Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

J E Z S Journal of Entomology and Zoology Studies

ISSN 2320-7078
JEZS 2014; 2 (6): 301-303

www.entomoljournal.com
Received: 30-10-2014
Accepted: 16-11-2014

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Prevalence of Cestode parasites in the intestine of local chicken (*Gallus Domesticus*) from Hyderabad, Sindh, Pakistan

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Abstract
Birds in a traditional and open environment carry a huge risk of parasitic infections. This study was carried out to evaluate the prevalence rate and species diversity of cestode parasites in local chicken (*Gallus domesticus*). For this purpose live chicken (*Gallus domesticus*) were randomly collected from different villages of district Hyderabad, Sindh, Pakistan. A total of 200 chickens were dissected and examined. Over all prevalence of infection was (94.5%). Three species of cestode parasites were recovered from the intestine of infected chickens. The identified cestode species and their prevalence were *Cotugnia digonopora* (94.5%), *Choanotaenia infundibulum* (89.5%), and *Raillietina cesticillus* (83.5%). The results of present study revealed that sub-standard poultry farming is a major factor for parasitic infection in local chicken which ultimately cause heavy loss.

Keywords: Prevalence, Cestodes. Chicken, Intestine.

1. Introduction
Poultry is an important sub sector of agriculture and has contributed enormously to food production by playing a vital role in the national economy by contributing towards food security of the country reducing pressure on demand for mutton and beef and earning of foreign exchange [1]. Poultry products (eggs and meat) are one of the important sources of protein for man. They constitute about 30% of entire protein consumed worldwide [2]. The poultry bird provides man with high nutritional value and other socio-economic benefits which cannot be overemphasized [3]. Chickens have a greater importance than other animals domesticated by humans. A lot of losses in poultry have been linked to disease causing agents such as viruses, bacteria and parasites. It has been estimated that more than 750 million chickens, guinea fowls and ducklings in Africa dies in each year as a result of various infections [4]. Although, somewhat reduction in bird's parasitic infection has been achieved in commercial production system mostly due to improvement of house hygiene and management practices, but the prevalence of gastrointestinal parasites is still very out of control [5]. In the rural areas of Pakistan, mostly chicken are kept in free range scavenging system. In this system birds are allowed to move around freely in the surroundings areas of the houses during day time, searching for food, which mainly consists of house hold wastes, insect larvae and seeds [6]. Due to scavenging habit the birds are at high risk to all type of infections, particularly gastrointestinal parasitic infections.
Nematodes, cestodes and trematodes are major parasites of poultry animal. These parasites can be found in the intestine or feces droppings especially when expelled as fresh Specimen [7]. Several species of cestodes may live in the intestinal tract of chicken. More than 1,400 tapeworms have been described in domesticated poultry and wild birds which are common in poultry free range or backyard flocks [8]. These parasites are found more frequently in the warm seasons, when the intermediate hosts are abundant. Beetles and houseflies inhabiting poultry houses act as intermediate host for most species of cestodes [9]. Poultry production plays a significant role in poverty alleviation and requires less land and financial investment, thus there is need to accomplish a research that will focus on the best way to prop up local poultry production. It is therefore necessary to identify species of intestinal parasites commonly occurring in local chicken. Information on the cestode parasites of chicken in this area is inadequate or unavailable. So the present study was carried out to determine the baseline information on the diversity and prevalence of intestinal cestodes of local chickens in the district Hyderabad, Pakistan.

2. Materials and Methods

2.1 Collection of birds

Present study was conducted with the approval of the Advanced Studies and Research Board (ASRB) under the guidelines at Department of Zoology, University of Sindh, Jamshoro, Pakistan during July 2013 to November 2013. For evaluation of the infected birds for cestode parasites, 200 live birds *(Gallus domesticus)* were collected from different villages of district Hyderabad, Sindh, Pakistan and brought to the Parasiotology Laboratory of Zoology Department University of Sindh, Jamshoro, Pakistan. Thereafter birds were dissected to retain different parts of intestine and removed organs were transferred to the labeled Petri dishes containing normal saline.

2.2 Collection, staining and identification of parasites

The different parts of intestine: duodenum, jejunum, ileum and ceca were searched carefully for parasites by the method of Dharejo [10]. Intestines were incised for the searching of parasites. Cestode Parasites were recovered and transferred to the Petri dish containing normal saline. It is important to relax cestodes before fixation, which was done by putting them in saline water 15-30 minutes or by putting 70% alcohol drop by drop. After killing, the worms were transferred to the jars containing 70% alcohol for the preservation. Before passing through the graded series of alcohol, the cestodes were pressed by putting them in between the two plain glass slides and tying them with thread by applying adequate pressure. The slides were then placed in 70% alcohol for 24 to 48 hours.

By using graded series of alcohol, cestodes were stained with Borax carmine and washed with 70% alcohol, and passed through 90% and absolute alcohol for complete dehydration. The stained cestodes were passed through clove oil then cleared in xylene and finally mounted permanently in Canada balsam. These cestodes were identified through the keys and description available in literature [11, 12].

3. Results

Three species of cestodes, *Cotugnia digonopora*, *Raillietina cesticillus* and *Choanotaenia infundibulum* were recovered (Table.1). Of the total of 200 birds, 189 were infected with one or more cestode species (Fig.1). *Cotugnia digonopora* was more prevalent (Table .1) and recovered from the duodenum of the infected chicken. It belongs to the family Davainedae of order Cyclophylladae. The average length of the worm was 10 to 11 cm possesses 2 rows of small hooks on the rostellum while the suckers were unarmed. It was observed that each segment had two sets of genital organs in each segment (Fig. 2). The prevalence of *Choanotaenia infundibulum* and *Raillietina cesticillus* is shown in Table 1. Cestode parasite *Choanotaenia infundibulum* was larger than the *Cotugnia digonopora* and *Raillietina cesticillus*. It belongs to the family Dilepidae, order Cyclophylladae. The average length of the worm was 23cm having unarmed suckers and rostillum with 16 to 20 hooks. The genital pores were irregular (Fig. 3). *Raillietina cesticillus* worm burden was observed heavy. The average length of the worm was 12to 13 cm identified by unarmed suckers and the broad rostillum which was armed with 400 to 500 minutes hooks. The genital pores alternate irregularly (Fig. 4).

4. Discussion

The present investigation reveals high prevalence of cestode parasites in local chickens. Parasitic infection may therefore be an evidence of poor management and control efforts in either the birds or in the immediate environment where infection or re infections (directly or indirectly) originate. The high prevalence rate of cestode parasites might be due to scavenging habit of chickens. The high prevalence of *Cotugnia digonopora* in this study could be an incidence of the infective stages and intermediate hosts of the parasite. These findings were higher than those results reported by (Zahrani *et al* 2012; Irungu *et al* 2004) [12, 13]. In the present study, prevalence of *Choanotaenia infundibulum* was 89.5%. This was higher than reported by (Medjouel *et al* 2013) [14], 40.67% in Ethiopia by (Hussen *et al* 2012) [15], 40.5% in Iran (Eslami *et al* 2011) [16]

The prevalence of *Raillietina cesticillus* in the current study was 83.5%. This was in line with the results of (Shaikh *et al* 2010) [17] who found 82.35% and this was higher than earlier results reported by (Butt *et al* 2012) [1], 70% by (Medjouel *et al* 2013) [18], 12.8% from Faisalabad, Pakistan by (Shah *et al* 1999) [19]. The overall prevalence rate was 94.5% and intensities of cestodes were higher in the present study. These finding were in accordance with previous reported results from Nigeria by (Oniye *et al* 2001) [20] and (Yoriyo *et al* 2005, 2008) [21, 22].

Poultry farming is playing a vital role in the national economy especially in developing countries like Pakistan. The results of present studies revealed that substandard poultry farming is a major factor for parasitic infections in local chicken consequently cause heavy losses. So it is recommended that attention should be given towards the poultry management of free range chickens.

Table 1: Prevalence of cestode infection in chickens (n=200)

Cestode	No. of host infected	Prevalence
C. Digonopora	189	94.5%
C. Infundibulum	179	89.5%
R. Cesticillus	167	83.5%

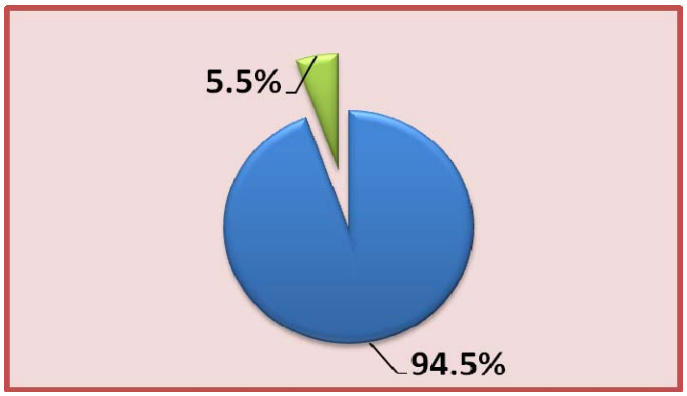

Fig 1: showing percentage of infected chicken (94.5%) and uninfected (5.5%) chicken in collected chickens during study

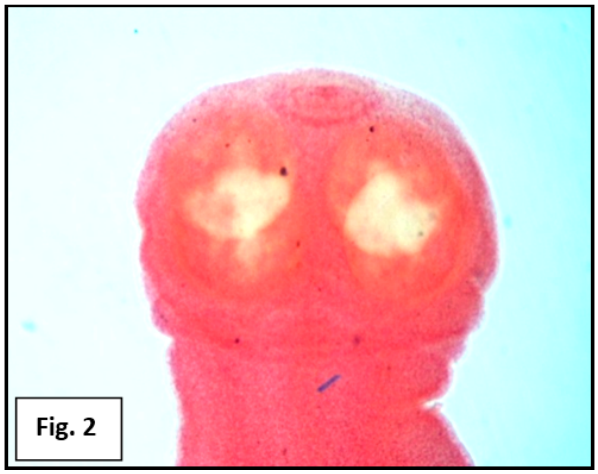

Fig 2: Scolex of cestode parasite *Cotugnia digonopora*

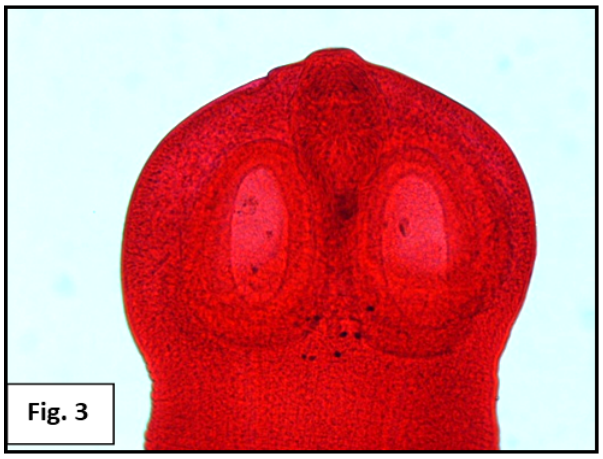

Fig 3: Scolex of cestode parasite *Choanotaenia infundibulum*

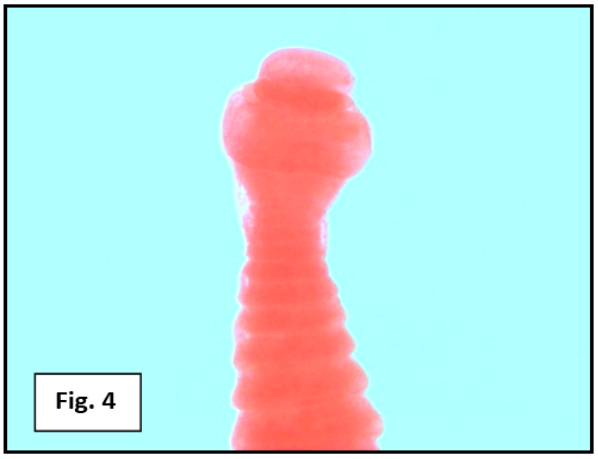

Fig 4: Scolex of cestode parasite *Raillietina cesticillus*

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