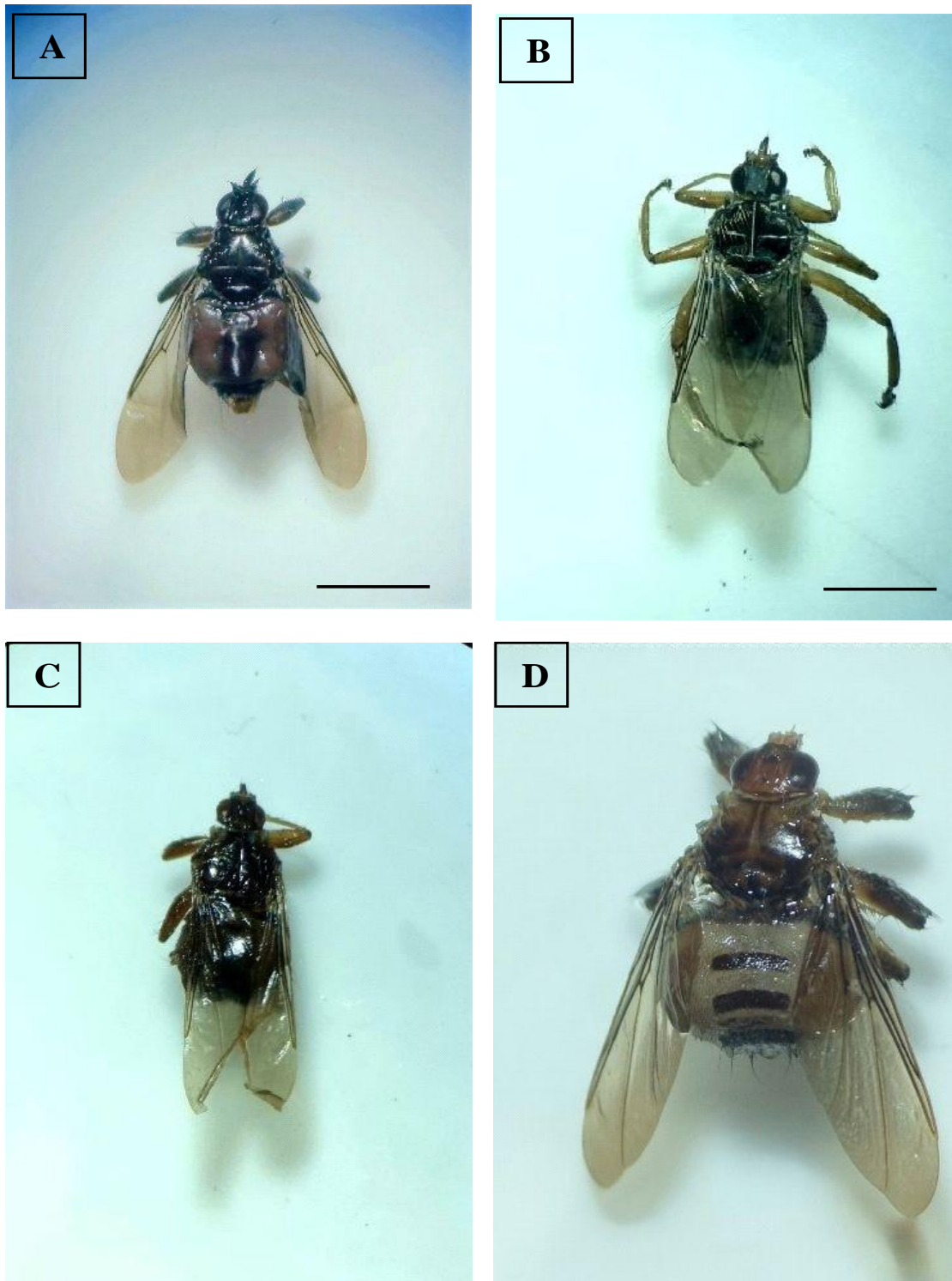


Figure 1. Adult specimens of hippoboscids flies collected from wild birds at Sorocaba Zoo: a) *Icosta american*, b) *Pseudolynchia canariensis*, c) *Stilbometopa podopostyla* and d) *Ornithoctona erythrocephala* (bar = 2 mm).

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Table 1. Relationship between host bird species and hippoboscids flies collected in clinical examinations at Sorocaba Zoo, from January 2021 to June 2022

Hosts Ectoparasites			
Family	Scientific name	Common name	Hippoboscidae
Strigidae	<i>Athene cunicularia</i>	Burrowing owl	<i>Icosta americana</i>
	<i>Megascops choliba</i>	Tropical screech owl	<i>Icosta americana</i>
	<i>Bubo virginianus</i>	Great horned owl	<i>Icosta americana</i>
	<i>Asio clamator</i>	Striped owl	<i>Ornithoctona erythrocephala</i> <i>Icosta americana</i>
Cathartidae	<i>Coragyps atratus</i>	American black vulture	<i>Icosta americana</i>
Falconidae	<i>Caracara plancus</i>	Southern caracara	<i>Ornithoctona erythrocephala</i>
Accipitridae	<i>Rupornis magnirostris</i>	Roadside hawk	<i>Ornithoctona erythrocephala</i>
Columbidae	<i>Patagioenas picazuro</i>	Picazuro pigeon	<i>Ornithoctona sp.</i>
	<i>Zenaida auriculata</i>	Eared dove	<i>Stilbometopa podopostyla</i>
	<i>Columba livia</i>	Domestic pigeon	<i>Pseudolynchia canariensis</i>
Ramphastidae	<i>Ramphastos toco</i>	Toco toucan	<i>Pseudolynchia canariensis</i>
Ardeidae	<i>Bubulcus ibis</i>	Cattle egret	<i>Pseudolynchia sp.</i>

DISCUSSION

Members of the family Hippoboscidae are mandatory hematophagous parasites, developing an important role in the transmission of pathogens to their hosts, besides causing anemia due to severe blood spoliation. According to Leite *et al.* (2013), parasitism by hippoboscids can affect the temporal and spatial dynamics of natural populations in avian communities. They can also act as vectors of West Nile fever virus for birds, compromising reproduction, causing immune depression, opportunistic infections, and death (Farajollah *et al.*, 2005; Gancz *et al.*, 2004).

In Brazil, hippoboscids are often found in Columbiformes, especially in domestic pigeons. In this host species, parasitosis can cause irritation due to hematophagy, beside the possibility of hematozoan transmission, such as *Haemoproteus columbae* (Gredilha *et al.*, 2008; Marcelino *et al.*, 2009). In this study, parasitized birds were not evaluated for the presence of hematozoa.

In agreement with a previous study conducted in 155 birds of prey received in a rescue center in Minas Gerais, Brazil, the parasitism by

Ornithoctona erythrocephala and *Icosta americana* reposted. (Barino *et al.*, 2021).

Studies conducted by Vaz and Teixeira (2016) and Moreira *et al.* (2019) reported parasitism by *Ornithoctona erythrocephala* and *Icosta americana* in avian, occurring in the Brazilian South and Southeast regions, respectively.

Parasitism by *Stilbometopa sp.* may be common in species of Columbidae. According to Adriano and Cordeiro (2001) *Stilbometopa sp.* can be found in wild doves (*Zenaida auriculata*) with a prevalence of 13.8% (46/331). In this study, only one specimen of eared dove was examined, positive for this parasitism.

Studies of this nature contribute to the knowledge of the parasitic fauna of wild animals while they allow establishing the areas of occurrence and geographic distribution of ectoparasites.

CONCLUSION

Most of the birds received at the Sorocaba Zoo presented ectoparasites, demonstrating how important it is to search for these organisms during the physical examination and quarantine.

This care and identification are very important because these ectoparasites can be responsible for diseases.

Studies on hippoboscids parasitizing wild animals are still scarce in Brazil. The diagnosis and research aiming to the identification of the wild avian host range for hippoboscids may be of help for the determination of risks associated to

the parasitic exploitation and hemoparasitism. The knowledge regarding the host occurrence for hippoboscids may help in determining the biosecurity and strategies for prevention. The biology of hippoboscids was not investigated.

Keywords: Ectoparasite, Diptera, Hippoboscidae, wild animals

RESUMO

Os dípteros hipoboscídeos são parasitos de aves e ocasionalmente de alguns mamíferos, encontrados em todos os biomas brasileiros, com aproximadamente 30 espécies, descritas em 10 gêneros. Durante o período de janeiro de 2021 a junho de 2022, foram coletados hipoboscídeos em exames de rotina de aves das famílias Accipitridae, Ardeidae Cathartidae, Columbidae, Falconidae, Ramphastidae e Strigidae, recebidas ou resgatadas pelo Zoológico de Sorocaba. Os parasitos foram encaminhados para diagnóstico taxonômico no Laboratório de Apoio Diagnóstico de Doenças Parasitárias da Universidade Federal Fluminense (UFF), em Niterói, RJ, onde as seguintes espécies foram identificadas: *Icosta americana*, *Ornithoctona eritrocephala*, *Pseudolynchia canariensis* e *Stilbometopa podopostyla*. Existem poucas informações na literatura sobre a especificidade parasitária, a relação parasito-hospedeiro e a importância desses ectoparasitos em hospedeiros selvagens.

Palavras-chave: ectoparasito, Diptera, Hippoboscidae, animais selvagens

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