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Nodular typhlitis associated with *Heterakis gallinarum* infection in a native chicken: A case report from Tamil Nadu

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Abstract
Heterakis gallinarum is a common caecal nematode of domestic poultry. *H. gallinarum* is a highly prevalent gastrointestinal nematode of poultry that affects a wide range of poultry. The parasite causes mild pathogenesis in severe cases, it may lead to motility. The veterinary significance of *Heterakis gallinarum* is attributed to its ability to transmit the protozoan *Histomonas meleagridis*. The *H. gallinarum* infection often occurs as coinfection with other pathogenic parasites. The present study reports the morphological identification of *H. gallinarum* in affected native chickens, corroborated by microscopic examination of the adult worms and their characteristic morphology, and the gross pathological lesions in the ceaca, which confirmed the infection without other parasitic co-infections. These findings highlight the occurrence of Heterakiasis in poultry under field conditions and highlight the need for routine parasitological surveillance in poultry to prevent associated health and production losses.

Keywords: Tamil Nadu, *Heterakis gallinarum*, nodular typhlitis, native chicken

Introduction
In India, poultry production contributes significantly to food security and rural livelihoods; however, gastrointestinal helminth infections remain a major challenge affecting bird health, welfare, and productivity, particularly in backyard and semi-intensive systems. Among these, *Heterakis gallinarum* (Schrank, 1788) is a cosmopolitan nematode parasite inhabiting the caeca of gallinaceous birds. The parasite is of low pathogenic significance in birds but is of considerable epidemiological importance as a carrier of *Histomonas meleagridis*, the causative agent of blackhead disease [1]. In severe infection, *H. gallinarum* caused symptoms such as limping, debilitation, starvation, diarrhoea, followed by high mortality [2]. In India, fatal cases of *H. gallinarum* infection have been reported in 21 guinea fowls, 8 turkeys and 43 desi chickens [3], 5 Aseel chickens [4], two golden pheasants in Uttar Pradesh [5], domestic fowl of Kashmir Valley [6], native ducks of Tamil Nadu [7]. The parasite frequently occurs as a mixed infection with other pathogenic parasites, including coccidian parasites [8], *Raillietina spp*, [9], Ascarids [10], and *Capillaria spp* [11], and *Acuaria hamulosa* [7]. The prevalence of the parasite is high in free-ranging birds due to the availability of intermediate hosts in rural habitats. The mode of transmission of *H. gallinarum* to the poultry is by ingestion of the parasitic eggs shed in the faeces by the definitive hosts. The intermediate host, the earthworm, ingests the parasitic eggs in which the larvae develop and may remain infective for at least one year. This case report describes an incident of nodular typhilitis in native chickens from Tamil Nadu, induced by *H. gallinarum* alone, without any concurrent infections, based on morphological identification of the parasite.

Materials and Methods
A dead seven-month-old native chicken was presented from Sathur village of Ranipet district, Tamil Nadu, for necropsy examination. The owner reported that the bird had been lethargic, with reduced feed intake, emaciation, and diarrhoea for the past five days.

The hen had been raised under a backyard free-range management system without any deworming interventions. Within the flock, five birds that exhibited similar symptoms had already succumbed. A detailed necropsy examination was done. The caecal content, scraping of the caecal lumen, and nodules were collected and examined for the presence of worms. The recovered worms were dehydrated in ascending grades of alcohol, cleared with lactophenol solution, and observed under a light microscope for morphological characterization [12]. The visceral organs were observed for the lesions.

Results and Discussion

In the present study, the examination of collected caecal content, scraping of the caecal lumen, and nodules revealed the presence of worms. The worms were collected, washed in physiological saline, and preserved for further examination [12]. Macroscopically, the worms appeared smaller, thread-like, white in colour, and tapered at both ends. The worms were examined under a light microscope. Worms were cylindrical nematodes with a smooth cuticle, three prominent lips at the anterior end, a long oesophagus with a prominent posterior bulb and valvular apparatus (Figure 1), and the posterior end was pointed (Figure 2). The uterus of the female worm was filled with eggs (Figures 3 & 4). Based on these morphological characteristics, the worms present in the caeca were identified as the nematode *Heterakis gallinarum*, commonly known as the caecal worm of poultry.

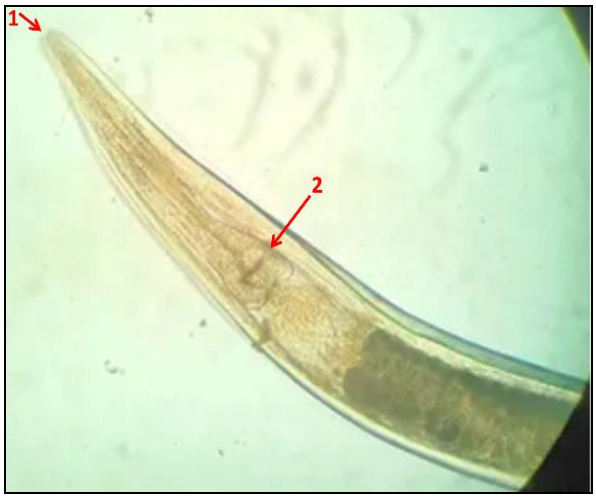

Fig 1: Anterior end of the nematode *Heterakis gallinarum* with 1, three lips, 2. Oesophagus with posterior bulb and valvular apparatus

Fig 2: Posterior end of the nematode *Heterakis gallinarum* with pointed tail

Fig 3: Female *Heterakis gallinarum* worm

Fig 4: Uterus of the female *Heterakis gallinarum* worm filled with eggs

The caeca of the affected chicken were found to be mildly distended with yellowish-brown exudate in semi-solid consistency. The caecal mucosa appeared thin, severely congested with multiple nodular necrotic foci. The proventriculus appeared congested with necrotic foci (Figure 5).

Fig 5: The proventriculus appears congested with necrotic foci (on the right), and the caeca appear congested with multiple necrotic foci (on the left)

Other visceral organs showed no significant lesions, except for mild congestion of the liver and lungs. The morphological features observed in the present study were consistent with standard descriptions of *H. gallinarum* reported in poultry [13].

Globally, reports of *H. gallinarum* causing granulomatous caecal nodules in chickens, guinea fowl, or pheasants without concurrent infections are rare [5, 14, 15-18]. The present study also reports the nodular typhilitis caused by *H. gallinarum* alone without any concurrent infections.

Although the pathogenicity of *H. gallinarum* alone is generally low, heavy infections can contribute to enteritis, reduced growth, poor feed conversion [5], and fatal nodular typhilitis. Though *H. gallinarum* infection is of low pathogenic significance, the poor body condition of the birds favors the severity of the infections [12], and other risk factors associated are free-range rearing system, absence of regular anthelmintic treatment, climate, feed quality, and body condition of the birds [7, 19-21]. Chronic attachment at multiple sites can induce nodular typhlitis, which is a major pathophysiological feature of *H. gallinarum infection*. This condition impairs caecal digestive function and adversely affects the overall productivity of the birds. The infection of *H. gallinarum* has been reported worldwide in many countries [6, 22-25] and in India in various poultry species [5, 7, 19, 21].

Furthermore, the presence of this nematode poses a serious threat because of its role in transmitting *H. meleagridis*, particularly in mixed poultry farming systems [18]. This protozoan causes blackhead disease in various farm birds, leading to severe mortality, and has a significant impact on both national and global poultry economies [5, 19].

The findings of the present case are consistent with earlier reports from various regions of India, confirming that heterakiasis remains endemic in poultry populations. Regular parasitological monitoring, strategic deworming programs, and improved management practices are therefore essential to reduce parasite burden and minimize associated production losses.

Conclusion

This case confirms *Heterakis gallinarum* infection in domestic fowl through gross and morphological examination. It emphasizes the need for routine parasitological surveillance and targeted control strategies in backyard and small-scale poultry farms to reduce infection-associated productivity losses.

Conflict of Interest

Not available

Financial Support

Not available

Reference

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