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The Morphological and Morphometric Study of *Rhabditis axei* from *Atherurus macrourus* (Asiatic Brush-Tailed Porcupine)

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Abstract: During an investigation on stool of *Atherurus macrourus* in Amol zoo, 16 parasites (14 females and 2 males) were collected. After fixing by Formalin, specimens cleared by lactophenol. Their morphological and morphometric characteristics were discussed elaborately.

Key words: *Rhabditis axei* · *Atherurus macrourus* · Morphological · Morphometric

INTRODUCTION

Rhabdiasidae family are minute, free-living nematodes which normally are considered as saprophytic nematodes that widely are distributed in soil. They have tiny mouth and rhabditi form esophagus. These nematodes are recognizable from similar species by prominent long tail in both sexes and observing thick gubernaculum which is two third of the spicules [1].Adults are usually recovered from feces and some infections may be spurious. Moreover, larval stages may be isolated from animal skin and lesions [2].They feed on bacteria in decaying organic matter, foul water and so on. They are considered to be the most primitive nematodes [3]. Although almost all species of rhabditids that use molluscs as definitive hosts and they are common parasite of amphibians and reptiles, some free-living Rhabditis readily invade decomposing carcasses [4, 5]. Recently the number of human and animal infections are increasing particularly in immune deficiency patients [6].

Furthermore, the discrimination of *Rhabditis* spp. from *S. stercoralis* should be considered during examination of patients for parasites, particularly in endemic areas of *S. stercoralis*. *R. axei* (cobbold, 1884) could easily be preserved and multiplied by culturing in nutrient agar plates whereas *S. stercoralis* just has only one generation of free-living stages [7]. Therefore, it is crystal clear that gathering and augmenting information regarding morphological and morphometric characteristic of *Rhabditis axei* and its differential identification seem precious and valuable.

Case Report: A total number of 16 parasites (14 females and 2 males) were extracted from feces of a three years male *Atherurus macrourus* (Asiatic Brush-tailed Porcupine) which dwelled in Amol zoo (latitude, 26°, 25' N and longitude, 52°, 21' E) in July of 2010. The collected parasites fixed by 10% Formalin and then cleared by lactophenol. Their figures were drawn by means of camera lucida and their morphological and morphometric criteria were studied carefully.

Descriptions of Examined Parasites: The examined parasites had the following characteristics:

The length of female and male parasites was 1400-1800 µm and 900-1550 µm, respectively. The width of body in female and male specimens was 100 and 60 µm respectively. Both sexes had a narrow and small buccal capsule without teeth, rhabditi form esophagus and remarkable long tails. Male's bursa possessed 9 pairs of papillae (ray); 6 pairs were caudal and 3 pairs were located before spicules and the dimension of spicules in male parasites which were equal and separated was 50-65 µm. Moreover, the length of gubernaculum which was two third of spicules was 35-45 µm.

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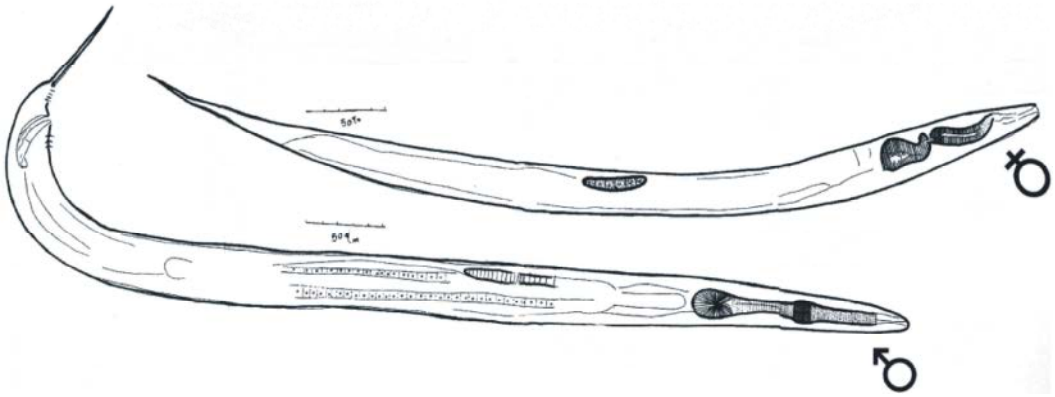

Fig. 1: Male and female of *Rhabditis axei*

The length of tail and distance of vulva from anterior end in female parasites were 650-850 µm and 220-280 µm respectively. The length of esophagus in female specimens was 250-300 µm. Females had didelphic uterus which was filled with embryonated eggs (Fig1). The length of eggs was 60 µm.

DISCUSSION

In current study the length of body in male *R. axei* was 900-1550 µm that is corresponds to Andrssay study [8] (720-1500µm) while is longer than examined specimens (673–1137µm) by Kia *et al*. [7], Shokohi [9] (593-773µm) and El-Azazy *et al*. [10] (870–1010). Furthermore, the length of tail in female parasites was 220-280 µm whereas, shorter range was reported by Goody [11], Kia *et al*. [7] and by Shokohi [9].The dimension of spicules was 50-65 µm that was longer compared to kia *et al*. study [7] on AIDS patients and to El-Azazy *et al*. report [10]. Distance of vulva from anterior end in current report was 451–530 µm whereas in Kia, Shokohi and El-Azazy studies were 650-850, 493-610 and 347-450 respectively [7-10].

Considering some literature review, probably there is a tendency in *R.axei* to have a shift from free-living to parasitic generations such as following sporadic reports in humans and animals: Report of *R.axei* severe infection on AIDS patients in Iran was recorded by Kia *et al*. [7]. Goldsmid [12] and feng [13] described three human infections of urinary tract. Ye *et al*. [14] studied two cases of *R. axei* infections in human digestive system and *R. axei* was observed in feces of a chicken in Egypt by El-Azazy *et al*. [10]. It is noteworthy to mention that sometimes *R. axei* can be confused with *Strongyloides* spp. during ordinary fecal examination. This may cause false records on strongyloidiasis due to similarity in first glance. Therefore, it requires more attention in respect of differential identification for laboratory technicians, especially in areas that humans and animals frequently come into contact with soil [7, 10].

In conclusion, considering some critical criteria, such as having filari form esophagus and metacorpous, prominent long tail in both sexes, two equal and separated spicules, well-developed gobernacolum, which is two third of spicules length and observation of 5 pairs papillae after spicules, the identification of *R. axei* was confirmed.

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