The morphology and Systematics of Rhabdochona (Rhabdochona) clupisomai sp. nov., a widespread parasite of freshwater fishes

Dr. Sadhana Gupta
Assistant Professor
Department of Zoology
Indira Gandhi Govt. P.G. College, Bangarmau, Unnao, India

ABSTRACT: Fishes form an important dietary component of humans since it is important the fish that are consumed should be healthy and free of infection ensuring public health. Parasite infested fish have no or low market value resulting in loss to fishery industry. Hence it is relevant to identify such infectious agents and suggest measures for prevention and elimination of such infections.

Present study aimed to investigate the intestinal nematode from host Clupisomagaruai inhabiting basin region of Gomati River at Lucknow to evaluate their population levels and its taxonomical status. In present study new species of Rhabdochona has been recorded having alated spicule, 15 pairs of caudal papillae and postequatorial vulva.

Index Terms – Rhabdochona, Clupisomagaruai, biodiversity, Nematoda

INTRODUCTION

Description: Body elongated, slender attenuated towards both extremities. Mouth bounded by two lips, opens into funnel shaped prostome not supported by longitudinal thickenings anteriorly into 8 pointed teeth. Prostome leads into mesostome or vestibule, a straight narrow tube. Oesophagus consists of short anterior muscular part and long posterior glandular part. Male tail conical, curved ventrally with narrow caudal alae. Female tail straight and elongate. Uterine branches opposed, eggs without filaments.

Male: Body 12.63-15.23 long, 0.16-0.18 in maximum thickness. Prostome 0.02-0.03 long, 0.01-0.02 wide. Vestibule 0.13-0.14 long. Oesophagus 2.46-2.82 long, anterior muscular oesophagus 0.30-0.36 long, 0.02-0.03 in width, posterior glandular oesophagus 2.16-2.46, 0.06-0.08 in width. Nerve ring 0.20-0.22 and excretory pore 0.25-0.27 from anterior end. Caudal alae narrow, extending up to tip of tail. Spicules alate unequal and dissimilar. Left long 0.75-1.00 with a bifurcated tip, right small, 0.21-0.27 with conical tip. Tail 0.16-0.18 conical, curved ventrally to form 2 or 3 spiral coils, gubernaculum absence.

Female: Body 19.21-23.46 long, 0.22-0.24 in maximum thickness. Prostome 0.03-0.04 long, 0.02-0.03 wide. Vestibule 0.15-0.17 long. Anterior muscular oesophagus 0.32-0.39 long, 0.02-0.03 wide, posterior glandular oesophagus 2.20-2.65 long, 0.10-0.13 wide. Entire oesophagus 2.52-3.04 long. Nerve ring 0.19-0.23 and excretory pore 0.02-0.28 from anterior end. Vulva postequatorial, 12.26-15.12 from anterior end. Vagina runs posteriorly forming a distinct U-loop. Uterine branches opposed. Eggs oval, smooth, without filaments 0.035-0.04 x 0.02-0.025. Tail 0.03-0.04 long, tapering with blunt tip.

MATERIALS AND METHOD

Host fish Clupisomagaruai (Hamilton) of average size were collected from Gomti river basin. Nematodes were recovered from small intestine of host species under stereo-zoom dissecting microscope and the number of each host species infected and no. of each nematode sp. in fish host were recorded. For light microscopy the recovered nematode were washed in saline solution, preserved in 70% ethyl alcohol, fixed in mixture having three part of the same fixative and one part of glycerine and cleared in lactophenol. These were mounted temporarily on glass slide in pure glycerine under coverslip. For scanning electron microscopy (SEM), specimens were postfixed in osmium tetroxide (in phosphate buffer), dehydrated through a graded acetone series, critical-point-dried and sputter-coated with gold and examined using a JEOL-JSM-T330 scanning electron microscope at an accelerating voltage of 4 kV. Drawings were made with the aid of cameralucida. All measurements are in millimetres unless otherwise indicated.

Taxonomic summary:

<table>
<thead>
<tr>
<th>Host</th>
<th>Clupisomagaruai (Hamilton)</th>
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<tbody>
<tr>
<td>Location</td>
<td>Small intestine</td>
</tr>
<tr>
<td>Locality</td>
<td>Lucknow</td>
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Prevalence: 14 male and 10 female specimens from 8 hosts out of 105 examined.
DISCUSSION AND RESULTS

Railliet(1916) erected the genus Rhabdochona with Rhabdochonadenuda (Dujardin,1845) as its type species. Gustafson (1949),Choquet(1951),Jainszeeka(1955), Campana-Rouget(1961),Raytman and Trofimenko(1964),Rasheed(1965),Holloway and Klewar(1969),Moravec(1972, 1975),Margolis et al.(1975) etc. have studied the taxonomy and morphology of the genus Rhabdochona and selected the eggs as a key feature.Moravec (1972) divided the genus Rhabdochona into three subgenera viz. Rhabdochona (Rhabdochona) Railliet (1916),Rhabdochona (Filochona) Saiidev (1953) and Rhabdochona (Globochona) Moravec (1972). He characterised the subgenus Rhabdochona (Rhabdochona) in having eggs without filaments. The subgenus Rhabdochona (Filochona) in having eggs with filaments and the subgenus Rhabdochona (Globochona) in having eggs with lateral globules and swellings.

Moravec (1975) revised his opinion and divided the genus Rhabdochona into four subgenera instead of three as he considered that the characters of the eggs are not sufficient to group the species into three subgenera. He thought that other characters such as number and arrangement of teeth in the prostome, presence of cervical alae, shape of female tail tip and shape of deirids are some of the characters which are necessary to include while dividing the genus Rhabdochonainto subgenera. These subgenera being Rhabdochona (Rhabdochona),Rhabdochona (Globochona),Rhabdochona (Globochoonoides) and Rhabdochona (Sinonema).

Subgenus Rhabdochona (Filochona) has been merged with Rhabdochona (Rhabdochona). Thus the subgenus Rhabdochona (Rhabdochona) include both types of filamentous and non-filamentous eggs.

Due to inadequate descriptions given by various authors the division of Rhabdochona in four subgenera is unnatural and the division of Rhabdochonainto three subgenera as proposed by Moravec (1972) appears to be more authentic and the author follows Moravec. This division has been accepted earlier by Margolis et al.(1975),Chabaud(1975),Fotedar and Dhar(1977) and Arya and Johnson(1977).


Under the subgenus R.(Globochona) following species have been kept.These are R.(G.)korys Majumdar and De,1971 and R.(G.)equispiculata Moravec and Scholz,1991; R.(G.)rashorae Moravec & Kamchoo,2012; R.(G.)kurdistanensis Moravec et al.,2012; R.(G.)jeerpia Nimbalkar et al.,2013; R.(G.)puntsi Gonzalez-Solis et al.,2014.

There are certain species in which the description of eggs has not been given so they have been separated from the above three subgenera. These are RhabdochonacutaiPearse,1932; R.chainawenesisZaidi and Khan,1975; R.minima Moravec and Deniel,1976; R.unispinate Arya,1980 and R.bariliusi Soota and Sarkar,1981.

Sahay and Narayan(1971) synonymized R.baylisi Rai,1969 with R.garuaI Agarwal,1965. The author does not agree with the synonymy of the above mentioned species as these two sp. appear different in having alated and alate spicule and vulva postequatorial. Pending the verification of characters in the type specimen these sp. can not be synonymized at present.

The present specimen resemble to Rhabdochona (Rhabdochona)baylisi Rai,1969 in possessing left spicule digitate, U-shaped muscular vagina, divergent uteri and non-filamentous eggs but differs from it in having alated spicules instead of non-alated,15 pairs of caudal papillae instead of 16 pairs and postequatorial vulva instead of vulva near middle of body.

All differences are sufficient to create a new species with specific name Rhabdochona (Rhabdochona)clupisomai sp. nov. Present species is named after the name of host.

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REFERENCES


**Fig. 1-4**

*Rhabdochona (R.) clupisoma* sp. nov.


*Scanning electron micrographs:* Cephalic end A. Apical view B. Subapical view