

PREVALENCE OF GASTROINTESTINAL HELMINTH PARASITES IN DOMESTIC CHICKENS *GALLUS DOMESTICUS* OF SELECTED AREAS AT KARIMNAGAR AND KHAMMAM DISTRICTS, TELANGANA STATE, INDIA

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ABSTRACT

The prevalence of gastrointestinal helminth parasites were observe in *Gallus domesticus* at different seasons. The mixed parasitic species were reported during the study period from September 2017 to August 2018. The population size (n= 142) in Karimnagar district observed as 87 chickens were infected and (n= 91) in Khammam district observed as 43 chickens were infected and the population size were positive to helminth infection. Which of these, two species of nematodes *Ascaridia galli*, *Heterakis gallinarum* and two species of cestodes *Raillietina tetragona*, *Raillietina echinobothrida* reported. The nematodes of *Ascaridia galli* prevalence in the population are 43.66% and the prevalence among helminth is 71.26%. The *Heterakis gallinarum* prevalence in the population is 38.03% and the prevalence among helminth is 62.07%. The cestods of *Raillietina tetragona* prevalence in the population are 50.72% and the prevalence among helminth is 82.76%. The *Raillietina echinobothrida* prevalence in the population is 46.48% and the prevalence among helminth is 75.86%. The results of this study observed that both nematodes and cestodes are highly prevalent in domestic chickens in the studied area.

KEYWORDS: Gastrointestinal helminthes, nematodes, cestodes, Prevalence.

INTRODUCTION

Roundworms are common in poultry, waterfowl and wild birds. Species of roundworms that affect poultry include species of large roundworms, also known as ascarids, species of small roundworms *Capillaria* sp., also known as capillary worms or threadworms and cecal worms *Heterakis gallinarum*. Roundworms can cause significant damage to the organs they infest. Most roundworms affect the digestive tract and others affect the trachea and eyes. Several species of cestodes are affect poultry and they range in size from very to more than 12 inches long. Tapeworms are made up of multiple flat segments; these segments are shed in groups of two or three daily through fecal matter. Each segment of tapeworm contains hundreds of eggs and each tapeworm is capable of shedding millions of eggs in its lifetime. Each species of tapeworm attaches to a different section of the digestive tract. A tapeworm attaches itself by using four pairs of suckers located on its head. Most tapeworms are host specific, with chicken tapeworms affecting only chickens.^[1] The tape-worm is responsible for stunted growth of young chicken, emaciation of adult and de-created egg production of hen. In general the tapeworm does not cause gross pathological damages on well nourished chicken, but do compete for food when

they grow to excessive number. In such situation, severe lesions on the intestinal walls and diarrhoea could arise, which ostensibly resulted in ill health.^[2]

Poultry production in Africa and parts of Asia is still distinctively divided into commercialized and village enterprise subsector, each with its peculiarities. The former comprises of strains specifically developed on the basis of primary products into parent stocks, layers, and broilers each with its specialized equipments and management approach. The latter however, consists of indigenous domestic fowls (*Gallus domesticus*) variously referred to as local or rural chickens, backyard poultry or village chickens, and or free range chickens. These refer to breeds strains ecotypes with no improvement history. A survey was conducted on diseases status of village chicken in Kenya to live stock community and environment.^[3] The present study is need to aware village peoples, which are protecting the local chicks against the helminth parasites.

MATERIALS AND METHODS

The chickens were sacrificed by cervical dislocation and the birds were examined according to Permin and Hansen.^[4] The chicken intestines were collected from

slatter throughout the year in seasons from different parts of Khammam and Karimnagar districts areas. To identify the gastrointestinal helminth, the whole digestive tract was removed carefully and subdivided into esophagus, crop, proventriculus, gizzard, intestine, caeca, and cloaca. All sections were opened longitudinally with a pair of scissors. After opening the intestine, the mucosa was scrapped and the proventricular glands was squeezed with the help of the forceps and washed under running tap water over a 90 nanometer aperture test sieve for recovering the smaller helminthes. All the larger helminthes was picked up from the sieve with forceps and the residual contents was examined under a microscope and all the parasites was collected and transferred to 70% alcohol.

All the helminth was counted individually, placed in sample collection tube for identification. All the helminths were examined under light microscope and were identified on the basis of helminthological keys described by Soulsby.^{[5][6]}

The faecal sample were put into sample bottles and identified appropriately. The samples were later processed in the laboratory using the salt floatation technique with saturated sodium chloride solution as the floating medium.^[7]

Identification of helminth eggs and coccidia oocysts was done using a standard microscope under $\times 10$ objective magnification. This was a qualitative assessment. Thorough examination was made to separate strongyle eggs from those of cestodes. In some cases proglottids or whole worms were collected in the faecal samples. These were humanly slaughtered, eviscerated and the content of the gastrointestinal tract harvested, washed thoroughly for possible worm recovery and identification.^{[7][8][9]}

The recorded data was analyzed to derive prevalence of infection and intensity of helminth infection by using following formulae.

$$\text{Prevalence in the population} = \frac{\text{Number of hosts infected}}{\text{Number of hostes examined}} \times 100$$

$$\text{Prevalence among helminth types} = \frac{\text{No. of positive individual helminths}}{\text{Number of infected hostes}} \times 100$$

RESULTS AND DISCUSSIONS

The results of the present study revealed that the occurrence of two species of nematodes and two species of cestode parasite helminthes were recorded in the present investigation. The gastrointestinal helminth parasites were observed in the intestine and faecal matter during the study period of one year from September 2017 to August 2018. The listed nematode species are *Ascaridia galli* "Fig 1,2,3" *Heterakis gallinarum* "Fig 3,4,5" and the cestode species are *Raillietina tetragona* "Fig 7" and *Raillietina echinobothrida* "Fig 8, 9". The population size (n= 91) in Khammam district was observed as 43 chickens were positive to helminth infection. The nematodes of *Ascaridia galli* prevalence in the population are 39.56% and the prevalence among helminth is 83.72%. The *Heterakis gallinarum* prevalence in the population is 30.77% and the prevalence among helminth is 65.12%. The cestods of *Raillietina tetragona* prevalence in the population are 41.76% and the prevalence among helminth is 88.37%. The *Raillietina echinobothrida* prevalence in the population is 35.17% and the prevalence among helminth is 74.42% was given in Table 1.

Puttalakshamma et al.,^[10] were screened 100 desi birds 71 were found positive of gastrointestinal parasites by gross examination of gastrointestinal tract. Out of 71 positive desi birds, 35 (52.2%) were found positive for cestodes, 23 (34.3%) harbour nematodes and remaining 13 (18.3%) had mixed infection. Nnadi and George^[11] observed that helminths and coccidia had prevalence of

35.5% each. Among the helminths *Ascaridia galli* was the most dominant species (17.2%). Generally, there was a significantly higher helminth infestation relative to the ectoparasites ($P < .05$), high prevalence of mixed infections and absence of tick infestation. These results were more similar to our present observations reported by different authors.^{[12][13][14][15][16][17][18][19][20]}

Helminth parasites were recorded of which five species of nematodes such as *Ascaridia galli*, *Heterakis gallinarum*, *Capillaria* spp, *Acuaria hamulosa* and *Dispharynx spiralis*; and one species was cestode called *Raillietina tetragona*. The highest prevalence was observed for *Ascaridia galli* (41.56%) followed in descending order by *Raillietina tetragona* (19.68%), *Heterakis gallinarum* (15.62%), *Acuaria hamulosa* (8.75%), *Capillaria* spp. (4.68%) and *Disopharinx spiralis* (1.56%). The gross pathological lesions were observed in case of *Acuaria hamulosa* and *Heterakis gallinarum* infection. Muraleedharan.^[21] reported the prevalence of intestinal parasites of livestock in dry zone of Karnataka. The similar results were illustrated of parasites prevalence throughout the year and in all seasons in different localities.^{[22][23][24]}

In the present study 233 local domestic chickens gastrointestinal helminth parasites were examined the total population in both districts. The population size (n= 142) in Karimnagar district was observed as 87 chickens were positive to helminth infection. The nematodes of *Ascaridia galli* prevalence in the

population are 43.66% and the prevalence among helminth is 71.26%. The *Heterakis gallinarum* prevalence in the population is 38.03% and the prevalence among helminth is 62.07%. The cestods of *Raillietina tetragona* prevalence in the population are 50.72% and the prevalence among helminth is 82.76%. The *Raillietina echinobothrida* prevalence in the population is 46.48% and the prevalence among helminth is 75.86%. During the study period mixed infection both nematode and cestods were observed during the study period, the highest helminth infection is *Raillietina tetragona* followed by *Raillietina echinobothrida*, *Ascaridia galli* and *Heterakis gallinarum* in Karimnagar district. *Raillietina tetragona* followed by *Ascaridia galli*, *Raillietina echinobothrida* and *Heterakis gallinarum* in Khammam district Table. 1

and 2; “Fig 11 and 12” The female nematode parasite uterus with eggs and stages of embryonated eggs were also observed during the study period “Fig 6, 10”.

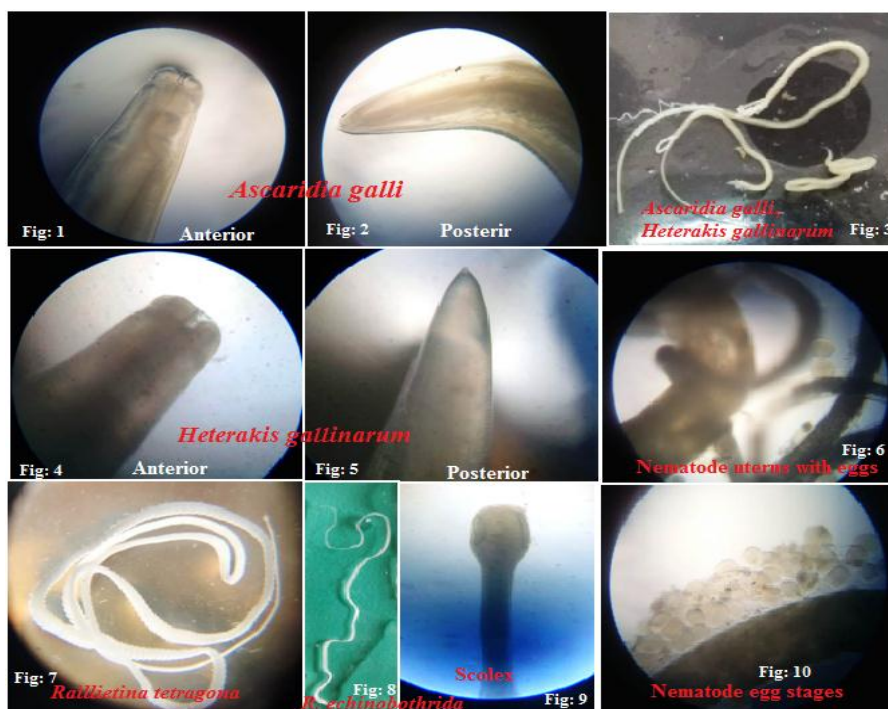
Achaiah and Vijaya Kumar^[25] reported the results of seasonal variations showed that the infection was more during summer followed by rainy and winter seasons. The infection was single or in association with other helminth parasites like *Raillietina echinobothrida*, *Raillietina cesticillus* and *Ascaridia galli*. The results were analysed with the seasonal variations by student t-test ($P < 0.05$). Sheikh et al^[26] were surveyed for helminth parasites in domestic fowls. The similar studies were observed in the domestic chicken in India and London.^{[28][29][30][31]}

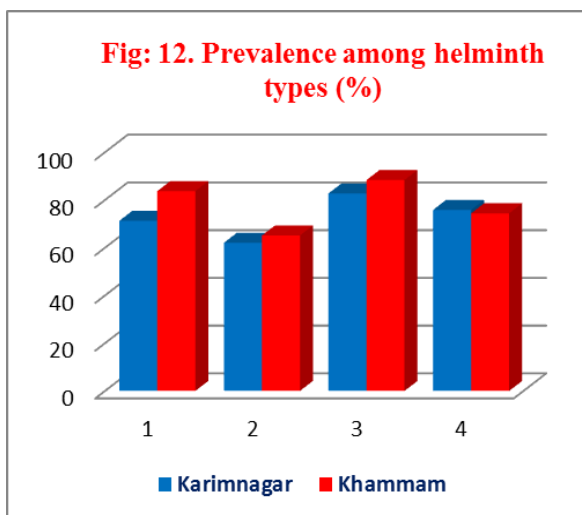
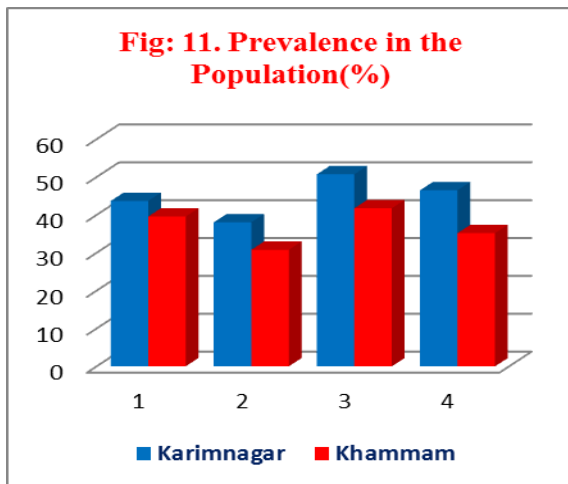
Table 1: The prevalence of the various helminth species in the Karimnagar dt. sample population, n = 142.

Helminth type	Population size	No. positive in the population	No. positive for individual helminths	Prevalence in the Population(%)	Prevalence among helminth types (%)
<i>Ascaridia galli</i>	142	87	62	43.66	71.26
<i>Heterakis gallinarum</i>	142	87	54	38.03	62.07
<i>Raillietina tetragona</i>	142	87	72	50.72	82.76
<i>Raillietina echinobothrida</i>	142	87	66	46.48	75.86

Table 2: The prevalence of the various helminth species in the Khammam dt. sample population, n = 91.

Helminth type	Population size	No. positive in the population	No. positive for individual helminth	Prevalence in the Population(%)	Prevalence among helminth types (%)
<i>Ascaridia galli</i>	91	43	36	39.56	83.72
<i>Heterakis gallinarum</i>	91	43	28	30.77	65.12
<i>Raillietina tetragona</i>	91	43	38	41.76	88.37
<i>Raillietina echinobothrida</i>	91	43	32	35.17	74.42





CONCLUSION

The present observations have revealed interesting results on the variations in the nematodes of *Ascaridia galli* prevalence in the population is higher than among in the *Heterakis gallinarum* population. The cestods of *Raillietina tetragona* prevalence in the population is less than among the *Raillietina echinobothrida*. During the study period mixed infection both nematode and cestods were observed during the study period, the highest helminth infection is *Raillietina tetragona* followed by *Raillietina echinobothrida*, *Ascaridia galli* and *Heterakis gallinarum* in Karimnagar district. The highest parasitic infection is *Raillietina tetragona* followed by *Ascaridia galli*, *Raillietina echinobothrida* and *Heterakis gallinarum* in Khammam district.

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