

Chewing lice of wild birds from Portugal: neglected group of ectoparasites

André Tomás^{1*}, Ricardo Palma², Maria Teresa Rebelo¹, Isabel Pereira da Fonseca³

¹ Center for Environmental and Marine Studies/Department of Animal Biology, Faculty of Sciences of University of Lisbon, Campo Grande 1749-016 Lisbon, Portugal

² Museum of New Zealand Te Papa Tongarewa, P.O. Box 467, Wellington 6011, New Zealand

³ CIISA - Centre for Interdisciplinary Research in Animal Health, Faculty of Veterinary Medicine, University of Lisbon, Av. Universidade Técnica, 1300-477 Lisbon, Portugal

Background

Chewing lice (Phthiraptera: Ischnocera and Amblycera) are permanent, obligate and host-specific ectoparasites commonly found on birds. The lice transmission occurs by direct contact among birds, or in some cases by phoretic association with hippoboscidae fly [1].

Although chewing lice are relatively benign parasites, when present in large numbers, they can cause changes in flight performance, thermoregulatory capacity, body mass, survival and sexual selection of the birds [2-4].

According to BirdLife International approximately 310 species of birds occur in Portugal. However, the number of louse species documented is very limited [5]. So, this study was carried out to determine chewing louse species of wild birds from Portugal.

Results

This work recorded 21 louse species, belong to suborders Amblycera (14 species) and Ischnocera (7 species), in Portugal. Chewing lice were found on 43 (21.94%) of the 196 specimens (36 species) of wild birds examined, independently of the method applied.

Table 1: Distribution of lice species according to their host bird species

Visually searched	n	Host scientific names	Louse species	Ni
	1	<i>Anas crecca</i>	<i>Trinoton queraquedulae</i> (Linnaeus, 1758)	1
	1	<i>Aquila fasciata</i>	<i>Degeeriella fulva</i> (Giebel, 1874)	1
	2	<i>Bubo bubo</i>	<i>Strigiphilus</i> sp. Mjöberg, 1910	1
	2	<i>Buteo buteo</i>	<i>Degeeriella fulva</i> (Giebel, 1874)	1
			<i>Craspedorrhynchus platystomus</i> (Burmeister, 1838)	1
			<i>Laemobothrion</i> (L.) <i>maximum</i> (Scopoli, 1763)	1
	1	<i>Fulica atra</i>	<i>Pseudomenapon pilosum</i> (Scopoli, 1763)	1
	6	<i>Gyps fulvus</i>	<i>Falcolipeurus quadripustulatus</i> (Burmeister, 1838)	6
			<i>Laemobothrion</i> (L.) <i>vulturis</i> (Fabricius [J.C.], 1775)	4
			<i>Nosopon castelli</i> Tendeiro, 1959	1
			<i>Colpocephalum turbinatum</i> Denny, 1842	3
	14	<i>Calidris alpina</i>	<i>Actornithophilus umbrinus</i> (Burmeister, 1838)	3
			<i>Lunaceps schismatus</i> Gustafsson and Olsson, 2012	2
			<i>Austromenapon lutescens</i> (Burmeister, 1838)	1
	14	<i>Larus michahellis</i>	<i>Actornithophilus piceus lari</i> (Packard, 1870)	4
	7	<i>Morus bassanus</i>	<i>Pectinopygus bassani</i> (Fabricius [O.], 1780)	5
			<i>Eidmanniella pustulosa</i> (Nitzsch [In Giebel], 1866)	4
	2	<i>Phoenicopertus roseus</i>	<i>Colpocephalum heterosoma</i> Plagel, 1880	2
			<i>Trinoton femoratum</i> Plagel, 1880	1
Fumigation chamber	32	<i>Sylvia atricapilla</i>	<i>Guimaraesiella tovarnikae</i> (Balát, 1981)	2
	33	<i>Turdus merula</i>	<i>Brueelia</i> sp. Kéler, 1936	15
			<i>Menacanthus eurysternus</i> (Burm., 1838)	1

n: number of birds examined; Ni: number of birds infested

Methodology

Data for this study were obtained from two fieldwork and sampling methods:

1st. Between September and December 2013, the plumage of each bird admitted at the Wildlife Rehabilitation and Investigation Centre of Ria Formosa – Association ALDEIA (RIAS/ALDEIA), and captured in mist-nets during scientific ringing sessions performed in the Ria Formosa Natural Park (PNRF), was visually searched for chewing lice, during approximately 2 minutes;

2nd. Between January and February 2018, Passeriformes birds were captured during scientific ringing sessions performed in the PNRF and exposed to ethyl acetate for 20 minutes, using fumigation chamber method, to collect chewing lice.

Lice specimens collected were prepared and slide-mounted according to the Canada Balsam technique and identified.

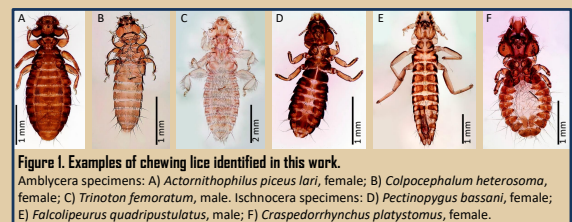


Figure 1. Examples of chewing lice identified in this work.

Amblycera specimens: A) *Actornithophilus piceus lari*, female; B) *Colpocephalum heterosoma*, female; C) *Trinoton femoratum*, male. Ischnocera specimens: D) *Pectinopygus bassani*, female; E) *Falcolipeurus quadripustulatus*, male; F) *Craspedorrhynchus platystomus*, female.

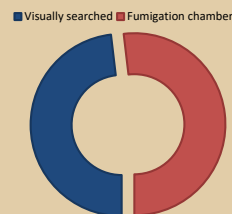


Figure 2. Prevalence (%) of chewing lice according two methods applied

One hundred and twenty-two birds were only visually examined, with 26 (21.3%) being parasitized. While for the fumigation chamber method, 74 birds were examined, with 17 (22.97%) infested.

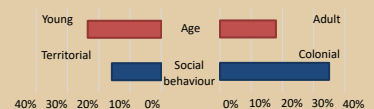


Figure 3. Prevalence (%) of chewing lice found on wild birds, according to age* and social behavior

*Birds with undetermined age (n=10) are not included in this statistical test

Prevalence of chewing lice was slightly higher in young birds (23.53%) than in adults (17.91%), but no significant differences were observed ($p > 0.05$).

Considering social behaviour, infestation rates of colonial birds (34.92%) were significantly higher than those of territorial birds ($p < 0.05$).

Conclusion

- This is the more exhaustive contribution to knowledge of avian chewing lice associated with birds in Portugal.
- Even though all host-parasite associations have been previously reported in other studies, we record 20 species of chewing lice for the first time from wild birds in Portugal.
- Our study showed that colonial birds were more significantly infested than territorial birds, i.e., the greater contact between colonial birds in colonies, during a nesting season, facilitates the transmission of lice.
- Fumigation chamber can be consider the best method to sampling passeriformes birds.
- These findings contribute to the knowledge of avian chewing lice from important birds areas in Portugal.



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Contact information

For further details, please contact: A. Tomás, e-mail address: andre_tomas2@hotmail.com

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