A comparative study of ectoparasites Infestation in domestic chickens and Turkey in Al-Diwaniya Province, Iraq

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ABSTRACT

The current of study was conducted on ٩٨ birds (٦٠ local chicken and ٣٨ Turkey) during the period from December ٢٠١٦ to March ٢٠١٧ was collected from different areas of Al-Diwaniya city With the aim of isolating the parasites of the birds and diagnosing them and conducting comparison between the parasites common to these birds.The resutes showed presence of six species of biting lice from chicken two species (*Menacanthus stramineus* ٤١.٦٦٪ and *Menapon gallinae* ٣,٣٣٪)and four species from Turkey (*Gonicotes gallinae* ٢٦,٣١٪ , *Cuclotogaster heterographye* ٢٣,٦٨٪ , *Gonicodes gigas* ١٥,٧٨٪ *and Lipeurus caponis* ١٥,٧٨٪*)*. In comparison, there are no common ectoparasites between chicken and turkey. The results showed the occurrence of specific clinical changes in lice infestations in birds. Feathers appeared in the appearance of bare areas without feathers, as well as redness of the skin areas and inflammation due to wounds, scratches and bleeding.

Keywords : ectoparasites ,poultry ,*Galluas gallus* , chickens , turkeys.

INTRODUTION

Birds, like other animals, are exposed to parasites such as lice, fleas, and flies.Liceis considered one of the most common parasites spread in birds, including chickens and turkeys, which have a role in the transmission of pathogens such as bacteria, Rectasia, fungi and viruses (Derakhshanfor *et al.*,٢٠٠٦).Chewing lice (Phthiraptera: Amblycera, Ischnocera) are important poultry ectoparasites belongs to lice to the order of Mallophage paraphyletic entomological group,whiche sneeze permanently or temporarily on the birds caused by large losses, which leads to the loss of infested birds (Bahi,٢٠٠٥; Saif *et al.*,٢٠٠٣). Lice is located on different parts of the body of birds such as the head, the chest, the wings, the abdomen and the back of the body (Clayton *et al.*,١٩٩٤), cause these parasites to have many problems such as the production of eggs in females, discomfort, itching, decreased sleep, loss of appetite, in addition to anemia(Calnek *et al.*,١٩٩٧). Parasites also act as storage and carrier for many pathogens such as those caused by bird cholera ,Toxoplasmosis and typhoid(Saxena *et al.*,٢٠٠٤) .Lice feed on different kinds of body of the plane, including feathers, skin secretions, scales, and debris of skin tissue and blood coagulation dry at the place of infection, but does not absorb blood(Ford *et*

*al.,*٢٠٠٤).The lice spend his entire life on the host because he needs warmth and temperature of his predicament to stay alive(Kaufman *et al.,* ٢٠٠٦). It considered of the cold weather and especially the winter of the most seasons of the year that can be seen many lice where the female lice in the form of clusters on the feather leg or around the blade feathers and the hatching phase takes three weeks(Jeffer *et al.,* ٢٠٠٥).The purpose of the study is to compare the external parasites found in chickens and turkeys and to identify and diagnose species.

MATERIALS AND METHODS

Study area

The study was conducted from July to January, ٢٠١٦ to February ٢٠١٧ in and around Al Diwaniyah is a city found in Al Qadisiyah, Iraq. It is in the center-south of the country. The estimated population of the province by about a million and a half million people , It is located ٣١,٩٩ latitude and ٤٤,٩٣ longitude and it is situated at elevation ٢٥ meters above sea level . including wetlands, arid zones, agricultural areas, as well as semi-desert regions. The average high temperature is ٣٠ degrees and the average low temperature is ١٧ degrees with a total area of approximately ٨،١٥٣ km٢ represents about ١,٩٪ of Iraq(NCCI, ٢٠١٥). Population distribution Rural-Urban: ٤٣،٥٪ -٥٦،٥٪ (Figure ١) .

Fig. 1: map of Iraq showing situation of Al-Diwaniya Province, Central Iraq.

Collection of samples

This study was conducted in Diwaniyah province , middle of Iraq including the Afak district, Sanniya district , Al-Sudair district and Hamza district as well as from the city center for the period from December ٢٠١٦ to March ٢٠١٧, where lice were collected from ٩٨(٦٠ domestic chickens and ٣٨ turkey) from the local markets for the sale of birds. The samples were collected visually by careful examination of all parts of the body of the bird and when watching the parasite sprayed the area with absolute ethyl

alcohol to anesthetize the Lice and then collected using a wide-force forceps to avoid lice damage and was placed in sampling bottles, containing ٧٠٪. The information was recorded for each bird (age, sex, date of collection and parasite site).

Samples examination : were placed in a cold potassium hydroxide (KOH) solution concentration of ١٠٪ and left for two days to acquire the color and transparency and then passed alcohol (٧٠, ٨٠٪, ٩٠٪, ١٠٠٪) and for one day each Concentrate and then placed in the xylol for a period of ١-٢ minutes and then loaded on a clean glass slide using Canada Balsam and covered with the lid of the slide and left to dry to conduct in the incubator at ٣٧ ° C and then examined under the microscope compound magnification force١٠ X , ٤٠ X. The ectoparasites were identified according to their morphological characteristics, using the entomological diagnostic guidelines(Soulsby,١٩٨٢) .The results were analyzed using a square test ($X^{٢}$) at a significant level P < ٠,٠٥(Al-Rawi,١٩٨٠).

Results and Discussion

The present study examined of ٦٠ and ٣٨ of domestic chickens and turkeys samples respectively from different regions of Al-Diwaniyah province and some of the villages and sub-districts during the period from December ٢٠١٦ to March ٢٠١٧. The total percentage (Intensity) of infection ٤٥% (١٠,٨٩) in domestic chickens and ٨١,٥٧٪ (١٧,٠٧) in turkeys (Table١).

The percentage of chicken and turkey with external parasites reached ٤٥٪,٨١,٥٧٪ respectively ,Which is higher than the rate ١٢,٥٪ recorded(AL-Safar & AL-mawla, ٢٠٠٨) in Mosul and lower than the rate ٧٠,٤٦٪ recorded(AL-Nakshabandy, ٢٠٠٢) in Erbil and lower than the rate ١٠٠٪ recorded(Permin *et al.*,٢٠٠٢) in Zimbabwe. The difference in recorded ratios is due to differences in study areas differences in the number of birds studied, climate variability and seasons Which have a significant role in the high or low infection(Hillgarth, ١٩٩٦; Roza *et al.*, ١٩٩٦; Wall & Shearer, ١٩٩٧).

Table ١:Shows the percentage injury males and females in chickens and Turkey.

Host	Sex	Examined (No.)	Infested (No.)	Prevalence (%)	Intensity
Chicken ٦٠	Males	١٨	١٠	٥٥,٥٥	١١,١
	Female	٤٢	١٧	٤٠,٤٧	١٢,٥٨
	Total	٦٠	٢٧	٤٥	١١,٧٠
Turkey ٣٨	Males	٢٠	٢٠	١٠٠	٢٩,٥
	Female	١٨	١١	٦١,١١	١٤,٨١
	Total	٣٨	٣١	٨١,٥٧	٧,١٦

Prevalence of lice in Relation to host Sex

. A total of ٦٠ domestic chickens comprising of ١٨ males and ٤٢ females and ٣٨ domestic turkey comprising of ٢٠ males and ١٨ females were used for the experiment. As many as ١٠ out of ١٨ males (٥٥,٥٥ %) and ١٧ out of ٤٢ females (٤٠,٤٧ %) were infected in domestic chickens, while ٢٠ out of ٢٠ males (١٠٠ %) and ١٨ out of ١١ females (٦١,١١ %) were infected in domestic turkey (Tables ٢). The infection rate was found to be more prevalent in males (٥٥,٥٥ % ; ١٠/١٨) as compared to females (٤٠,٤٧ %; ١٧/٤٢) (Tables ٢) in domestic chicken, while the infection rate was more prevalent in male (١٠٠ %;٢٠/٢٠) as compared to female (٦١,١١٪;١١/١٨) in domestic turkey. when statistical comparison shows that there were significant differences between the sexes in the susceptibility to lice at a level p<٠,٠٥ in the both of chicken and Turkey (Table١) .

Chickens were found to be infested with two species of chewing lice of amblyceran species *Menacanthus stramineus* and *Menapon gallinae* while Turkey were found to be infested with four species of chewing lice of ischnoceran species *Gonicotes gallinae , Cuclotogaster heterographe, Gonicodes gigas and Lipeurus caponis* . The dominant species was *M. stramineus* and *G. gallinae* , with ٤١,٦٦٪,٢٦,٣١٪ occurrence in Chicken and Turkey respectively. In second place stood *Cuclotogaster heterographe* (٢٣,٦٨٪)in Chicken and followed by *Gonicodes gigas* (١٥,٧٨٪) and *Lipeurus caponis* (١٥,٧٨٪) in Turkey (Table ٢) .

Table ٢: Number and sex of ectoparasite recovered from the infected chicken and turkey.

No. Host	lice Species	Infested (No.)	No. of parasite found		Total	%
			Males	Female		
Chickens ٦٠	*Menacanthus stramineus*	٢٥	١٢٧	١٧٥	٣٠٢	٤١,٦٦
	Menapon gallinae	٢	٦	٨	١٤	٣,٣٣
Turkey ٣٨	*Gonicotes gallinae*	١٠	٣٥	٦٤	٩٩	٢٦,٣١
	Cuclotogaster heterographe	٩	١١	٩٧	١٠٨	٢٣,٦٨
	Gonicodes gigas	٦	١	٣٢	٣٣	١٥,٧٨
	Lipeurus caponis	٦	٠	٤١	٤١	١٥,٧٨
Total		٥٨	١٨٠	٤١٧	٥٩٧	٥٩,١٨

Site of lice Species in the both bird

A total of ٥٩٧ lice , ١٨٠ male and ٤١٧ female were collected from each species from different part of the body infested of the both bird examined. lice tend to prefer specific sites of attachment on the body. Lice preferred the wings in comparison to other parts of the body (Table ٣).

Table ٣: number collected from each species from different part of the body infested .

Lice species recovered	Host	Site				
		Wing	Back	Body	Feathers	Head
Chickens ٦٠	*Menacanthus stramineus*			+		
	Menapon gallinae				+	
Turkey ٣٨	*Gonicotes gallinae*		-			
	Cuclotogaster heterographe					+
	Gonicodes gigas	+				
	Lipeurus caponis	+				

Mencanthus straminus It is one of the most common types of lice recorded during the current study reached by infection ٤١,٦٦٪ which has detrimental effect on chicken causing decrease in egg production , weight loss and loss of plumage(Makaratirwa & Khumalo, ٢٠١٢). Which is higher than the rate ٤٠٪ recorded(Eslami *et al.*,٢٠٠٩) in Iran and the rate ٣٤٪ recorded (Ibraheam, ٢٠١٣) in Dohuk ,Which is lower than the rate ٤٨٪ recorded(Sychra *et al.*,٢٠٠٨) in In the Czech Republic The reason for the high incidence of this type of life to shorten its role and spread in places like a bird's body(Hassan & Aboud, ٢٠٠٥).It can be separated from the rest of the other types *M.cornutes*, especially the type to the presence of bristles on the chests of the middle and back(Mani, ١٩٧٤; Habeeb, ٢٠٠٠) (Figure ١).

Fig. ١: *Menacanthus stramineus*

Menapon gallinae Is a type of lice isolated from chickens reached by infection ٣.٣٣٪ Which is lower than the rate٣,٣٣ % recorded(Saxena *et al.*, ٢٠٠٤) in Basra and the rate ٢٤,٤٨٪ recorded(AL-Nakshabandy, ٢٠٠٢) in Erbil,and his record(Kurdy, ٢٠٠٥) in India in his study on chickens the rate ٥١,٣٪.Characterized by the fact that

the abdomen with a total of elongated hairs on the edge of external belly(Wall & Shearer, ١٩٩٧; Romoser & Stoffolano, ١٩٩٨) . It affects turkeys and ducks and there are no appendages in the frontal ventricle of the head(Al-Mayali & Kadhim ٢٠١٥) (Figure٢).

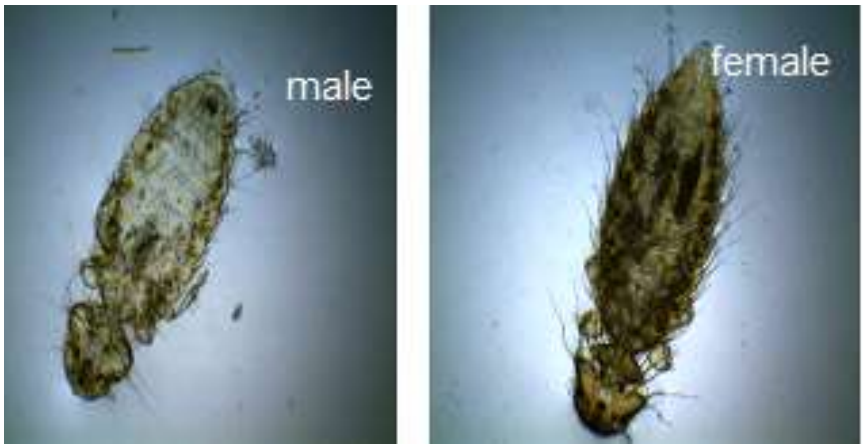

Fig. ٢: *Menapon gallinae*

Goniodes gigas It is a type of lice, which is characterized by large size was isolated from the turkey by a percentage ١٥,٧٨٪,Which is higher than the rate ٤,٤٢٪ recorded(Hanssan, ١٩٨٩) in Diwaniya , and the higher than rate ١,٩٦٪ recorded(Al-Jaboury, ٢٠١٠) in Mosul lower than the rate ١٦٪ record(Salifou *et al.*,٢٠٠٨) ,Which is lower than the rate ٦٢,٢٥٪ record(Fabiyi, ١٩٨٠) in West France and the rate٢٣,٥٪ recorded(Abdullah & Mohammad, ٢٠١٣) in Nigeria.(Figure ٣).

Fig. ٣: *Gonoids gigas*

Gonicotes gallinae It is called villus feathers lice was isolated from the turkey by a percentage ٢٦,٣١٪,In different safety of the body of the bird and especially the feathers of the fuzz caused by his rapid movement ,Which is lowar than the rate ٥٤,١٧٪ recorded(Salifou, ٢٠٠٨) in Sulaymaniyah and the rate ٣٧,٨٢٪ recorded(Flaih,

٢٠١٤) in Nasiriyah , Which is highert han the rate ٦,٨١٪ recorded(Al-Mayali & Kadhim, ٢٠١٥) in Diwaniya , and the isolation of the turkey in Brazil by a percentage ٦٢,٢٥٪(Santos, ٢٠١١). It is located in different places of the body of the bird, especially fuzzy feathers due to rapid movement and be present during the wet month of the year(Fabiyi, ١٩٩٦).(Figure ٤).

Fig. ٤: *Gonicotes gallinae*

Cuclugaster heterographus A lice that is characterized by its dark gray color head lice are called and was isolated from the turkey by a percentage ٢٣,٦٨٪(Abo Alhab , ١٩٧٥) his record without mentioning the percentage of injury , Which is higher than the rate ١٠,٤٢٪ recorded(Abdullah & Mohammad, ٢٠١٣) in Sulaimaniyah ,Which is lowar than the rate ٤٠,٨٧٪ recorded(Murillo & Mullens, ٢٠١٥) in Calvonia and the rate ٥٪ recorded(Mishra *et al.,* ٢٠١٦) and lower than also the rate ٦٦% on Tukey in Ninevenh city(Al-Ani *et al.,* ١٩٩٤). It is characterized by the presence of three prongs on each side of the dorsal surface of the head(Kakarsulemankhel, ٢٠١٠).(Figure ٥).

Fig. ٥: *Culotogaster hetergraphes*

Lipeurus caponis The females were found only in the wing area, which is called the wing lice and was isolated from the turkey by a percentage ١٥,٧٨٪,Which is lowar than the rate ١٠,٩٪ recorded(Ebrahimi *et al.,* ٢٠١٦) in Iran and the rate ٦٣,٣٪ recorded(Rahman & Haziqqh, ٢٠١٥) in Malaysia .(Figure ٦).

Fig. ٦:Female *Lipeures caponis*

Where the birds are used to care for the period and the beaks to remove lice and clean the feathers and loss of the blade and this is consistent with(Koehler & Butler, ١٩٩٦). And also causes these birds nervous tension and back to feed the lice by the parts of the mouth, which leads to an excitation of those birds and this is consistent with the study of parasites in the external chicken(Calnek *et al.*, ١٩٩١) .

Conclusion

During our this study,it was found out that there were ٦ species of Mallophage of the lice infected domestic chicken and Turkey of the Al-Diwaniya city,٢ species infected the chicken : *Mencanthus straminus* and *Menapon gallinae* and ٤ species infected the Turkey : *Goniodes gigas* , *Gonicotes gallinae*, *Cuclugaster heterographus* and *Lipeurus caponis*.Among them, *Mencanthus straminus* dominated with a share of ٤١,٦٦٪ of the tatol . Parasitic infections are distributed on the body of the bird depending on the nature of its nutrition and the availability of the nutrients it needs.
The occurrence and intensity of parasitic infestations may be influenced by number of epidemiological factors including host ,sex,age,breed and environment.

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