



PREVALENCE OF HELMINTH PARASITE OF DOMESTIC CHICKEN (*Gallus domesticus*) IN DISTRICT KHAIRPUR, SINDH, PAKISTAN

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Author HG designed the study, wrote the first draft of manuscript. Author MLMKA managed the literature search, analyze the study and wrote the final draft of manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

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. Birds in a traditional and open environment carry a huge risk of parasitic infections. A survey was made to determine the prevalence of helminth parasite of *Gallus domesticus* in district Khairpur. A total of 46 domestic chicken (*Gallus domesticus*) were randomly collected from different villages of district Khairpur, were examined for the prevalence of helminth parasite. Seven species of helminth parasites identified, out of which four species of cestodes and three species of nematodes. Cestodes comprises *Cotugonia dignopora* 44 (91.6%) *Raillietina tarquata* 40 (86.9%), *Raillietina tetragona* 20 (43.4%) *Choanotaenia infundibulum* 6 (13%). Among nematodes 33 (71.7%) *Ascaridia galli* were observed. 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: *Gallus domesticus*; *Cotugonia*; *Raillietina tetragona*; *Raillietna tarquat*; *Choanotaenia infundibulum*; *Subulura barampati*; *Ascaridia galli*; *Heterakis galinarum*.

1. INTRODUCTION

The domestic chicken is supposed to have evaluated from its inmates belong to the genus *Gallus* (Jungle fowl) which contain four species. These include *Gallus gallus* "Red Jungle fowl"; *Gallus Sonneratii* "Gray Jungle fowl"; *Gallus varius* "Green Jungle fowl" and *Gallus lafayetii* "Ceylon Jungle fowl" [1, 2]. The chicken are usually get length about 24 cm and it is one of species of bird which not very successful for flying. The male chicken referred cockerel; but known as rooster in some countries such

as Australia. Female chickens called hen; and little fluffy yellow called chicks. (AZ animal.com). *Gallus domesticus* left to scavenge around housing during daytime as result they directly expose to environment and obtain whatever to feed. They may be able to find in environment often offal; seeds; fruits and insects which may infective stage of parasite and also include large no of parasitic species particularly gastrointestinal ones; including platyhelminths; acanthocephans; nematodes [3]. Among these parasites; the cestodes; nematodes and termatodes are most common intestinal infections occurring in

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domestic. The domestic chickens are social animals have general hierarchy that they are territorial which means they can live in group without fighting [4]. The domestic chicken feed wide ranges of food; they eat fruits; grains; insects; snails etc [5].

Rural domestic chicken (*Gallus domesticus*) have great socio economic importance than other animal domesticated by human it is important item of human food as well as source of income due to production of meat; egg; fiber; bulleting and other substances [6- 8]. Chicken are one of most wide spread meat in the world numerous culture have own way to prepare and eat chickens. The UK's common dish is roasted chicken USA's fried chicken and in China people use every part of chicken including their feet; which are common found in soup (A.Z animal.com).

Beside food and other importance; the chicken is widely use as model organism. It has been applied in various areas of science; but its main role in have been in research in embryological development and genetic disease (Chick as model organism web node.com). Farmer of Marathwada region use fertilizer which formed from domestic fowl in their field to increase soil fertility [9]. Based on these mentioned fact the desi fowl *Gallus domesticus* have selected for the research purpose.

2. MATERIAL AND METHOD

The present study was conducted in district Khairpur of Sindh Pakistan. The live birds have collected from different villages of district khairpur and brought to slaughter house; slaughtered to get viscera of bird *Gallus domesticus* and brought to word Zoological

laboratory of Shah Abdul Latif University Khairpur. All the viscera of bird include liver; gizzard; gall bladder; kidney; intestine were put into separate Petri dishes into normal saline. All the organs cut longitudinally with the help pointed scissor; the inner portion of each organ scraped with zero size brushes to remove adhering parasite. All the material were checked under the dissecting microscope. Cestodes and nematodes were collected with fine forceps. The parasites were preserved in 70% alcohol-formalin-Acetic acid. Specimens were stained with Grenachers alcohol borax carmine for 10-15 mints. After staining cestodes were washed in 70% alcohol twice to remove extra stain after that gives one wash in to 90% alcohol and cestodes remain 10 min in this grade after that into 100% (Absolute) alcohol for 10 min to complete dehydration; After dehydration cestodes were put in to clove oil for shine then into xylene for clearing. Finally; cestodes were mount into Canada balsam then slides were dried in to oven at 60⁰c. Live nematodes were preserved in 70% alcohol then temporary slides were made by using glycerol and lactophenol cotton blue for further studies; these parasites were identified through the keys and description available in literature [10].

3. RESULT

Total of 46 domesticus chicken (*Gallus domesticus*) were examined for the prevalence of helminth parasites; 100 percent were observed with positive results of four species of cestodes parasites and only one species of nematode parasites from various organs of gastrointestinal tract; 46 (100%) of birds were infected with cestodes parasites followed by 33 (71.7%) were infected with nematodes parasites.

Table 1. Overall % of Cestodes and Nematode parasites

No of birds examined	No of birds find positive	% of infection	Number of host infected with cestodes	% of cestodes	Number of host infected with nematodes	% of nematodes
46	46	100%	46	100%	33	71.7%

Table 2. Prevalence of Cestodes parasite *Gallus domesticus*

Name of parasite	Predilection site	Number of chicken examined	Number of chicken found positive	Number of chicken found negative	Prevalence of parasite
<i>Cotugnia dignopora</i>	Intestine	46	44	2	91.6%
<i>Raillietina torquata</i>	Intestine	46	40	6	86.9%
<i>Raillietina tetragona</i>	Intestine	46	20	26	43.4%
<i>Choanotania infundibulum</i>	Intestine	46	6	40	13.0%

Table 3. Prevalence of nematode parasites of *Gallus domesticus*.

Name of parasite	Predilection site	Number of chicken examined	Number of chicken found positive	Number of chicken found negative	Prevalence of parasite
<i>Ascaridia gilli</i>	Intestine	46	33	13	71.7%

Among the cestodes the highest prevalence were recorded for *Cotugonia dignopora* was 44 (91.6%) from intestine; gizzard followed by *Raillietma torquata* 40 (86.9%) from intestine and *Raillietina tetragona* 20 (43.4%) from intestine and lowest prevalence of *Choanotaenia infundibulum* 6 (13.6%) were recorded. Among the nematodes *Ascaridia galli* 33 (71.7%) were recorded.

4. DISCUSSION

The survey on the prevalence of helminth parasite of *Gallus domesticus* from district Khairpur were reported for first time. The total of seven species of helminth parasite were collected from study area. Out of which four species of cestodes and three single species of nematodes were observed. The prevalence of cestodes were higher than nematodes because 100% of birds were infected with cestodes parasite. 71.7% of domestic chicken were infected with nematodes. The present results differ from others finding carried out by [11] from Peshwar Pakistan who reported five species of cestode parasite *R. Cesticillus* 4.02%; *R. tetragona* 10.7%; *R. ransomi* 4.25% *Choanotaenia infundibulum* 35%; *C. digonophora* 6.5%; and *Hymenolepis contaniana* 26.13%. [12] stated prevalence of two nematode species of chicken from district Sawat Pakistan over all burden was 16% among them *Ascaridia galli* 42% and *Heterakis gallinarum* was 9%. [13] reported *Ascaridia galli* infection in *gallus domesticus* of Hyderabad Sindh and found 100% of bird were infected with the worm. [14] stated that the prevalence of cestode parasite from Hyderabad Sindh was *C. digonopora* 94.5%; *Choanotaenia infundibulum* 89.5% and *R.cesticillus* 83.5%. [15] reported cestodes recorded in district Tando Allahyar was 72.2%. Furthermore; five species of cestode were recovered which include *D. proglottina* 10%; *R. tetragona* 31.1%; *R. cesticillus* 14.45%; *Choanotaenia infundibulum* 7.78% and *R. echinobothrida* 17.78%. [16] gives prevalence of *Ascaridia gilli* on various aspects like age; season; gender wise were reported from Rawalpindi. Age wise prevalence were observed from 4-7 week percentage of worm were higher at the age of 7 week was 14.8% and lowest at the age of 4 week was 5.22% during 5th and 6th week was 7.22% to 12.15% seasonal prevalence was 36.71% during summer;

27.02 during rainy climate; and in winter it was 16.89%.

5. CONCLUSION

The overall prevalence of helminth parasite in the present findings was 100% recorded which is higher than the findings of others. Variation among prevalence and diversity among the parasite due to climate changes and variation among the intermediate hosts so diversity and prevalence among the parasites may varies. High prevalence of parasites are lethal for the health of host birds causing diarrhea; weight loss of appetite; growth retardation. *Ascaridia galli*; cause ascariidiosis disease in domestic chicken which cause reduce growth rate; diarrhea; dehydration and death [17,18]. 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.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Al-Nasser A, Al-Khalifa H, Al-Saffar A, Khalif F, Al-Balouch M, Ragheb G, Al. Haddad A, Mashaly M. Overview of chicken taxonomy and domestication. World Poultry Science Journal. 2007; 63:285-300.
2. Permin A, Ranvig H. Genetic resistance in relative to *Ascaridia gilli*. Veterinary Parasitology. 2001; 102 (1-2):101-111.
3. Shinde L, Jadhav B, Lanka LP. Ecological survey of endoparasites from alimentary canal of (*Gallus domesticus*) at Bhokardan District Jalana M.S. Daccan Current Science. 2009; 11:23-30.

4. Butt Z, Shaikh AA, Memon SA, Mal B. Prevalence of cestode parasites in the intestine of local chicken (*Gallus domesticus*) from Hyderabad Sindh Pakistan. *Journal of Entomology and Zoology Studies*. 2014; 2(6): 301-303.
5. Rehman AW, Salim H, Ghouse MS. Helminth parasite of scavenging chickens (*Gallus domesticus*) from village Penang Island Malaysia. *Tropical Life Science Research*. 2009; 2(1):1-6.
6. Mature BM, Dawam NBN, Malann YD. Gastrointestinal helminth parasite of local and exotic chicken slaughtered in Gwage alada; Abuja (FCT) Nigeria. *New York Science Journal*. 2010; 3(5):96-99.
7. Yousfi F, Senouci K, Medjoul I, Djelli L, Slimane TH. Gastrointestinal Helminth in local chicken (*Gallus gallus domesticus*) (Linnaeus; 1758) in traditional breeding North Western Algeria. *Biodiversity Journal*. 2013; 4(1):229-234.
8. Ohaeri CC, Okwan C. Helminth parasite of domestic fowl in Ikwano Albania state Nigeria. *Journal of Natural Science Research*. 2013; 3(11):1-5.
9. Bhuri DB, Nanware SS, Burshe MU. Prevalence of gastro-international helminth parasite of (*Gallus domesticus*) in and around Lature district M.S India. *International Journal of Scientific Research*. 2013; 2(9):434-436.
10. Bhuri DB, Nanware SS, Sunnap NV. Status of diversity of cestode parasite of domestic fowl (*Gallus domesticus*) from district Maharashtra State. *Indian Journal of Applied Research*. 2013; 3(10):1-4.
11. Mature BM, Dawam NBN, Malann YD. *Gastrointestinal helminth* parasite of local and exotic chicken slaughtered in Gwage alada; Abuja (FCT) Nigeria. *New York Science Journal*. 2010; 3(5):96-99.
12. Sayyed RS, Paulan MS, Bhatti WM, Pardehi MS, Ali S. Study of nematode in indigenous chickens in Sawat district. *Pakistan vet J*. 2000; 20(1):55-56.
13. Soomro F, Arijio AG, Bilqees FM, Phulan MS. *Ascaridia gilli* infection in local and exotic chicken in district Hyderabad. *Proceedings of Parasitology*. 2010; 501:85-90.
14. Butt Z, Shaikh AA, Memon SA, Mal B. Prevalence of cestode parasites in the intestine of local chicken (*Gallus domesticus*) from Hyderabad Sindh Pakistan. *Journal of Entomology and Zoology Studies*. 2014; 2(6): 301-303.
15. Fatihu MY, Ogbobu VC, Njoku CU, Sarror DI. Comparative studies of gastrointestinal helminth of poultry in Zaria Nigeria. *Revue d'Élevage Médicine Vétérinaire Pour Pays Tropicaux*. 1991; 44(2):175-177.
16. Yousaf A, Tabasam MS, Memon A. Prevalence of ascaridia galli in different broiler poultry farms of Potohar region of Rawalpindi-Pakistan. *J Dairy Vet Anim Res*. 2019; 8(1): 71-73
17. Nair KV, Nadakal AM. Hematological change in domestic fowl infected with cestode *Raillietina tetragona* (Molin; 1958). *Vet. Parasitol*. 1981; 8:59-58.
18. Fatihu MY, Ogbobu VC, Njoku CU, Sarror DI. Comparative studies of gastrointestinal helminth of poultry in Zaria Nigeria. *Revue d'Élevage Médicine Vétérinaire Pour Pays Tropicaux*. 1991; 44(2):175-177.