

## A TAXONOMICAL STUDY OF LICE FROM SOME BIRDS AT SOUTHERN IRAQ

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### ABSTRACT

The present study samples were collected from domestic poultry in the provinces of Basrah and Myssan for six months from the period between November 2013 till March 2014. This study showed the spread the following type between the poultry and a percentage in domestic chicken, local Duck and Domestic pigeons then the infestation of domestic pigeons it is hardest during the study period.

<i>Culclotogaster heterograhus</i>	Chicken head lice
<i>Menopn gallinae</i>	Feather shift lice
<i>Columbicala Columbae</i>	Bite lice
<i>Menacanthus Straminens</i>	Chicken body lice
<i>Heterodoxus Spiniger</i>	

### INTRODUCTION

Ectoparasites are organisms which inhabit the skin or out growths of the skin of another organism (the host) for various periods, and may be detrimental to the latter; various ectoparasites cause significant infestations in many kinds of domestic animals including livestock, pets, laboratory animals, poultry, fish and bees (Flynnr, 1973; Marshall, 1981). Many of these ectoparasites (e.g. most lice) are host specific, while others (e.g. many ticks) parasitize a wider range of hosts. Several ectoparasites currently associated with domestic animals have been acquired by the introduction of either host or parasite into new regions, as animals have become domesticated throughout the world (Magdalena, *et. al.*, 2012).

Many ectoparasites are known to be vectors of pathogens, which the parasites typically transmitted hosts while feeding or (occasionally) defecating. However, ectoparasites - especially in large aggregations feathers with a glandular cement (Janovey, 1997). The eggs tend to be congregated in regions that the bird cannot preen, such as the head or the underwing coverts. Louse intensity can sometimes be estimated by counting eggs (Lee and Clayton, 1995). At times, however, large numbers of hatched eggs may be present - may also debilitate domestic animals in hears (Janovey, 1997).

Lice are permanent parasites that glue their eggs to the host's in the absence of lice. Louse eggs have species specific micro topography (Foster, 1996), making it possible to distinguish the eggs of different species of lice from a single host (one must first determine the specific association of egg type and hatched lice). It is relatively easy to distinguish hatched and unhatched eggs; the former are missing the distal tip and usually appear flattened. Visual examination has been used by numerous workers to quantify adult and nymphal lice.

### **Morphology of chewing Lice**

Lice are clearly recognizable as insects since they have a segmented body divided into a head, thorax and abdomen (Smart, 1943). They have three pairs of jointed legs and a pair of short antennae. All lice are dorsoventrally flattened and wingless, the sensory organs are poorly developed; the eyes are vestigial or absent. Adult Mallophaga (Amblycera and Ischnocera) are usually about 2-3 mm in length. They have large, rounded heads on which the eyes are reduced or absent; in Amblycera the four segmented antennae are protected in antennal grooves, so that only the last segment is visible, in the Ischnocera the antennae are three to five segmented and are not hidden in grooves, at least the first two segments of the thorax are usually visible (Richard and David, 2000).

### **Scientific classification of Mallophaga**

Kingdom: Animalia  
Phylum: Arthropoda  
Class: Insecta  
Order: Phthiraptera  
Suborder: Mallophaga (Nitzsch, 1818)

### **Characteristics of Mallophaga**

There are approximately 3000 species of mallophaga in the world. They are easily identifiable by their head which is wider than the prothorax. The species that feed on birds typically have two claws on the end of each tarsus while those that feed on mammals typically have just a single claw (Flynnr, 1973).

Mallophaga have mandibulate mouthparts which are located on the ventral side of their head. They use these mouthparts to feed on feathers, hair and epidermal skin scales. Some

species also use these mouthparts to feed on blood which they obtain by piercing the pulp of young feathers or by gnawing through the skin (Marshall, 1981).

### **Life Cycle**

Mallophaga develop by gradual metamorphosis. Females will typically lay 150-300 eggs over an interval of 2-3 weeks. The eggs, commonly known as nits, are oblong and approximately 1mm long. The eggs are glued to the hairs or feathers of the host with a secretion from the female accessory gland. The eggs typically hatch several days or up to three weeks from the time they are laid. The nymphs that hatch from the eggs resemble the adults except for their smaller size and lighter color. These nymphs go through three nymphal instars during a 2-3 weeks period. After these three instars, they are considered adults. Most adult species are light tan to brown in color and are usually 1-4 mm in length although some livestock species can grow to be 5-7 mm and some wild bird species can even get to 10 mm. (Richard and David, 2000).

Mallophaga are often adapted to live on a specific part of their host and typically spend their entire lives on a single host. They can only survive for about three days after their host has died and they typically use phoresis, which is hitching a ride from a fly, as an attempt to reach a new host. Mallophaga may also use phoresis, in order to spread to a new host even if the present one is still alive (Johnson and Clayton, 2003).

### **Aims of Study**

1. Identification the types of chewing lice which ectoparasites on domestic poultry (Domestic pigeon, Domestic chicken and local Duck) in Basrah city.
2. Calculate the Percentage of spread the chewing lice (mallophaga) between the domestic poultry.
3. Providing advice and guidance for educators to devoid the spread of injury

### **MATERIALS AND METHODS:**

#### **1. Method of lice collection from birds:**

The birds examined immediately in the field and then collect the lice from birds by using fingers gently and then we put lice in containers that contain ethanol (70%) then we transfer samples to the laboratory. The identification of lice was conducted based on the description by (Richard and David, 2000; Abul-Hab, 1975; Manning and Graham, 1997).

## **2. Study of occurrence of lice infestation:**

This study was began from November 2013 to March 2014 and includes the following:

- 1) Total isolated lice from each host with examined number of host, infested host, and percentage of host infestation.
- 2) Determination the species of isolated lice from each host with percentage of infestation on that host.
- 3) Infested area each isolated species from lice on their host.
- 4) Determination the relationship between the presences of host in studied areas and infestation guide.
- 5) Determination of monthly and geographic distribution for isolated species of lice according to their hosts.
- 6) Show the severity of different infestation of domestic chicken, domestic pigeon and goose with lice.

We calculate the percentage and severity of infestation according to (Margolis *et. al.*, 1982) that

Infestation percentage= (number of infested host with certain species of lice \ number of examined host) X 100.

And infestation severity= number of certain species of lice\ number of infested of host with that species of lice.

While: infestation guide= number of certain species of lice\ total number of examined host.

examine domestic chicken, domestic pigeon and local duck in different area of Al Basrah governorate which include (old Basrah, Shat al Arab city, Karmat Ali and Qurna) and different areas of Myssan governorate which include (Al Mahmoodia and Majadia).

## **RESULTS AND DISCUSSION**

The present study found a five different species of lice that spread between the domestic poultry, as below:

1-	<i>Culcotogaster hterographus</i>	Image ( 1,2 )
2-	<i>Menopoy gallinae</i>	Image (3)
3-	<i>Menacanthus stramineus</i>	Image (4)
4-	<i>Columbicola columbae</i>	Image (5,6)
5-	<i>Heterodoxus spiniger</i>	Image (7)

The result in table one showed that the domestic pigeons recorded the highest rate of infestation 43.3% while the local ducks is the least injury 20% this may be due to habitat and environmental factors in which they live and the fact that the ducks from the animals that are frequently used water. While the chicken was in the middle of them, so it should be noticed that the study took place in winter months, which is experiencing record to high injuries of lice. Furthermore, the presence of lice in bird body at the most areas, like tail, wings, head and neck.

In table two can be noticed the genus and species of isolated lice with their length and width and recorded as *Culcotogaster heterographus* (Picture, 1 and image 1 and 2), *Menopon gallinae* (Picture, 2 and image 3) and *Menacanthus stramineus* (Picture, 3 and image 4) from domestic chicken, while, *Columbicola columbae* (Picture, 4 and image 5; 6; 7) isolated from domestic pigeons and *Heterodoxus spiniger* from local duck. In this region of Iraq it can be reviled that these lice were isolated from the first time in this birds.

Muntather, et. al., (2014) noticed that chewing lice *Goniocotes gallinae* collected from 119 turkeys (53 males and 66 females) from popular markets for the sale of birds and some villages the ages of these turkeys were (5-24) months at Thi- Qar governorate and the results showed that the turkey infested with percentage infection was 37.82%. While, (Amin and Al-iraqi, 2007) found that the biting lice attacking the chickens in twenty locations within Arbil governorate and the results showed that the chickens were infested with six species of lice: chicken body lice *Menacanthus stramineus*, feather shaft lice *Menopon gallinae*, chicken head lice *Cuclogaster heterographus*, fluff lice *Goniocotes galline*, large chicken lice *Goniodes gigas* and wing lice *Lipeurus caponis*, but the chicken body lice is the dominant species in all locations with a percentage of 58.41% of the total infested chickens.

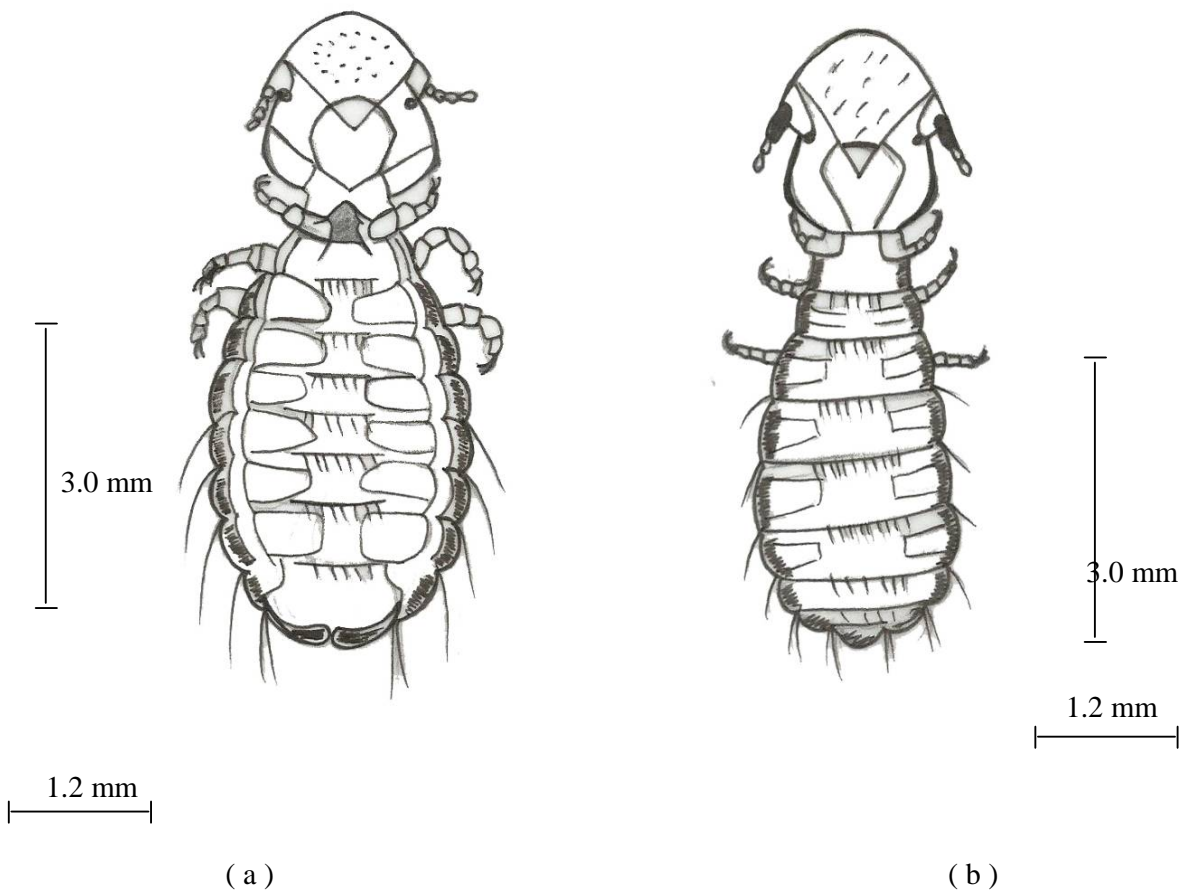
Al-Saffar and Al-Mawla, (2008) recorded and identify different ectoparasites infesting 280 chicken from various regions of Mosul city with total percentage of ectoparasites in chickens were 19.3% of which (54 positive case out of 280 chicken) 81% were single infections and 19% mixed infections. Lice infestation (12.5%) and four types of chewing lice were classified (*Menacanthus stramineus*, *Cuclogaster heterographus*, *Goniocoteus gallinae*, and *Columbicola columbae*).

**Table 1:- Clear the number of examined and infected animal, site and percentage of infection**

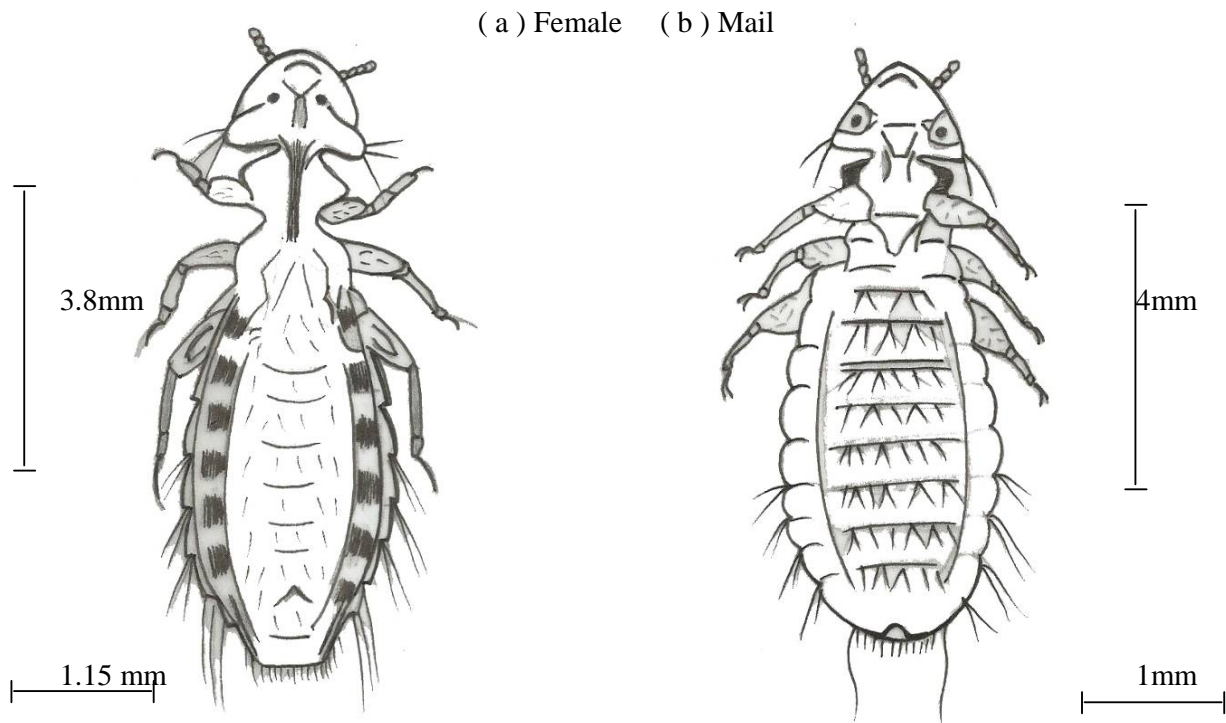
Animal	No. Exam.	Site of Infection	No. Inf.	% Of Inf.
Domestic chicken	35	Tail and wing	10	28.5
Local duck	25	Wings and head	5	20
Domestic pigeons	30	Wing and neck	13	43.3
Total	90		28	31.11

**Table (2) clear that the lice genus and total length and range**

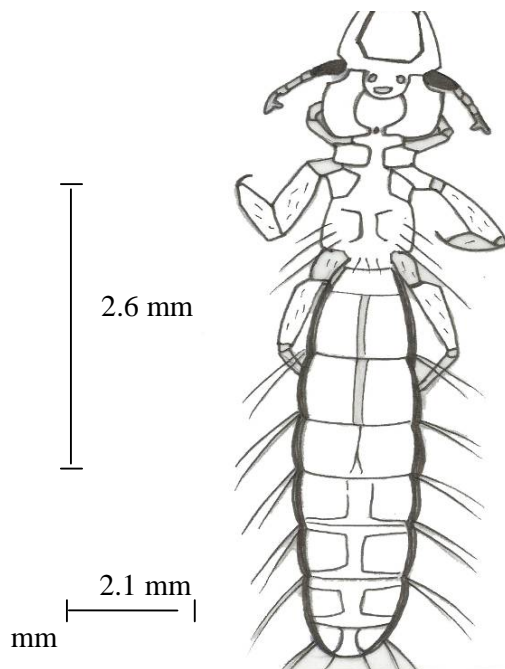
Animal	Lice genus	Length	Width
Domestic chicken	<i>Culcotogaster hterographus</i>	7.9	2.6
	<i>Menopoy gallinae</i>	9.7	2.2
	<i>Menacanthus stramineus</i>	9.2	2.0
Domestic pigeons	<i>Columbicola columbae</i>	5.7	2.1
Local duck	<i>Heterodoxus spiniger</i>	6.8	2.3



**Picture (1) Male and female of *Culclotogaster hterographus***

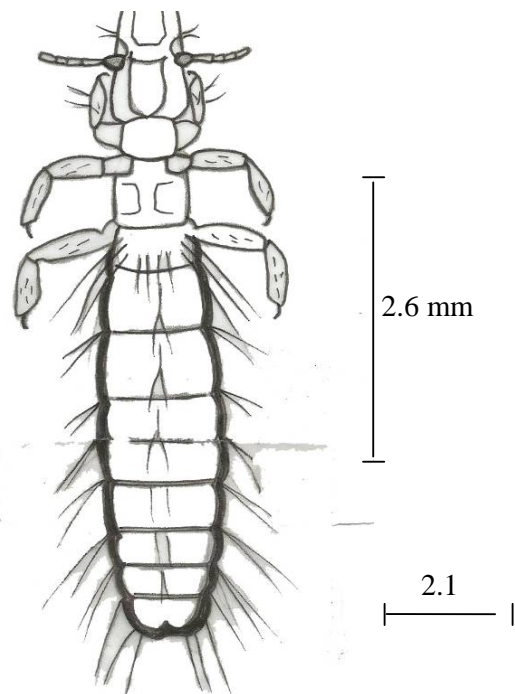


Picture ( 2 ) Male of *Memopoy gallinae*



( a )

Picture ( 3 ) Female of *Menacanthus stramineus*



( b )

Picture (4) a –Mail , b- Female of *Columbicola columbae*





Image (1) Female of *Culclotogaster hterographus* (X4)



Image (2) Male of of *Culclotogaster hterographus* (X4)



Image (3) Male of *Memopoy gallinae* (X 4)



Image (4) Female of *Menacanthus stramineus* (X4)





Image (5) Male of *Columbicola columbae* (X4)



Image (6) Female of *Columbicola columbae* (X )



Image (7) Couple of *Columbicola columbae* (X4)

## REFERENCES

1. Abul-Hab, J. C. (1975) .Biting Lice Parasitism on poultry and pigeons in city of Baghdad. Biol. Res. Center (Periodics), 4: 1-36 (in Arabic).
2. Al-Saffar, T. M. and Al-Mawla, E. D. (2008). Some hematological changes in chickens infected with ectoparasites in Mosul. Iraqi J. of Veterinary Sciences, 22, (2): 95-100.
3. Amin, K. A. and Al-iraqi, R. A. (2007). Survey and identification of lice from local chickens at Arbil Province. Iraqi J. of Vet. Scie. 21(1): 31-21.
4. Flynnr, J. (1973). Parasites of laboratory animals. Iowa State University Press, Ames, Iowa, 884 pp.
5. Foster, M. S. (1996). The eggs of three species of Mallophaga and their significance in ecological studies. J. of Parasitol., 55( 2): 453-456.
6. Janovey, J. ( 1997). Protozoa, Helminths and Arthropods of birds. Pp. 303-337. Oxford university press, New York, USA.
7. Johnson, K. P. and D. H. Clayton, (2003). The Biology, Ecology and Evaluation of Chewing Lice .p 476.
8. Lee, P. L. M and Clayton, D. H. (1995). Population dynamics of Swift (*Apus apus*) Ectoparasites in relation to host fitness. Ecological Entomology, 20: 43-50.
9. Magdalena, N.; Krzysztof, S.; Zofia, W. and Krzysztof, P. (2012). Species Diversity of Ticks (Acari: Ixodida) on Migrating Birds on the Baltic Sea Coast of Poland. Zoological Studies 51(8): 1411-1417.
10. Manning, A. Price and Graham , O. H. (1997). Chewing and suking lice as parasites of mammals and birds .Technical Bulletin Number 1849, July 1997.
11. Margolis, L. R.; Esch, G. W.; Homes, J. C.; Karis, A. M. and Schad, G. A. (1982). The use of ecological terms in parasitology. J. parasit, 68:131-133.
12. Marshall, A .G. (1981). The ecology of ectoparasitic insects. Academic Press, London.
13. Muntather, M. Flaiyyh and Fawzia, S. Kadhim. (2014). Identification chewing lice (*Goniocotes gallinae*) in Mealigris Gallopavo in some areas Thi-Qar governorate. Thi-Qar J. Agric. Res., 1 (3).
14. Richard, W. and David, S. (2000). Veterinary Ectoparasites, Biology, Pathology and control. Second ed.
15. Smart, J. A. (1943). Handbook for the identification of Insects of medical importance. British museum (Nature History). London.