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On a new species of the Genus Spinicauda, Travassos (1920) (Nematoda: Heterakidae) in *Duttaphrynus melanostictus* (Anura: Bufonidae) from Industrial area of Aurangabad (Maharashtra) India

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ABSTRACT

Spinicauda anurae sp. nov. from the intestine of *Duttaphrynus melanostictus* [21] collected from industrial area of Aurangabad (M.S.) India. The specimens under investigation show the resemblance in their various body characters with *S. cophotis* Baylis, [7]. Morphologically the most closely related species is *S. voltaensis* [2] in *Bufo sp*. from Burkina Faso, but it differs in smooth cuticle and is less sclerotized.

Keywords : Spinicauda, intestine, *Duttaphrynus melanostictus,* investigation, Aurangabad.

I. INTRODUCTION

Nematode parasites of different species of amphibians of Maharashtra were studied in past years by many workers. One new species of the genus *Subcularis* from *Rana tigrina* have reported by P.G. Deshmukh and A.C. Choudhari [12]. Spinicauda was created by Travassos [16] during revision of Heterakidae, in which *Spinicaudinae* was established to contain the previously described *Strongyluris*, *Africana* and *Spinicauda*.

The species of the genus *Spinicauda* belongs to the family Heterakidae [19] and are parasites of reptiles and amphibians from tropical and subtropical regions: South America (Brazil), Africa (Madagascar, Egypt, Algeria, and Burkina Fasto), Australia, New Guinea, Taiwan, Indonesia and India. *Spinicauda anurae sp. nov.* is morphologically the most closely related species is *S. voltaensis* [2] in *Bufo sp*. from Burkina Faso, but it differs in smooth cuticle and is less sclerotized.

Present investigation reported as a first nematode species from Maharashtra. It was previously reported from Kolkata (W.B.) in amphibian host. Although record of this genus either from reptiles or from amphibian in India. Hence *Bufo melanostictus* and *Rana tigrina* forms the new host record from Study area.

II. METHODS AND MATERIAL

Toad *Duttaphrynus melanostictus* [21] were collected in different seasons throughout the year from industrial areas namely Waluj, Chikalthana, Shendra and Ranjangaon of Aurangabad. One annual cycle 2018-19 were considered for the collection of nematodes.

The parasites so recovered were first studied in live condition in normal saline under the Stereoscopic binocular microscope. For face view the head end of the worm was cut with a sharp blade under a binocular. A very small amount of glycerine jelly was taken on a clear dry cover glass. The cut head end was then placed in the glycerine jelly in an upside-down condition with the aid of a fine needle and observed under a binocular microscope. Basic techniques used for preservation [11]. The parasites are killed instantaneously in a straight and extended condition. When the specimens are satisfactorily fixed, usually after a few minutes, they were preserved in 70% alcohol in a vial with a few drops of glycerine and a proper label with name of host, locality, location of parasite and date of collection.

Nematodes were cleared with lactophenol and mounted in temporary slides [18]. All the measurements are in millimeters, unless otherwise mentioned and all diagrams are drawn with the help of Camera Lucida in addition, photomicrographs of the specimens were also taken.

All the nematode species are identified following the CIH keys to the nematode parasites of vertebrates "Systema Helminthum" [23], "The Fauna of British India," Vol. I and Vol. II [8] [9] Parasites: A guide to Laboratory Procedures and identification [1].

III. RESULTS AND DISCUSSION

Etymology:

This species is named as ***Spinicauda anurae sp. nov.*** based on the order, Anura of amphibians from which the host belongs.

Observations:

Spinicauda anurae sp. nov.

Classification:

Class	: Nematoda [15]
Order	: Ascaridida
Superfamily	: Heterakoidea
Family	: Heterakidae [19]
Subfamily	: Spinicaudinae [16]
Genus	: *Spinicauda* [16]
Species	: *anurae*

Materials Examined:

Host	: *Duttaphrynus melanostictus*
Location	: Intestine.
Locality & Ranjangaon.	: Waluj, Chikalthana, Shendra
Holotype	: 1
Paratype	: 2
Etymology hosts.	: Named after the order of
Deposition Dept. of zoology, Dr. B. A. M. University, Aurangabad.	: Helminth Research lab,

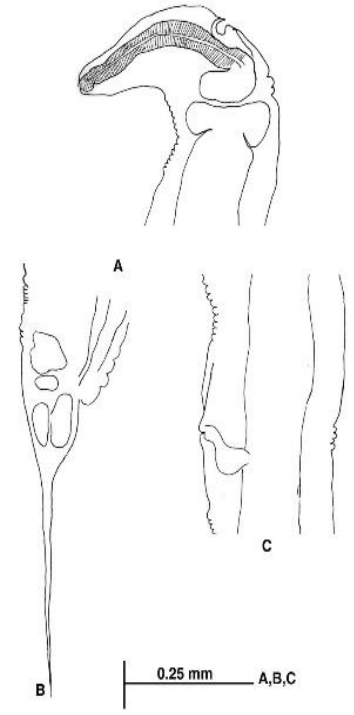
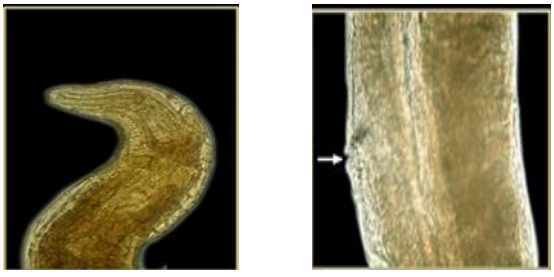


Figure 1. ***Spinicauda anurae sp. nov.*** Camera lucida drawing (Holotype); a - anterior portion of female worm, b – posterior portion of female and c – middle region showing vulva



A **B**

C D

Figure 2. Photomicrograph of ***Spinicauda anurae sp. nov.*** **(female) :** a - anterior portion of female worm, B – middle region showing vulva, C – posterior portion of female and D- entire body of female.

Figure 3. Host ***Duttaphrynus melanostictus***

Generic diagnosis:

Lateral fields conspicuous, composed of single row of large cells. Mouth with three subtriangular lips, expanded anteriorly and laterally as in Strongyluris, without cordons. Oesophagus cylindrical with short pharynx and posterior bulb.

Female:

Tail long, tapering and conical ended in spine; vulva near middle of the body, prominent. Uterine branches parallel. Oviparous; eggs with thick, often rugose, shell. Parasitic in alimentary canal of reptiles and amphibians.

Measurements and description:

Female:

Body measures 2.84-3.75x 0.25-0.42; Oesophagus including bulb 0.39-0.47x0.03-0.05; nerve ring at 0.035-0.057; bulb 0.11-0.24x0.05-0.08; excretory pore placed 0.032-0.037 from the anterior end; vulva positioned 0.096-0.11 from the anterior extremity; tail tapering 0.48-0.52 long and pointed at the tip.

Male: Not found.

Discussion:

The genus *Spinicauda* was described by Travassos [16] is characterized by conspicuous lateral fields, subtriangular lips, expanded anteriorly and laterally, without cordons, pharynx present, oesophagus with posterior bulb, male tail long and without alale, papillae small, sessile, spicules short, subequal, gubernaculum present, in female tail long, tapering, vulva near middle of body, uterine branches parallel, oviparous, eggs with thick shell and often rugose. It is a parasite in the alimentary canal of reptiles and amphibians.

After two years the genus was synonymised by Baylis and Daubney in Sonsinia [3]. The genotype *Spinicauda spinicauda* described by Rudolphi [20] in *Lacerta teguixin* from Brazil, South America is also recorded from *Cternodon sp.* [23].

Baylis [7] described the species *Spinicauda cophotis* from alimentary canal of lizards from *Cophotis ceylonica* and *Lyriocephalus scutatus* (Agamid lizards) from Gammaduwa in Sri Lanka (then Ceylon). There is a record of immature *Spinicuda* from *Dyricephalus scutatus* in the Zoological Survey of India, probably belngs to *S. cophotis* by Brazil [7]. Inglis [13] reconstituted the genus *Meteterakis* [17] as a distinct morphological and geographical group on the basis of some morphological characters. The movement of species to it has altered the constitution of the genera Africana [16] and *Spinicauda* [16] and the remaining species in the genus *Spinicauda* are *Spinicuda spinicauda* [15], [16]; *S. amarali* [14]; *S. australiensis* [6]; *S. campanula* [16]; *S. icosiensis* [16]; *S. mathevossianae* [16]. While the *Spinicauda cophotis* [7]; *Spinicauda japonica* [22] and *S. longispiculata* [4][5]transferred to genus *Mateterakis* by him. According to his description the male tail bears the caudal alae supported by large fleshy papillae and a gubernaculum mass is developed from the walls of the cloaca and *Spinicauda* is characterized by the presence of a distinct gubernaculum, sessile papillae only on the tail (or caudal papillae small and sessile); the spicules are short and subequal; caudal alae are absent or rudimentary in male and in the female the vulva is near the middle of the body; tail long and tapering.

This present specimens show the characteristic feature similar to genus *Spinicauda* [16]. It shows some variation in the morphological characters with the type species, *Spnicauda spinicauda* Olfers in [15] [23]; Syatema Helminthum Vol.111. Part 1, 154p.). Length of female body is 5-7 in case of *Spinicauda spinicauda* [24] while it is 2.84-3.75 in the present specimens; distance of excretory pore from anterior end is 0.73-0.80 in *S. spinicauda* and whereas it is 0.032-0.037 in present specimens; distance of nerve ring from anterior end is 0.40-0.45 in *S. spinicauda* and whereas it is 0.035-0.079 in present specimens.

The specimens under investigation also show the resemblance in their various body characters with *S. cophotis* [7]. In both cases the cuticle is finely striated but they differ in the length of the body, length of tail and distance of vulva. In *S. cophotis* length of body 7.3-9.0, nerve ring at 0.3-0.36 distance, length of oesophagus is 1-1.16, distance of vulva 3-3.5 form the head end and is very immediately behind it, length of tail is 0.4-0.55. Thus this is relatively larger than present specimens. Bayli's specimens recorded from reptiles, Agmid lizard *Cophotis ceylonica* and *Lyriocephalus scutatus* from Gammaduwa, Ceylon; but the present specimen is recorded from amphibian, *Duttaphrynus melanostictus* [21] from Aurangabad, Maharashtra, India. The present specimens under investigation also show variation in its body measurements and different body characters with all other species; *Spinicauda australiensis* [7] and *Spincauda grimmae* [10]; in length of the body, length of tail, distance of vulva from anterior end and position of vulva.

Morphologically the most closely related species is *S. voltaensis* [2] in *Bufo sp*. from Burkina Faso, but it differs in smooth cuticle and is less sclerotized.

The present specimen also differs with *S. dugessi* in having vulva, (salient vs prominent), total length of body (10x 0.58 vs 2.84-3.75x 0.25-0.42), pharynx (long & wide vs small), oesophagus (0.98 vs 0.39-0.47) and tail (0.15vs 0.48-0.52).

Thus from the above discussion, it is confirmed that the present species is consider to be a new species to the genus *Spinicauda* [16]. This reported *Spinicauda sp.n.* in present investigation reported as a second report after Mukul Dutta, from W.B. in an amphibian host in India and first from the Maharashtra as there is no any previous report of this genus from reptiles and amphibians before this study.

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