Study on the parasites of chukar partridge *Alectoris chukar* from Shaqlawa district, Kurdistan region, Iraq

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Abstract

A total of 96 specimens of chukar partridge *Alectoris chukar* were collected from Shaqlawa district, northeast of Erbil city, Kurdistan region, north of Iraq, during the period from May 2009 to the end of April 2010 and inspected for parasites. The study revealed the existence of five species of parasites including:one species of digenetic trematode (*Dicrocoelium petrowi*), two species of cestodes (*Cotugnia latiproglottina* and *Raillietina alectori*), and two species of nematodes (*Ascaridia numidae* and *Hartertia gallinarum*). Two species of these parasites (*D. petrowi* and *A. numidae*) are considered as first records in Iraq. Also, *A. chukar* was regarded as a new host for *R. alectori* and *H. gallinarum*.

Introduction:

Chukar partridge (*Alectoris chukar*) is one of the native birds, which are spread in Iraq in general and in Kurdistan Region in particular. The chukar is one of the most important birds area for its beauty, its wonderful singing and the good taste of its meat [1].

Alectoris chukar belongs to Order Galliforms, Family Phasianidae and Sub Family Phassianinae [2]. The genus *Alectoris* consists of seven species and 24 subspecies, including 14 subspecies of *A. chukar* [3]. Only four subspecies are found in four different areas in Iraq namely: *A. chukar asoica*, *A. chukar kurdistanica*, *A. chukar sinaica* and *A. chukar werae* [4]. The common names of this bird are: chukar, kabk, keklik, chikone, kaukau, chukru, chukor, chickore and nek-pa [5].

Many problems are facing wild chukars which limit its activity, growth and vitality, including competition, predation, parasites, diseases, hunting, accidents and habitat degradation[6]. Chukars are susceptible to many of the common fowl parasites such as: protozoa, helminthes, lice, fleas and mites [7]. The study of chukars parasite is necessary and important to reduce the impact on this national wealth, to increase the productivity, the possibility of breeding or acclimatization of this bird in new locations, and it plays an important role in spreading diseases and parasites to domesticated birds and even to man. The objectives of this work are to determine the composition of the parasites community of a natural population from *A. chukar* in Kurdistan region.

Materials And Methods:

A total of 96 chukar partridge *A. chukar* were collected from Shaqlawa district (located about 51 Km northeast of Erbil city, Kurdistan region, in the north of Iraq, situated between 36°-24° north latitude and 44°-21° east longitude). Monthly samples of this bird specimen were caught by hunters using different types of traps, during the period from May 2009 to the end of April 2010. Chukars were kept alive in a wood basket and transferred to the Parasitology laboratory in the Department of Biology, College of Education, University of Salahhadin.

In the laboratory, the birds were identified according to Lepage [8], and were examined internally for parasites after slaying them. After removing the feathers, the birds were opened from abdominal site and each organ (intestine, liver, gallbladder, lung and trachea) was separated, transferred to Petri dishes containing tap water and examined under a dissecting microscope at 40x magnification. The gastrointestinal tract was removed out from the oesophagus to the rectum and opened longitudinally and examined carefully [9].

Fixation, preservation and staining of parasites:

Digenetic trematodes: The adults of digenetic trematodes were removed from the liver, then cleared in 5% saline solution, fixed in 70% hot ethanol, and stored in70%ethanol. Stained with acetocarmine, dehydrated in concentration series of ethanol, cleared with xylene and mounted in Canada balsam [10].

Cestoda: Cestodes were removed from thr intestine of the infected birds, washed with 5% saline solution, fixed in 5% hot formalin and stored in 70% ethanol. They were stained with Semichon's acetocarmine, dehydrated in ethanol series, cleared in xylol and mounted in Canada balsam [11].

Nematoda: the specimens were cleaned by a fine brush, fixed by adding 70% hot alcohol, and stored in the mixture of glycerin and alcohol (v/v, 5:95). After treatment with lactophenol for transparency, mounted in jelly glycerin [8].

Photos were taken with Canon Power Shot Sd 1200 Is Digital Camera model 10.0 Mega Pixels. The figures were taken by using a Camera Lucida (Drawing tube). Measurements of parasites were made with an Olympus ocular micrometer. The identification of parasites was carried out in accordance with the methods [9; 12].

Results And Discussion:

The study revealed the existence of five species of parasites including: one species of digenetictrematode (*Dicrocoelium petrowi*), two species of cestodes (*Cotugnia latiproglottina* and *Raillietina alectori*) and two species of nematodes (*Ascaridia numidae* and *Hartertia gallinarum*). The distribution of the parasites and their location in the chukar host body are summarized in Table (1). Also, the prevalence

and mean intensity of infection are shown in the same table. The following is an account on description and measurements of these parasites.

Dicrocoelium petrowi Kassimov, 1952

This species was obtained from the liver of *A. chukar* with a prevalence of 10.41% (Table 1).

Body elongated, total length 6-10mm, maximum width 1.25-1.75mm at the median level of posterior third of the body. Cuticula slightly thickened and smooth. Oral sucker terminal, sub circular, smaller than ventral sucker 0.1-0.3mm in diameter. Ventral sucker, located at the front end of the body 0.8-1.2mm in diameter. Pharynx present, esophagus short, ceca delicate, sub equal in length, terminating at one-fifth of body length from posterior end of the worm. Testes relatively large, ovoidal, located beneath ventral sucker about 0.6- 1.2mm. Cirrus poach long, well-developed and measures 0.25-0.35mm. Ovary ovoidal-triangular, posttesticular near mid body, about 0.3-0.4mm in diameter. Vitellaria reach 0.15-0.35mm in length and begin at melissa calf, without reaching the testes (Fig. 1). Eggs brown, ovoidal, non-operculated and measured 0.017-0.022 X 0.012mm.

The description and measurements of the present specimens are similar to those reported by Skrjabin [13] for *D. petrowi* detected for the first time in the liver of *A. graeca* in Soviet Union. Based on the consulting with the specialized scientific side Professor Dr. David I. Giboon, Editor, Systematic Parasitology, Department of Zoology, Natural History Museum, London SW75BD, UK, it was seem close to the parasite *D. petrowi*. Since no further reports were available on its occurrence in Iraqi birds, so the present record represents the first record of *D. petrowi* in Iraq.

Table (1): The distribution of parasites in different sites of *Alectoris chukar* (n=96) from Shaqlawa district.

Parasites	No. of chukar infected	Prevalence (%)	Mean intensity	Site of infection
Dicrocoelium petrowi *	10	10.41	75.2	Liver
Cotugnia latiproglottina	6	6.25	6.5	Small intestine
Raillietina alectori **	32	33.33	6	Small intestine
Ascaridia numidae *	18	18.75	25.4	Small intestine
Hartertia gallinarum **	6	6.25	22.3	Intestinal caecum

*new record in Iraq.
**new host record in Iraq.

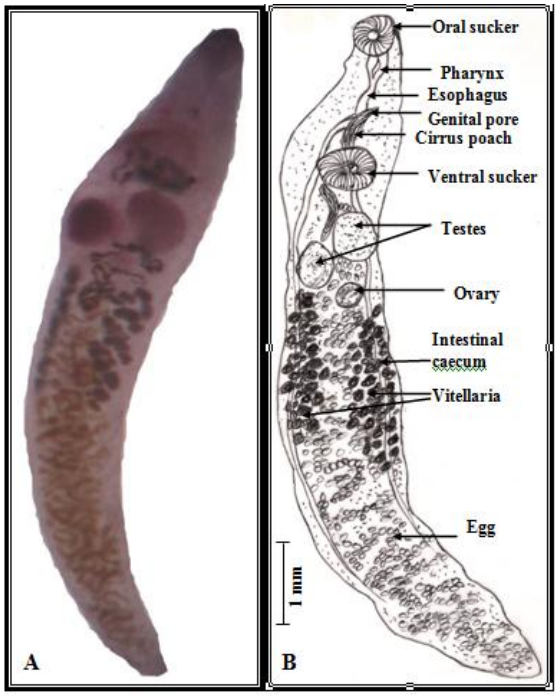

Fig. (1): *Dicrocoelium petrowi*.
A- Photomicrograph of worm (20X); B- Camera lucida drawing of worm.

Cotugnia latiproglottina Sawada, Molan *et* Saeed, 1989

This species was isolated from the small intestine of *A. chukar* with a prevalence of 6.25% (Table 1).

Worms of moderate size. Length 50-55mm, width 1.3-2mm. Metamerism distinct, segment margin serrate and all segments much broader than long. Scolex well developed, measuring 0.4-0.6 X 0.5-0.6mm. Rostellum prominent, measuring 0.12-0.15 X 0.15-0.2mm, bearing T-shaped hooks 0.014mm long. Round suckers, unarmed, situated at corner of quadrangle, measuring 0.12-0.15 X 0.10-0.14mm wide. Neck slender, its length is 0.35-0.40mm and its width 0.22-0.25mm (Fig. 2A; B). Genitalia double in each segment, genital pores located a little anterior to the middle of the segment margin. Testes spherical to oval, 84-100 in numbers, measuring 0.045-0.050 X 0.040-0.055mm. Cirrus sac elongate, 0.238-0.241mm long by 0.049mm wide. Cirrus unarmed. Vas deferens extremely convolute. Ovary coarsely lobate, measuring 0.25- 0.30mm. Vagina 0.224-0.280mm long by 0.035-0.049 mm wide. Seminal receptacle swollen, 0.070-0.105mm by 0.028-0.035mm wide (Fig. 2C; D).

the classification was confirmed due to coincidence of the characters described here with those reported by Sawada *et al.* [14], who recorded *Cotugnia latiproglottina* for the first time in the small intestine

of *A. chukar* from Erbil city in Iraq. It was also recorded in the same host by Al-Barwari and Saeed [15]. No further reports were available on its occurrence in Iraqi birds.

Formerly, seven species of *Cotugnia* were recorded from Iraqi birds, namely: *C. columbae* in the small intestines of pigeon, *Columba livia domestica* collected from Ninevah and some areas of Erbil and Duhouk provinces [16], *C. intremedia* from pigeons in Basrah city [17], *C. paucitesticulata, C. attariyana and C. francolini* from *Francolinus francolinus* in Attariya city, and *C. iraqensis* in the small intestine of *Columba palumbus* collected in Baghdad city [18] and *C. satpuliensis* from *Columba livia domestica* collected from Erbil city [14].

Raillietina alectori **Schmidt, Greenberg *et* Wertheim, 1986**

This species was found in the small intestine of *A. chukar* with a prevalence of 33.33% (Table 1).

Worms of moderate size. Length 52-64mm, width 0.4-0.8mm. Scolex round, measuring 0.15-0.20 X 0.17-0.25mm. Rostellum 0.035-0.053 X 0.060-0.063mm, rostellar hooks about 115-130 in number and its length 0.010-0.013mm. Suckers oval measuring 0.070-0.091 X 0.049-0.070mm, acetabular hooks very well developed, 0.007-0.009mm long, in 7-8 rows (Fig. 3A; B). Genital pores unilateral, located slightly anterior to middle of each segment margin. Cirrus sac pear- shaped, measuring 0.084-0.091 X 0.021-0.28mm, extending to ventral excretory canal. Testes 36-42 in number, 0.028-0.035mm in diameter. Ovary irregularly fan-shaped, composed of a number of follicles, measuring 0.0175-0.189 X 0.105-0.119mm. Vitelline gland reniform, 0.077-0.091 X 0.042-0.063mm, located close below ovary (Fig. 3C; D). Gravid segment containing 6-9 egg sacs. Egg sacs occupying nearly whole segment with exception of lateral margin. Each sac contains 10-18 eggs, measuring 0.035-0.045 X 0.035 mm. Onchosphere spherical, 0.021-0.025 X 0.018-0.021mm, embryonic hooks 0.011mm long.

The present specimen shows a great similarity with the specimens of Sawada and Mohammad [18], who reported it in the small intestine of *Ammoperdix griseogularis* from Qara area, west of Iraq. After that, it was recorded from the intestine of *A. graeca* collected from Gara area west of Iraq [19]. No more hosts are known for this parasite in Iraq. So, *A. chukar* is considered as a new host for *R. alectori* in Iraq.

Previously, six species of *Raillietina* were recorded from different species of birds in different localities in Iraq, namely: *Raillietina tetragona* from *Columba livia domestica* [16], *R. micracantha* from pigeons [17], *R. francolini* from *Francolinus francolinus* in Attariya and *R. baghdadensis* from *Columba livia domestica* [18], *R. carpophagi* from *Columba livia domestica* [14] and *Raillietina sp.* from turkeys [20].

Ascarida numidae **(Leiper, 1908; Travassos 1913)**

This species was recovered from the small intestine of *A. chukar* with a prevalence of 18.75% (Table 1).

The body length of females are 30-32mm, width 1.05-1.1 mm. length of esophagus is 1.8-2.5mm (Fig. 4A; B). Vulva was located in posterior of the medial line (Fig. 4G). The distance of anus and vulva from the posterior end was 0.7- 0.9mm and 15-17mm respectively (Fig. 4C; D). Mean egg size was 0.010 X 0.06mm (Fig. 4H).

The length of males 20-22mm, width 1-1.08mm. Length of esophagus 1.8-2.3mm. Both spicules were thin and equal in length 2.02-2.8mm. Dimension of the preanal suckers is 0.18-0.2mm (Fig.4E; F). The male discrimination in this species can be attained by the presence of one papillae at the posterior edge of the preanal sucker. Caudal papillae (n= 10) are positioned as pairs preanally (n=2), adanally (n=2) and postanally (n=6).

The features of the present specimens are similar to those of Avcioglu *et al*. (2008), who recorded *A. numidae* in the small intestine of *A. chukar* in Turkey. Since, there is no previous report about recording this species in Iraq. Therefore the present record represents the first record of *A. numidae* in our country. Previously, only one species of the genus *Ascaridia* has been reported in Iraq which was *A. galli* in the intestine of *Gallus gallus domesticus*, *Columba livia domestica* and *A. chukar* from north of Iraq [15; 16; 21].

Hartertia gallinarum **(Thieler 1919)**:This species was obtained from intestinal caecum of *A. chukar* with a prevalence of 6.25% (Table 1).Worms of fine and elongated body. Lateral flanges very narrow, limited to anterior part of body. Cervical papillae just behind lips. Mouth tow, large, trilobed, lateral lips. The cuticle of the inner surface of each lip is thickened, toothed, and thrown into folds interlocking with those of the opposite side. Each lip with a lateral papilla and a pair of sub-median papillaea, interlabia small or rudimentary. Vestibule short, esophagus divided into two parts, of which the anterior is short and muscular (Fig. 5A; B).

The females are usually twice longer than males which may reach double a male measuring 50-53mm in length and 0.67-0.72mm in diameter. Vulva near middle of body. Tail conical and rounded at tip (Fig. 5C; D).

The body length of male 25-27mm, width 0.35-0.39mm. Caudal alae more or less wide, with four preanal and two postanal pairs of pedunculate papillae and a group of sessile papillae at tail tip. Spicules unequal, gubernaculums present (Fig. 5E; F).

Eggs with thick double shell and a very distinct vitelline membrane, embryonated when deposited. Egg size 0.03-0.035 X 0.018-0.021mm (Fig. 5G).

The present specimens of *Hartertia gallinarum* are slightly smaller than those reported by Mohammad [19] who recorded it in the caecum of *A. graeca* in Gara-area, Rutba, west of Iraq. Later, it was reported

in *Ammoperdix griseogularis* in the same locality [22], and in *Gallus gallus domesticus* in Mousl city [23]. So, *A. chukar* is
considered as a newly recorded host for this parasite in iraq.

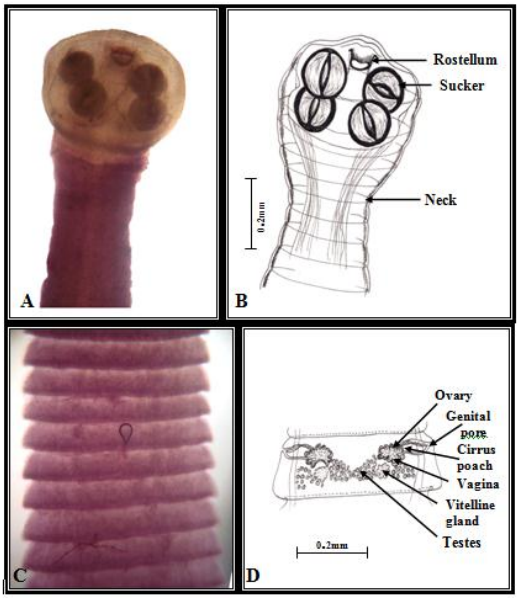

Fig. (2): *Cotugnia latiproglottina*.
A- Photomicrograph of the scolex (100X); B- Camera lucida drawing of the scolex; C- Photomicrograph of mature proglottids (100X); D- Camera lucida drawing of matures proglottids.

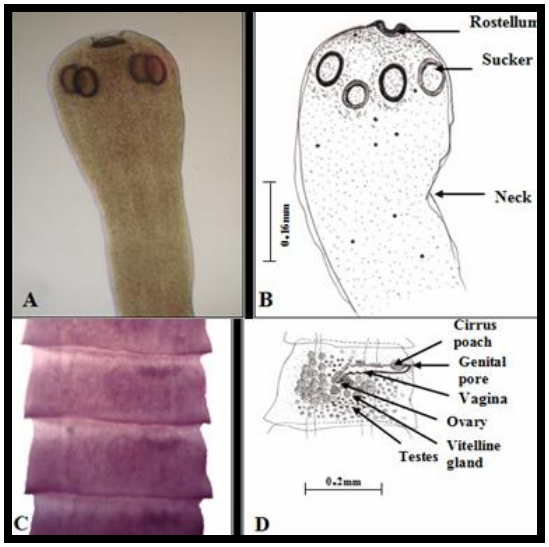

Fig. (3): *Raillietina alectori*.
A- Photomicrograph of the scolex (120X); B- Camera lucida drawing of the scolex; C- Photomicrograph of mature proglottids (100X); D- Camera lucida drawing of matures proglottids.

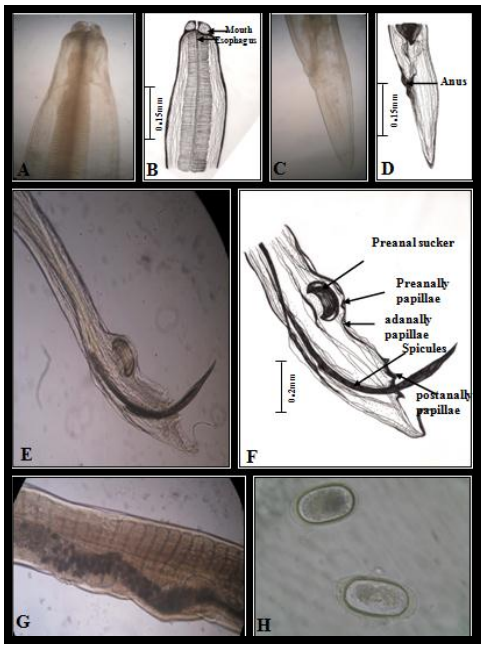

Fig. (4)*: Ascarida numidae.*
A- Photomicrograph of the anterior end (100X); B- Camera lucida drawing of the anterior end. C- Photomicrograph of the posterior end of female (100X); D- Camera lucida drawing of the posterior end of female; E- Photomicrograph of the posterior end of male (100X); F- Camera lucida drawing of the posterior end of male; G- Photomicrograph of the Vulva (100X); H- *Ascarida numidae* egg (400 X).

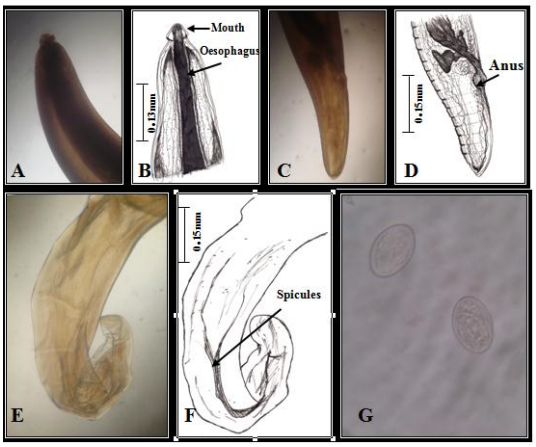

Fig. (5): *Hartertia gallinarum*.
A-Photomicrograph of the anterior end (100X); B- Camera lucida drawing of the anterior end; C- Photomicrograph of the posterior end of female (100X); D- Camera lucida drawing of the posterior end of female; E- Photomicrograph of the posterior end of male (100X); F- Camera lucida drawing of the posterior end of male; G- Eggs of Hartertia gallinarum (400 X).

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دراسة عن طفيليات طائر القبج *Alectoris chukar* من منطقة شقلاوة، إقليم كوردستان، العراق

ذالّة عمر أبراهيم خوشناو ، شمال محمد أمين عبدالله

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(تاريخ الاستلام: 25 / 5 / 2012 ---- تاريخ القبول: 19 / 11 / 2012)

الملخص:

تم جمع 96 من طيورالقبج *Alectoris chukar* من منطقة شقلاوة الواقعة في شمال شرق محافظة اربيل، أقليم كوردستان– شمال العراق، خلال الفترة المحصورة بين شهر مايس 2009 الى نهاية شهر نيسان 2010 وفحصت بحثا عن الطفيليات التي تصيبها. أظهرت نتائج الدراسة الحالية وجود خمسة أنواع من الطفيليات، والتي تضمنت نوعاً واحداً من المخرّمات ثنائية المنشأ (*Dicrocoelium petrowi*)، ونوعين من الديدان الشريطية (*Cotugnia latiproglottina* و *Raillietina alectori*)، ونوعين من الديدان الخيطية (*Ascarida numidae* و *Hartertia gallinarum*). نوعان من هذه الطفيليات سجلت لأول مرة في العراق هي *D. petrowi* و *A. numidae*. وأعتبر طائرالقبج مضيفا جديدا لكل من *R. alectori* و *G. gallinarum*.