



BIOSYSTEMATIC STUDIES ON NEMATODE *Spinitectus indica* SP. NOV. FROM *Mastacembelus armatus* (LACEPADE, 1800)

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Abstract- The present investigation deals with morpho-taxonomic observation of the nematode parasites *Spinitectus indica* Sp. Nov. of fresh-water fish *Mastacembelus armatus* from Satara district of M.S. India. After going through the literature the present worm comes closer to known valid species of the genus *Spinitectus* in having all the essential morphological characters as body medium, having annulations, annula bearing spines, oesophagus divided into two parts muscular anterior and glandular posterior one, thin cuticle, Males are smaller than females, spicules unequal, tail curved in male, two ovaries, situated at one anterior and other posterior one, tail pointed in females. But differs due to Caudal Papillae nine pairs, out of them five pairs are pre-anal while four pairs are post-anal in position and vulval opening in front of the anus.

Keywords- Biosystematic Study, Nematode parasite, *Spinitectus indica* Sp. Nov. *Mastacembelus armatus*

Introduction

Parasites have to encounter a number of hazards to establish themselves successfully in a host. Fishes are parasitized by helminth parasite. Helminthic infection reduces the nutritional, medicinal and economical value of fishes. At present our total annual fish production is about 5.7 million tones but the estimated potential based on the present levels of productivity is about 8.5 million tones irrespective of the advances and achievements, intensive fish farming remains a high risk investment, mainly due to the disease problem. Flesh of fish contains high amount of proteins, Vitamin-A and Vitamin-D. Fishes are said to be gold from water. Fishes are useful for preparation of soup, liver oil, skin, other oils etc. Hence the study of helminth parasites is therefore an urgent necessity today.

Genus *Spinitectus* was established in 1883, includes a large number of species described from freshwater and marine fishes [2]. To date, 12 of them have been recorded from different parts of World. *S.corti* [3]; *S.bevaeri* [4]; *S. pachyuri* [5]; *S.multipillatus* [5]; *S.yuanjiangensis* [6]; *S.bagri* [6]; *S. osorioi* [7]; Moravec [8] reported three species viz. *S. petrowi* [9], *S.gigi* [10-11] and *S.tabascoensis* [2,12].

During studies on the helminth fauna of freshwater fishes of different parts of M.S. India, Results of their detailed examination by both light and electron microscopy are presented below.

Material and Methods

Nematodes were collected from the intestine of a freshwater fish, *Mastacembelus armatus* [1] from Satara district of M.S. India. Collected nematode parasites are preserved in hot 10% glycerol, cleared in lactophenol, mounted in glycerin jelly and drawings are made with the aid of camera lucida. Photomicrographs were taken by trinocular computerized research microscope. All measurements are recorded in millimeters.

Results

Description based on [Fig-1], [Fig-2] and [Fig-3].

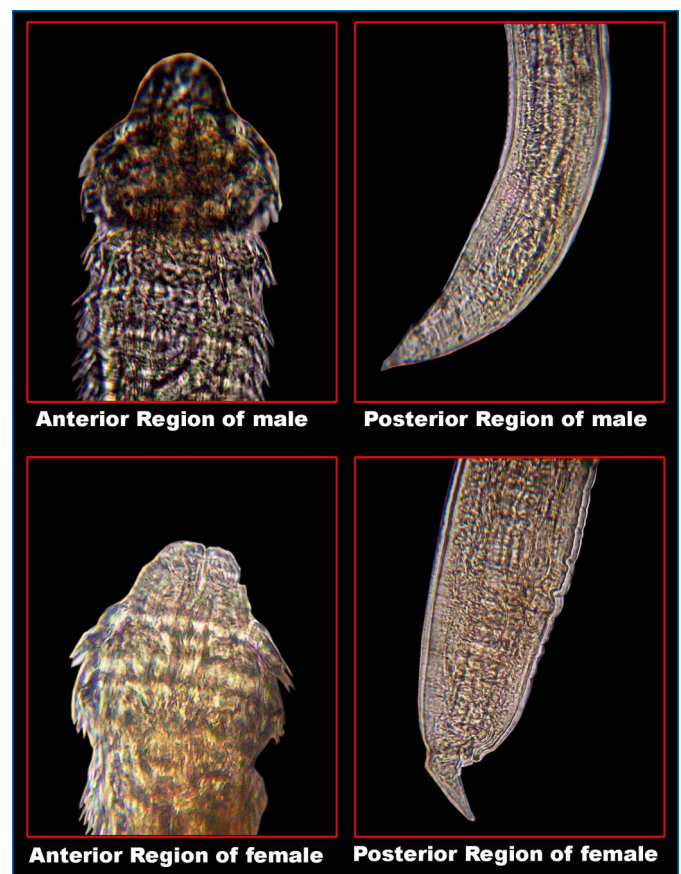


Fig. 1- Photomicrograph of *Spinitectus corti* Moorthy, 1938 A- Anterior region of male, B- Posterior region of male, C- Anterior region of female and D- Posterior region of female.

The body is medium, wide anteriorly and tapering posteriorly. The cuticle is thin and delicate. It is provided with a series of transverse annulations, bearing series of backwardly directed spines. The mouth is situated at the apex. Lips are absent. The mouth leads into

a thin walled, short, funnel shaped vestibule. Oesophagus consists of two parts. The posterior part of oesophagus joins to intestine.

The intestine leads into short rectum that opens directly to the exterior at the anus in female and in male into the cloaca.

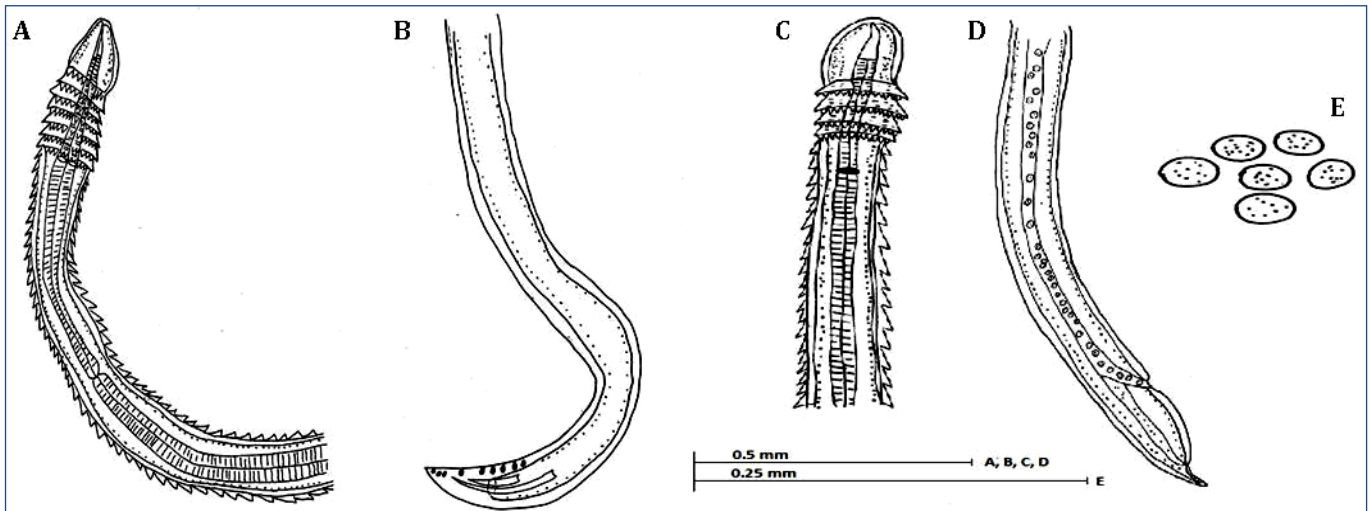


Fig. 2- Camera lucida diagram of *Spinitectus corti* Moorthy, 1938 A- Anterior region of male B- Posterior region of male, C- Anterior region of female and D- Posterior region of female E- Eggs.

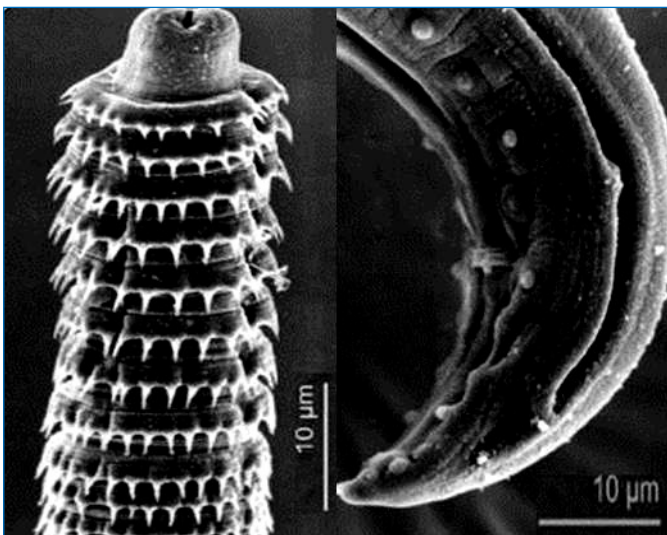


Fig. 3- *Spinitectus corti* Moorthy, 1938, scanning electron micrographs. A- Anterior end of body; B- Posterior end of male.

Male Characters

Males are smaller than females and measures 3.35(3.20-3.50) mm in length and 0.85(0.83-0.87) mm in width. Buccal capsule long and measures 0.104(0.097-0.111)mm in length and 0.072(0.048-0.097) mm in width. The first three annulation bears 24 spines and next annulation bears 26 spines. This number is constant till the first post-oesophageal annulation. The nerve ring surrounding the muscular portion of oesophagus and lies at 0.271 mm from anterior extremity. The excretory pore lies at 0.330 mm from anterior extremity. The oesophagus consisting muscular and glandular parts and measures 0.580(0.567-0.592) mm in length. The total nine pairs of caudal papillae are present, out of them five pairs are pre-anal and four pairs are post-anal in position. The spicules are unequal. The right spicule is short and measures 0.080(0.072-0.087) mm in length while left spicule is long and measures 0.279(0.266-0.291)mm in length. The tail is curved and measures 0.084(0.072-0.097) mm in length.

Female Characters

The females are longer than males and measures 4.3 (4.2-4.4) mm in length and 0.90(0.87-0.93) mm in width. The buccal capsule measures 0.135(0.131-0.140) mm in length and 0.094 (0.087-0.101) mm in width. The first three annulation bears 24 spines and next annulation bears 26 spines. This number is constant till the first post-oesophageal annulation. The nerve ring surrounding the muscular portion of oesophagus and lies at 0.317 mm from anterior extremity. The excretory pore lies at 0.381 mm from anterior extremity. The oesophagus consisting muscular and glandular parts and measures 0.762(0.718-0.805) mm in length. The vulval opening in front of the anus at the distance of 0.3 mm from posterior extremity. The narrow vagina runs forward from it. There are two ovaries, one anterior and other posterior one. The tail is pointed and measures 0.128(0.121-0.135) mm in length.

Discussion

The genus *Spinitectus* was established in 1883. After going through the literature the present worm comes closer to known species of the genus *Spinitectus* in having all the essential morphological characters as body medium, having annulations, annula bearing spines, oesophagus divided into two parts i.e. muscular anterior and glandular posterior one, thin cuticle and spicules unequal.

It differs from *S.carolini* in having 25-35 annular spines. The present form differs from *S.yorkeri* in having 15 pairs of pre-cloacal papillae. It differs from *Spinitectus corti* [3] in having nine pairs of caudal papillae, arrangements and numbers of spines in each annula, some variability in measurements of organs and reported from *Ophiocephalus gachua* in Mysore (India). *Spinitectus indica* Sp.Nov. differs from *S.bevaeri* [4] in having 10-16 spines, 4 pair of pre-caudal and 5 pairs of post-caudal papillae, length of spicule ratio is 1:2.5-3 and reported from *Albula vulpes*. The present parasite differs from *S.pachyuri* [5] due to 12 spines and 6 pairs of pre-anal papillae. It differs from *S.multipapillatus* [5] due to 12 spines and 6 pairs of pre-anal papillae. It differs from *S.yuanjiangensis* [6] in having 28-30 spines per ring, 5 pairs of post-anal papillae and reported from *Silurus asotus*, *Pelteobagrus vachellii*, *Pseudobagrus analis*,

Leiocassis crassilabris, *Mystus macropterus*, *Pseudobagrus ussuriensis*, *Odontobutis obscura* and *Ctenogobius* sp., from rivers of the Wuling Mountains region Provinces Guizhou, Hubei, Hunan and Sichuan), southwestern China. It differs from *S. bagri* [6] in having 22-34 spines per ring, 4 pairs of pre anal and 4 pairs of post anal papillae and reported from *Pelteobagrus fulvidraco*, *Leiocassis crassilabris*, *Mystus macropterus* and *Pseudobagrus analis*; China. The present species *Spinitectus indica* Sp.Nov. differs from *S. osorioi* [7] in having 47-99 rows of spines, 4 pairs of pre anal and 6 pair of post anal papillae and reported from *Chirostoma astor*, *Chirostoma attenuatum*. It differs from *S. petrowi* [8-9] in having 29-37 spines, 4 pair of pre anal and 5 pairs of post anal papillae, length of spicule ratio is 1:2.6-2.8 and reported from *Pelteobagrus fulvidraco*. The present form differs from *S. gigi* [8,10-11] in having 28-31 spines, 4 pair of pre anal and 6 pairs of post anal papillae and reported from *Pelteobagrus fulvidraco*, *Clarias fuscus*. It differs from *S. tabascoensis* [2,12] in having 18-22 spines, 4 pair of pre anal and 5 pairs of post anal papillae and reported from *Ictalurus furcatus*, *Cathorops aquadulce*, *Ictalurus punctatus*, Southern Mexico.

Conclusion

These distinguishing taxonomic characters are valid enough to erect a new species for these worms and hence the new species is designated as *Spinitectus indica* Sp. Nov. after the name of country.

Taxonomic Summary

Genus: *Spinitectus* Fourment, 1883

Species: *Spinitectus indica* Sp.Nov.

Type host: *Mastacembelus armatus*

Habitat (Site): Intestine

Type locality: India, Maharashtra (Satara districts)

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Conflicts of Interest: None declared.

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