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New Report of *Rhabdias* sp. (Nematoda: Rhabdiasidae) from Nepal

Shyam K. Pun and Mahendra Maharjan
Central Department of Zoology, T.U. Kirtipur, Kathmandu, Nepal
E-mail: rauyan.pun2@gmail.com & maharjan.m@gmail.com

ABSTRACT

Rhabdias spp. are parasitic nematodes of amphibians and reptiles. They are distributed across wide range globally. An unidentified species of the genus *Rhabdias* was reported first time from the host Indian marbled toad *Bufo stomaticus* from Kirtipur, Kathmandu, Nepal.

Keywords: *Rhabdias*, *Bufo stomaticus,* nematode parasite.

INTRODUCTION

The parasitic genus *Rhabdias* are widely distributed group of nematode from different hosts. Till date species from eight genera belonging to family Rhabdiasidae have been reported. They are *Acanthorhabdias acanthorhabdias*, *Serpentirhabdias agkistrodonis* from snakes (Pereira 1927, Sharpilo 1976) *Chabirenia cayennensis, Entomelas* sp. from Lizards (Lhermitte-Vallarino *et al.* 2005, Martinez-Salazar *et al.* 2005), and *Kurilonema* sp*., Neoentomelas* sp. and *Pneumonema* sp. from Skinks (Johnston 1916, Hasegawa 1989, Kuzmin & Tkach 2011). *Rhabdias bufonis* and *Rhabdias americanu* were reported from *Bufo viridis* and *B. americanus* respectively (Bolek & Coggins 2000, Sey & Ghaith 2000). The lung nematode parasites of amphibians were reported from various countries including India (Sarkar & Manna 2004), Ukraine (Kuzmin 2005), Mexico (Salazar 2008), Costa Rica (Goldberg & Bursey 2008) and Brazil (Santos *et al.* 2011). To the best of our knowledge helminth parasites of toad has not been reported from Nepal yet. This study provides the first evidence of nematode parasite *Rhabdias* sp. from the host *B. stomaticus* (Fig. 1A) from Kirtipur, Nepal.

MATERIALS AND METHODS

Twenty *B. stomaticus,* Indian marbled toads were collected from Kirtipur Municipality, Nepal. The live toads were anaesthesized and parasites were collected from lungs. All internal organs were examined for helminthes using a stereoscope. Nematode parasites were collected and placed in saline solution, and fixed by immersion in warm 70% ethanol, and finally stored in 70% ethanol. The parasites were cleared in lactophenol and the taxonomic determination was conducted by comparing morphological traits (using ocular and stage micrometers) with the taxonomic key (Yamaguti 1961), and descriptions from the literature (Sarkar & Mann, 2004).

TAXONOMIC TREATMENTS

Nematode Order Rhabdiasidea includes two families; Rhabdiasidae and Strongyloididae. All parasitic nematodes of amphibians and reptiles with the characteristics of short oesophagus with posterior bulb and vulva near middle of body belong to family Rhabdiasidae (Yamaguti 1961). Parasitic nematodes of intestine with long oesophagus without intestinal bulb and presence of vulva at posterior third of the body belongs to family Strongyloididae (Yamaguti 1961). Diagnostic characters of the genus *Rhabdias* are cylindrical body, mouth surrounded by six distinct small lips, oesophagus ending with bulb, position of vulva near middle of the body, short and conical tail (Yamaguti 1961).

The nematode parasite recovered from lungs of *B. stomaticus* samples collected from Kirtipur, Nepal. This parasite possesses a cylindrical and smooth body (body length 11.7 mm, width 475 µm) (Figs. 1C,1D). Mouth surrounded by 6 small muscular flaps (lips) forming a cup-shaped buccal cavity. Oesophagus short and cylindrical (length 375 µm, width 62 µm) ending in a cup-shaped posterior swelling (Fig. 1F). Diameter of oesophagus 112 µm (Fig. 1E). Vulva near middle of body, located 6.2 mm from anterior end. Tail short, conical, 1.35 mm in diameter (Fig. 1G). Ovaries deflexed, extending along intestine. Uteri filled with numerous, oval shaped eggs in different stage of development and some containing larva resulting ovoviparous nature of the parasite (Fig. 1B). On the basis of the observed taxonomic characters this nematode was identified as genus *Rhabdias* (Rhabdisidae) and undetermined species.

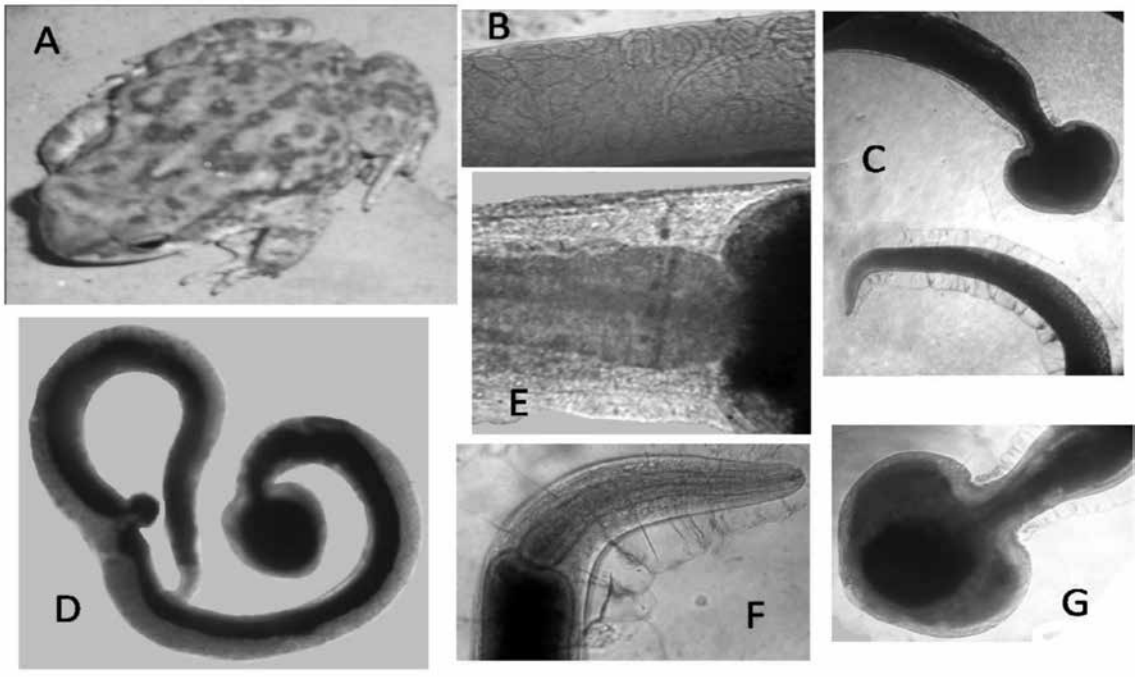

Fig. 1. A. *Bufo stomaticus* host of *Rhabdias* sp. from Kirtipur, Nepal. B-G. *Rhabdias* sp. (B. larvae in uterus, C. Anterior and posterior view D. Adult female. E. Oesophageal bulb, F. Oesophagus G. Caudal bulb).

Out of lungs of twenty toads examined 10 of them were found to be infected with *Rhabdias* sp. indicating 50% prevalence and 10.9 intensity (Table 1).

Table 1. Prevalence and intensity of *Rhabdias* sp. infecting *Bufo stomaticus*

Month	No. of *Bufo stomaticus* dissected	No. of host infected by *Rhabdias* sp. Female	No. of *Rhabdias* sp. Female collected	Percentage of infection[1]	Intensity of infection[2]
April	1	-	-		
May	2	1	17		
June	17	9	92		
Total	20	10	109	50%	10.9

[1]Percentage of infection= Total no. of host infected x 100/ Total no. of host.

[2]Intensity of infection= Total no. of parasites collected or showed/ Total no. of host infected.

DISCUSSION

Rhabdias bufonis is one of the highly pathogenic nematode parasites present in lung of amphibians (Sey & Gaith 2000). The parasites are host specific and rarely are parasites of more than one host group (Martínez-Salazar 2006). The parasite recovered in present study differs from *R. savagei* and *R. leonae* with respect to the position of the vulva (postequatorial instead of equatorial), furthermore the parasite infects Ranidae (frogs) and Polychrotidae (lizards) (Bursey *et al.* 2003). Another species *R. lamothei* that has been reported from snakes poses coiled body shape (Martínez-Salazar, 2006), instead of cylindrical as in this parasites. Similarly, *Rhabdias* spp. has been reported from other species of *Bufo*. *Rhabdias americanus americanus* (Bolek & Coggins 2000) and *Rhabdias paraenensis* (Santos *et al.* 2011) has been described from *Bufo americanus americanus* and *Rhinella marina.* Similarly, *Rhabdias* sp. (Sarkar & Manna 2004) described from *Bufo melanostictus* has been almost similar with present study. Other typical *Rhabdias* species described from

Bufonidae includes *R. elegans, R. fuelleborni, R. kuzmini,* and *R. pseudospheaerocephala*, which are different from with respect to the body dimensions (Martínez-Salazar & León-Règagnon, 2007)

Since, *B. stomaticus* of Kirtipur are parasitized with high prevalence and intensity of these parasites, it is highly recommended to emphasize further in depth research in order to conserve *B. stomaticus* in the country.

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