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Journal of Threatened Taxa

10.11609/jott.2022.14.9.21751-21902
www.threatenedtaxa.org

26 September 2022 (Online & Print)
14(9): 21751–21902
ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

Open Access

ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

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Cover: ***Pipistrellus tenuis*** **recorded during the small mammalian fauna study, Manipur, India. © Uttam Saikia.**

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 September 2022 | 14(9): 21900–21902
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
https://doi.org/10.11609/jott.5870.14.9.21900-21902
#5870 | Received 14 March 2020 | Final received 19 July 2022 | Finally accepted 20 September 2022
OPEN ACCESS
NOTE

Visceral tetrathyridiosis *Mesocestoides* sp. (Cestoda: *Cyclophyllidea*) in a wild Barn Owl *Tyto alba* - a first report and new host record

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Mesocestoides sp. is most commonly recorded in all parts of the world (Soulsby 1982) except Australia (Bradley et al. 2018) and this is probably the first record from India. Incidence depends on the species and the region and the disease caused by *Mesocestoides sp.* tapeworms is called as mesocestoidosis or mesocestoidiasis. Predilection site of adult *Mesocestoides* sp. tapeworms is the small intestine.

Tapeworms of the genus *Mesocestoides* sp. require three hosts. The primary definitive host are carnivorous mammals or birds of prey and it does not affect cattle, sheep, goats, swine or horses (Padgett & Boyce 2004). Tetrathyridium is a second stage larvae affecting vertebrate (second intermediate host) and the first stage larvae (metacestode) of first intermediate host is unknown but believed to be an coprophagous arthropod (Brigitte 1991). *Mesocestoides* species can live in a wide range of hosts, but are particularly widespread in carnivores (Barker et al. 1993; Tenora 2004; David et al. 2011).

Tetrathyridium attached to internal organs were torn loose or cut free and fixed in histo-pathological examinations in 10% neutral-buffered formalin. During necropsy, the encapsulated tetrathyridium were searched throughout the body with a bright LED light source. Formalin fixed tissues were processed by routine paraffin embedding method and 4-µm-thick sections mounted and stained with hematoxylin and eosin (HE). The tissues samples were examined under light microscope. (Rifki et al. 2005; Karl et al. 2016).

Microscopic examination of the tissue samples taken from the liver and lung revealed chronic multiple pyogranuloma due to infestation by *Mesocestoides* sp. Individual larvae (around six number) were different in shape with convoluted borders. Thick eosinophilic cuticle lined larvae resemble a single layer of cells. The remaining body of the parasite was composed of a loose mesenchymal network with widely scattered parenchymal and muscle cells. Numerous clear vesicles/ refractile bodies namely calcareous corpuscles, round to oval in shape, were observed within the stroma of the parasite. Mineralized areas were seen in some of the old lesions (Soulsby 1982; McAllister 2014; McAllister et al. 2018).

Tetrathyridia in the liver parenchyma were surrounded by a thick mantle of inflammatory cells and a scant, loose connective tissue. In some lesions, there were small lymphocytic nodules at the periphery. No

Editor: Bahar Baviskar, Wild-CER, Nagpur, India. **Date of publication:** 26 September 2022 (online & print)

Citation: Vimalraj, P.G. & A. Latchumikanthan (2022). Visceral tetrathyridiosis *Mesocestoides* sp. (Cestoda: Cyclophyllidea) in a wild Barn Owl *Tyto alba* - a first report and new host record. *Journal of Threatened Taxa* 14(9): 21900–21902. https://doi.org/10.11609/jott.5870.14.9.21900-21902

Funding: None.

Competing interests: The authors declare no competing interests.

Acknowledgements: Authors would like to thanks Dr. Karrie Rose DVM, DVSc, Taronga Conservation Society Australia, NSW and Dr. Allan Pessier, DVM, clinical associate professor Washington Animal Disease Diagnostic Laboratory, Washington State University for the scientific cooperation and analysis and other fellow veterinarians.

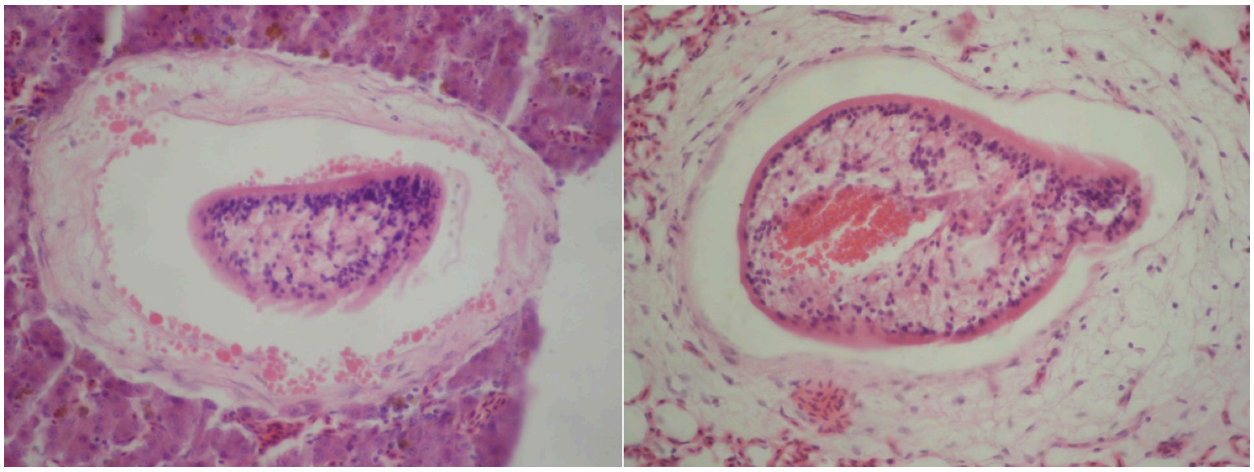

Image 1. Histological section of *Mesocestoides* sp. tetrathyridia from liver H&E. Bar: 50 µm

reactive changes were seen in the visceral peritoneum except in superficial lesions where the inflammation extended to the liver surface. Single tetrathyridia occurred in each nodule.

Tetrathyridium on the pleura surface of the lungs were surrounded by a thin layer of loose connective tissue that appeared to be continuous with the pleura. The inner lining of the capsule was partly lined by flattened epithelial-like cells. There was a mild inflammatory reaction to the tetrathyridia, with infiltration of a few macrophages, lymphocytes, and plasma cells. In all lesions examined, tetrathyridia were intact and showed no evidence of degeneration.

We conclude that, Tetrathyridium has been reported in various vertebrate hosts, including wild and domestic animals like birds, snakes, frogs, and rodents (Soulsby 1982; Frank 1991; McAllister et al. 2017) but this is the first record from Barn Owl. Prey species were more prone to risk due to hunting or scavenging on small vertebrates infected with tetrathyridia and detailed molecular discrimination (Skirnisson et al. 2016) within the species to be studied. There are no real effective preventative measures that prevent *Mesocestoides* tapeworm infection. Effective prevention and control can be achieved with numerous anthelmintic products in domestic animals but less possible in wildlife (Ivan et al. 2004; Ubelaker et al. 2014). Biological control of *Mesocestoides* is so far not feasible and there are no reports on resistance of *Mesocestoides* tapeworms to anthelmintics.

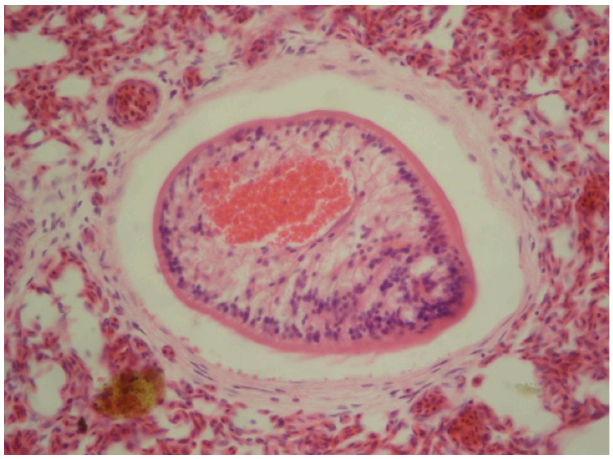

Image 2. Histological section of *Mesocestoides* sp. tetrathyridia from lung H&E. Bar: 50 µm

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NAAS rating (India) 5.64

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No. 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road,
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www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

September 2022 | Vol. 14 | No. 9 | Pages: 21751–21902
Date of Publication: 26 September 2022 (Online & Print)
DOI: 10.11609/jott.2022.14.9.21751-21902

Publisher & Host

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