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Investigation of Lice in Turkeys

Abstract

Lice are important external parasites due to their widespread distribution, as well as their high reproductive efficiency, tolerance to unfavorable conditions, and hiding, which makes them deadly pests for birds. The results of the study showed a high rate of lice infection in turkeys in Nineveh Governorate, with the infection rate reaching 64,16%, with a higher infection rate in females 80 % compared to males 42%. The rate was also high in turkeys of older ages 85.18%, with significant differences in the infection rate depending on gender and age. Four types of lice were diagnosed *Menacanthus stramineus, Menacanthus cornutus, Menopon gallinae, and Lipeurus caponis*.The most common type was *Menacanthus straminens* 87% and the least common lice was *Lipeurus caponis* 25.97%,.Some important morphological characteristics of the identified lice species parasitizing turkeys were also studied in this study.

Keywords: lice in turkeys, *Menacanthus straminens* , *Menacanthus cornutus*, *Lipeurus caponis*

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Introduction

Turkey farming is an important economic source of income for many families and farmers, especially in rural areas, as it contributes to improving living standards(1) . Moreover, raising turkeys does not require complex equipment, making it a suitable option for small farmers( ). The danger of external parasites, including lice, is almost comparable to that of internal parasites due to their widespread prevalence, in addition to their high efficiency in reproduction, their tolerance of unfavorable conditions, and their ability to hide, which has made them pests that kill birds (3) Lice are small, wingless insects that live on the surface of the skin or between the feathers, feeding on skin debris, dead body cells, and sometimes blood (4,5). Lice vary in their body composition according to the areas they parasitize in birds. There are feather lice, head lice, down lice, and wing lice (6)

The presence of lice on a turkey's body can lead to intense itching. The bird will begin to scratch constantly, appear anxious and irritated, and may gradually weaken due to blood loss or the constant effort of trying to get rid of the parasite, resulting in feather loss and general poor health. Lice not only affect a bird's health, but also its productivity and activity, especially if left untreated, negatively impacting the bird's growth and production (7,8). Lice infestations are more prevalent in unsanitary breeding conditions, overcrowding, or a lack of regular hygiene. Because lice are easily transmitted between birds, discovering them in one bird could mean they are present in the entire flock, necessitating rapid intervention to control them (9,10).

Given the importance of turkeys, this study aims to identify the most important types of biting lice that parasitize domestically raised turkeys in Nineveh Governorate and to determine the infection rates of different types.

Materials and Methods

A total of 120 turkeys of both sexes and ages were examined in different areas of Nineveh Governorate during the study period. Lice were stored in containers containing 70% ethanol (11), and the head, wings, back, abdomen, legs, thorax, and tail were carefully examined using a magnifying glass. Samples were prepared for microscopic evaluation after being transported to the veterinary parasitology laboratory. The lice were immersed in a 10% potassium hydroxide solution for one day. The lice were then passed through a series of alcohol solutions in increasing sequence, starting with 70%, 80%, 90%, and 99% alcohol. Canada balsam-coated slides were used to mount the lice (12,13,14). The presence of lice in turkeys in Nineveh Governorate was determined by examining the lice under a light and dissecting microscope. The parasite identification method was carried out by (15,16,17). The digital camera was use for taking the pictures.

Results

In this study, the total percentage of turkeys infected with lice was 64.16 % (Table 1), with a high incidence rate in females (80%) and males (42%). The highest incidence rate was found in older turkeys (85.18%) and younger turkeys (46.96%). When conducting statistical analysis, it was found that there was a significant difference depending on the sex and age of the turkey (Table 2,3). Four species of lice were diagnosed in this study: *Menacanthus stramineus, Menacanthus cornutus, Menopon gallinae, Lipeurus caponis* .The predominant species was *M. stramineus*, accounting for 87% of the total lice infestation. The least common species was *Lipeurus caponis*, accounting for 25.97% of the total lice infestation Table4(figs 1,2,3). Upon visual inspection of various body parts such as the head, body, leg, feathers, etc., it was found that *Menacanthus stramineus* was most commonly found on the body of turkeys, while *Lipeurus caponis* was most prevalent on Feather base (shaft area), Some important morphological characteristics of the identified lice species parasitizing turkeys in this study were also recorded (Table 5).

Table 1: Percentage of infestation with lice in examined turkeys.

No. of examined	No. of infested	Percentage of infestation (%)
120	77	64,16%

Table 2: Percentage of infestation of lice in male and female turkeys

Sex	No. of examined	No. of positive animals	%
Female	70	56	80[A]
Male	50	21	42[B]
Total	120	77	64.16%

Differences between males and females of tutkeys at p≤0.05

Table 3: Percentage of infestation according to the age of the turkey.

Age	No. of examined	No. of positive animals	%
Young	66	31	46.96% [A]
Adult	54	46	85.18% [B]
Total	120	77	64.16%

The difference in letters indicates significant

Table 4 : Species of lice On turkeys in this study.

Species of lice	No. of positive animals	%
Menacanthus stramineus	67	87
Menacanthus cornutus	45	58.4
Lipeurus caponis	20	25.97%
Menopon gallinae	56	72.72%

Table 5: Morphological characteristics of the lice species parasitizing turkeys in this study

Morphological characteristics	*Menopon gallinae*	*Menacanthus stramineus*	*Menacanthus cornutus*	*Lipeurus caponis*
Size	1.5 – 2.5 mm	2 – 3.5 mm	2 – 3 mm	2 – 2.5 mm
Color	Pale yellow or whitish	Yellow or light brown	Pale yellow	Grayish or light yellow-gray
Head shape	Broad, no special projections	Broad, smooth	Broad with small horn-like parts	Long and narrow
Body shape	Flattened and long	Slightly wider and flattened	Flattened with tiny projections	Long, slim, and smooth
Location of the bird	Feather base (shaft area)	On the skin between feathers	On the skin and near the feather base	On wing and tail feathers only

Fig. 1: *Menacanthus stramineus in* turkeys under a dissecting microscope.

Fig.2: *Menopon gallinae in* turkeys under a dissecting microscope.

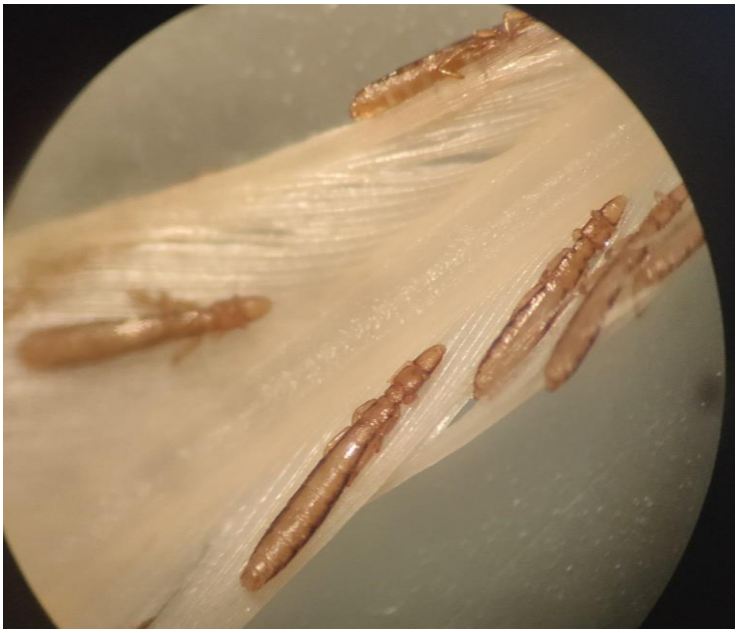

Fig 2: *Lipeurus caponis* in a turkey feather under a dissecting microscope.

Discussion

Lice are external parasites that infest birds and cause huge economic losses, leading to the death of many infected birds, in addition to reducing their production of meat and eggs. They also lead to the transmission of many fatal diseases and pathogens, and the most common secondary infections are bacterial, viral, and fungal diseases. In severe infections of its name in young birds, it leads to deaths (18,19). The overall incidence of turkey lice was 64.16%, a result consistent with those reported by other researchers. Al-Ani *etal*., (20) and Hassan *etal*., (21)reported a lice prevalence rate of 66% and 72.8% in turkeys in Nineveh, while Khoshnaw (22), Flaih,(23), and Al-Safar and Al-Mawla (24) reported a lice prevalence rate of lice on turkeys was 2.08% in Erbil, 33.85% in Nasiriyah, and 12.50%(23), in Mosul, respectively.The various reasons for the different rates of lice infection are related to the rapid spread of lice and their transmission through direct contact between flock members during feeding and mating, as well as the deterioration of sanitary and reproductive conditions in turkey pens, which are often damp and poorly ventilated.

The results showed significant differences between the sexes in susceptibility to lice infection, this result is consistent with the findings of (25), which indicated significant differences between the sexes in the incidence of infection, with females being more susceptible to lice than males, while it did not agree with Al-Mayali and Kadhim (26) who recorded a higher rate of infection in males than in females.

The infection rate increased at older ages, and this was consistent with what the researcher recorded (27). Present results showed four isolated species of lice on turkeys in Nineveh governorate they are Menacanthus straminens, *Menacanthus cornutus, Menopon gallinae*, and *Lipeurus caponis*. The diagnosis of these species of lice in this study was based on morphology by light and dissecting microscope confirms with other studies described by (12,15)

This study also showed that the incidence of infection with *Menacanthus stramineus* lice is higher than other species due to its rapid movement, which allows it to evade behaviors such as cleaning birds' feathers. This was consistent with what the researcher recorded. (28) , While the louse *Lipeurus caponis* is characterized by its low movement, this may be the reason for its low percentage.

Conclusion

The results of the study showed a high rate of infection with lice in turkeys in Nineveh Governorate, and infection with four species*: Menacanthus stramineus, Menacanthus cornutus, Menopon gallinae, and Lipeurus caponis*. The study also showed a higher rate of infection in females than in males, and infection was high at great depths. Given the importance of turkeys, this study aims to identify the most important types of lice that parasitize domestically raised

turkeys in Nineveh Governorate and to determine the incidence of infection with different types during the current study period for this bird in Iraq.

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Conflicts Of Interest

The authors declare that there is no conflict of interest.

Ethical Clearance

This work is approved by The Research Ethical Committee.

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التحري عن القمل في الديك الرومي

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الخلاصة

يعد القمل من الطفيليات الخارجية المهمة نظرًا لانتشاره الواسع، بالإضافة إلى كفاءته التناسلية العالية، وتحمله للظروف غير المواتية، وقدرته على الاختباء، مما يجعله آفة قاتلة للطيور. أظهرت نتائج الدراسة ارتفاع معدل الإصابة بالقمل في الديوك الرومية في محافظة نينوى، حيث بلغ معدل الإصابة 64,16%، مع ارتفاع معدل الإصابة لدى الإناث 80% مقارنةً بالذكور 42%. كما كان المعدل مرتفعًا أيضًا لدى الديوك الرومية الأكبر سنًا 85.18%، مع وجود فروق معنوية في معدل الإصابة تبعًا للجنس والعمر. تم تشخيص أربعة أنواع من القمل وهي *Menacanthus stramineus* و *Menacanthus cornutus* و *Menopon gallinae* و *Lipeurus caponis* ، وكان النوع الأكثر شيوعًا هو *Menacanthus straminens* ، وكان أقل أنواع القمل شيوعًا هو *Lipeurus caponis*. كما تمت دراسة بعض الخصائص المورفولوجية المهمة لأنواع القمل التي تم تحديدها والتي تتطفل على الديوك الرومية في هذه الدراسة.

الكلمات المفتاحية: قمل الديك الرومي,,*Lipeurus caponi Menacanthus straminens, Menacanthus cornutus*