

Occurrence of *Cylicospirura petrowi* (Nematoda: Spirocercidae) in a leopard in Kerala, India – Case Report

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Abstract

Gastrointestinal helminth fauna of wild carnivores might be associated with morbidities in affected hosts. The present communication places on record the occurrence of *Cylicospirura petrowi*, a rare spirurid in a leopard in Kerala, India. The nematodes were subjected to single step processing using FAAL solution to reveal the characteristic features of the head and tail ends. The presence of typical spirurid ova during routine faecal sample examination of felines could signal the occurrence of this rare nematode as well. The present report contributes to the knowledge of parasite diversity among felines of the country.

Key words: Carnivore, Helminth, Spirurid, Wild

Highlights

- First report of *Cylicospirura petrowi* in an Indian leopard.
- Nematodes processed in FAAL to identify morphological features.

Parasitic infections are responsible for morbidities in carnivores and heavy infections might actually be fatal (Chhabra and Pathak, 2013). Parasites contribute significantly to gastrointestinal diseases in felines worldwide, amongst which a spectrum of helminthosis in leopards (*Panthera pardus*), the species listed as Vulnerable on the IUCN Red List (Stein *et al.*, 2016), have been documented worldwide. Moudgil *et al.* (2015) extensively reviewed the parasite fauna of wild felids, and have suggested that most of the published reports describe helminth infections that are associated with morbidity and occasional mortality in this host species. Despite the fact that parasitism is not the most prevalent cause of declining population of wild felids, it is imperative to identify and document the

parasites associated with mortalities in wild carnivores especially in Kerala, a hot humid state of south India with climatic conditions ideal for propagation of parasites and their vectors. Nematodes like *Galonchus* (Pythal *et al.*, 1993), *Toxascaris leonina* (Varadharajan and Pythal, 1999) *Toxocara*, *Strongyloides* and hook worms (Varadharajan *et al.*, 2001) were reported in wild felids of Kerala. Here, we have reported the occurrence of a rare spirurid nematode, *Cylicospirura petrowi*, in a leopard in Kerala, India.

The carcass of a seven year old male, free ranging Indian leopard (*Panthera pardus fusca*) found dead in the forest was presented to the Department of Veterinary Pathology, College of Veterinary and Animal Sciences, Mannuthy for post-mortem examination. The detailed

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Cylicospirura petrowi in an Indian leopard

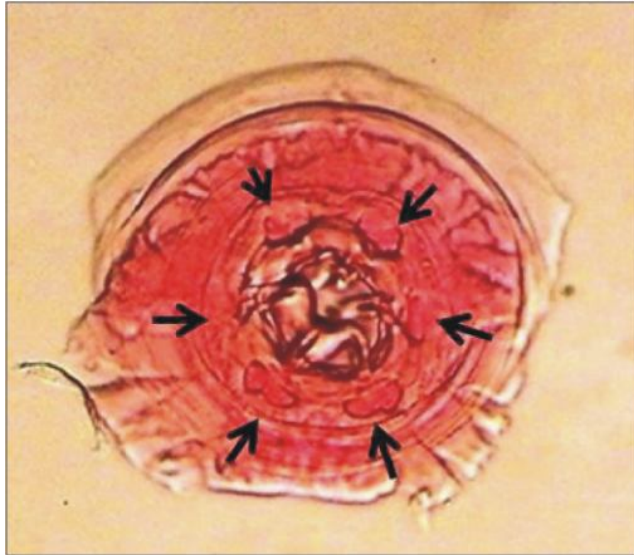


Fig. 1. Enface view of mouth opening of *C. petrowi* showing six lips (arrows)



Fig. 2. Head end of *C. petrowi* showing funnel shaped pharynx (arrow)



Fig. 3. Tail end of *C. petrowi* showing preanal papillae (arrows) and post anal papillae (arrowheads)

necropsy performed in carcass that was severely bloated and in an advanced state of putrefaction with extensive maggot infestation, revealed sub-serosal nodules in the stomach (n=2) and proximal part of duodenum (n=1).

The nodules measuring approximately 1cm in diameter, appeared black in colour and were found penetrating the whole thickness of tissue. The nodules were dissected to unveil presence of adult parasites that were identified in the Department of Veterinary Parasitology. Nematodes recovered from small peanut sized nodules in stomach and intestine were immediately transferred into FAAL solution (Kelly, 1997) containing formalin (5 mL), rectified spirit (20 mL), lactophenol (75 mL) and Azocarmine G (10 mg) for 24-48 hours and identified based on Yamaguti (1961).

The recovered nematodes (n=6) were 1.6 to 2.1 cm long with an average width of 0.5 mm. Though nematodes are not usually stained during processing, FAAL solution proved to be efficient as a single step method for simultaneous fixing, clearing and staining (Sabu *et al.*, 2012). The mouth opening of the nematode was surrounded by six bilobed lips with small interlabial papillae (Fig. 1). The buccal capsule was characteristically funnel shaped with heavily chitinised wall and six longitudinal ridges along its length (Fig. 2). The male tail end revealed four pairs of preanal and two pairs of postanal pedunculated papillae and unequal spicules (Fig. 3). The uterus of female worms had typical spirurid ova within. The nematode was identified as *Cylicospirura petrowi* (Nematoda: Spirocercidae) based on morphological features Yamaguti, 1961).

The reports pertaining to this nematode are rare. Except for a report on *P. petrowi* in a domestic cat in India (Arya, 1979), there is no documentation of this species either wild or in domestic feline population of this country. Krone

et al. (2008) identified this spirurid from a wild cat in Germany and concluded that its pathology and life cycle are to be studied systematically. *Petrowospirura petrowi* had been transferred to *Cylicospirura* (Junker *et al.*, 2013). These nematodes belong to the family Spiruroidea that includes feline gastrointestinal spirurids like *Physaloptera*, *Ollulanus*, *Gnathostoma* spp. etc that utilise arthropod vectors as intermediate host to complete the life cycle. *Ollulanus tricuspis* (Mandal and Chaudhury, 1985), *Physaloptera* (Mahali *et al.*, 2010) and *Gnathostoma spinigerum* (Shrivastava *et al.*, 2011) have been recovered from stomach lesions in Royal Bengal Tigers in India. Besides, *Toxascaris leonina*, hook worms *Dirofilaria* spp., *Strongyloides* spp., *Gyalonchus perniciosus*, *Filaroides osleri*, *Paragonimus westermani*, *Nanophyetus salmincola*, *Echinococcus granulosus*, *Taenia* spp., *Diphyllobothrium* spp., *Mesocostoides lineatus*, *Spirometra* spp. have all found place in the list of helminths in wild felids in India (Moudgil *et al.*, (2015). The present communication emphasises the inclusion of *C. petrowi* also among the list of spirurids in wild felids of India.

Conflict of interest: Authors have no conflict of interest in this study.

Authors' contribution: BL: Processing of the nematode, preparation of manuscript; DC: Necropsy of the leopard and collection of specimen, preparation of manuscript; DSS, ANML, KS, JJ: Necropsy of the leopard and collection of specimen; SK: Processing of the nematode; D: Necropsy of the leopard.

ACKNOWLEDGEMENT

The authors thank Kerala Veterinary and Animal Sciences University, Wayanad for the facilities provided.

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