

## Histopathological changes in the intestine of *Gallus gallus domesticus* (chicken) infected with nematode *Heterakis gallinae* in Jalna district (M.S.) India

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### Abstract

The present communication deals with the infection of intestine in (domestic chicken) *Gallus gallus domesticus* (Gmelin 1790, Freeborn, 1923), causes due to nematode parasite *Heterakis gallinae* collected from Jalna District during May 2017 to June 2019. After the dissection of intestine of *Gallus gallus domesticus*, it is found that the heavy infection of *Heterakis gallinae* damages the lamina propria, mucosa, sub mucosa, muscularis, serosa and intestinal villi with profuse infiltration of eosinophils, lymphocytes and plasma cells.

### INTRODUCTION

The procedure adopted for the histopathological study, "It refers to the microscopic examination of effected part (tissue) of intestine and preparation of this part for the study" is known as histopathology. It is an indication of environmental changes (stress) to which the host is unable to adopt. This is a simple technique to know or to identify the health problem. On the other hand, it is also said that the environmental factors are responsible for the transmission, colonization, fecundity, adaptation of the parasites. Survival rate of the infected parasites is also dependent on the quantity of infection to the intestine of the host. Infection of nematode *Heterakis gallinae* (Gmelin 1790), Freeborn affects the large population of *Gallus gallus domesticus* everywhere at large scale. *Heterakis gallinae*, parasite found in large numbers in the intestine of *Gallus gallus domesticus*, it is having penetrative type of prostomum with the help of which they damage the host tissue and causes the heavy damage which leads to the disease like anemia, loss of weight, decrease the quality of food etc. It has been

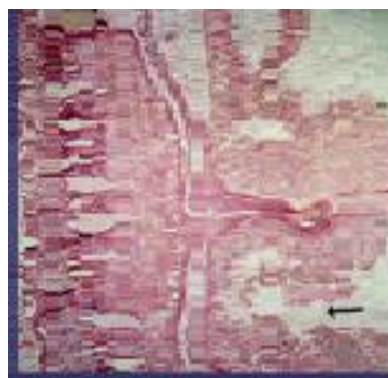
also observed that there is large amount of glycogen, protein and lipids in the worm body indicate that the nematode absorbs these as foods from the surrounding tissue of the host.

### MATERIALS AND METHODS

Fourteen Intestine of the host *Gallus gallus domesticus* were dissected and observed to see the degree of infection. Most of the Intestine was found infected by nematode parasites, some of them were preserved in Bouins fluid for histopathological studies. Fixative inhabits the post mortem changes of the tissues. The pieces of infected intestine were fixed in Bouin's fluid. Later on the material washed, dehydrated through alcohol grades, cleared in Xylene and embedded in paraffin wax at (58-60°C). Blocks were cut at 7µ and slides were stained with Double stain (Haematoxyline and Eosin). Best slides were selected and observed under microscope by using the keys "systema helminthum" (Yamaguti, 1956). The taxonomical study revealed that the nematode is *Heterakis gallinae*, (Gmelin, 1790, Freeborn, 1923).



Non- infected intestine



Infected intestine

### OBSERVATIONS AND DISCUSSIONS

The worms *Heterakis gallinae*, (Gmelin, 1790, Freeborn, 1923) is having penetrative type of prostomum with the help of which they damage their host tissue. It has been also observed that along with the infection of intestine large amount of glycogen, protein and lipids absorb in the form of food from the surrounding tissue of the host.

When T.S. of infected intestine observed under microscope, it is found that the nematode parasite successfully stay in the host tissue finds congestion of blood vessels in lamina propria and external layer of muscles, expansion of some blood vessels and tissue damage in that area, occurrence of inflammatory and focal hemorrhage caused by the attachment of parasite. It causing the disturbance to intestinal villi results in ulceration, penetrating, destructed the layers i.e., mucosa, sub-mucosa damage. Hence it can assume that the parasite force the host to change their metabolic process or activities (Esch *et al.*, 1977).

On the other hand non infected part of the intestine shows no change in the morphology. All layers of villi looks in proper position. There is no disturbance in the mucosa, sub-mucosa and intestinal villi hence found healthy.

### CONCLUSION AND RESULTS

*Heterakis gallinae*, Parasite (Gmelin 1790, Freeborn, 1923) infect heavy amount of mucous with pale color at the edge of infected part of intestine. Some inflamentry nodules see at the site of attachment. This study finds that the *Heterakis gallinae* parasite get the nutritive material from the host tissue which is favourable for its nourishment and growth. The presence of the parasite in the host intestine causes to epithelial lining. It decreases the retarded growth rate of host. It decreases the quality

of flesh and subsequently drop the food value, host become sensitive to other diseases like diarrhea, enteritis, anemia, hemorrhage, loss of vitamin etc., infection increases in the egg production, host become weak with down feathers, it increases the mortality rate of *Gallus gallus domesticus* and cause heavy loss to the nation.

### Exhortation (Counsel):

Owner of the *Gallus gallus domesticus* should improve the quality of food for good health condition of the animals. Cultivation area should be expanded that prevent the crowding of chicken to minimize the infection. Eggs should keep away from the breeding places. Farmer or owner should make aware of the helminthes diseases so that loss of gallus can stop. Awareness program should be organized to educate the society for prevention and treatment methods from the diseases. Domestic chicken places should keep cleaned and disinfected and checked regularly. Vaccine should be developed for treatment of helminthes parasites to control the infection of not only *Gallus gallus domesticus* (chicken) but to the food lovers for the better hygiene.

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