

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.

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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 *Mencanthus 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%. Regarding cestodes, the recorded species included: *Raillietina tetragona*, *R. echinobothrida*, *R. cesticillus*, *Fimbriaria fasciolari*, *Davainea proglottina*, and *Amoebotaenia sphenoides* with infection rates of 27.5%, 24.1%, 6.6%, 1.6%, 2.5%, and 0.8%, respectively.

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, salmonellosis, 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 proventriculus, 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 (χ^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.

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

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 (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 ($P > 0.05$)
Degree of Freedom: 1

P value = 0.9204
 χ^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 χ^2 : 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 *Mencanthus 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	<i>Mencanthus stramineus</i>	41	87.2	34
	<i>Goniocotes gallinae</i>	1	2.1	0.8
Soft ticks	<i>Aragas persicus</i>	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 (<i>Eimeria</i> 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
<i>Ascaridia galli</i>	46	38.3
<i>Heterakis gallinarum</i>	30	25
<i>Sublura Spp</i>	56	46.6
<i>Capillaria Spp</i>	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
<i>Raillietina tetragona</i>	33	27.5
<i>Raillietina echinobothrida</i>	29	24.1
<i>Raillietina cesticillus</i>	8	6.6
<i>Fimbriaria fasciolaris</i>	2	1.6
<i>Davainea proglottina</i>	3	2.5
<i>Amoebotaenia sphenoides</i>	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 coccidian oocysts. While higher rate of infection with coccidian 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 Eslami *et al.* (2009) in Iran, they found that *A. galli*, *H. gallinrum* and *Raiellietina 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.

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پوختنه

ئهؤ فه كولينه هاتيه ئهجامدان ژ پيخه مهت ديار كرنا مشه خورين دهره كي و نافخوي بين تووشى مريشكا ژ جورى *Gallus domesticus* دبن، كو ب شيوه كي خومالي دهينه خودانكرن ل ناه بازي ري دهوكي \ هيريما كوردستانا عيرافي. هاتيه ئهجامدان د ماوي دناقهرا خزيрана 2012 ههتا چريا دوي يا هه مان سال. بو فئ مه ره مي، 120 مريشكين خومالي ژ ههردوو ره گهزان ههرديسان هه ژ ئهجامين هاتينه توماركرن دفي فه كولينى دا دوو جورين سپهان *Mencanthus stramineus* و *Goniocotes gallinae* ب ريژا 34% و 0,8% ل دوي ف ئيك. ههرديسان جوره كي پليپلكا نه رم *Aragas persicus* ب ريژا 4,1%.

ههرديسان تيستين مايكروسكوبي بو پيساتيا هندهك مادده بين ژ نافخوشى ريفيكين وان هاتينه وه رگتن هاته كرن بو ديار كرنا جورين جودا جودا بين هيكيين ئيميري *Eimeria ooc* و ريژا تووشبونى 16,6% دفي فه كولينى دا چ حاله تين تووشونى ب مشه خورين خوينى blood parasites نه هاتنه توماركرن ژ سه رجه مي وان هه مي مريشكين هاتينه تاقيكرن.

چوار پولين جودا جودا بين كرمين نيماتودا بين ريفيكان هاتنه توماركرن ژ سه رجه مي مريشكين تووشوبى، ههرديسان بلندر تين ريژا كرمين نيماتودا ژ جورى *Sublura* ب ريژا 46,6% و پاشى كرمى *Ascaridia galli* ب ريژا 38,3% و پاشى كرمى *Heterakis gallinarum* ب ريژا 25% و دو ماهي زي كرمى *Capillaria* ب ريژا 4,1%.

ده باره ي ريژا كرمين شريتي بين تووشى ريفيكين مريشكين خومالي بووين، دفي فه كولينى دا شهش جورين فان كرمان هاتنه توماركرن ئه و زي ئه فه بوون *R. cestricillus*, *R. echinobothrida*, *Raillietina tetragona*, *Fimbriaria fasciolaris* و *Davainea proglottina* ب ريژين 27,5%, 1,6%, 2,5%, 0,8% ل دوي ف ئيك. دماوي ئهجامدانا تاقيكرنان لسهر ئه ندامين نافخوي بين مريشكان چ جورين كرمين په حن Flat Worm نه هاتنه ديتن.

الخلاصة

أجريت هذه الدراسة لغرض تحديد الطفيليات الخارجية والداخلية التي تصيب الدجاج الأليف من نوع *Gallus domesticus* المربي محليا في مدينة دهوك / إقليم كردستان العراق. وكانت فترة العمل من حزيران إلى تشرين الثاني 2012. تم فحص 120 دجاجة محلية من كلا الجنسين سجل في هذا البحث، نوعين من القمل هما *Mencanthus stramineus* و *Goniocotes gallinae* بنسبة إصابة 34% و 0,8% على التوالي، ونوع واحد من القراد اللين (Soft ticks) بنسبة إصابة 4,1%. وكانت نسبة الإصابة بالأوالي (*Eimeria*) 16,6% من مجموع الدجاج المفحوص.

لم تسجل في الدراسة الحالية أي إصابة بطفيليات الدم blood parasites وأكياس ال *Cryptosporidium* في جميع الدجاج المفحوص.

تم تسجيل أربعة أنواع مختلفة من الديدان الخيطية المعوية و أعلى نسبة للديدان الخيطية كانت بدودة *Sublura* بنسبة إصابة 46,6% تلتها دودة *Ascaridia galli* 38,3% ثم دودة *Heterakis gallinarum* 25% وأخيرا دودة *Capillaria* بنسبة إصابة 4,1%. أما بالنسبة للديدان الشريطية التي وجدت في أمعاء الدجاج المحلي في هذه الدراسة حيث تم تسجيل ستة أنواع من هذه الديدان وهي كالتالي *R. echinobothrida*, *R. cestricillus*, *Raillietina tetragona*, *Fimbriaria fasciolaris* و *Davainea proglottina* و *Amoebotaenia sphenoides* و بنسب إصابة 27,5%, 1,6%, 2,5%, 0,8% على التوالي. ولم يتم عزل أي نوع من أنواع الديدان المسطحة (Teratode) في جميع الدجاج المفحوص.