Some chewing lice (Phthiraptera) species as ectoparasites infested aquatic birds with a new record of three species from Al-Sanaf marsh/ southern Iraq

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(Received May 26, 2019; Accepted July 6, 2019)

Abstract

The present study was carried out to determine additional chewing lice of aquatic birds and additional data on the prevalence of chewing lice in aquatic birds found on the Southern marshes of Iraq. Sixty-nine of different species of aquatic birds were randomly collected and examined for chewing lice in Al-Sanaf marsh, which is located in Thi-Qar province / Southern Iraq, between October 2016 and February 2017, the lice placed in tubes containing 70% ethanol after that they cleared, mounted and identified according to morphological features. Twenty-five (36.23%) out of 69 aquatic birds were infested with chewing lice, a total of six lice species were identified from birds in the current study included Piagetiella titan and Pectinopygus forficulatus infested White Pelican Pelecanus onocrotalus, Actornithophilus piceus lari infested Slender-billed Gull Larus genei, Actornithophilus himantopi infested Black-Winged stilt Himantopus himantopus, Rallicola fulicae isolated from coot Fulica atra and Rallicola parani infested moorhen Gallinula chloropus. Three lice species: Pectinopygus forficulatus, Rallicola fulicae and Rallicola parani were recorded in current study for the first time in Iraq. We need further investigations of Phthiraptera fauna are very important, not only to complete the list, but also to provide information about parasite-host vector relationships and phylogenetic relation among species.

Keywords: Chewing lice, Aquatic birds, Al-Sanaf marsh, Southern Iraq

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Introduction

Chewing lice are small wingless insects, that are found as ectoparasites on birds and mammals, they are characterized by their chewing mouth parts (1), and they are permanent obligate ectoparasites feed on feathers and skin scales and cause skin irritation and suck blood, causing decrease in productivity of the host (2), as they deteriorate the quality of the plumage, provoke small holes on feathers, and increase feather breakage (3). Four thousand lice species were recorded on avian species in the world (4), most studies of chewing lice of birds in Iraq were concerned with chewing lice infested domesticated birds as chickens and pigeons (5,6,7). The studies about chewing lice of aquatic birds are very limited. The chewing lice fauna of aquatic birds is almost unknown in Al-Sanaf marsh which located in the western north part of Al-Hammar marsh eastern south of Thi-Qar province /southern Iraq its area is nearly 250 Km², it is used by many aquatic birds such as fish eating-birds, some new records for the aquatic bird louse fauna have been recorded in recent years (8-10).

The present study was carried out to document additional chewing lice of aquatic birds and determine the prevalence of chewing lice in aquatic birds found on the southern marshes of Iraq.

Materials and methods

A total of 69 aquatic birds belonging to five bird species white pelican P. onocrotalus, slender-billed gull L. genei, black-winged stilt H. himantopus, coot F. atra and moorhen G. chloropus were randomly collected from Al-Sanaf marsh and examined, these birds related to three orders and four families (Table 1).

Five aquatic bird species were collected from Al-Sanaf marsh and examined, these birds related to three orders and four families (Table 1).

Six different chewing lice species were identified from five aquatic birds: P. titan and P. forficulatus on white pelican P. onocrotalus, A. piceus lari on slender-billed gull L. genei, A. himantopi on black-winged stilt H. himantopus, R. fulicae on coot F. atra and R. parani infested moorhen G. chloropus. Three lice species P. forficulatus, R. fulicae and R. parani were recorded in the current study for the first time in Iraq (Table 2).

Piagetiella titan

This lice species was isolated from white pelican P. onocrotalus (Figure 1).

Pectinopygus forficulatus

This lice species was isolated from white pelican P. onocrotalus with prevalence 100% and mean of intensity 53.50 (Figure 2). The measurements of five males were total body length (3.32-3.54) 3.46 mm, head length (0.66 -0.69) 0.67 mm, head width (0.54-0.58) 0.56 mm, thorax length (0.61-0.67) 0.65 mm, thorax width (0.54-0.64) 0.59 mm, abdomen length (2.23-2.60) 2.33 mm, abdomen width (0.71-0.84) 0.80 mm.

Actornithophilus piceus lari

This lice species was isolated from slender-billed gull L. genei with prevalence 13.33% and mean of intensity 2.00 (Figure 3).

Actornithophilus himantopi

This lice species was isolated from black-winged stilt H. himantopus with prevalence 6.66% and mean of intensity 1.00 (Figure 4).
Table 1: Species of examined aquatic birds for chewing lice in the current study

<table>
<thead>
<tr>
<th>Order</th>
<th>Family</th>
<th>Common name of bird</th>
<th>Scientific name of bird</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelecaniformes</td>
<td>Pelecanidae</td>
<td>White Pelican</td>
<td>P. onocrotalus</td>
</tr>
<tr>
<td>Charadriiformes</td>
<td>Laridae</td>
<td>Slender-billed Gull</td>
<td>L. genei</td>
</tr>
<tr>
<td></td>
<td>Recurvirostridae</td>
<td>Black-Winged stilt</td>
<td>H. himantopus</td>
</tr>
<tr>
<td>Ralliformes</td>
<td>Rallidae</td>
<td>Coot</td>
<td>F. atra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moorhen</td>
<td>G. chloropus</td>
</tr>
</tbody>
</table>

Table 2: Aquatic bird species studied, infestation percentage and lice species

<table>
<thead>
<tr>
<th>Aquatic bird species</th>
<th>No. of examined birds</th>
<th>No. of infested birds</th>
<th>%</th>
<th>Lice species</th>
<th>Mean of intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Pelican P. onocrotalus</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>P. forficulatus*</td>
<td>-</td>
</tr>
<tr>
<td>Slender-billed Gull L. genei</td>
<td>15</td>
<td>2</td>
<td>13.33</td>
<td>A. piceus lari</td>
<td>2.00</td>
</tr>
<tr>
<td>Black-Winged stilt H. himantopus</td>
<td>15</td>
<td>1</td>
<td>6.66</td>
<td>A. himantopi</td>
<td>1.00</td>
</tr>
<tr>
<td>Coot F. atra</td>
<td>12</td>
<td>7</td>
<td>58.33</td>
<td>R. fulicae*</td>
<td>19.50</td>
</tr>
<tr>
<td>Moorhen G. chloropus</td>
<td>25</td>
<td>13</td>
<td>52.00</td>
<td>R. parani*</td>
<td>14.00</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>25</td>
<td>36.23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* First record in Iraq.

Figure 1: (A) Piagetiella titan lice showed anterior end, 40x. (B) larvae, 40x. (C) adult male posterior end, 100x. (D) adult female posterior end, 100x.
Figure 2: (A) *Pectinopygus forficulatus* lice showed adult male, 40x. (B) anterior end, 100x. (C) adult male posterior end, 100x. (D) male genitalia, 400x.

Figure 3: *Actornithophilus piceus lari* showed adult female, 40x.

Figure 4: *Actornithophilus himantopi* showed adult female, 40x.
**RALLICOLA FULICAE**

This lice species infested *F. atra* with prevalence 58.33% and mean of intensity 19.50 (Figure 5).

The measurements of five males were total body length (1.07-1.25) 1.21 mm, head length (0.39-0.49) 0.43 mm, head width (0.31-0.39) 0.33 mm, thorax length (0.20-0.23) 0.21 mm, thorax width (0.29-0.33) 0.32 mm, abdomen length (0.53-0.62) 0.61 mm, abdomen width (0.31-0.45) 0.41 mm. The measurements of five females were total body length (1.13-1.27) 1.25 mm, head length (0.40-0.47) 0.42 mm, head width (0.35-0.40) 0.41 mm, thorax length (0.21-0.29) 0.27 mm, thorax width (0.30-0.34) 0.32 mm, abdomen length (0.65-0.70) 0.68 mm, abdomen width (0.45-0.52) 0.50 mm.

**RALLICOLA PARANI**

This species of *Rallicola* genus infested *G. chloropus* with prevalence 52.00 % and mean of intensity 14.00 (Figure 6).

The measurements of five males were total body length (1.53-1.64) 1.61 mm, head length (0.40-0.45) 0.44 mm, head width (0.31-0.36) 0.34 mm, thorax length (0.23-0.28) 0.26 mm, thorax width (0.31-0.34) 0.32 mm, abdomen length (0.89-0.95) 0.94 mm, abdomen width (0.45-0.50) 0.48 mm. The measurements of five females were total body length (1.51-1.58) 1.56 mm, head length (0.41-0.47) 0.44 mm, head width (0.36-0.40) 0.38 mm, thorax length (0.22-0.29) 0.27 mm, thorax width (0.30-0.35) 0.33 mm, abdomen length (0.90-0.96) 0.95 mm, abdomen width (0.46-0.52) 0.50 mm.

Figure 5: (A) *Rallicola fulicae* showed adult male, 100x. (B) Adult female, 100x. (C) Male genitalia, 400x. (D) Female posterior end, 400x.
Figure 6: (A) *Rallicola fulicae* showed adult male, 40x. (B) Adult female, 40x. (C) Male genitalia, 400x. (D) Female posterior end, 400x.

**Discussion**

About 10,711 bird species have been detected in the world (19). The birds in Iraq were very numerous and comprise as many as 385 different species. Among these birds many species of aquatic birds could form an important source of animal protein which can be easily available to marsh people and villagers (20).

The birds infested with different species of ectoparasites which live on skin or feathers permanently or temporarily (1). Chewing lice (Phthiraptera: Ishnocera, Amblycera) are obligate ectoparasites, which in general parasitize avian species (4), they had severe effect on birds when they present in large numbers, they can cause feather damage, decrease food consumption, loss body weight, egg production, irritation, restlessness and they can effect on birds indirectly by serving as vector or intermediate hosts of other pathogens as bacteria, viruses, fungi and some helminths (1).

The studies on chewing lice of aquatic birds in Iraq are very limited, therefore the studies on the lice have a big potential for new discoveries to investigate and identify louse species on aquatic birds and provide data on the chewing lice list. Mohammad (8) recorded *Laemobothrion atrum* on *F. atra* birds, *Ciconophilus decimfasciatus* on three aquatic bird species *Egretta garzetta*, *Bubulcus ibis* and *Ardeola ralloides*, *Pseudomenopon pilosum* lice on *F. atra* and *G. chloropus* birds, *Ibidoeucis bisignatus* lice on *Plegadis falcinellus* birds, *Fulicoffula gallinule* lice on *G. chloropus* birds, *Fulicoffula lurida* lice on *F. atra* birds, *Saemundssonia lari* lice on three aquatic bird species: *L. genei*, *Larus ichthyaeus* and *Larus ridibundus*, *Ardeicola rhaphidius* lice on *P. falcinellus* birds, *Ardeicola goisagi* lice on *Nycticorax nycticorax* birds, *Quadraceps punctatus punctatus* lice on three aquatic bird species *L. genei*, *L. ichthyaeus* and *L. ridibundus*, *Anaticola crassicornis* and *Anatoecus icterodes* lice on *Anas clypeata* birds.

Four different species of chewing lice related to *Menoponidae* family have been recorded from Iraq for the first time *A. piceus lari* isolated from *L. genei* birds, *A. himantopi* and *Austromenopon himantopi* infested *H. himantopus* birds, *Colpocephalum leptopygios* isolated from *P. falcinellus* birds (9).
**References**


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