# DIAGNOSTIC STUDY ON MICROFILARIAE AND SOME BLOOD PROTOZOA IN QUAIL BIRDS (*COTURNIX COTURNIX JAPONICA*) IN NINEVEH GOVERNORATE

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## ABSTRACT

The study covered a diagnosis for detection of microfliaria in 90 blood samples obtained from quail birds. The results recorded that total infestion rate was (15.6%).

Three species of microfliaria have been diagnosed in quail. Form A of detected larvae measured 106 – 125 µm in length and 2.5 –3.0 µm in width, while form B measured 97–145.4 µm in length and 4.0 – 6.0 µm in width , finally form C dimensions measured 120–150 µm and 4.5 – 5.0 µm in width respectively. Knott technique detected most positive cases with higher sensitivity rate 85.7%, than other techniques used in the study. The rate of infection recorded in adult birds 14.5% was little higher than it in young birds 10.7% with no significant statitiscal defferences between males and females. The study showed appearance of 7.7% of mixed infections of microfliaria with *Aegyptianella spp.* and 4.4% with *plasmodium spp.* Finally the study pointed that microfliaria appeared with high percentage in circulating blood than peripheral blood of 40 quail birds, as15% and 10%in circulating and peripheral blood respectively.

## INTRODUCTION

Japanese quail (*Coturnix coturnix japonica*) belong to Family: Phasianidae of the Order: Galiformes of the Class: Aves, (1), and has been introduced to Iraq as domastic bird because it has desirable meat which has tasteful, energy higher than in chickens meat and for eggs productions (2). The birds have considered one of the common birds farm in Egypt and Saudi Arabia for it's charctristics mentioned above and has been used as laboratory animals(3), although it poses quality resistance to disease than those of chickens but may hindered by various problems such as haemoparasites which include one or more genera typically live in blood of the host during at least some development(4).

Filarial nematodes larvae whose adult stages live in internal organs and cavities, circulates in blood from where they are ingested by vector during blood meal (5) and may causes ecological and behavioral changes in avian host and induced morbidity and mortality in susceptible animals (6).The present study was conducted to determine the incidence and diagnosis of microfliaria in

blood of quail bird in nineveh governorate and teste the best method and site for diagnosis it in blood . The study considered the first deal with this aspect in quail at nineveh governorate.

## MATERIAL AND METHODES

A total of (130) quail species (*Coturnix coturnix japonica*) were collected from different areas in nineveh governorate. Blood samples were collected from 90 quail birds in different ages and both sexes at the time of slaughter from jugular vein and the blood was kept in vials with anticoagulant . All samples examined by using three laboratory techniques; wet blood film technique (7), Giemsa stain(thin blood smear ) technique(8), and knott's technique .

Microfliaria and other blood parasites measured with ocular micrometer and identified depending on data given by (9,10,11) while intensity calculated according to (12).

Thin blood smear prepared from (40)quail birds collected from preipheral blood (wing vein) according to (11) befor slaughter birds and from circulating blood (lung) as in (13) after slaughtered birds to compare between two sites for isolation of microfliaria . chi-square test were used to compare among the resultes (14).

## RESULTS

Examination of (90) blood samples from quail birds (*Coturnix coturnix japonica*) revealed presence of microfliaria with total infection rate(15.5%). (Table ,2).Three forms of microfliaria have diagnosed in blood samples based on morphological characteristics with low intensity for all three forms as shown in table (1).Figures (1,2,and 3).

The current resultes appeared that knott's technique is the most sensitive technique for detection of microfliaria in blood among other techniques, it has detected (12) out of (14) positive sample detected by all techniques used in the study, with sensitivity reached to (85.7%) fllowed by wet blood film technique which considered also as suitable technique for microfliaria detection which is gave sensitivity (71.4%) and Giemsa stain with sensitivity (57.1%).(Table ,2). Figures(4 and 5).

The study showed that percentage of infections in adult birds was higher than it in young which represented with (14.5%) and (10.7%) in adult and young respectively, (table,3) .This difference was not significant at ($p>0.05$) . Also there was no significant differences between females and males . Females recorded (12.7%) of infection while males represnted (14.3%).(Table,4).

Table (5) showed presence of mixed infections of microfliaria with *Aegyptianella spp.*in 7 (7.7%), *Plasmodium spp*. in 4 (4.4%) of positive samples and mixed infection of microfliaria with both above parasite genera in 3 (3.3%*)* of positive blood samples .

The study notes high single infections of *Aegyptianella spp.* parasites. It is found in 16 blood samples of quail with percentage (17.7%) and intensity moderate which appears as redish

organism in erythrocytes with varied sizes from (0.4-1) µm.( Fig, 6), and low single infection with *plasmodium spp.* with percentage (4.4%) and low intensity. (Fig,6). (Table,6).

Comparative study between peripheral blood (wing vein) and circulating blood(lung) of 40 examined quail bird indicated that microfliaria was higher in circulating blood (15%) than in peripheral blood (10%) with significant difference between them at (p<o.o5).(Table ,7).

Table (1) Measurments of three forms of microfillaria recoverd from (90) blood of quail birds.

| **Form of microfliaria** | **Length(µm) mean (range)** | **Width(µm)** | **Characteristic feature** |
|---|---|---|---|
| Form A | 112.4 (106-125) | 2.5-3 | Unsheathed |
| Form B | 118.7 (97-145.4) | 4.0-6.0 | Unsheathed |
| Form C | 129.4 (120-150) | 4.5-5 | Sheathed |

Table (2) Number of positive blood samples with different tecniques and sensitivity of each.

| No. of samples | Positive samples No. (%) | Techniques | | | | | |
|---|---|---|---|---|---|---|---|
| | | knott's | | Wet blood film | | Giemsa stain | |
| | | Positive | Sensitivity(%) | Positive | Sensitivity(%) | Positive | Sensitivity(%) |
| 90 | 14 (15.5) | 12 | 85.7 | 10 | 71.4 | 7 | 57.1 |

Table (3) Percentages of infection with microfliaria in (90) blood samples of quail bird according to age.

| Age | No. of examined samples | No. of positive sample | Percentage of infection(%) | Signification |
|---|---|---|---|---|
| Adult(more than 10 weeks) | 62 | 9 | 14.5 | Not significant at p>0.05 |
| Young (less than 10weeks) | 28 | 3 | 10.7 | |

Table (4) Percentages of infection with microfliaria in (90) blood samples of quail birds according to sex.

| Sex | No.examined | No.Positive sample | Percentage of infection(%) | Signification |
|---|---|---|---|---|
| Females | 55 | 7 | 12.7 | Not significant at p>0.05 |
| Males | 35 | 5 | 14.3 | |

Table(5) Mixed infections of microfliaria with the other blood parasites in (90) blood samples of quail birds.

| Type of parasite mixed with microfliaria | No. of infected samples | Percentage of infection(%) |
|---|---|---|
| Microfliaria and *Aegyptianella spp.* | 7 | 7.7 |
| Microfliaria and *plasmodium spp.* | 4 | 4.4 |
| Microfliaria , *Aegyptianella spp.* and *plasmo spp.* | 3 | 3.3 |

Table (6) percentages of single infections with blood parasites in (90) blood samples in quail bird and intensity of each one.

| Type of blood parasites | No. of Positive samples | Percentage of infection(%) | Intensity |
|---|---|---|---|
| Microfliaria | 14 | 15.5 | Low |
| *Aegyptianella spp.* | 16 | 17.7 | Moderate |
| *plasmodium spp.* | 4 | 4.4 | Low |

Table(7) Prevalence of microfliaria according to site of collected blood sample in (40)quail birds.

| Site of collection | No. of positive samples | Percentage of infection(%) |
|---|---|---|
| Peripheral blood(wing vein) | 4 | 10 |
| Circulating blood (lung) | 6 | 15 |

Fig. (1) form A/ unsheathed microfliaria.

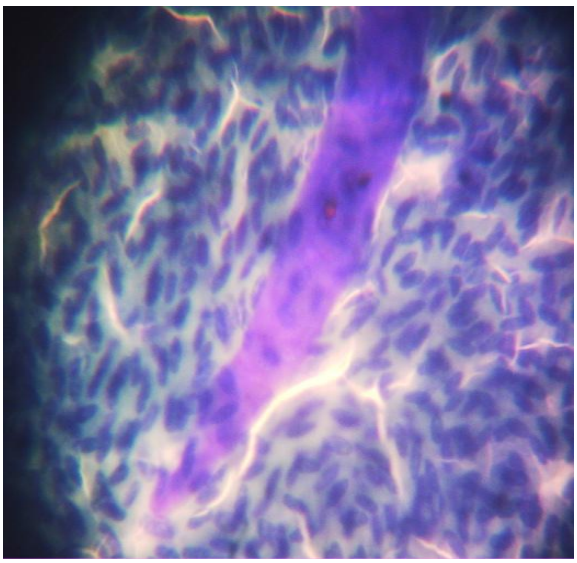

Fig. (2) form B/ unsheathed microfliaria.(posterior end).

Fig.(3) form C/ sheathed microfilaria.

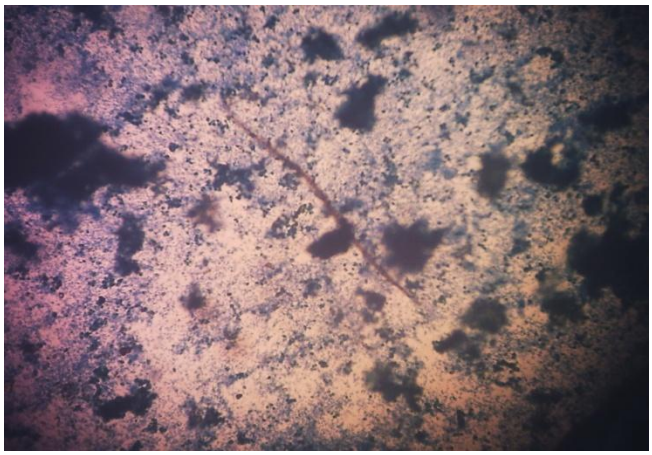

Fig.(4) unidentified microfilaria in blood of quail bird(Knott technique,10x).

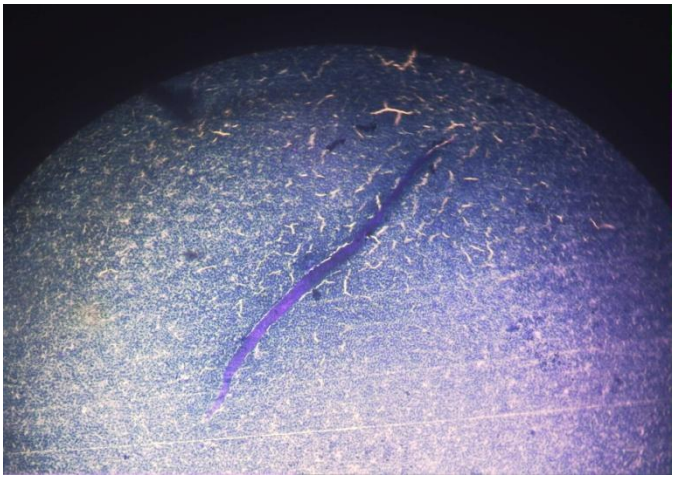

Fig.(5) unidentified microfilaria in blood of quail bird(Giemsa stain technique,40x).

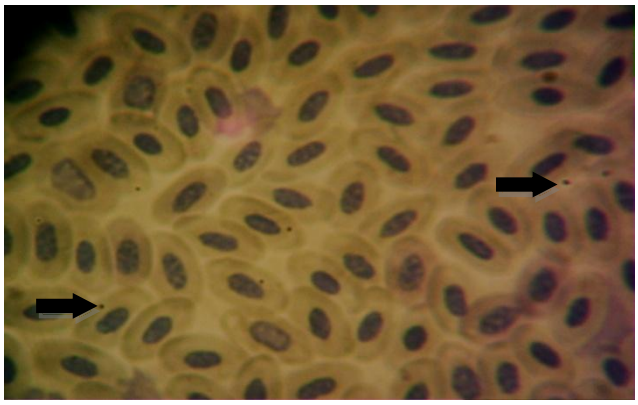

Fig.(6) Single infection of *Aegyptianella spp*.in blood film of quail bird(Giemsa stain technique,100x).

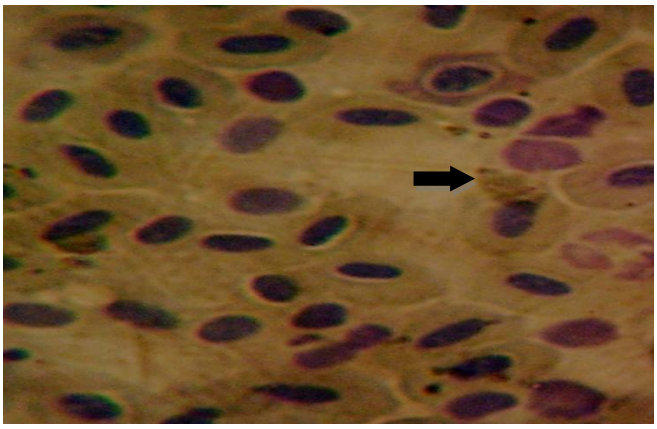

Fig.(7) Single infection of *plasmodium spp*.in blood film of quail bird(Giemsa stain technique,100x).

## DISCUSSION

Quail birds deserve care since they have many benefit charctristics as it is resistance to diffrerent diseases, not need big distance to farm, and considered as important source of animal proteins which is nessesary to human.

In the current study (14)quail birds from (90)examined for presence of microfliaria harboure nematode larva(microfliaria)in blood with total infection rate (15.6%). This study is the first deals with this aspect in quail in iraq, there is no study that deals with this parasites in our country but studies performed in different parts in world indicated presence the parasite in birds, such study in texas (2) which observed that (25%) of quail examined in brewster country,texas was infected with microfliaria,and other study which considered avian filariasis occure in wide range in avian species and may be contributing factor in causing diseases or death(15). Distribution of infection with microfliaria depends upon environment demands of vector and different exposure of birds to vector, the exposure may be depends on the time of daily activities of indivuals species and selection place for nesting, rest(4).

From the laboratory techniques used under this study to diagnose microfilaria in blood of quail, knott's technique was the best for identification which recorded sensitivity (85.7%) , these finding disagree with(7)but agree with (16) which was considered this technique as the best and give accurate results in number of positive samples diagnosed and time saved.

The morphology and size of microfilaria detected in our study approached with the resultes given by several studies such as (11) , current study did not identify species because the adult worms; which parasitized the body cavity and air sac that may belong to several genera like ornithofilaria, sarconema and splendidofilaria; can not be observed.

The percentage of infection is little higher in adult birds (14.5%) than young birds(10. 7%), this result agrees with (17) while disagres with(18); this may reflect along prepatent peroid or agreater probability of exposure to infected intermediate host with age (19) on the other hand there is no statistical differences in rates of infection between male and female of quail examined, these results are similar to those abtained by (20) and may be attributed to that male and female affected equally for contributing factor to disease.

The study evidence appearing of mixed infections of microfilaria with *Aegyptainella spp* which is intraerythrocytic parasite of domastic birds which now placed in family Anaplasmataceae( 21) as percentage(7.7%) .(15)found similar association in chickens kept near cages of birds ,also my study observed high single infection with *Aegyptianella spp* in blood of quail as percentage (17.7%) which indicates importance of this parasite in quail that it may becomes high pathogenic and often fatal (22) while low mixed infections of *plasmodium spp* with microfliaria (3.3%) and low single infections with *plasmodium spp.*(4.4%) in quail indicate less

susceptible of quail to infection with plasmodium parasite. Presence of these three types of parasites(microfliaria, *Aegyptianella spp. and plasmodium spp.* in 3 blood smears of quail in my study varies from the results observed in other studies in world because of several factors may affect the presence of blood parasites such as type of bleeding , presence suitable environment to vector and immuno status of birds .

Results of the study agreed with the other accompianed studies such as (13,17) , studied on Willo ptarmigan and passerine birds respctively, that indicated the relationship between the site of blood collection and the prescence of blood parasites. Circulating blood (heart and lung) is the more correct site for diagnosting study of microfilaria than peripheral blood(wing vein) that microfilaria congreat in deep circulation especially in lung where flow rate of blood is slow(23) .

## دراسة تشخيصية عن اليرقات الخيطية الدقيقة وبعض الاوالي الدموية في طائر السمان (*Coturnix coturnix japonica*) في محافظة نينوى

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### الخلاصة

اشتمل البحث على دراسة تشخيصية للكشف عن اليرقات الخيطية الدقيقه في 90 عينة دم من طائر السمان.شارت النتائج الى ان النسبة الكلية للخمج بلغت 15.6%،شخصت ثلاثة انواع منها في طائر السمان تراوحت طول النوع Aبين106- 125 مايكرومتر والعرض 2.5- 3.0 مايكرومتر والنوع B بين97 - 145.4 مايكرومتر والعرض بين4.0- 6.0 مايكرومتر والنوع C بين 120- 150 مايكرومتر والعرض بين4.5- 5.0 مايكرومتر. كشفت تقنية Knottعن معظم الحالات الموجبة اذ سجلت اعلى نسبة كفاءة من بين التقنيات الاخرى المستعملة بلغت 85.7% سجلت نسبة الخمج في الطيور البالغة ارتفاعا قليلاعنها في الصغيرة العمر اذ بلغت 14.5% و10.7% في الطيور البالغه والصغيرة على التوالي مع عدم وجود فرق معنوي بين الذكور والاناث .واظهرت الدراسة وجود خمج مختلط لطفيلي اليرقات الخيطية الدقيقة مع طفيلي*Aegyptianella spp.* بنسبة بلغت 7.7% ومع طفيلي

*Plasmodium spp.* بنسبة بلغت 4.4% ووجد من خلال فحص عينة دم ماخوذة من الدم المحيطي الوريد الجناحي وماخوذة من الدم الدائر(الرئة) من 40 طائر من السمان ان نسبة تواجد طفيلي اليرقات الخيطية الدقيقة في الدم الدائر اعلى من الدم المحيطي اذ بلغت 15% و 10% في الدائر والمحيطي على التوالي.

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