

## **SURVEY ON GASTROINTESTINAL HELMINTHES OF NATIVE POULTRY IN ABHARCITY, IRAN**

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### **ABSTRACT**

A study of intestinal helminthic parasites of domestic chickens was carried out in Abhar city, Iran during 2015. One hundred (100) gastrointestinal samples were examined in necropsied chickens microscopically using the lactophenole and carmine-acid staining technique. The result showed a high prevalence of intestinal parasitic infection. Out of a total of 100 domestic chicken studied 57 (57%) were infected by parasite. Cestodes had the highest prevalence 36(36%), followed by the Nematode with prevalence of 21 (21%). Cestodes specially *Reillietinatetragona* 15 (15 %) and *Reillietinae chinobothrida* 12 (12 %) and *Choanotaenia infundibulum* 9 (9%) were most prevalent in the birds. *Hetera kiscalinarum* 21 (21 %) was found to be the highest in occurrence among the Nematode encountered. No trematode was encountered among the birds. The average parasite burden per chicken was found to be 8.5 and majority of the species were restricted to small and large intestine. 14 (14 %) cases of mixed infections were encountered. The study reveals that there was a high prevalence of intestinal parasites of domestic chicken in the study area. This calls for improved management and disease control to enhance their potential.

**Keywords:** *Gastrointestinal Helminthes, Native Poultry, Abhar City, Iran*

### **INTRODUCTION**

The domestic chicken (*Gallus gallus domesticus*) is widely reared traditionally in the tropics (Hodasi, 1979; Permin and Hansen, 1998). These chickens are the most important protein sources of human population in some developed and developing countries of the world and also serve as means of generating income. The local family poultry is an integrated component of nearly all rural and some urban households in Iran. The main advantage of indigenous breeds is that their production is not labour intensive. They can thrive under adverse conditions (e.g. poor mismanagement, diseases, lack of feeding and predators), which may cause low productivity and high mortality (Akinwumi *et al.*, 1979). Since these domestic chickens are sources of ready cash and meat to the local communities, their potential could be enhanced through improved management and disease control. Parasitic diseases are problems wherever poultry are raised whether in large commercial operations or in small backyard flocks and economic losses can be significant (Fatihu *et al.*, 1991). These parasites constitute a major factor limiting fruitful production in poultry industry by affecting the growth rate of the flock resulting in organ malfunctioning and finally death (Soulsby, 1982). Effective control measures however can be realistic if based on a thorough knowledge of the epidemiology of the endemic infectious agents. Limited studies undertaken on commercial farms which raise mainly exotic birds indicated that helminth infection is a threat to the Iran poultry industry (Oyeka, 1989). There is a definite paucity of information on infections of indigenous chicken especially in Abharcity of Iran. However, some studies have been carried out in Northern and Southern Iran (Eslami *et al.*, 2009). Poor management systems and most importantly diseases are the major cause of financial loss in poultry production (Oluyemi and Robert, 1979). Ajayi and Ajayi (1983) found that the major constraint to profitable livestock and poultry production in several countries including Iran could be traced to helminthiasis. The domestic chicken has a wide range of feeding habits including feeding on faeces which may be carrying stages of parasites, thus predisposing them to parasitic infections (Adang, 1999). Heavy gastrointestinal helminthiasis is characterized by retarded growth, emaciation, and decreased egg production, mucoid diarrhoea, and catarrh, loss of appetite, anaemia, weakness, paralysis and death (Nair and Nadakal, 1981; Fatihu *et al.*, 1991). These are

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causes of great economic losses. Scavenging, backyard and free-range poultry production systems have by definition a much greater degree of contact with potential disease causing organisms and the objective of this study is to investigate the helminthic parasites found in domestic chickens in parts of Abhar city, Iran. This investigation is aimed at providing information on their prevalence, species composition, preferred site of infection and parasite burden.

## MATERIALS AND METHODS

### Study Area

The study was conducted in Abhar city, Iran. The study vicinity has a subtropical weather, the raining season is usually from April to October while the cold season begins in November and ends in March.

### Collection of Samples

The study area was visited twice in a month and maximum of 20 samples were collected every month from different domestic chicken from August to October, 2015. A total of 100 gastrointestinal tract samples of local breed chicken slaughtered at the local markets and shops located in Abhar city, Iran were collected. The gastrointestinal tracts were collected into plastic bags and taken to the diagnostic and examination laboratory of the veterinary medicine, Islamic Azad University, Tabriz branch for examination and identification. Samples that could not be immediately analyzed were stored in the refrigerator.

### Examination of Samples

The gastrointestinal tracts were separated into gizzard, crop, small intestine, large intestine and caecum after which each region was cut open by longitudinal incision. Intestinal and scrapping was done and any parasite seen was removed with forceps, washed in saline and identified.

Examination of samples for helminthes was based on lactophenole and carmine-acid staining technique (Soulsby, 1982). The preparations were then examined under the microscope using x10 and x40 magnification.

**Data Analysis:** The results obtained were analyzed using descriptive statistics. Level of significance was set at  $p < 0.05$ .

## RESULTS AND DISCUSSION

### Results

The overall prevalence of the parasitic infection is shown in Table 1. Out of a total of 100 domestic chicken studied 57(57%) were infected by parasite. Cestodes had the highest prevalence 36(36%), followed by the Nematode with prevalence of 21 (21%), (Figure 1-4).

**Table 1: Overall prevalence of helminthic parasites in domestic chicken, (Number examined = 100)**

Parasites	Number of chicken infected	Prevalence (%)
Trematoda	0	0
Nematodes	21	21
Cestodes	36	36
Total (%)	57	57

The parasite species found in the study are shown in Table 2. The parasitic Nematode (*Heterakis galinarum*) was the most prevalent 21 (21%). Of the 2 parasitic groups encountered, the cestodes were the most prevalent followed by nematodes. All the parasites showed high predilection for specific sites in the gastrointestinal tract of the birds. Both cestodes and nematode showed high predilection for specific sites in the gastrointestinal tract of the birds. Most of the helminthic parasites were restricted to the small intestine, particularly the duodenum.

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**Table 2: Species composition of helminthic parasites of domestic chicken, (Number examined = 100)**

Parasite species	No. of chicken infected	Species prevalence %
<b>Cestodes</b>	<b>36</b>	<b>36</b>
<i>Reillietina tetragona</i>	15	15
<i>Reillietinae chinobothrida</i>	12	12
<i>Choanotaenia infundibulum</i>	9	9
<b>Nematodes</b>	<b>21</b>	<b>21</b>
<i>Heterakisgalarum</i>	21	21

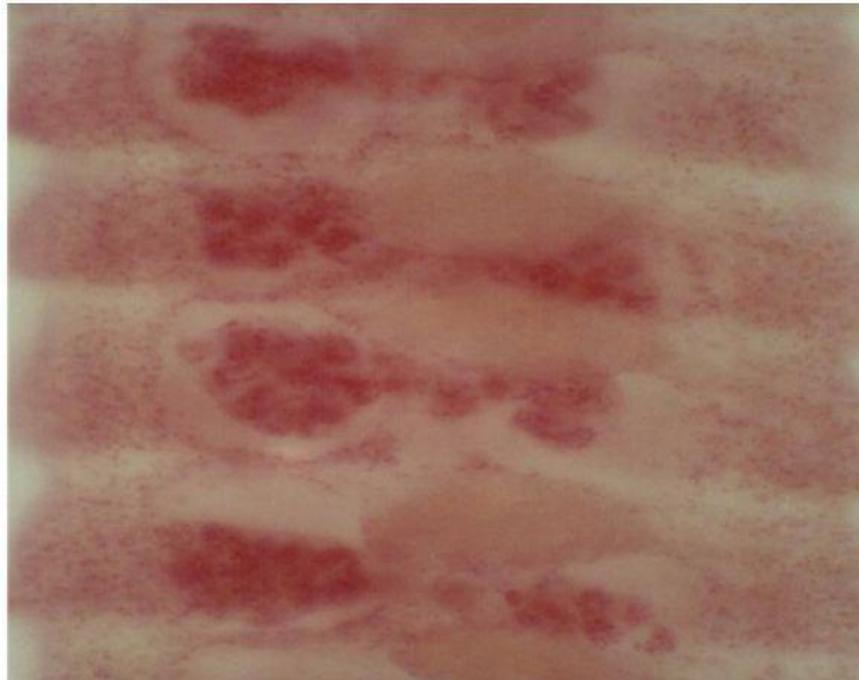
Mixedinfections were also encountered with a prevalence of 14% (Table 3).

**Table 3: Mixed infection of intestinal helminthic parasites of domestic chicken, (Number examined = 100).**

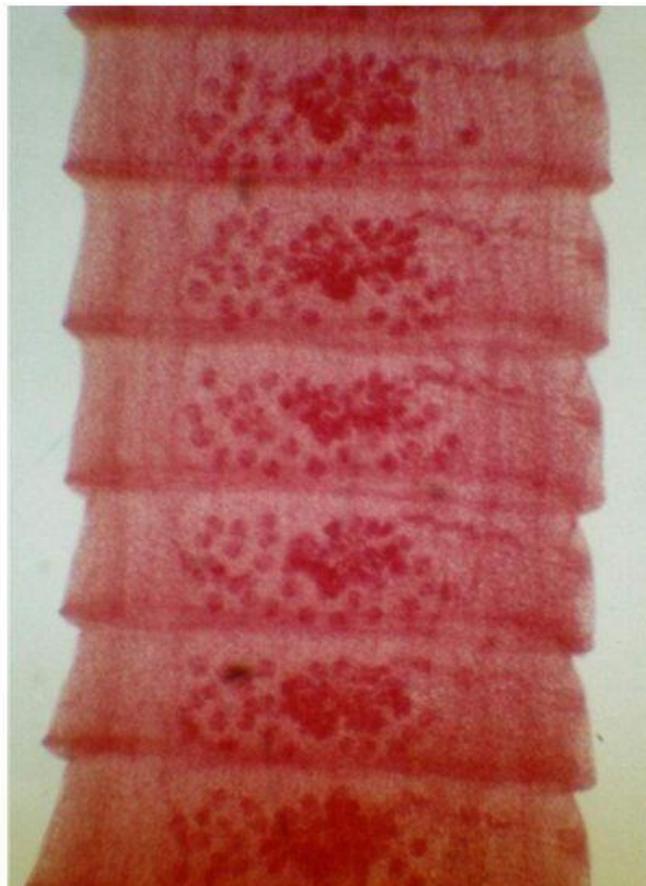
Parasites	Number of domestic chickens infected	% Mixed Infection
<i>Choanotaenia infundibulum</i> + <i>Reillietina tetragona</i> + <i>Reillietinae chinobothrida</i>	4	4
<i>Heterakis gallinarum</i> + <i>Reillietinae chinobothrida</i>	3	3
<i>Choanotaenia infundibulum</i> + <i>Reillietina tetragona</i>	4	4
<i>H. galinarum</i> + <i>Reillietina tetragona</i> + <i>Choanotaenia infundibulum</i>	2	2
<i>Reillietinae chinobothrida</i> + <i>Reillietina tetragona</i> + <i>H. galinarum</i>	1	1
<b>Total</b>	<b>14</b>	<b>14</b>



**Figure 1: Adult worm of *Heterakis gallinarum* that isolated from native chickens**



**Figure 2:** *Choanotaenia infundibulum* mature proglottids that isolated from intestine of native chickens



**Figure 3:** *Reillietina tetragona* mature proglottids that isolated from intestine of native chickens

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**Figure 4: *Reillietinae chinobothrida* mature proglottids that isolated from intestine of native chickens**

**Discussion**

The occurrence of parasites is probably, the most damaging infections of domestic chicken and a source of serious economic loss. The main effect of helminthic parasites is the amazing losses they cause to animal industries through meat contamination and morbidity (Naem and Eskandari, 2005). The generally high prevalence rate observed in this report could be due to the fact that birds kept under free range or backyard scavenging flocks are not normally fed with grains in the morning (which use to be the practice in the early years) before going out for grazing. Lack of this practice could be attributed to the present poor economic condition. The intermediate hosts (e.g. dung beetle, grasshopper, cockroach, crustaceans, earthworm and snail) for some of the helminthic parasites found are available in the environment and could constitute problems in chicken reared on free range or backyard scavenging production system. The majority of parasites reported here could be potentially pathogenic for the poultry and some to human by inducing enteritis, ulceration or granuloma followed by anorexia, depression, emaciation and death. Due to the effects in body condition, it has been shown that weight loss due to helminthic infections in domestic chicken can be outstanding (Permin and Hansen, 1998). Similar reports of helminthic infections found in domestic chicken in this study have been documented as described from other parts of Iran (Eslami and Anwar, 1973). The result of this study showed that the domestic chicken were heavily parasitized by a large number of helminthic parasites. Mixed infections were also encountered and most with nematode. These results are comparatively similar to studies in some regions such as Urmia (Naem and Eskandari, 2005), which reported high prevalence of the helminthic parasites. Previous studies have attributed this high endemicity to poor sanitary conditions and lack of health services (Eslami and Anwar, 1973). This study which is in agreement with Eslami *et al.*, (2008) further support the observation that parasites are most predominant in subtropical countries due to the climatic and environmental conditions prevailing there which favour helminth growth. The reasons being that nematodes do not require intermediate hosts and at the same time they are soil transmitted parasites. The adults lay many eggs daily which can retain their viability for as long as 12 months and so domestic chickens are constantly picking up viable eggs from the droppings that contaminate the environment as they feed (Permin and Hansen, 1998) and this also predispose them for heavy parasite burden. More so cestodes require intermediate host to complete their life cycle and so transmission is dependent on the availability of the intermediate hosts. Most of the parasites were restricted to the small intestine, particularly the duodenum where there is optimum concentration of saline and glucose (Fatihu *et al.*, 1991). Earlier report (Smyth, 1976) suggests that the preference for the small intestine by these parasites is to complement their physiological osmotic

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feeding nature where nutrients exist in dissolved form. The differences in the worm burden could be attributed to climate difference, availability of intermediate host, and possibly host factors such as host immunity. Parasitic intervention to limit hallmark complication of the infection is thus necessary in poultry industries.

### **Conclusion**

Parasitic infections are the major cause of financial loss in poultry and huge losses to the livestock industries. The work carried out revealed high helminthic infections with nematodes having the highest prevalence.

This may however increase due to seasonal or climatic abundance of specific invertebrate hosts. Therefore improvement of sanitary practice to interrupt the life cycle of the parasite species and as such reduce the rate as well as the burden of the infection in poultry farm is recommended.

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