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INTENSITY AND HISTOPATHOLOGICAL EFFECTS OF THE NEMATODE HARTERTIA GALLINARUM(THEILER, 1919) ON SEESEE PARTRIDGE, AMMOPERDIX GRISEOGULARIS (BRANDT, 1843)COLLECTED FROM QA' RA AREA, WEST OF IRAQ.

Mahmoud, S. S * Mohammad. M. K * * and Au. S.Y.*
*college of Education for women, Univ. Baghdad. Baghdad. Iraq
**Iraq Natural History Museum. Univ. Baghdad. Baghdad. Iraq

ABSTRACT

This work deals with the description of histopathological effects of the nematode Hartertia gallinarurn Theiler. 1919 on the digestive system of the seesee partridge collected from Qa'ra area in the western desert district of Iraq. along with some notes on intensity fluctuation of the parasite according to the seasons. It is found that the major effects of the nematode are necrosis and fibrosis of gizzard: granulomatous reaction. necrosis and mononuclear infiltration of proventriculus: damage of mucosal lining of intestine and lymphocytic infiltration of liver.

INTRODUCTION

Qa'ra is a large open depression some 60 km E -W by 20 km N-S situated about 60 kms north of Rutba (33° 30' N. 40° 15' E) in the western desert district of Iraq (Guest and AL-Rawi . 1966) . The resident birds of this area are mainly seesee partridge. .4rninoperdix griseogularis and chukar partridge. . graecca that are found in large numbers. Presently, the area is being considered as a site for a national park. So. an introductory effort is needed to study the nematodes. which constitute the most important group of helminth parasites. Nematodes so far exceeds the trematodes and cestodes in the amount of damage done to the host (Ruff, 1978).

The present work is undertaken to investigate the intensity and the histopathological effect of the most dominant parasite on the native seesee partridge, which is found to be heavily infected with the nematode ,Hartertia gallinarurn.

Some informations are available abroad on the intensity and histopathological effects of the nematodes on their phasianid hosts. These include works of Cram (1927): Cram et al. (1931); Fernando et al. (1971): Vetesi et al. (1976). and Weiner and Soulsby (1976). In Iraq AL-Hubaity and Al-Habib (1979) isolated the nematode Heteakis gallinaruni from domestic fowl in Mosul vicinity without studying its effects on the host‘

MATERIALS AND METHOD

A total of 42 seesee paridge birds were collected from Qa ra region during the period between May 87 to Feb. 88. The birds were dissected immediately and the worms along with the infected organs such as intestine, proventriculus and liver were removed, washed with warm normal saline, then kept in 70% alcohol. Sections of paraffin embedded tissue samples were cut at 5 um thick and stained with Haemtoxylene-Eosine for detailed examination.

RESULTS

The intensity of parasites and date of collection are shown in table I. The mean important measurements of 10 male and female parasites each are as following: Hartertia gallinarurn (Theiler , 1919) (Spiruoidea. Spiruridae) (Figs . 1- 3) . Male: total length 35 mm, maximum width 0. 49 mm left spicule 2 mm. right spicule 0.48 mm. The posterior extremity tubercular. Female: total length 57 mm. maximum width 0. 71 mm eggs 35x22 um. The worms were recovered mostly from the intestinal lumen of infected birds that were blocked in some cases (Fig. 4), some worms were located under the gizzard lining (Fig. 5) and liver parenchyma. Certain worms were also observed in other foci such as the mesenteries.

Histopathological effects

Gizzard: many worms were found under the lining of the gizzard (Fig. 6). The worms were encapsulated. sometimes forming superficial nodules (Fig.7). Necrosis and fibrosis were also observed.

Proventriculus: many granulomatous reactions and necrosis around ova of the parasite were found (Fig. 8) with many mononuclear inflation in the site of infection (Fig. 9-10).

Intestine: damage of most of the mucosal lining of intestine (Fig. II). Small intestinal mucosa showed inflammation cells composed of lymphocytes. plasma cells and heterophils (Fig. 12), but there is no infiltration of the muscular coat.

Liver: worms were seen in liver parenchyma (Fig. 13). Cellular infiltration composed mainly of lymphocytes (Figs. 14-15). No other specific lesions were seen. Necrosis and fibrosis of lesser extent were observed in different sites of the liver.

Preliminary examination of the crops of the dissected birds showed that ants were the most common animal food utilized by these birds.

In addition, a minor infection with the cest Raillietina tetragona was observed among some infected hosts of this study.

DISCUSSION

The nematode Hartertia gallinarum is well known as a spiruroid parasite of the small intestine of chickens in Africa and transmitted to the final host by the workers of ants and termites (Kotlan . 1960 Chandler and Read , 1961 Yamaguti 1961) . As shown in the results the ants were the most common animal food, this may explain the high infection rate of the total bird sample (61. 9%) and the high intensity of the parasite (Table I). It is the first time that this nematode is recorded in Iraq and its reporting from seesee partridge constitutes a new host record. Specimens of the parasite of this study are slightly smaller than those reported by Kotlan (1960) but they fit well in other characters.

The intensity of the parasite fluctuates according to the seasons. It is very high in fall and of lesser extent in spring and summer, while it is very low in winter. This is in accordance with Chricton and Welch (1972) who found that the intensity of nematodes infecting certain ducks in Canada was high in autumn, spring and summer, and this may be related to the abundance and activity of the invertebrate intermediate host during seasons.

The tissue reaction to nematode parasites probably have not been studied as extensively as the reactions to other infective agents (Poynter, 1966) although the nematodes constitute the most important group of helminth parasites (Ruff. 1978) . The considerable reaction of host tissues found in this study indicates that the association between the parasite and host lead to acute reaction. Types of these reactions seem to be similar in certain areas of digestive tracts of different hosts infected with different parasites. For example. in the intestine, the acute inflammation of small intestinal mucosa found in this study was observed by Khatoon and Ansari (1985) in pigeons infected with Ascaridia colurnbae and also by Kodzoilka (1960) in chickens infected with certain ascarids

Histological examination of the intestine and liver revealed intense cellular infiltration of leukocytes around the trapped worms and damage of epithelial lining, necrosis and fibrosis. Similar observations were made by (Bertram. 1966: Mohan, 1973: Weiner and Soulsby. 1973). The effects on gizzard and proventriculus are caused by the presence of encapsulated parasites. which were accompanied with fibrosis and g reaction around ova. Cornwell (1963) and Chricton and Welch (1972) who studied the pathogenicitv of Echinuria uncinata on certain anatid hosts also observed such effects. However, the amount of the damage in each organ is correlated with the number of parasites harbored.

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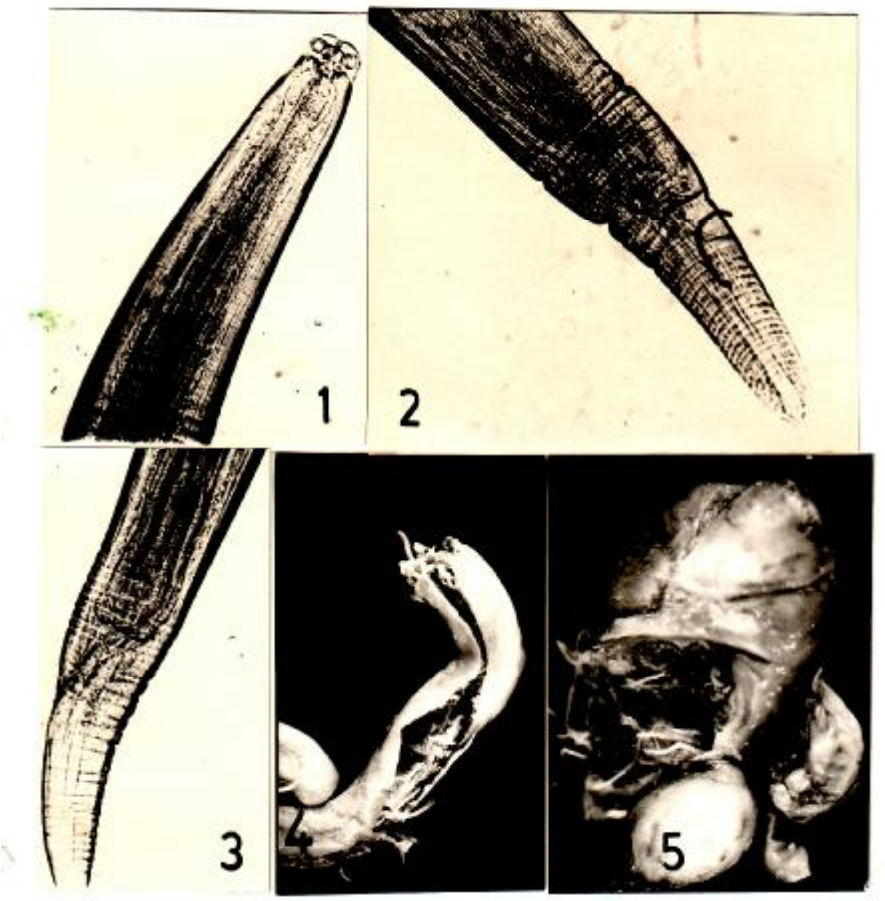
Table I: Intensity and rate of infection of Hartertia gallinarurn from seesee partridge in Qa'ra area, Rutba, west of Iraq.

date of collection	No. birds examined	No. birds infected	% infection	No. nematodes harbored	nematode/ host
2.5. 1987	10	7	70	151	21.6
27.8.1987	10	5	50	132	26.4
1.10.1987	18	12	66.6	918	76.5
12. 2. 1988	4	2	50	7	3.5

Fig . 1 : Harteria gallinarurn , anterior end of female
Fig. 2 : Hartertia gallinaruni , posterior end of female
Fig. 3 : Hartertia gallinarum , posterior end of male
Fag. 4 Intestine of seesee partridge blocked with Hartertia gallinarurn
Fig . 5 : Gizzard of seesee partridge with H gallinarurn under gizzard lining
Fig. 6. 7 : c.s. of gizzard with H. Gallinarurn encapsulated under lining
Fig. 8 : c.s. of proventriculus with H. gallinaruin . necrosis around ova
Fig. 9. 10 : c.s. of proventriculus with H. gallinarurn . mononuclear infiltration.
Fig. 11: c.s. of Intestine with H. gallinaruni . damage of mucosal lining.
Fig . 12 : c.s. of Intestine with H. gallinaruin . inflammation cells in small Intestinal mucosa.
Fig . 13 c.s. of liver with H. gallinaruin . a worm in liver parenchyma Fig . 14 c.s. of liver with H. gallinarun1 - cellular infiltration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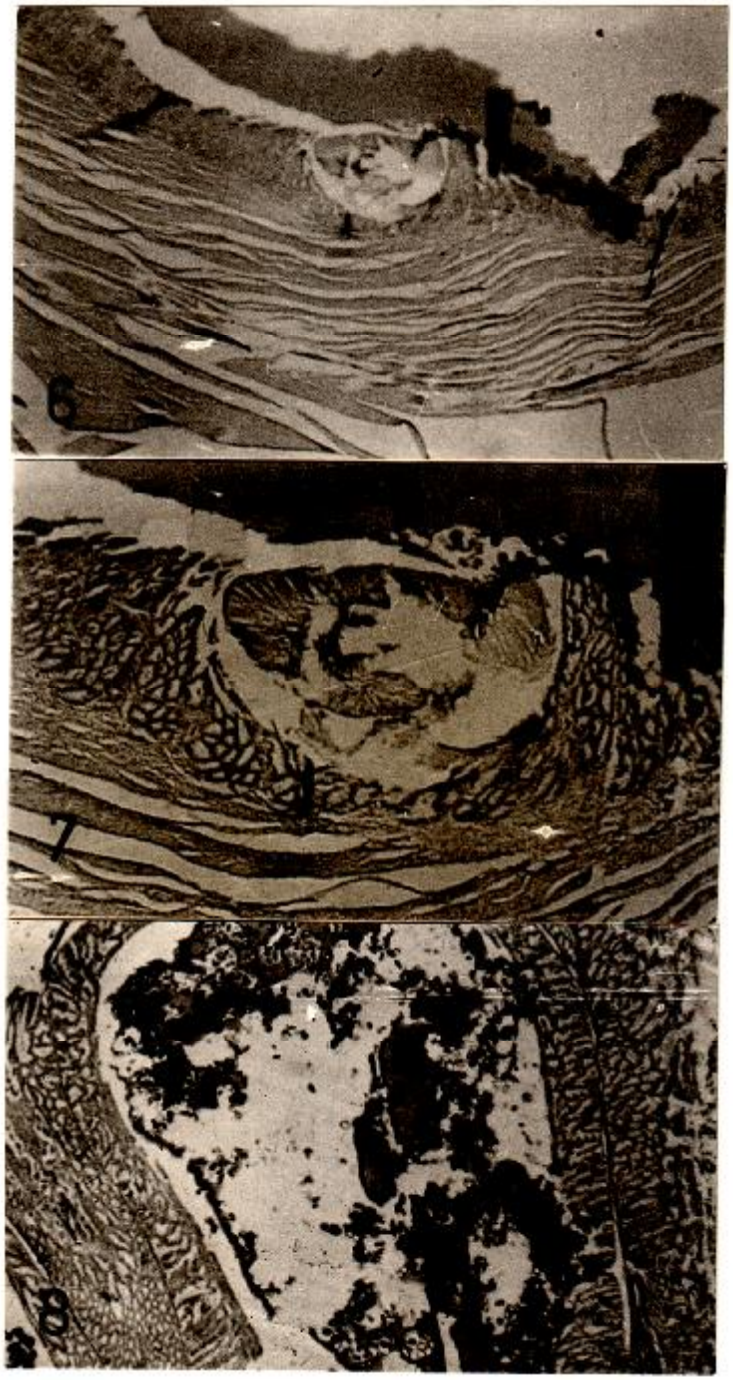
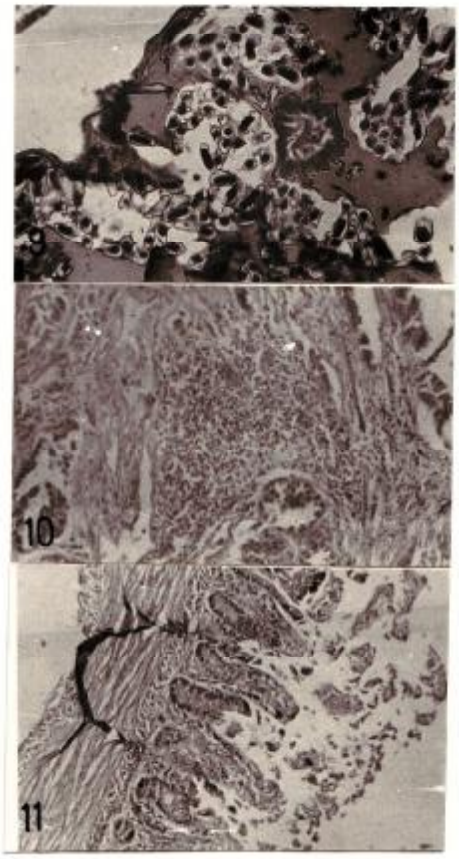
Inheritance of dark head

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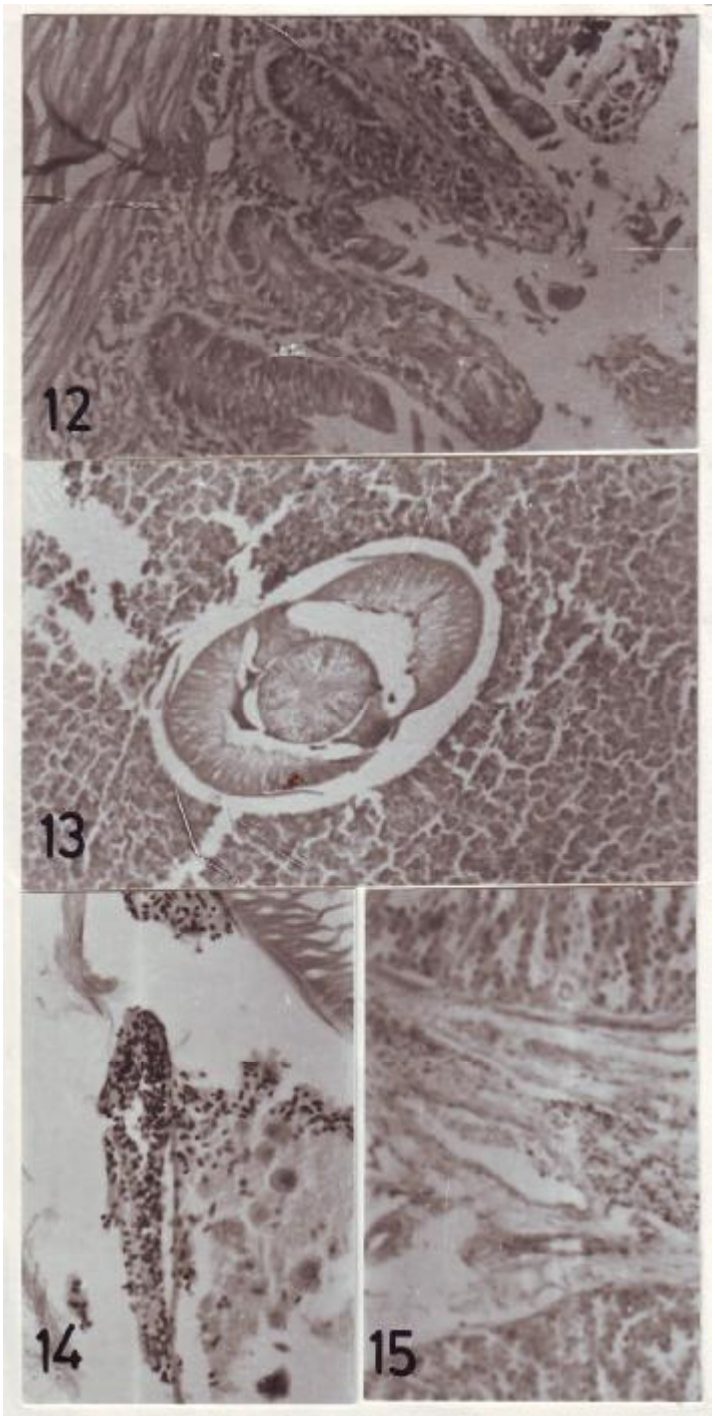
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