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Chewing lice (Insecta, Phthiraptera) parasitizing birds in Botucatu, SP, Brazil

Malófagos (Insecta, Phthiraptera) parasitando aves em Botucatu, SP, Brasil

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Abstract

Three hundred and ten birds were examined for chewing lice. Eleven individuals belonging to eleven species of exotic (1), and wildlife Brazilian birds (10) were positive for these ectoparasites. Ten species of chewing lice were identified (three belonging to the family Menoponidae and seven to Philopteridae). Three of these species were recognized as contaminators, and two were identified in Brazil for the first time. Distribution of these parasites and their hosts are discussed.

Keywords: ectoparasites, birds, entomology, animal health.

Resumo

Trezentas e dez aves de espécies distintas foram analisadas quanto à presença de piolhos, sendo encontradas onze parasitadas. Destas, uma espécie (1) era exótica e dez (10) eram silvestres da avifauna brasileira (10). Foram identificadas neste estudo dez espécies de piolhos (três pertencentes à família Menoponidae e sete a família Philopteridae). Destes piolhos, três espécies foram classificadas como contaminantes e duas espécies estão sendo relatadas no Brasil pela primeira vez. A distribuição destes parasitos e os seus hospedeiros habituais são discutidos neste artigo.

Palavras-chave: ectoparasitos, aves, entomologia, saúde animal.

Introduction

Chewing lice of the order Phthiraptera are obligate host-specific parasitic insects commonly observed in birds. The entire life cycle of chewing lice (i.e., egg, three nymph, and adult stages) is developed on a single host (Serra-Freire and Mello, 2006). Chewing lice usually cause severe bite-induced pruritus leading to such a discomfort that the bird can stop feeding in an attempt to free itself of the parasites (Guimarães *et al*., 2001; Serra-Freire and Mello, 2006). It is common to observe self-mutilation of the bird that might increase the risk of secondary bacterial infection (Linardi, 2001). There are almost 4,000 species of chewing lice parasitizing birds (Price *et al*., 2003) and at least forty of them are of medical and economic importance for domestic birds (Price & Graham, 1997). Two (i.e., Amblycera and Ischnocera) of the four suborders, composing the order Phthiraptera, are found on birds. Regarding the suborder Amblycera, only three (i.e., Menoponidae, Laemobothriidae and Ricinidae) of six families has species parasites from birds, while the suborder Ischnocera (which has two recognized families) only species belonging to the family Philopteridae parasitizes birds (Johnson and Clayton, 2003). There are only few reports on the geographic distributions of chewing lice worldwide, particularly in the Neotropics. Thus, the aim of this article is to describe the occurrence of chewing lice in ten species of wildlife birds belonging to native avian fauna, and one species of exotic bird in Brazil.

Material and methods

Three hundred and ten birds belonging to 67 species and 14 orders were attempted in the veterinary hospital from several origins (private owner, zoo collections and traffic seizure) and examined in the Avian Pathology Laboratory of the School of Veterinary Medicine and Animal Science (FMVZ-UNESP), São Paulo State University, Botucatu, SP, Brazil. Two hundred and two specimens belonged to wildlife native avian fauna and 88 animals were exotic birds introduced in Brazil for ornamental purposes. Parasites were collected from dead and live birds. Collection in dead birds was performed using a forceps. A pyrethroid powder (Bolfo®, Bayer Healthy Care, Germain) was applied in live birds. After five minutes, the white paper sheets placed on the bottom of the cages were removed and chewing lice collected using forceps. No paper sheets were reused in order to avoid iatrogenic straggling. Specimens were fixed and conserved in 70% ethanol for further analysis. The samples is analyzed in Ixodides Laboratory of the Departament of Entomology, Instituto Oswaldo Cruz (FIOCRUZ), Manguinhos, RJ, Brazil, and the identification of chewing lice was performed based on the nomenclature by Price *et al*. (2003).

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Results and discussion

The order, family, common name, and number of examined birds are summarized in table 1. Parasites were observed in only 11 individuals belonging to 11 different species. All but three specimens (*Pavo cristatus*, *Ramphastos toco*, and *Amazona aestiva*) were wildlife birds (see table 1). Results regarding suborder, family, species, number and sex of adult specimens, and number of nymphs of chewing lice are summarized in Table 2.

Occurrence of chewing lice on captive wildlife and exotic birds in Brazil has been documented (Valente et al., 2001; Brum and Rickes, 2003; Brum et al., 2003; Silva et al., 2004; Valim et al., 2005). However, these data were from bird species different than those evaluated in our work. We observed *Struthiolipeurus struthionis* on *Rhea americana*. In general, *R. americana* is the natural host for *Struthiolipeurus nandu* and two more *Struthiolipeurus* species (Price et al., 2003), but no for *S.*

Table 1: Occurrence of chewing lice on exotic and wild birds from Botucatu city during the years of 2005 to 2007 examined in the Avian Pathology Laboratory of FMVZ-UNESP

Species	Common name	Examined birds	Parasited birds	Chewing lice genera
Anseriformes				
Anatidae				
Aix spansa[1]	Wood duck	1	-	
Anas platyrinchus[1]	Domestic duck	5	-	
Anser anser[1]	Greylag goose	2	-	
Cairina moschata	Muscovy duck	6	-	
Dendrocygna viduata	White-faced tree-duck	1	-	
Charadriiformes				
Charaiidrae				
Vanellus chillensis	Southern lapwing	1	-	
Ciconiiformes				
Accipitridae				
Buteo magnirostris	Roadside hawk	2	-	
Ardeidae				
Ardea cocoi	White-necked heron	1	-	
Bubulcus ibis	Cattle egret	1	1	*Ciconiphilus decimfasciatus* (Boisduval and Lacordaire, 1835)
Butorides striatus	Striated heron	1	-	
Egretta thula	Snowy egret	1	1	*Ciconiphilus decimfasciatus*
Syrigma sibilatrix	Whistling heron	1	-	
Tigrisoma fasciatum	Rufescent tiger-heron	1	-	
Falconidae				
Falco sparverius	American kestrel	1	-	
Polyborus plancus	Crested caracara	1	-	
Columbiformes				
Columbidae				
Columba livia[1]	Rock pigeon	7	-	
Columbina talpacoti[1]	Ruddy ground-dove	1	-	
Streptopelia risoria[1]	Ringneck dove	1	-	
Craciformes				
Cracidae				

Species	Common name	Examined birds	Parasited birds	Chewing lice genera
Penelope superciliaris	Rusty-marginated guan	1	1	*Menopon gallinae*[2] (Linnaeus, 1758) *Menacanthus spp.* Goniodes spp.[2]
Cuculiformes				
Cuculidae				
Guira guira	Guira cuckoo	1	1	*Osborniella guiraensis* (Kellogg, 1906)
Piaya cayana	Squirrel cuckoo	1	-	
Galliformes				
Phasianidae				
Pavo cristatus[1]	Indian peafowl	2	1	*Amyrsidea spp*.
Numidae				
Numida meleagridis[1]	Guinea fowl	1	-	
Gruiformes				
Cariamidae				
Cariama cristata	Red-legged seriema	1	1	*Heptapsogaster frielingi* (Eichler, 1941); *Tinamotaecola wardi* (Hellenthal, Price and Timm, 2002)
Rallidae				
Aramides cajanea	Gray-necked wood rail	2	-	
Gallinula melanops	*Spot-flanked gallinule*	1	-	
Porphyrio martinica	Purple gallinule	1	-	
Passeriformes				
Cardinalidae				
Saltator similis	Green-winged saltator	6	-	
Corvidae				
Cyanocorax cristatellus	Curl-crested jail	1	-	
Emberezidae				
Coryphospingus cucullatus	Red-crested finch	4	-	
Sicalis flaveola	Saffron finch	19	-	
Sporophila angolensis[1]	Lesser seed-finch	27	-	
Sporophila caerulescens	Double-collared seedeater	24	-	
Sporophila lineola	Lined seedeater	1	-	
Sporophila maximiliani[1]	Great-billed seed-finch	12	-	
Sporophila nigricollis	Yellow-bellied seedeater	1	-	
Volatinia jacarina	Blue-black grassquit	1	-	
Zonotrichia capensis	Rofous-collared sparrow	6	-	

Species	Common name	Examined birds	Parasited birds	Chewing lice genera
Estrildidae				
Lonchura striata[1]	White-rumped munia	2	-	
Erythrura gouldiae[1]	Goudian finch	30	-	
Taeniopygia guttata[1]	Zebra finch	3	-	
Fringilidae				
Carduelis carduelis[1]	European goldfinch	1	-	
Carduellis magellanica	Hooded siskin	40	-	
Serinus canaria[1]	Canary	20	-	
Icteridae				
Molothrus bonariensis	Shiny cowbird	1	-	
Gnorimopsar chopi	Chopi black-bird	1	-	
Muscicapidae				
Turdus leucomellas	Pale-breasted thrush	1	-	
Turdus rufiventris	Rufous-bellied thrush	2	-	
Thraupidae				
Euphonia violacea	Violaceus euphonia	1	-	
Piciformes				
Picidae				
Colaptes campestris	Campo flicker	1	-	
Ramphastidae				
Ramphostos toco[b]	Toco toucan	9	1	*Columbicola columbae*[2] (Linnaeus, 1758)
Psittaciformes				
Cacatuidae				
Nynphicus hollandicus[1]	Cockatiel	5	-	
Psittacidae				
Agapornis fisheri[1]	Fisher's lovebird	2	-	
Agapornis personata[1]	Blacked-masked lovebird	2	-	
Agapornis roseicollis[1]	Peach-faced lovebird	1	-	
Amazona aestiva[1]	Blue-fronted amazon parrot	12	1	*Paragoniocotes semicingulatus* (Piaget, 1890)
Amazona amazonica[1]	Orange-winged amazon parrot	2	-	
Amazona xanthops[1]	Yellow-faced amazon parrot	1	-	
Aratinga leucophtalmus	White-eyed conure	8	-	
Brotogeris tirica	Plain parakeet	1	-	
Melopsittacus undulatus[1]	Budgerigar	1	-	
Neophema elegans[1]	Elegant parrot	1	-	
Psittacula krameri[1]	Ring-neck	1	-	
Strigiformes				
Strigidae				
Athene cunicularia	Burrowing owl	1	1	*Strigiphilus desertae* (Carriker, 1966)

Species	Common name	Examined birds	Parasited birds	Chewing lice genera
Tytonidae				
Tyto alba	Barn owl	2	1	*Strigiphilus aitkeni* (Clay, 1966)
Struthioniformes				
Rheidae				
Rhea americana	Greater rhea	4	1	*Struthiolipeurus nandu* (Eichler, 1950)
Trochiliformes				
Trochilidae				
Eupetomena macroura	Swallow-tailed hummingbird	6	-	

[1]captive birds, 2parasite species considered as contamination.

Table 2: Chewing lice species observed on exotic and wild birds from Botucatu city during the years of 2005 to 2007 examined in the Avian Pathology Laboratory of FMVZ-UNESP

Phthiraptera			Samples		
Subordem	**Family**	**Species**	♂	♀	**Nymphs**
Amblycera	Menoponidae	*Amyrsidea spp.*	-	1	4
		Ciconiphilus decimfasciatus	1	4	-
		Menacanthus spp.	-	2	1
		Menopon gallinae	4	2	-
		Osborniella guiraensis	7	6	8
Ischnocera	Philopteridae	*Columbicola columbae*	7	6	1
		Goniodes spp.	-	-	2
		Heptapsogaster frielingi	4	3	2
		Paragoniocotes semicingulatus	6	15	-
		Strigiphilus aitkeni	5	6	3
		Strigiphilus desertae	7	7	9
		Tinamotaecola wardi	1	2	2
		Struthiolipeurus nandu	1	2	-

Some chewing lice were found on unexpected hosts (Price et al., 2003). This phenomenon was defined by Hopkins (1939) and Pilgrim and Palma (1982) as “straggling” and “contamination”, respectively. The term “straggling” is used when chewing lice are found on an atypical host. The “stragglers” are the result of an infestation in captive birds not related with human handling. It mainly occurs when birds of different species are placed together. The term “contamination” is used when chewing lice infest uncommon hosts due to human handling. Cases of “straggling” i.e., *Menopon gallinae,* and *Goniodes* spp. *struthionis,* whose main host is the ostrich (Dominguez-De-Tena et al., 1976; Mey, 1998). Parasitism by *S. struthionis* on *R. americana* was previously described in Brazil (Sinkoc et al., 2005), but this phenomenon was considered as straggling.

Ciconiphilus decimfasciatus can be found on 32 species of egrets e.g., *Bubulcus ibis* and *Egretta thula* (Price and Beer 1965; Price et al., 2003). This chewing louse was recently found by Albano et al. (2005) on Great egret (*Ardea alba*), on the State of Rio Grande do Sul, Brazil.

Both chewing lice, *Heptapsogaster frielingi* and *Tinamotaecola wardi* (Hellenthal et al., 2002) found on *Cariama cristata* in our study were previously reported in specimens from Brazil.

Both *Strigiphilus aitkeni* found on *Tyto alba*, and *Paragoniocotes semicingulatus* found on *Amazona aestiva* were already reported in Brazil (Guimarães, 1947; Clay, 1966). On the other hand, neither *S. desertae* found on *Athene cunicularia* nor *Osborniella guiraensis* collected on *Guira guira* were previously mentioned in Brazil, and so are reported in this study for the very first time.

Absence of male specimens of *Amyrsidea* spp. impeded specific identification of chewing lice collected from *Pavo cristatus*. Although *P. cristatus* is often infested by two *Amyrsidea* species (Scharf and Price, 1983, Price et al., 2003), it was not possible to determine to which species the chewing lice specimens belong.

parasitizing *Penelope superciliaris*; and *Columbicola columbae* parasitizing *Ramphastos toco*, are shown in Chart 1.

There is no report of chewing lice on *P. superciliaris*. Thus, we believe that the presence of *M. gallinae* and *Goniodes* sp. on this host is not natural and represents a case of straggling since they are found exclusively on Galliformes, family Phasianidae (Clay, 1940; Emerson, 1954).

Although Valim *et al*. (2005) had reported *Menacanthus chaparensis* on *P. superciliaris,* the specimens of *Menacanthus* spp. were morphologically more similar to those found on the order Galliformes, family Phasianidae, than to those typically found on Craciformes.

Columbicola columbae on *R. toco* is a typical case of straggling. *Austrophilopterus* is the only genus of the family Philopteridae found on the family Ramphastidae, order Piciformes (Carriker, 1950; Price and Weckstein, 2005), and the genus *Columbicola* is exclusively found on birds of the family Columbidae, order Columbiformes (Tendeiro, 1955; Clayton and Price, 1999).

We infer that straggling cases in our study are easily justified due to voluntary or involuntary exposure of wildlife birds to urban and/or farm environments. So, we found chewing lice from non-native species parasitizing wildlife native species. Identification of parasitic fauna is critical due to the ecologic importance of these biological entities in the control of populations of wildlife birds, as well as to identify exotic species parasitizing native birds. Our study contributes to the epidemiological mapping of avian chewing lice and represents the first description in the region of Botucatu, São Paulo state, Brazil.

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