STUDY OF THE PARASITES OF THE LOCAL CHICKENS (GALLUS GALLUS DOMISTICUS) IN DUHOK PROVINCE, KURDISTAN REGION-IRAQ

Adel T. M. Al-Saeed* and Mohammed A. I. AL-Badrani **
*Faculty of Medical Sciences, University of Duhok, Kurdistan Region, Iraq.
** Faculty of Science, University of Duhok, Kurdistan Region, Iraq.
(Accepted for publication: February 10, 2014)

Abstract

One hundred and twenty chickens the local breed (Gallus gallus domesticus) were examined during the period from June to October 2012 in Duhok Province / Kurdistan Region of Iraq. To investigate the prevalence of ecto and endoparasites among them. The recorded parasites included: Two species of lice namely Mencanths stramineus with infestation rates of 34% and Goniocotes gallinae, with infestation rate of 0.8%. One species of soft tick, genus Aragas persicus, was also recorded, with an infestation rate of 4.1%. Whereas, the endoparasite examination revealed 16.6% from protozoa (Eimeria) and the presence of four nematodes and six cestode species, but no trematodes and blood parasites. The highest nematode infection rate was 46.6% with Subulura species, followed by Ascaridia galli with infection rate of 38.3%, Heterakis gallinarum with infection rate of 25% and, Capillaria with infection rate of 4.1%.

Keywords: Local chickens, ecto and endoparasites, lice, cestode, nematodes

Introduction

The domestic fowls are the most important protein sources of human populations in every part of the world. It is demonstrated that during the last thirty years, eggs and poultry meat were constantly increasing (Kaingu et al., 2010). Parasitic infections of poultry are the major factors responsible for economic losses through reduction in productivity and increased mortality (Mirhadi et al., 2011). Poultry are subjected to a wide variety of diseases including Newcastle disease, salmonelosis, respiratory disease and a large number of ecto-endoparasites. Various ectoparasites are reported in the local fowls such as lice, fleas, mites and soft ticks (Urquhart et al., 1996). Gastrointestinal helminthes of poultry are commonly divided into three main groups: nematodes, cestode and trematodes. Nematodes are considered the most important group of helminthes of poultry (Bachaya et al., 2012)

Limited work has been done on ectoparasites and endoparasites of fowls in Iraq including Kurdistan Region, therefore, this study aimed to investigate the ecto and endoparasites of the Domestic fowl Gallus gallus domesticus in Duhok Province.

Materials and Methods

This study was carried out in Duhok province – Kurdistan Region of Iraq, during the period from June to October 2012, to investigate the presence of ecto and endoparasites of the local chickens were randomly selected and purchased from different parts of the Duhok city and its surrounding areas such as Shinkal, Semel, Aqra, Faida and other area in the Animal's House Laboratory of the Faculty of Medical Sciences / Duhok University.

One hundred and twenty live indigenous breed chickens (Gallus gallus domesticus) of both sexes (50 hens and 70 cocks) and different ages of free range breeding were purchased from local markets randomly, and examined for ecto and endoparasites.

Examination of Chickens

1- ) Antemortem examination and collection of ectoparasites

The whole body of each chicken, including the skin and the feathers, was examined by the naked eye and with the aid of magnifying lens for the presence of ectoparasites (Moyo, 2009). The ectoparasites were collected gently using thumb forceps throw inflammatory lesion of skin scraped, these samples were mixed with 10% KOH, and from the feather by spraying with commercial insecticide after that ectoparasites were preserved in a test tube containing 70% ethyl alcohol until the time of identification. The
ectoparasites were examined under dissecting microscope and identified according to keys described by Soulsby (1982).

2- ) Postmortem Examination
Following slaughtering of each chicken, the blood samples were collected directly in a sterile test tube containing EDTA anticoagulant for thin blood film were stained with leishman's stain for the presence of blood parasites.

The trachea, abdominal and thoracic cavity were opened followed by incised the esophagus, crop, gizzard and proventiculus, then small intestine (duodenum and ileum). Each part was incised longitudinally; visible worms to the naked eye were picked up using thumb forceps and the contents were examined by gross examination for the presence of worms. The observed helminthes were washed with physiological saline and then fixed with warm 70% alcohol.

Nematodes were cleared in lactophenol and examined for morphology under the light microscope at 10X magnification. Identification of helminthes was based on the helminthological keys (Soulsby, 1982), while cestode were stained with Carmine stain.

Intestinal contents were also examined by flotation methods for the presence of coccidian oocysts. Only the genus of coccidian oocysts was identified according to morphological features (Soulsby, 1982), and scraping from the intestinal mucous were taken and examined for Cryptosporidium Oocysts identification.

3-) Statistical Analysis
Chi-square ($\chi^2$) test was used to analyze the association between prevalence and the explanatory variables such as age, sex, and management system. In all the cases, $p <0.05$ were considered to be statistically significant (Tesfaheywet et al., 2012).

Results and Discussion

Table (1) shows the percentage distribution of parasitic species identified in 120 local breed chickens examined in this study. 83.3% of the chickens were found to be infected with external and internal parasites. The percentage of infection with internal parasites was 44.1%, while 9.1% was with external parasites and 30% with mixed infection.

Regarding the sex, 84.2% of the female chickens were infected, while 82% of the male chickens were infected, but statistically the difference in the rate of infection in both sexes was non-significant ($P>0.05$) as summarized in Table (2).

Table (1): The percentage of infection with ecto and endoparasites and mixed parasites among examined chickens (No. 120).

| Type of parasites                        | No. of infected chickens | %   |
|-----------------------------------------|--------------------------|-----|
| External parasites                      | 11                       | 9.1 |
| Internal parasites                      | 53                       | 44.1|
| External and internal parasites         | 36                       | 30  |
| Total No. infected                      | 100                      | 83.3|

Table (2): The percentage of infection with ecto and endoparasites among examined chickens, according to sex.

| Sex            | No. of examined chickens | No. of infected chickens | %   |
|----------------|--------------------------|--------------------------|-----|
| Female chickens| 70                       | 59                       | 84.2|
| Male chickens  | 50                       | 41                       | 82  |
| Total          | 120                      | 100                      | 83.3|

Non- significant ($P>0.05$)  
P value = 0.9204  
Degree of Freedom: 1  
$\chi^2$: 0.009995
The highest percentage (88.4%) of infection was among the chick group, while the percentages of infection in adult and growing groups were slightly lower (86.2%, and 75%, respectively), but statistically there were no significant differences (P>0.05) between parasitic infections and age groups as shown in Table (3).

**Table (3):** The percentage of infection with ecto and endoparasites among the examined chickens according to age groups.

| Age groups | Age / months | No. of examined chickens | No. of infected chickens | % of infection |
|------------|--------------|--------------------------|--------------------------|----------------|
| Adult      | > 8          | 58                       | 50                       | 86.2%          |
| Growing    | 2 - 8        | 36                       | 27                       | 75%            |
| Chick      | < 2          | 26                       | 23                       | 88.4%          |
| Total      |              | 120                      | 100                      | 83.3%          |

Non-significant (P> 0.05)  
P value= 0.6203  
Degree of Freedom: 4  
χ²: 2.637

**Ectoparasites:**

The percentage of infestation with ectoparasites among all of the examined chickens was 39.1%. The results showed that 2 species of lice were identified. These species were *Mencanths stramineus* and *Goniocotes gallinae* with infestation rates of 34% and 0.8%, respectively. Regarding the soft ticks, one species was recorded, which was *Aragas persicus* with infestation rate of 4.1% as summarized in Table (4).

**Table (4):** The percentage of infestation with ectoparasites among all infested chickens.

| Type of parasites | Species of parasites | No. of positive | % infested with External parasites (47) | % of examined chickens (120) |
|-------------------|----------------------|-----------------|----------------------------------------|-----------------------------|
| Lice              | *Mencanths stramineus* | 41              | 87.2                                   | 34                          |
|                   | *Goniocotes gallinae* | 1               | 2.1                                    | 0.8                         |
| Soft ticks        | *Aragas persicus*    | 5               | 10.6                                   | 4.1                         |

**Endoparasites:**

The current study revealed that none of the blood parasites were observed in all of the examined chickens as shown in Table (5). Regarding the endoparasites different types of *Eimeria* oocysts with infection rate of 16.6% were recorded in this study (table.5).

**Table (5):** The percentage of infection with *Eimeria* oocysts among total examined chickens.

| Parasites         | No. of examined chickens | No. of positive | %     |
|-------------------|--------------------------|-----------------|-------|
| Protozoa (*Eimeria oocysts*) | 120                      | 20              | 16.6  |

The percentage of infection with helminthes among the total number of examined chickens is listed in Table (6) according to their classes.
Table (6): The percentage of infection with different types of helminthes according to their classes among the examined chickens (No.120).

| Type of parasites     | No. of positive | % of infection |
|-----------------------|-----------------|----------------|
| Nematodes             | 44              | 36.6           |
| Cestodes              | 11              | 9.1            |
| Nematodes + Cestodes  | 34              | 28.3           |
| Trematodes            | 0               | 0              |

According to the percentage distribution of nematodes, the highest percentage of infection was 46.6% with Sublura, followed by Ascaridia galli which was 38.3%, Heterakis gallinarum with infection rate of 25% and Capillaria sp. with infection rate of 4.1% as summarized in Table (7).

Table (7): The percentage of infection with intestinal nematodes among the Examined chickens (No.120).

| Species of parasites | No. of positive | % of infection |
|----------------------|-----------------|----------------|
| Ascaridia galli      | 46              | 38.3           |
| Heterakis gallinarum | 30              | 25             |
| Sublura Spp          | 56              | 46.6           |
| Capillaria Spp       | 5               | 4.1            |

Six species of tapeworm were recorded and identified, which were: Raillietina tetragona, R. echinobothrida, R. cesticillus, Fimbriaria fasciolaris, Davainea proglottina, and Amoebotaenia sphenoides with percentage distribution of 27.5%, 24.1%, 6.6, 1.6%, 2.5%, and 0.8%, respectively Table (8).

Table (8): The percentage of infection with intestinal cestode among the examined chickens (No.120).

| Species of Cestode    | No. of positive | % of infection |
|-----------------------|-----------------|----------------|
| Raillietina tetragona | 33              | 27.5           |
| Raillietina echinobothrida | 29      | 24.1           |
| Raillietina cesticillus | 8            | 6.6            |
| Fimbriaria fasciolaris | 2             | 1.6            |
| Davainea proglottina  | 3               | 2.5            |
| Amoebotaenia sphenoides | 1            | 0.8            |

The results of the present study demonstrated a high rate of infection (83.3%) in the local breed chickens while Eslami et al. (2009) in Iran reported a higher rate (96%) of infection in the free-range chickens. Regarding the sex of the infected chicken female chickens had a slightly higher infection in comparison to male chickens this result is in agreement with the findings of Matur et al. (2010) in Nigeria during their studies of 500 gastrointestinal tracts of native and exotic breeds of chickens. The relation between parasitic infection and age groups of the present study is in line with that of Tesfaheywet et al. (2012) in Southeastern Ethiopia in which they recorded slight difference in infection rates of examined chickens among chicks, growers and adults which were 38.0%, 37.6% and 45.9% respectively. High infection rate was recorded with ectoparasites similarly AL- Hubaity (1976) in Mosul; Ashenafi and Yimer, (2005) in central Ethiopia also recorded high rates of infection with ectoparasites. A high rate of infection (89%) with endoparasites was recorded in this study, this rate is much higher than the rates
recorded by other researchers as they recorded rates ranged from 4.3% to 36% of infection with endoparasites of domestic fowl (Sayyed et al., 2000; Muhairwa et al., 2007). Regarding the blood parasites, the present study did not show any species of blood parasites in all of the examined chickens. This result disagrees with those found by Sabuni et al. (2010) in Kenya who found high infection (79.2%). In the current study, only 20 (16.6%) were positive for coccidial oocysts. While higher rate of infection with coccidial have been reported by Bachaya et al. (2012) in Pakistan, they recorded a rate of 59.6%. With respect to cestodes, similar results were reported by Esiami et al. (2009) in Iran, they found that A. galli, H. gallinum and Raillietina species were the most prevalent helminthes species. The same results were reported in chickens of Ethiopia and India (Yadav and Tandon, 1991) Trematodes were not found in this study, the reason may be due to the absence or limited spreading of the snail the intermediate hosts responsible for the transmission of trematodes in the studied areas.

References
Al- Hubaity, I. A. (1976). Studies on the parasites of fowl Gallus gallus domesticus in Mosul district, Iraq. M. Sc. Thesis, University of Mosul.
Ashenafi, H. and Yimer, E. (2005). Ectoparasites of local scavenging chickens of central Ethiopia. Ethiopian Journal Science, 28 (1): 69–74
Bachaya, H. A.; Raza, M. A.; Khan, M. N.; Iqbal, Z.; Abbas, R. Z.; Murtaza, S. and Badar, N. (2012). Predominance and detection of different Eimeria species causing coccidiosis in layer chickens. Journal of Animal Plant &Sciences, 22(3): 597-600.
Esiami, A.; Ghaemi, P. and Rahbari, S. (2009). Parasitic Infection of Free-Range Chickens from Golestan Province, Iran. Iranian J. parasitol., 4 (3):10-14.
Kaingu, F. B.; Kibyr, A. C.; Ahivairo, R.; Kutima, H.; Okeno, T. O.; Waihenya, R. and Kahi, A. K. (2010). Prevalence of gastro-intestinal helminthes and coccidian in indigenous chicken from different agro-climatic zones in Kenya.African Journal of Agricultural Research, 5(6): 458-462.
Matur, B. M.; Dawam, N. N. and Malann, Y. D. (2010). Gastrointestinal Helminthes parasites of local and exotic Chickens Slaughtered in Gwagwalada, Abuja (FCT), Nigeria. New York Science Journal, 3(5): 96-99.
Mirhadi, K.; Yagoob, G.; Alireza, A. and Heidar, K. (2011). The Effect of Ivermectin Pour on Administration Against Natural Heterakis gallinarum Infection and its prevalence in Native Poultry. Research Journal of Poultry Sciences, 4(3): 41-44.
Moyo, S. (2009). Alternative Practices Used By Resource-Limited Farmers to Control Fleas in Free-Range Chickens in the Eastern Cape Province, South Africa. M.Sc, South Africa. Thesis M.Sc. Faculty of Science and Agriculture. University of Fort Hare.
Muhairwa, A. P.; Msoffe, P. L.; Ramadhani, S.; Mollel, E. L.; Mtambo, M. M. A. and Kassuku, A. A., (2007). Prevalence of gastro-intestinal helminthes in free-range ducks in Morogoro Municipality, Tanzania. Livestock Research for Rural Development, 19 (4):1-6.
Sayyed, R. S.; Phulan, M. S.; Bhatti, W. M.; Pardehi, M. and Ali, S. (2000). Incidence of Nematodes parasites in commercial layers in Swat.Pakistan Vet. J., 20 (2):107-108.
Soulsby, E. J. L. (1982). Helminths, Arthropodes and protozoa of domesticated Animals. 7 edsBailliere Tindal, London, U.K pp: 99-166.
Tesfahewet, Z.; Amare, E. and Hailu, Z. (2012). Helminthosis of Chickens in Selected Small Scale Commercial Poultry Farms in and around HaramayaWoreda, Southeastern Ethiopia. Journal of Veterinary Advances, 2(9): 462-468.
Urquhart, G.M.; Armour, J.; Duncan, J. L.; Dunn, A.M. and Jennings, F. W. (1996). Veterinary Parasitology. 2ed Edition. Blackwell Science Ltd. Osney Mead. Oxford Oel, London.
Yadav, A. K. and Tandon, V. (1991). Helminth parasitism of domestic fowl (Gallus gallusdomesticus) in a subtropical high rainfall area of India. Beitr Trop Land Wirtsch Vet Med., 29: 97-104.
أجريت هذه الدراسة لغرض تحديد الطفيليات الخارجية والداخلية التي تسبب الدجاج الأليف من نوع Gallus gallus في مدينة دهوك/إقليم كردستان العراق. وكانت فترة العمل من حزيران إلى تشرين الثاني 2012. تم فحص 120 دجاجة محلية من كلا الجنسين في هذا البحث. نعتبر من القليل 56.2% نسبة إصابة Heterakis gallinarum و 78.5% بإصابة Ascaridia galli. أما بالنسبة للديدان البرية ذاتية تتبع (Soft ticks) بنسبة 10.2%على التوالي. ونوع واحد من الفراد لين (Eimeria) بنسبة إصابة 6.1%. وكانت نسبة الاصابة بالأوالي (Termatode) بنسبة 41.9% على التوالي. 

لم تسجل في الدراسة الحالية أي إصابة بطفيليات الدم والدم الحمضي. 

تم تسجيل أربع أنواع مختلفة من الديدان الحمضية المبعوثة وأعلى نسبة للديدان الحمضية كانت نسبة 65.6% أصغر دودة Mencanths stramineus. أما بالنسبة للديدان الحمضية الأخرى فهي كانت بنسبة 38.4% Heterakis gallinarum و3.8% Ascaridia galli، 38.4% Heterakis gallinarum و3.8% Ascaridia galli. 

تم تسجيل صعوبة مرضية من هذه الفئات، وهي كلا إلى أصغر دودة Mencanths stramineus. أما بالنسبة للديدان الحمضية الأخرى فهي كانت بنسبة 38.4% Heterakis gallinarum و3.8% Ascaridia galli. 

تتضمن هذه الدراسة أشير إلى أن هذه الطفيليات المسمى (Termatode) وتتضمن Mencanths stramineus، Capillaria cesticillus، R. echinobothrida، R. cesticillus، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris، Davainea proglottina، Fimbriaria fasciolaris.