

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

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

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

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

<sup>1</sup>captive birds, <sup>2</sup>parasite 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		
Suborder	Family	Species	♂	♀	Nymphs
Amblycera	Menoponidae	<i>Amysidea</i> spp.	-	1	4
		<i>Ciconiphilus decimfasciatus</i>	1	4	-
		<i>Menacanthus</i> spp.	-	2	1
		<i>Menopon gallinae</i>	4	2	-
		<i>Osborniella guiraensis</i>	7	6	8
Ischnocera	Phloptoridae	<i>Columbicola columbae</i>	7	6	1
		<i>Goniodes</i> spp.	-	-	2
		<i>Heptapsogaster frielingi</i>	4	3	2
		<i>Paragoniocotes semicingulatus</i>	6	15	-
		<i>Strigiphilus aitkeni</i>	5	6	3
		<i>Strigiphilus desertae</i>	7	7	9
		<i>Tinamotaecola wardi</i>	1	2	2
	<i>Struthiolipeurus nandu</i>	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 "stragglers" and "contamination", respectively. The term "stragglers" 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 "stragglers" 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 stragglers.

*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 *Amysidea* spp. impeded specific identification of chewing lice collected from *Pavo cristatus*. Although *P. cristatus* is often infested by two *Amysidea* 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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