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Rhabdochona haspani, New Species (Thelazioidea: Rhabdochonidae) from Stream Fish (Actinopterygii Klein, 1185) of Sibi Division, Balochistan

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Abstract.- A new nematode *Rhabdochona* (*Rhabdochona*) *haspani* n. sp. is described on the basis of the specimens recovered from the intestine of a fish, *Cyprinion watsoni* (Day, 1872) from fresh waters in Harnai (Sibi Division) Balochistan. The new nematode specimens are clearly different from all the previously reported species of *Rhabdochona* Railliet, 1916 by the relevant length of esophagus, shape and sizes (0.24-0.34 and 0.071-0.076) of spicules, distance of nerve ring, deirids and excretory pore from the anterior extremity and, in the females by measurements of eggs (0.013-0.035), morphology of vagina, position of vulva and excretory pore. Additionally, the new specimens have 8 teeth in the prosotme and 13 pairs of caudal papillae including 8 preanal and 5 postanal.

Keywords: Parasitic nematode, *Rhabdochona haspani* n. sp., *Cyprinion watsoni*.

INTRODUCTION

The genus *Rhabdochona* Railliet, 1916 is cosmopolitan represented by many species that had been reported mainly from freshwater fishes. It is a parasite of wide range found in Pakistani freshwater cyprinids (carps), balitorids (loaches) and bagrid cat fishes (Asmatullah-Kakar *et al*., 2010). To date, 12 species of the genus are known from the inland fishes in our region (Balochistan province). These include *R. kharani* from the host *Labeo gedrosicus* (Zugmayer, 1912); *R. magnavesicula* from *Schizocyprus brucei* (Regan, 1914); *R. watsoniai* and *R. gubernaculus* from *Cyprinion watsoni* (Day, 1872); *R. nushkiai*, *R. milesi* and *R. hingoli* from *C. milesi* (Day, 1880), and *R. uvaginus*, *R. cephalodiverticula*, *R. bolanii*, *R. bifidum*, and *R. mujibi* all from *Tor putitora* (Hamilton, 1822). In the present work, a new species of *Rhabdochona* from *C. watsoni* of river Bolan is described here constitutes the first report of an internal helminthes parasite species in this fish and locality.

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MATERIALS AND METHODS

Sample collection

A total of 34 fishes *Cyprinion watsoni* (Day) were sampled from stream waters at Haspani, Harnai (30° 5′ 58″ North and 67° 58′ 4″ East) in August, 2007. These were measured ranging from 7 to 26 cm in size and examined for helminth parasites in laboratory under dissecting microscope. Twelve fishes were found infected harbor 23 (13 ♂ and 10 ♀) nematodes in the intestine.

Preservation, fixation and mounting

The nematode specimens were preserved in 70% alcohol and later fixed in fresh fixative of the same kind with few drops of glycerol. These were cleared in lacto phenol for the preparation of the temporary microscopic mounts. Enface preparations were made by hand cutting sections of the anterior end and mounting these in pure glycerol or lacto phenol.

Drawing and deposition of materials

The sketches were drawn with the aid of camera Lucida. All measurements are given (length x width) in millimeters followed by means in parentheses. The holotype and allotype specimens

were deposited in helminthes collection in the museum of Zoology Department, University of Balochistan at Quetta, Pakistan available for other researchers.

***Rhabdochona* (*Rhabdochona*) *haspani*, new species**
(Figs. 1-2)

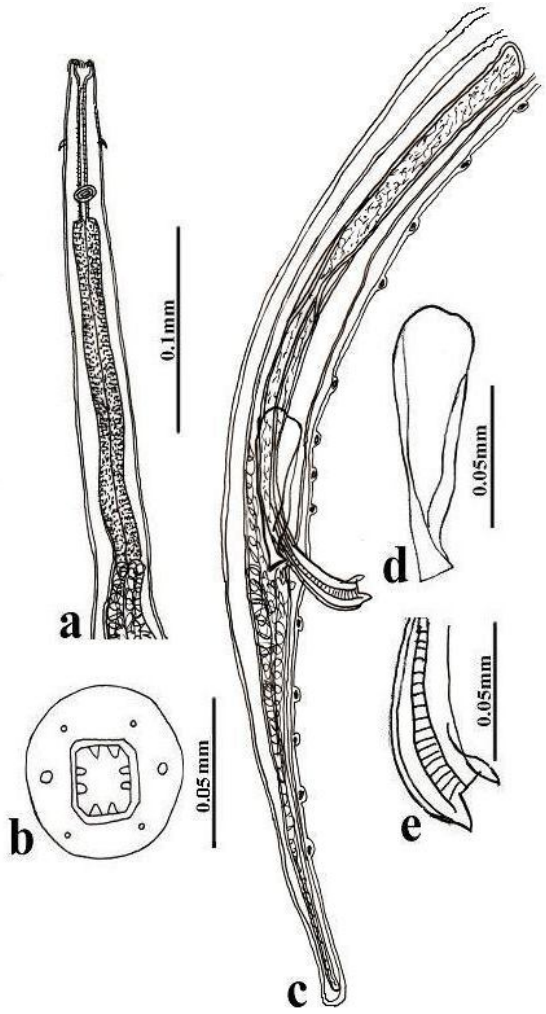

Fig. 1. *Rhabdochona (Rhabdochona) haspani* n.sp., holotype male. a, anterior body region showing buccal capsule, muscular, glandular esophagus and anterior part of intestine. Nerve ring and deirids are also seen; b, enface view showing prostomal teeth; c, posterior region showing large and small spicules, caudal papillae and tail; d, small spicule enlarged; e, tip of large spicule enlarged. Scale is same for a and c.

Description

Relatively small worms. Body smooth, tapering at both extremities, broader in the middle region. Anterior end flat, caudal end rounded in males and bluntly pointed in females. Prostome slightly wider than mesostome. Buccal capsule funnel shaped. Eight anterior teeth present, the 4 lateral (2+2) rounded and 2 dorsoventral pointed. Muscular esophagus narrow, straight, smaller than glandular part of esophagus Glandular esophagus almost straight in females than in males. Nerve ring located near the base of muscular esophagus in both male and female specimens. Deirids simple and pointed, situated almost in the middle of muscular esophagus and slightly anterior in females. Spicules unequal and dissimilar. Large (left) spicule generally L-shaped when protruding from the body, flat anteriorly, slightly broader at both ends, narrower in the middle terminating in a prominent striated projections. Small (right) spicule slightly more than one-fourth as long as the large spicule, provided with lateral alae, anterior end much broader than distal end, terminating in a small flat portion. Thirteen pairs (8 preanal and 5 postanal) caudal papillae. Excretory pore of both sexes postequatorial. Vulva postequatorial consists of half-moon shaped lips, convex anteriorly, upper lip muscular and large, lower lip delicate and chitinous. Vagina muscular and straight, joining the uterus posteriorly. Uterus long containing numerous smooth, non-filamented, oval to round eggs rarely with a small projection on one end.

Male

(Based on 6 male specimens): Body 2.89-3.45 (3.09)) mm long, greatest width 0.069-0.083 (0.075). Prostome 0.002-0.003 (0.0024) x 0.006-0.007 (0.0064), mesostome 0.006-0.008 (0.007) x 0.009-0.1 (0.024). Muscular esophagus 0.069-0.075 (0.071) x 0.004-0.005 (0.0043), glandular esophagus 0.12-0.18 (0.15) x 0.016-0.017 (0.0165) in size. Distance of nerve ring, deirids and excretory pore 0.05-0.06 (0.053), 0.03-0.037 (0.033) and 1.0-1.2 (1.05) respectively from the anterior end of body. Large spicule 0.24-0.34 (0.28) x 0.015-0.017 (0.016), small spicule 0.071-0.076 (0.074) x 0.019-0.025 (0.021). Spicules length ratio 1: 4.08-4.47 (4.31). Tail 0.1-0.16 (0.11).

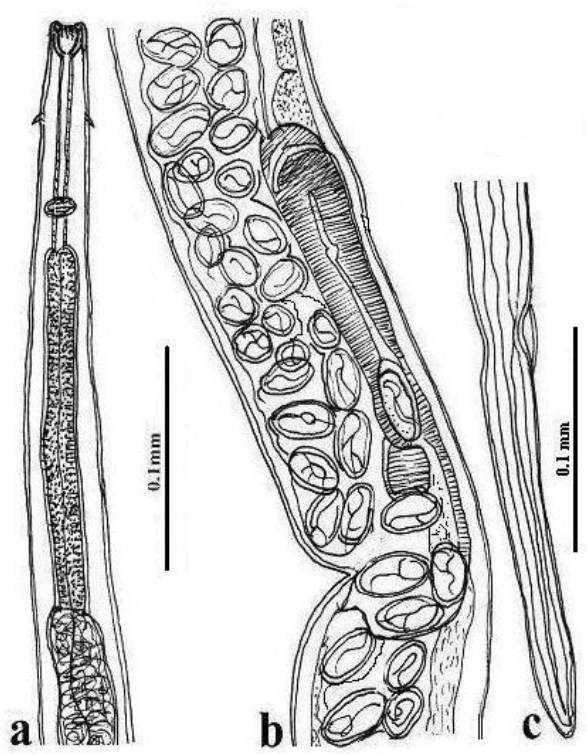

Fig. 2. *Rhabdochona (Rhabdochona) haspani* n.sp., allotype female. a, anterior body region showing buccal capsule, muscular and glandular esophagus and anterior part of intestine. Nerve ring and deirids are also seen; b, region of genital opening showing submarginal vulva, vagina; c, c, posterior region showing tail, and associated structures. Scale is same for a and c.

Female

(Based on 5 female specimens): Body 3.68-4.43 mm long (4.04), greatest width 0.094-0.13 (0.107). Prostome 0.0038-0.005 (0.0044) x 0.0069-0.008 (0.0074), mesostome 0.006-0.007 (0.0064) x 0.095-0.12 (0.102). Muscular esophagus 0.072-0.085 (0.078) x 0.0048-0.006 (0.0054), glandular esophagus 0.125-0.175 x 0.01-0.02 in size. Distance of nerve ring, deirids and excretory pore 0.06-0.07 (0.063), 0.03-0.04 (0.032) and 1.0-1.2 (1.05) respectively from the anterior end of body. Vulva 0.06-0.07 (0.063) x 0.015-0.02(0.017). Distance of vulva 2.1-2.13 (2.11) from the posterior end of body. Vagina 0.01-0.15 (0.013) x 0.02-0.03 (0.024). Mature eggs 0.013-0.035 (0.026) x 0.009-0.019 (0.008). Tail 0.23-0.27 (0.025).

Etymology

The new nematode specimens are named *Rhabdochona* (*R.*) *haspani* refers to the locality of the fish host.

Type host

Cyprinion watsoni (Cyprinidae)

Location

Intestine

Type locality

Haspani stream, Harnai, Sibi (Balochistan).

Number of specimens

Twenty three nematodes (13 ♂ and 10 ♀) from 12 out of 34 hosts examined. Maximum 6 males and 5 females from a single fish.

Holotype male

ZBU-N52

Allotype female

ZBU-N53

DISCUSSION

The new specimens can be included in the group of *Rhabdochona* bearing 8 teeth. These exhibit greater distinctions from *R. cavasius* Rehana and Bilqees, 1973a; *R. charsaddensis* Siddiqui and Khattak, 1984; *R. helichi* (Sramek, 1901) Akram and Khatoon, 2001; *R. rahimi* Ghazi *et al*., 2003; *R. milesi* Asmatullah-Kakar *et al*., 2008b; *R. magnavesicula* Asmatullah-Kakar and Bilqees, 2008 and *R. gubernaculus* Asmatullah-Kakar *et al*., 2010 reported from Pakistan by the presence of 8 teeth, by the size ratios between muscular, glandular portion of esophagus and between small, large spicules, by the number and arrangements of caudal papillae, sizes and shape of the egg and position of vulva and vaginal morphology.

In the present specimens *R. haspani* n. sp. size ratio between muscular and glandular portion of esophagus is 1:1.08-1.5 for the males and 1:1.18-1.4 for the females. Caudal papillae comprise of 13 pairs 8 of which are preanal and 5 postanal, spicular ratio is 1:4.08-4.47. None of the above mentioned

species have similar size ratios of muscular and glandular esophagus, number and arrangements of caudal papillae (except *R. cavasius*) and spicular ratios. Mature eggs of new specimens are 0.013-0.035 in diameter differ from above named species, almost smooth similar to *R. cavasius*, *R. milesi* and *R. magnavesicula* differ from *R. charsaddensis*, *R, helichi* and *R. gubernaculus* in lacking filaments on egg poles and from *R. rahimi* in the absence of floats on lateral sides of egg. The new specimens have postequatorial vulva similar to above named species differ from them in possessing backwardly directed, muscular and straight vagina.

Other Pakistani species of the genus *R. sarana* (Kerve and Naik, 1951) Akram and Khatoon, 2001 (based on female only); *R. kharani* Asmatullah-Kakar *et al*., 2006; *R. uvaginus* Asmatullah-Kakar and Bilqees, 2007b; *R. mujibi* Asmatullah-Kakar and Bilqees, 2009; and those species based on males only (*R. wastoniai* Asmatullah-Kakar and Bilqees, 2007a; *R. bolani* Asmatullah-Kakar *et al*., 2008a and *R. bifidum* Asmatullah-Kakar and Bilqees, 2007c) are very close to new specimens in having 8 teeth, smooth eggs, postequatorial vulva and excretory pores. *R. uvaginus* further close to the specimens under study in possessing 13 pairs (8 preanal and 5 postanal) caudal papillae. Females of *R. wastoniai*, *R. bolani* and *R. bifidum* are not known.

Species of the genus described from other localities (*R. coronacauda* Belouss, 1956; *R. paski* Baylis, 1928; *R. garuai* Agrawal, 1965b; *R. chudokini* Osmanov, 1957; *R. versterae* Boomker and Petter 1993; *R. congolensis* Campana-Rouget, 1961; *R. moraveci* Duggal and Kaur, 1987; *R. sarana* Karve and Naik, 1951; *R. fotedari* Katoch and Kalia, 1993 and *R. brevichona* Guitang *et al*., 1994) come closest to new nematodes in having 8 teeth and smooth eggs. *R. coronacauda* and *R. fotedari* further close to new nematodes in having 13 pairs (7+6 and 8+5 respectively) of caudal papillae. Other species *R. sulaki* Saidov, 1953; *R. chabaudi* Mawson, 1965; *R. beatriceinsleyae* Holloway and Klewer, 1969 and *R. barsui* Majumdar and De, 1971 also have 8 teeth close to new nematodes distinguished from them in other morphological features.

Several other known species of *Rhabdochona* have more than 8 teeth can be distinguished from the new nematodes: those having 10 teeth (*R. penangensis*, , *R. paxmani* and *R. salmonis, R. singhi, R. lichtenfelsi, R. Mexicana, R. kisutci, R. onchorynchi, R. catostomi, R. ahuehuelensis*, and *R. mazeedi*); 12 (*R. hopeti, R. gambiana, R. macrolaima, R. glytothoracis, R. guerrerrensis, R. polonica, R. srivastavai and R. japonica*); 14 (*R. ictaluri, R. acuminata, R. denudat*a, *R. gnedini, R. laurentiana, R. kidderi, R. alii, R. Noemacheli, R. oligopapilata, R. barbi, R.cotti, R. decaturensis, R. cascadela, R. milleri, R. rotundicaudatum, R. uruyeni* and *R. zacconis*) and 16 (*R. salgadoi* and *R. parastrometi*).

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