

FIRST REPORT OF *HYPODERAEUM CONOIDEUM* INFECTION IN FREE RANGING DUCK FLOCK IN TAMIL NADU

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ABSTRACT

*Six adult dead ducks from neighbouring area of Namakkal district were brought for post-mortem examination with a history of chronic debility, morbidity and mortality to Poultry Disease Diagnosis and Surveillance Laboratory, Namakkal, Tamil Nadu. Post mortem examination of carcasses revealed that flatworms were attached to the lining of the mucosal epithelium and obstructing gastro intestinal tract indicative of verminous enteritis. The flukes were identified as *Hypoderaeum conoideum*. The parasitological studies revealed that *H. conoideum* was the cause of verminous enteritis in the affected flock.*

Key words: Duck, Flukes, *Hypoderaeum conoideum*, Tamil Nadu

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INTRODUCTION

Duck population in India is 33.51 million which constitutes 4.0% of total poultry population (DAHD &F, 2019). The duck rearing is mostly carried out in Eastern (64.5%), North Eastern (16.02%), and Southern

(12.60%) states of India (Kamal *et al.*, 2022). Duck rearing is one of the important incomes generating activity in North-Eastern, Eastern and Southern states of India (Naik *et al.*, 2022). Duck rearing in India plays an important role in livelihoods of rural families in these states. However, duck rearing in India is mostly unorganised and ducks are managed as small holder units under free ranging conditions. The free ranging foraging behaviour of the ducks makes them to susceptible to many helminthic diseases due to frequent exposure of intermediate hosts (Vestbo *et al.*, 2019). Among the diseases of ducks, trematode infection mainly *Hypoderaeum conoideum* is one of the causes for morbidity in duck

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(Yousuf *et al.*, 2009 and Saijuntha *et al.*, 2013). *Hypoderaeum conoideum* found in intestine of ducks, geese and chicken and reported many parts of the world. *Hypoderaeum conoideum* is a digenean trematode belongs to the family Echinostomatidae. It has complex life cycle with involvement of two intermediate hosts and repeated infection is possible due to presence of intermediate hosts in aquatic environments. Though the cases of *H. conoideum* has been reported in few Asian countries (Anh *et al.*, 2010 and Yang *et al.*, 2015) there is limited information regarding incidence of this helminthic infection in ducks in Indian sub-continent. This report describes about the incidence of *Hypoderaeum conoideum* in a free ranging duck flock in Namakkal region of Tamil Nadu.

MATERIALS AND METHODS

Six adult dead ducks from neighbouring area of Namakkal district were brought for post-mortem examination with a history of chronic debility, morbidity and mortality to Poultry Disease Diagnosis and Surveillance Laboratory, Namakkal. The carcasses were subjected to detailed necropsy examination. During gross examination, the wall of the small intestine was found thickened and lumen was filled with mucoid contents. Numerous flatworms were attached to the lining of the mucosal epithelium and obstructing the mucosa. The worms embedded in the small intestinal mucosa were collected carefully and transferred to the laboratory. The recovered worms were cleaned thoroughly with normal saline. The worms were counted

and differentiated by size wise after that they were subjected for flattening with 10% formalin, stained with acetic alum carmine and destained with 1% acid alcohol. Then they were dehydrated in ascending grades of alcohol i.e., 70%, 90 %, and absolute alcohol, further cleared in carbofic acid and final mounting was done with DPX (Soulsby, 1982).

RESULTS AND DISCUSSION

Pathological examination of duck carcass revealed emaciated carcass with chronic debility. Gross examination of intestinal tract revealed that numerous reddish brown flat worms (trematodes) obstructed the larger portion of the small intestine (Figure 1). The wall of the intestinal mucosa revealed thickening with mucoid exudates in the lumen indicative obstructive and verminous enteritis.

Based on morphological characteristics the worms were identified as trematode parasite *Hypoderaeum conoideum* (Figure 2). *Hypoderaeum conoideum* was identified based on elongated body (8-10mm length and 2-2.5mm width). The anterior part of the body was covered with minute spines extending to half of the ventral sucker to half of the mid-posterior on the dorsal side. Ventral sucker was placed in the first sixth of the body and bigger than oral sucker. Digestive system consisted of short muscular pharynx, bifurcation of oesophagus in front of the ventral sucker. The two intestinal caecae extended near to the posterior end of the body. Testes were tandem in position and located in the posterior half of the body. The cirrus-sac



Fig. 1. Reddish flat worms deeply embedded in small intestinal mucosa.



Fig. 2. *Hypoderaeum conoideum* fluke (1.5 x under stereozoom microscope)

was club-shaped reaching posterior margin of the ventral sucker. Ovary was located in front of the testes. Uterus was linear and located between oviduct and ventral sucker (Soulsby, 1982).

Mostly the ducks were reared under free ranging conditions foraging freely in aquatic environments like rivers and ponds (Gajendran and Karthickeyan, 2009). This acts as an ideal eco-epidemiological environment for trematode infestation, where the ducks could often encounter many intermediate hosts of tematodes such as snails and fishes. *Hypoderaeum conoideum* required fresh water snails, *Lymnaea peregra* as a first intermediate host and *Physella acuta* and *Gyraulus chinensis* as second intermediate hosts (Azizi *et al.*, 2015) before infecting the ducks. Since the affected ducks were free ranging nearby river channels, which were inhabited with fresh water snails could made them ideal environment for infestation of *Hypoderaeum conoideum*. The average flock size of ducks

in India ranges from 10 numbers/household in back yard farming to up to 4000 numbers for a small holder unit (Cheriyana and Jacob, 2023). In back yard farming, the farmer may not give more emphasis to veterinary care whenever, few ducks become sick/die, due to small flock size (~10 numbers), hence the parasitic infestations were remained neglected unless until they affect sizable number of ducks in small holder units of around >100 ducks where more attention is given for veterinary care. The pathological lesions such as chronic debility and obstructive verminous enteritis clearly indicative of cause of death due to gastro intestinal parasitism which was one of the significant cause of death in free ranging ducks. Further the morphological characteristics of the worms in the present study correlates with the findings of Azizi *et al.*, (2015) which confirms the *Hypoderaeum conoideum* associated with verminous enteritis in the affected ducks.

CONCLUSION

In conclusion, the present study describes about the incidence of *Hypoderaeum conoideum* infestation in free ranging ducks in Namakkal region of Tamil Nadu. Further studies are required to understand the prevalence and economic loss due to this neglected helminthic infestation in ducks in India.

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