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DESCRIPTION OF *COSMOCERCA ORNATA* (NEMATODA: COSMOCERCIDAE) IN *DUTTAPHRYNUS MELANOSTICTUS* FROM DISTT. UNA, HIMACHAL PRADESH, INDIA.

Kiran Bala

Department of bioscience, Himachal Pradesh University, Summer Hill Shimla (H.P) India, 171005

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Abstract

Cosmocerca ornata (Nematoda: Cosmocercidae) a Cosmocercid nematode discovered in the large intestine of *Duttaphrynus melanostictus* from distt. Una, Himachal Pradesh, India is described and illustrated. It is characterized by presence of 5 pairs of plectanes; oesophagus comprising of cylindrical corpus, an anteriorly differentiated pharyngeal part, an elongated isthmus and oesophageal bulb; excretory pore situated approximately near the anterior level of oesophageal bulb; lateral alae well developed in both male and female; spicule rudimentary and poorly visible, gubernaculum well sclerotized; eggs non filamentous.

Keyword: *Cosmocerca ornata*, Nematoda, *Duttaphrynus melanostictus*, Amphibia, India.

*Corresponding authors: sharmakiran977@gmail.com

Introduction

Nematodes of the genus *Cosmocerca* (Diesing, 1861) are a prominent component of the amphibian parasitofauna (Martinez and Maggenti, 1989). Occurrences of these parasites have been reported from all the continents. In the oriental and palaearctic region, the genus is represented by seven species- *C. ishaqi* (Islam *et al.*, 1979); *C. banyulensis* (Chabaud and Campana - Rouget, 1955); *C. commuta* (Diesing, 1851); *C. longicaudata* (Linstow, 1885); *C. japonica* (Yamaguti, 1938); *C. kalesari* (Rizvi *et al.*, 2011); *C. ornata* (Dujardin, 1845) [to replace *C. indica* (Nama and khichi, 1973)]; *C. macrogubernaculum* (Rao, 1979); *Paracosmocerca spinocerca* (Rao, 1979)

An examination of the intestines of *Duttaphrynus melanostictus* for helminth parasites yielded the nematodes belonging to genus *Cosmocerca*. The purpose of this paper is to describe the species assigned to genus, *Cosmocerca ornata*.

Materials and Methods

The collection of parasitic nematodes for present studies was done from Una town H.P. The toad found dead in fields and open places around houses collected and their alimentary canal and other visceral organs were recovered in separate petriplates containing normal saline.

The alimentary canal was opened by longitudinal incision and the intestinal mucosa was scrapped with the help of scalpel. Whereas visceral organs were teased into smaller bits in respective petriplates for the release of nematodes. The recovered

parasites were thoroughly washed in normal saline to remove the debris, if any.

The parasites were fixed into boiling hot 3 – 4% formalin. The boiling hot fixative was poured upon the parasites retained in a film of saline having drained off the excess saline. This step helped in almost straightening of the worms. The specimens were latter preserved in fresh fixative in the vials and labeled for date, locality of host and location of parasites in host body and name of host.

The identification of parasites were done by following `CIH keys to nematode parasites of vertebrates` (vol 1-10) and also with the help of `systema helminthum` (vol 111) (part 1 and 2) by (Yamaguti, 1961).

The drawings were made with the help of camera lucida. The work has also been supported by 11 photomicrographs were taken at `Leica DML S2 – Camera DFC 320`. The measurements for the identification of the specimens were done with the help of ocular and stage micrometers. All the measurements have been given in millimeters, unless otherwise indicated.

Results

Family: Cosmocercidae (Railliet, 1916 Subfam) Travassos, 1925.

Cosmocerca ornata (Dujardin, 1845) Railliet and Henry, 1916.

Syn: *Oxyuris ornata* (Dujardin, 1845); nec Walter, 1856; nec Diesing, 1861; *Nematoxys ornatus* (Schneider, 1866); *Ananconus comutatus* (Railliet and Henry, 1916); nec *Ascaris comutatus* (Claparede, 1859); *C. miniscula* (Travassos, 1931); *Paracosmocerca mucronata* (Kung and Wu, 1945); *Cosmocecella polissensis* (Maguza, 1972); *C. indica* (Nama and khichi, 1973); *Paracosmocerca spinocerca* (Rao, 1979); *C. macrogubernaculum* (Rao, 1979); *C. uruguayensis* (Moravec and Barus, 1990 nec Lent and Freitas, 1948); *C. paraguayensis* (Moravec and Kaiser, 1994); *C. banyulensis* (Chabaud and campana-Rouget, 1955).

Description

Small, whitish, stout worms; sexual dimorphism prominent; oesophagus comprising of cylindrical corpus, an anteriorly differentiated pharyngeal part, an elongated isthmus and oesophageal bulb (Figs. 1,8); excretory pore situated approximately near the anterior level of oesophageal bulb (Figs. 1,9); lateral alae well developed in both male and female (Figs. 10,16).

Male

Body 1.7 - 2.5 long, 0.20 - 0.25 in maximum width; oesophagus 0.22 – 0.24 long, with pharynx 0.026 – 0.031 long,

and oesophageal bulb 0.069 – 0.077 x 0.058 – 0.061 in size; excretory pore and nerve ring 0.31 and 0.124 – 0.175 from anterior extremity respectively; male without a preanal sucker; lateral alae well developed, reaching posteriorly approximately to level of second pair of plectanes (anterior to cloaca) (Fig. 10); five pairs of plectanes in precloacal region (Figs. 2, 11) with oblique, paired subventral muscle bands; precloacal papillae numerous, postcloacal papillae 16 pairs (8 pairs ventral, 3 pairs subventral, 4 pairs lateral, 1 pair subdorsal) (Figs. 2, 12, 13); spicule rudimentary, poorly visible, gubernaculum 0.10 – 0.11, well sclerotized (Figs. 2, 15); posterior extremity bent ventrally and rapidly narrowing behind anus and ending in a fine spike 0.015 – 0.018 long (Fig. 14).

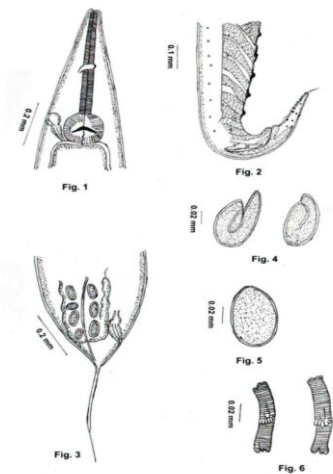
Female

Body 5.8 – 8.9 long, 0.39 – 0.62 in maximum width; oesophagus 0.45 – 0.59 long, with pharynx 0.042 long, and oesophageal bulb 0.16 – 0.18 x 0.13 – 0.16 in size; excretory pore and nerve ring 0.58 and 0.198 – 0.239 from anterior extremity respectively; lateral alae well developed, extending backward beyond anus; tail conical 0.495 – 0.568 long, vulva 2.59 – 2.80 from anterior end, uteri prodelphic, eggs 0.094 – 0.112 x 0.058 – 0.077, non filamentous (Fig. 16).

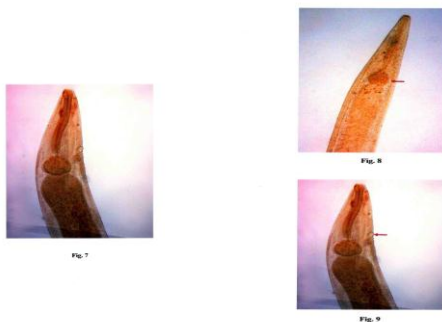
Type host – *Duttaphrynus melanostictus* (Schneider, 1799)

Location – Large intestine

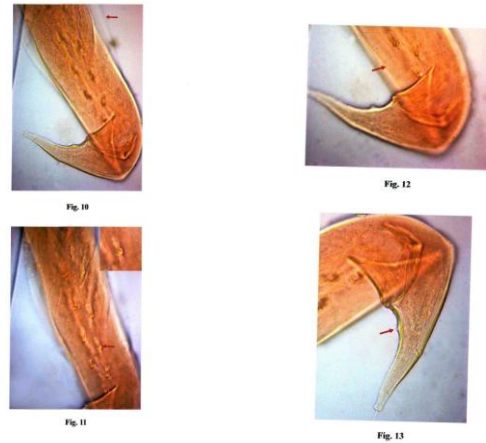
Locality - Una (H.P.)



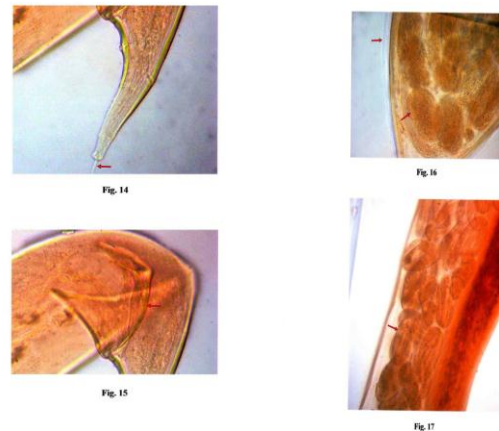
Figs. 1 – 6. *Cosmocerca ornata* (Dujardin, 1845) Railliet and Henry, 1916. Fig. 1. Anterior end of male, lateral view. Fig. 2. Posterior end of male, lateral view. Fig. 3. Posterior end of female, lateral view. Fig. 4. Larvae. Fig. 5. Egg. Fig. 6. Plectanes.



Figs. 7 – 9. *Cosmocerca ornata* (Dujardin, 1845) Railliet and Henry, 1916. Fig. 7. Anterior end, lateral view. Fig. 8. Anterior end of male, lateral view. Fig. 9. Anterior end of female, lateral view.



Figs. 10 – 13. *Cosmocerca ornata* (Dujardin, 1845) Railliet and Henry, 1916. Fig. 10. Posterior end of male, lateral alae in ventral view. Fig. 11. Posterior end of male, plectanes in ventral view. Fig. 12. Posterior end of male, precloacal papillae. Fig. 13. Posterior end of male, postcloacal papillae.



Figs. 14 – 17. *Cosmocerca ornata* (Dujardin, 1845) Railliet and Henry, 1916. Fig. 14. Caudal end of male, terminal spike. Fig. 15. Posterior end of male, gubernaculum in ventrolateral view. Fig. 16. Posterior end of female, ventral view. Fig. 17. Larvae.

Remarks

The observation on *Cosmocerca ornata* (Dujardin, 1845) Railliet and Henry, 1916 are in agreement with (Travassos, 1931) and (Moravec *et al.*, 1987) excepting some intraspecific variations in the measurements of various body organs. The locality in Himachal Pradesh is an added record from India, as *Cosmocerca ornata* is a widely distributed nematode being found in many anurans (Halajian *et al.*, 2013).

From amphibian in China (Kung and Wu, 1945);

From *Rana cyanophlyctis* in India (Nama and Khichi, 1973);

From *Bufo melanostictus* in South China (Wang *et al.*, 1978);

From *Duttaphrynus melanostictus* in India (Rao, 1979);
From *Rana ridibunda* in Turkey (Yildirimhan *et al.*, 2005);
From *Rana ridibunda* in Southwestern Turkey (Dusen, 2006);
From *Hyla arborea* in Turkey (Yildirimhan *et al.*, 2006).

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