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MORPHOLOGICAL STUDIES OF *ASCARDIA GALLI* (SCHRANK, 1788) PARASITIC IN DOMESTIC FOWL *GALLUS DOMESTICUS*

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ABSTRACT
Present study deals with report of *Ascardia galli* (Schrank, 1788) collected from intestine of *Gallus domesticus*. The present worm resembles *Ascaridia galli* (Schrank, 1788) in having all the essential morphological characters i.e. body elongated, semitransparent, creamy white in colour, mouth is surrounded by three lips, oesophagus is without posterior bulb, spicule equal in size but differs from the same form due to presence of six pair of caudal papillae, Vs against ten pair of caudal papillae, Length of spicule Long Vs short, some variability in measurement in organs. As characters are minor it is redescribed here as *Ascaridia galli* (Schrank, 1788).

Keywords: *Ascardia galli, Gallus domesticus, Nanded, Nematode*

INTRODUCTION

Ascardia galli is a parasitic roundworm belonging to the phylum Nematoda. Nematodes of the genus *Ascaridia* are essentially intestinal parasites of birds. *A. galli* is the most prevalent and pathogenic species, especially in domestic fowl, *Gallus domesticus*. It causes Ascaridiasis, a disease of poultry due to heavy worm infection, particularly in chickens . It inhabits the small intestine, and can be occasionally seen in commercial eggs. The lifecycle of *A. galli* is direct in a single host, involving two principal populations, namely the sexually mature parasite in the gastrointestinal tract and the infective stage (L2). The nematode infects fowl of all ages, but the greatest degree of damage is often found in birds under 12 weeks of age. Heavy infection is the major cause of weight depression and reduced egg production in poultry husbandry. In severe infections, intestinal blockage can occur. Unthriftiness, drooping of the wings, bleaching of the head, and emaciation are seen. Infection also causes loss of blood, reduced blood sugar content, increased urates, shrunken thymus glands, retarded growth, and greatly increased mortality. In heavy infections, adult worms may move up the oviduct and be found in hens' eggs, and sometimes they are also found in the birds' feces.

The genus *Ascarida* is erected by Dujardin, 1845. The types species *A.galli* is described (Schrank, 1788), Freeborn, 1923. Ramadan and Znada, 1992 studied Morphology and life history of *Ascaridia galli* in the domestic fowl Ashour, 1994 studied Scanning electron microscopy of *Ascaridia galli* (Schrank, 1788)

The important characters of genus *Ascardia* is- The worms are large in size females are larger than male. Mouth usually bearing three lips, one dorsal and two subventral in position. Oesophagus straight and long. Ventrical and diverticula are absent. Spicules somewhat equal in size. Male caudal alae poorly developed or absent. Preanal sucker more or less rounded. Female valva near the middle of the body. Oviparous eggs with thick cell. Parasitic in birds.

MATERIALS AND METHODS

117 nematodes were collected from the 84 intestine of *Gallus gallus domesticus* out of 240 examined from Nanded M.S., India, during February, 2018 to January, 2020. Out of them 4 males and 3 females are used for taxonomic study. These parasites are preserved in glycerol, mounted in glycerin and drawings are made with the aid of Camera lucida. All measurements are recorded in mm.

RESULTS

The worms are medium to large in size, elongated to cylindrical in shape, semi-transparent, creamy white in colour.

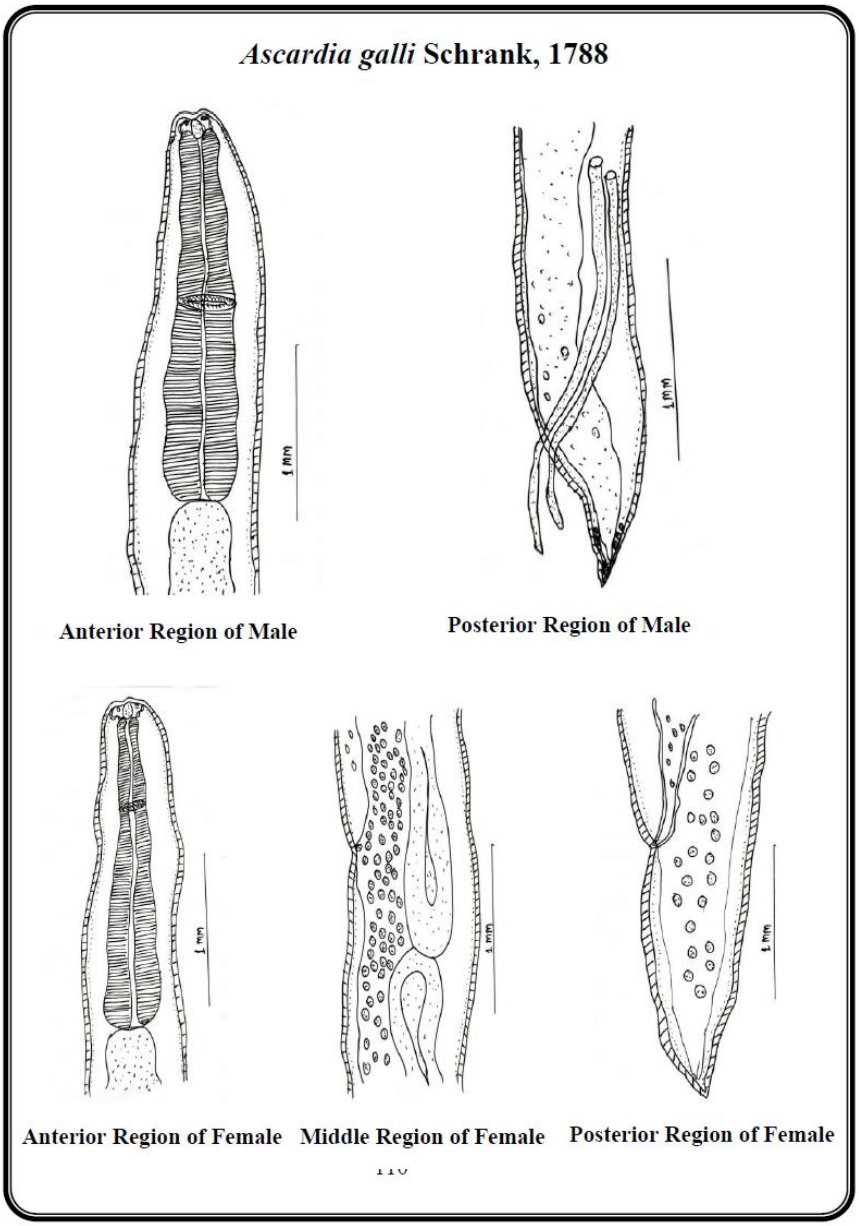

Figure 1: Camera Lucida diagram of *Ascardia galli* Schrank, 1788

Male: Males are smaller in size than female, It measures 22.5 (21-24) x 1.60 (1.55-1.65) mm in length and breath. Buccual capsule is medium in size, present at the anterior end of body and measures 0.073 (0.065-0.081) x 0.151 (0.138-0.164) mm in length and breath. The nerve ring is surrounding the muscular portion of oesophagus and lies at 1.68 millimeters from anterior extremity. The excretory pore lies at 6.15 millimeters from anterior extremity. The oesophagus consisting muscular and glandular parts and measures 2.83 (2.72 - 2.94) millimeters in length and 0.28 (0.18 - 0.39) millimeters in width. The posterior end of male bears a narrow bursal membrane on each side. The pre anal sucker is predominant, oval in shape, lies at 0.720

(0.698-0.742) mm from posterior extremity and measures 0.081 (0.068-0.094) x 0.055 (0.045- 0.065) mm in length and breath. The spicules are two in numbers, long, somewhat equal in size and measures 0.309 (0.293-0.326) x 0.042 (0.039-0.065) mm in length and breath. The caudal end of male bears six pair of papillae. The positions of papillae are three pair are pre-anal, and remaining three pair are post anal. The tail is somewhat curved, pointed at its tips and measures 0.0669 (0.0645-0.0693) x 0.0314 (0.0254-0.0375) mm in length and breath.

Female: The females are longer than males and measures 30 (28- 32) x 1.8 (1.7-1.9) mm in length and breath. The body is elongated, long, semitransparent, wide anteriorly and tapering posteriorly. Buccal capsule is medium, lies at anterior end and 0.281 (0.244 – 0.318) millimeters in length and 0.202 (0.172 – 0.232) mm in length and breath. The nerve ring is surrounded by muscular portion of oesophagus and lies at 2.42 mm from anterior extremity. The oesophagus is long, muscular and measures 0.306 (0.288-0.324 x 0.0237 (0.0168- 0.0306) mm in length and breath. The vulva is pre-equatorial, lies at 13.5 (12.5-14.5) from anterior extremity. The oesophagus is long, muscular and measures 0.295 (0.285-0.305) x 0.0248 (0.0174-0.0322) mm in length and breath. The valval opening is an oval at mid dorsal side of the body. The muscular vagina runes posteriorly. The vagina gives uterine tubes. The eggs are large in size, oval in shape and measures 0.0067 (0.0065- 0.0069) x 0.0045 (0.0039-0.0053) mm in length and breath. The tail is straight, without caudal alae and measures 0.071 (0.0922-0.102) x 0.0254 (0.0176-0.0349) mm in length and breath.

DISCUSSION

The genus *Ascaridia* was erected by Dujardin, 1845, The Description of the adult nematode examined in this study, coincide with the known taxonomic characters and diagnostic features of *Ascaridia galli* which is a cosmopolitan species. Measurements of the various organs of the parasite lie in the ranges which have been recorded by previous authors.

After going through literature, the present worm resembles *Ascaridia galli* (Schrank, 1788) in having all the essential morphological characters i.e. body elongated, semitransparent, creamy white in colour, mouth is surrounded by three lips, oesaphagus is without posterior bulb, spicule equal in size but differs from the same form due to presence of six pair of caudal papillae, Vs against ten pair of caudal papillae, Length of spicule Long Vs short, some variability in measurement in organs.

As characters are minor it is redescribed here as *Ascaridia galli* (Schrank, 1788).

Significance of Work/Findings

Ascaridia galli is a parasitic roundworm belonging to the phylum Nematoda. Nematodes of the genus *Ascaridia* are essentially intestinal parasites of birds. *A. galli* is the most prevalent and pathogenic species, especially in domestic fowl, *Gallus domesticus*. It causes ascaridiasis, a disease of poultry due to heavy worm infection, particularly in chickens and turkeys. The said nematode inhabits the small intestine, and can be occasionally seen in commercial eggs. It is the largest nematode in birds. The body of *Ascardia galli* is semitransparent, creamy-white, and cylindrical. The anterior end is characterized by a prominent mouth, which is surrounded by three large, trilobed lips. The edges of the lips bear teeth-like denticles. The body is entirely covered with a thick proteinaceous structure called cuticle.

TAXONOMIC SUMMARY

Type species : *Ascaridia galli* (Schrank, 1788)
Host : *Gallus domesticus*.
Habitat : Intestine
Locality : Kandhar, Mukhed, Degloor, Nanded M.S. India.
Period of collection : February, 2018 to January, 2020.
No. of Specimen : 117
Prevalence : 117 specimens are collected from 84 host out of 240 examined
Accession number : PGDZ/YMN/1-7/ February, 2018 to January, 2020.
Deposition : P.G. Department of Zoology, Yeshwant Mahavidyalya, Nanded. (M.S.) India.

Amongst all gastrointestinal nematodes, *Ascaridia galli* is of significant concern due to the parasite's direct life cycle and ability to survive extreme environmental conditions. In laying hens, *A. galli* parasites have been associated with reduced health, welfare, immunity, and egg production. Redescriptions of animal species such as *Ascaridia galli*, even without significant observed changes, contributes to the scientific process by ensuring taxonomic accuracy, maintaining a comprehensive scientific record, leveraging technological advancements, providing educational value, establishing baselines for future studies, and placing the findings in historical context.

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REFERENCES
Ashour AA (1994): Scanning electron microscopy of *Ascaridia galli* (Schrank, 1788), Freeborn, 1923 and A. columbae (Linstow, 1903). *Journal of Egyptian Society of Parasitology* **24**(2) 349–55. *PMID 8077754.*
Ramadan HH and Znada NYA (1992): Morphology and life history of *Ascaridia galli* in the domestic fowl that are raised in Jeddah" *(PDF). J.K.A.U. Sci. 4: 87–99. doi:10.4197/sci.4-1.9.*
Döring M (2022). *Ascaridia galli* Schrank, 1788. English. *Wikimedia Foundation. Checklist dataset https://doi.org/10.15468/c3kkgh. Accessed via* GBIF.org on 2023-10-14.
Natural History Museum of London (2020): *[Statut pour la France métropolitaine] Natural History Museum of London. 2020. Natural History Museum (London) Collection Specimens. Occurrence dataset https://doi.org/10.5519/0002965 accessed via GBIF.org on 2020-04-02. [https://www.gbif.org/dataset/7e380070-f762-11e1-a439-00145eb45e9a].*