



Original Research Article

Ectoparasites of Domestic Turkey (*Meleagris gallopavo*) in Al-Diwaniya City/Iraq

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ABSTRACT

The present study was conducted during the period from 1/9/2014 - 1/5/2015; 50 birds of domestic turkey (*Meleagris gallopavo*) was collected from different areas of Al-Diwaniya city, in order to isolate and diagnose ectoparasites on turkeys as well as study infection percentage by these parasites with the intensity and the most important pathological changes caused by the infection. The results showed presence of four species of biting lice (*Gonoiocotes gallinae*, *Goniodes gigas*, *Menacanthus straminus* and *Oxylipeurus* sp.) by infection and intensity of 10% and 6.81, 0.4% and 4.72, 2% and 0.54, 2% and 0.09, respectively, and two species of ticks (*Arguspersicus* and *Haemophysalis* sp. Nymph) by injury and intensity of 2% and 0.54, 0.2% and 0.24, respectively. The results also showed that the infection distribution in external parasites of turkey by sex were higher in males than females because the infection percentage was reached 32 and 12% respectively, as well as incidence a many of pathological and gross changes of infected birds lice such as lethargy, laziness, wings sagging, nervous tension, break feathers and loosed in addition to skin color changed, appearance of scratches and bleeding.

Keywords

Domestic turkey,
Biting lice,
Ticks

Introduction

The poultry is an important source of national income sources in many countries of the world; it provides high nutritional value and other economic benefits (Matur, 2002), as well as providing jobs and income for small farmers, especially in the non-growing seasons for crops (Aini, 1990). Turkey's (*M. gallpova*) is a domestic birds that live in a symbiotic relationship with human societies, as it lives freely and feed on food waste or gets its food from educators as well as drinking water from various water sources (Spradbrow, 1993) so be a factor fit parasites, especially

gastrointestinal (Frantovo, 2000; Oniye *et al.*, 2001).

Turkey's live in small groups eat different kinds of seeds, fruits, insects and other food, is a production about 7% of the total production of meat Global poultry of 81 million tons/ year in 2005; it's France, Germany, Canada, USA, Netherlands and Sweden are among the most productive of meat countries turkey, which ranks second after chickens in the production of poultry meat (FAO, 2007).

All body areas were vulnerable to infection with worms is the gut due to eating contaminated food by eggs and larvae directly or through infected intermediate hosts that may be of beetles, snails, crustaceans, grasshoppers or earth worms (Ford, 2007). The birds infected with different types of external parasites as lice, ticks, scabies and some types of flies that parasitize on the skin and feathers are permanent or temporary, as well as its transfer of pathogens important as parasites, bacteria and viruses (Allam, 1977), and caused the occurrence of inconvenience, discomfort and lack of sleep as a result of sucking the blood which cause of it anemia infected by birds leads to many death in their numbers (Derakhshanfar *et al.*, 2004; Adang *et al.*, 2008).

Pathogenesis of turkey is high in poultry particular age (2-12) week, which is characterized by loss of appetite, lack of weight, sulfur diarrhea and wings sagging by percentage of infection and death up to about 100% (Salifou *et al.*, 2006). Therefore, the present study was designed to isolate and diagnose external parasites types on turkey for the purpose of control and mitigate their impacts on turkey.

Materials and Methods

Samples collection

The study samples collected from Al-Diwaniya city markets (180 Km south of Bagdad) from September 1/9/2014 - the end of May 30/5/2015 a total of 50 birds of domestic turkey (*M. gallpova*) from different areas of Al-Diwaniya city, included Al-Shammiya, Ghammas and Al-Mhnawiya from local markets as well as from the city center were brought after the process collected it to the Parasitology laboratory/ Department of Biology/ College of Education/ Al-Qadisiya University to be

process of weighing and isolate the ectoparasites.

Isolate and identification ectoparasites

Domestic turkey birds were check it by eye and magnifying glass for the purpose of ectoparasites isolating from feathers manually, and Abu Alhab (1975) method used in the samples test that have been obtained from turkey birds then directly transfer (parasites) to ethyl alcohol 70% to kill her and then placed in cold KOH solution 10% for 24 hours to purpose of clarification and then washed with distilled water and placed them in Xylolfor 1-2 minutes and have been carrying on a glass slide by using loading martial (Canada Balsam) and covered it then left to dry for usedit in examination. Isolated samples (ticks and lice) were posted to Natural History Museum/ University of Bagdad/ Iraq for the purpose of diagnosis ticks samples by Prof. Dr. Mohammed Kadim Mohammed and lice sample by Prof. Dr. Mohammed Saleh Abdul Rasul and Dr. Hana Hani Al-Saffar.

Statistical analysis

Chi-square test was used (χ^2) at a level of probability ($P \leq 0.05$) to compare ectoparasites infection percentages and intensity of turkey on the side and the relationship between the infection and bird sex on the other side (Al-Rawiand Khallaf Allah, 1980).

Results and Discussion

Ectoparasites isolated from turkey

Results of examination of 50 domestic turkey (*M. gallopavo*) showed that included 25 males and 25 females being infected by four species of biting lice (*Gonoiocotes gallinae*, *Goniodes gigas*, *Menacanthus*

straminus and *Oxylipeurus* sp.) and two species of ticks (*Argus persicus* and *Haemophysalis* sp. Nymph) reached by infection (10, 4, 2, 2, 2 and 2% respectively) and the considered recording types *Oxylipeurus* sp., *Haemophysalis* sp. Nymph in the turkey was first recording in Iraq (Table 1).

The results showed (Table 1) that turkey infection percentage by ectoparasites reached at 22%, which is lower than 33.85% recorded by the results Flaih (2014) on the turkey in Al-Nasiriya city, and higher than 12.50% recorded by the results of Al-Safer and Al-Mawla (2008) on turkey in Mosul city, all of which are local results, but when compared with global results were higher than 12.50% recorded by the results of Lane *et al.*, (2006) in the United States on the different types of ectoparasites that infect turkey and lower than 62.25% recorded by the results of Salifou *et al.* (2008) in the city of Benin/ France western on the turkey.

The attributed of difference cause on infection percentage by ectoparasites under study to the deterioration of breeding and health conditions in turkeys birds stockades, which are often wet and a few ventilation as well as ectoparasites rapid spread and move it through direct contact between members of the herd during the processes of feeding and mating (Hillgarth, 1996; Roza *et al.*, 1999).

On the other side *Gonoiocotes gallinae* was considered of the most species recorded under study at a rate of 10%, which is lower than the 23.43% recorded by Flaih (2014) results on turkey in Al-Nasiriya city and 15% recorded by the results of Al-Jubouri (2010) on *Gallusgallus domestcus* while it was higher than 2.90% recorded by Al-Shabani (2008) results on *Columbalivia*, moreover, the mentioned kind was scored by

Al-Kurdy (2005) in Erbil governorate, Al-Hubaity (1976) in Mosul city and Abu Alhab (1975) without mentioning infection percentage. Globally *G. gallinae* isolated from turkey in the city of Benin/ France western infection percentage reached 62.25% (Salifou *et al.*, 2008). Njunga (2002) results also recorded infection percentage at 41% for rural and commercial breeding systems.

The attributed of cause high infection of this type more than other species under study to provide an appropriate environment for those living parasites in different parts of the body and to the speed of his movement, which enables him to escape from behavior cleaning bird feathers.

G. gigas species of the most common species and distinctive as big size and color of dark gray; it is widely spread in the back area of the bird infected scored infection percentage reach at 4% in the current study, which is less than recorded results of Al-Jubouri (2010) the percentage of infection at 16% in on *Columbalivia* and *Gallus gallus domestcus* respectively. Globally Salifou *et al.* (2008) study on ectoparasites that turkey infect in the city of Benin/ France western by infection reached to 62.25%, also recorded by Fabiyi (1980) in Nigeria by infection percentage (78.9 and 23.5)% for each rural breeding and crowded systems respectively.

M. straminus also deemed to be a common species recorded in the current study by infection reached to 2%, which is lower than recorded Al-Shabani (2013) results from the infection percentage at (2.9, 19.16 and 26.16)% in nightingale Iraqi white cheek, domestic pigeons and domestic chicken respectively, as well as Al-Jubouri (2010) results were recorded infection percentage 66% in *Gallusgallus domestcus*, Kaream

(2006) results Basra province, which recorded infection percentage at 26.4%, and the results of Al-Kurdy (2005) in Erbil governorate recorded the infection percentage to 54.41% as well as pre-recorded in the same governorate by Al-Nakshabandy (2002) at infection percentage to 72.36%, and recorded by Hanssan *et al.* (1989) in Mosul city at 82.35%. Also globally recorded in America, California by Lane *et al.* (2006) when studying the turkey as the infection of this type of lice reached to 12.5%, and recoded in France in the city of Benin by Salifou *et al.* (2008) at infection percentage to 62.25%.

Oxylipeurus sp. record for the first time in Iraq by this study of infection percentage 2%, which is lower than the results recorded by Lane *et al.* (2006) on turkey in the state of California/ America by infection percentage reached at 50%.

With regard to ticks the current study was recorded infection turkey by two types of ticks; the first was *A. persicus* by infection percentage at 2%, which is the spread globally in most parts of the world such as United States of America, Australia, South Africa, Algeria, Egypt and Iraq as it affects

the pigeon and poultry as well as other types of birds from which turkey (Soulsby, 1968). Abu Alhab (1975) referred to remove it from the chicken in Iraq and description of this type match with the samples diagnosed description; he stressed in his description that this kind of ticks spread commonly in the Iraqi poultry, causing a lot of problems have been recorded by Al-Shabani (2008) in Iraq by infection percentage to 1%, while Swai *et al.*, (2007) recorded it on *Argas persicus* in Tanzania as it is this kind of ticks very spread commonly in tropical and subtropical countries afflicts turkey, chickens, ducks, pigeons and many wild birds that have distinguished and glued on the skin it for the purpose of get the blood (Permin and Hansen, 1998). The reason for the lack of numbers recorded for this type in the current study may be due to their adherence to the host body for a get the blood before laying eggs then fall to eggs lay in crevices or under the bark of trees and nests, remain on the host body for (4-5) days to leave the host after order hiding nearby and dark for eggs laying and life cycle complete (Calnek *et al.*, 1991). This explains was the lack of numbers on the bird's body.

Table.1 Types, infection percentage and intensity of ectoparasites for domestic turkey (*M. gallopavo*) in Al-Diwaniya city

Parasite type		Number infected	Infection percentage (%)	Infection intensity
Lice	<i>Gonoiocotes gallinae</i>	5	10	6.81
	<i>Goniodes gigas</i>	2	4	4.72
	<i>Menacanthus straminus</i>	1	2	0.54
	<i>Oxylipeurus</i> sp.	1	2	0.09
Ticks	<i>Argas persicus</i>	1	2	0.36
	<i>Haemophysalis</i> sp. Nymph	1	2	0.24
Total		11	22	12.76

*Refer to significant differences by using chi square test (χ^2) at a level of probability ($P \leq 0.05$)

Table.2 Distribution of ectoparasites infection for turkey (*M. gallopavo*) by gender in Al-Diwaniya city

Gender	Number tested	Number infected	Infection percentage (%)
Males	25	8	32
Females	25	3	12
Total	50	1	22

*Refer to significant differences by using chi square test (χ^2) at a level of probability ($P \leq 0.05$)

Lice



Male: *Gonoiocotes gallinae* (100 X)



Female: *Gonoiocotes gallinae* (100 X)



Male: *Goniodes gigas* (100 X)



Female: *Goniodes gigas* (100 X)



Male: *Menacanthus straminus* (40 X)



Female: *Menacanthus straminus* (40 X)



Male: *Oxylipeurus* sp. (40 X)

Ticks



Tick: *Argus persicus*(40 X)



Ticks: *Haemophysalis* sp. Nymph



Picture.1 Break the feathers and the loss of the blade in domestic turkey (*M. gallopavo*)



Picture.2 Inflammation and redness of the skin areas domestic turkey (*M. gallopavo*) eaten by lice and the emergence of paired areas scratches and bloody wounds and bleeding caused by lice bites and feather plucking

The second type of ticks *Haemophysalis* sp. Nymph be deemed to be it first recording in Iraq by the current study by infection percentage to 2%, which is lower than the recorded results by Asadollahi *et al.* (2014) in the south of Iran by infection percentage at 3.7%. There are also other species belonging to the *genus* *Haemophysalis* including *H. sulcate* which is one of diagnosed species and internationally known spread capacity; they are adults of this type present on the large animals usually like sheep, goats, cattle and camels causing her paralysis tick and factors vectors that cause animals and humans fever Q (Hoogstraal and Valdez, 1980).

Infection relationship with birds' gender

The results of the current study showed that there were significant gender differences in susceptibility to ectoparasites infection it reached (32 and 12)%, both males and females respectively (Table 2), and this result agreed with the results of Calnek *et al.* (1991), which indicated the presence of significant differences between gender in bringing about the infection and that the females were more susceptible to ectoparasites male and this reversed the findings of the present study was that males are more susceptible than females for some reason may be due to the quality of food

available and climatic conditions as well as the presence of poultry or other ground help bring more infection than females to males. Also results of the current study differed with results of Brown (1972) on excluding the impact of gender to ectoparasites infection in chickens, as well as with study of Permin *et al.* (2002) in Zimbabwe, Njunga (2002) in Malawi which indicated where the infection of all samples chicken examined 100% and Al-Jubouri (2010) researched to the absence of significant differences between *Gallusgallus domesticus* male and female infection in Iraq.

Gross pathological changes caused by ectoparasites for turkey

Turkey birds attacking by many species of lice leading to the creation of a group pathological changes that appear to clear the infected birds as observed in the current study that turkey birds infected with lice was suffering from laziness cases and idle, in the case of severe infection observes the abnormal changes in behavior characterized nervous tension, continuous movement and wings sagging compared with non-infected birds and a noted birds infected frequent use of legs and beaks to remove lice, feathers clean and blade loosed, This is consistent with referred to Kaufman *et al.* (1996) in their study of different types of birds, while in the case nervous tension caused by parasite lice on turkey birds goes back to feed the lice by mouth parts leading to excitation of these birds, cases of annoyance and discomfort, or the reason may be due to walking the lice on the skin by the claws legs, and this consistent with the observation Calnek *et al.* (1997) in ectoparasites on a local poultry in Mousl city. The damages caused by lice infection were feathers crash and broken it in some areas of the body, especially the back area as effect of lice feed on feathers and attachment with it (Picture

1). This is consistent with Al-Shaibani (2008) founded of ectoparasites on the *Columbalivia*. The skin color change to red color and contain on clot blood patches was attributable to the offending bird for himself by scratching place of infection and a plunks it resulting in hemorrhage (Picture 2). This is consistent with the findings of Al-Kurdy (2005) of the results on biting lice parasitism on local fowl in Erbil province.

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