

# First Report of a Nematode *Pterygodermatites affinis* Parasitizing a Stray Cat (*Felis catus*) from North India

Pradeep Kumar<sup>1\*</sup>, Jitendra Tiwari<sup>1</sup>, Alok Kumar Singh<sup>2</sup>, Vinay Kishor Tiwari<sup>1</sup>, Tarun Kamal<sup>3</sup>

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The genus *Pterygodermatites* (Order: Spirurida, Family: Rictulariidae) represents a group of spirurid nematodes known for their complex life cycles and wide host range among terrestrial vertebrates. These nematodes are primarily intestinal parasites of small mammals, with the majority of species infecting rodents and insectivores (Anderson *et al.*, 2009). Occasional infestations have also been reported in carnivorous hosts, including wild canids and felids, although such occurrences remain relatively rare. Transmission of *Pterygodermatites* spp. follows an indirect life cycle involving arthropod intermediate hosts typically cockroaches or beetles which ingest embryonated eggs and in turn are consumed by the definitive mammalian host (Yue *et al.*, 1986; Sundar *et al.*, 2023). While the genus has a cosmopolitan distribution, most documented infections in felids are restricted to regions in Europe and North Africa (Feliu *et al.*, 1997). In felines, infections are often under-diagnosed due to the cryptic nature of parasitism, limited veterinary care for stray animals, and a general lack of targeted parasitological surveillance. Stray cats, in particular, occupy a unique ecological niche. Often unmanaged and lacking routine veterinary attention, they serve as potential reservoirs and transmission agents for a variety of helminth parasites, some of which may pose risks to human and animal health (Alho *et al.*, 2017; Khedri *et al.*, 2024).

In India, while several studies have documented the presence of gastrointestinal helminths in stray cats, infections with *Pterygodermatites* spp. have remained unreported. The absence of previous records may be attributed to limited diagnostic resolution, lack of comprehensive morphological examinations, or true absence of this nematode in local cat populations. The present study fills this gap by documenting, for the first time, the presence of *Pterygodermatites affinis* in a stray domestic cat (*Felis catus*) from Mathura, a semi-urban region in northern India characterized by a high density of free-roaming animals and poor waste management. This report contributes new data to the parasitological record, extending both the host range and geographical distribution of *P. affinis*, and highlights the urgent need for integrated, One Health-based parasitic surveillance in urban and peri-urban environments.

<sup>1</sup>Department of Veterinary Parasitology, U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya evam Go-Anusandhan Sansthan (DUVASU), Mathura-281001, UP, India

<sup>2</sup>Department of Veterinary Parasitology, College of Veterinary Science & Animal Husbandry, Kuthuliya, Rewa-486001, MP, India

<sup>3</sup>Veterinary Clinical Complex, U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya evam Go-Anusandhan Sansthan, Mathura-281001, UP, India

**Corresponding Author:** Dr. Pradeep Kumar, Department of Veterinary Parasitology, DUVASU, Mathura- 281001, UP, India. e-mail: drpkdiwakar@gmail.com

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## CASE HISTORY AND OBSERVATIONS

As part of an ongoing helminthological surveillance program targeting stray animals in urban regions of northern India, a deceased adult female stray cat (*Felis catus*) was recovered from the vicinity of Mathura Veterinary College (Uttar Pradesh) in February 2025. The cat had succumbed to a fatal road traffic accident. The carcass was immediately transported to the College for post-mortem examination. Upon necropsy, special attention was directed toward the gastrointestinal tract, which was carefully excised to examine for endoparasitic infections. Dissection and parasitological examination procedures were conducted following standardized methods (Bowman, 2020). The small intestine was longitudinally opened and gently flushed with 0.85% physiological saline solution into a petri dish to recover any lumen-dwelling helminths. Using fine entomological forceps, all visible nematodes were manually isolated under a stereomicroscope. A total of 21 adult female nematodes were recovered from the small intestine of the examined stray cat. Recovered worms were first washed in saline to remove debris and subsequently fixed in 70% ethanol for long-term preservation. Prior to morphological analysis, the specimens

were cleared in lactophenol for 48 hr to enhance visualization of internal and external anatomical structures.

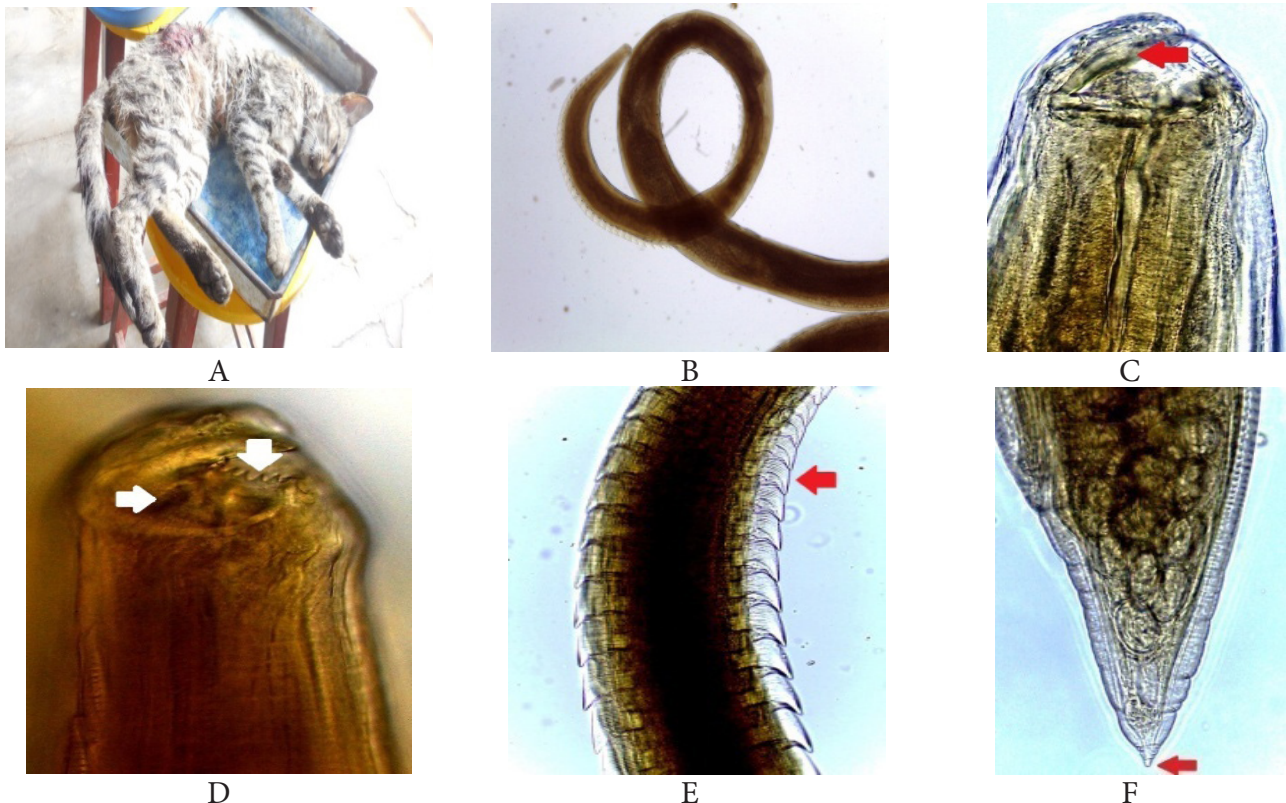
For taxonomic identification, detailed microscopic examination was carried out using a compound light microscope (Olympus CX23) under varying magnifications. Morphometric data including body length, width, position of the vulva, and oral cavity dimensions were obtained using a calibrated ocular micrometer. Each measurement was taken from well-preserved specimens to ensure accuracy. Species identification was conducted through comparative morphological analysis, employing the diagnostic taxonomic keys of Anderson *et al.* (2009), and confirmed against previously published descriptions of *Pterygodermatites affinis* by Baruš *et al.* (1996) and Feliu *et al.* (1997). Distinct features such as the number and arrangement of cuticular projections, the configuration of the oral capsule and esophageal teeth, and the vulval positioning were central to the identification process. All specimens and associated data were cataloged and stored in the departmental reference collection for future comparative and molecular studies.

### MORPHOMETRY OF PARASITE AND DISCUSSION

The nematodes were filiform in shape, reddish in color when fresh, and became translucent-white upon clearing in lactophenol. Morphological assessment revealed body lengths ranging from 9.40-15.02 mm, with a mid-body width between 0.32-0.62 mm (Fig. 1A,B). The oral capsule was distinctly dorsally positioned, measuring 42-62  $\mu\text{m}$  in length

and 22-59  $\mu\text{m}$  in width. Surrounding the oral opening were 11 uniform marginal teeth, while the interior of the capsule harbored three prominent esophageal teeth two pointed and one rounded ensheathed within a cuticular capsule exhibiting a characteristic zigzag-edged margin (Fig. 1C,D). A pair of subventral rows of blade-like cuticular projections (denticles) extended from the anterior esophageal region toward the posterior end of the body. These projections were densely arranged anteriorly, larger and more spaced at the mid-body, and sparser near the posterior extremity. The muscular-glandular oesophagus measured 2.09-4.27 mm in length, with its termination point located between the 32<sup>nd</sup> and 39<sup>th</sup> cuticular projection (Fig. 1E). The vulvar opening was situated 3.80-7.10 mm from the anterior extremity. The uterus was amphidelphic and extensively branched, containing embryonated, oval-shaped eggs that measured 50-60  $\mu\text{m}$  in length and 30-35  $\mu\text{m}$  in width. The tail was conical, curved ventrally, and terminated with prominent phasmids (Fig. 1F).

The observed morphological characters especially the structure of the oral capsule, number and arrangement of cuticular projections, configuration of esophageal teeth, and vulval positioning were consistent with the diagnostic features of *Pterygodermatites affinis* as described in previous taxonomic accounts (Baruš *et al.*, 1996; Feliu *et al.*, 1997; Anderson *et al.*, 2009; Hoppe *et al.*, 2010). These findings confirm the identity of the specimens as *P. affinis* and represent a novel regional record in felid hosts from northern India.



**Fig. 1:** Morphological feature of *Pterygodermatites affinis* found from a stray cat

The present study documents the first confirmed occurrence of *Pterygodermatites affinis* in India, based on the recovery and morphological characterization of adult female worms from the small intestine of a stray cat (*Felis catus*) in Mathura, Uttar Pradesh. Prior to this report, *P. affinis* has been documented primarily in Europe and North Africa, with infections reported in felids, rodents, and small carnivores (Baruš *et al.*, 1996; Feliu *et al.*, 1997). This finding, therefore, represents a significant expansion in both the host and geographic range of the species. The likely route of infection is the ingestion of infected intermediate arthropod hosts, particularly cockroaches and beetles, which have been experimentally and naturally implicated in the life cycle of *Pterygodermatites* spp. (Yue *et al.*, 1986; Sundar *et al.*, 2023). The urban ecosystem of Mathura, characterized by poor waste management, abundant stray animals, and a high density of synanthropic arthropods, provides favourable ecological conditions for the transmission and maintenance of such parasites.

Similar epidemiological patterns have been reported in urban areas of the Middle East and Latin America, where members of *Pterygodermatites* are increasingly being identified in free-roaming domestic and wild carnivores (Lahmar *et al.*, 2014; Scioscia *et al.*, 2016). These observations suggest that urban adaptation is an emerging feature of this genus, underscoring its host plasticity and ecological resilience (Hoppe *et al.*, 2010; Erol *et al.*, 2021). The current findings provide robust morphological evidence for species identification and reinforce the taxonomic reliability of classical diagnostic criteria.

Although *P. affinis* is not currently considered zoonotic, its increasing occurrence in urban settings, particularly in stray and free-ranging animals, raises concerns from a One Health perspective. The potential for parasite spillover or co-infection with other zoonotic agents warrants attention. As highlighted by Bouzid *et al.* (2013) and Reyes-Canul *et al.* (2024), the interface between human, animal, and environmental health in urban environments necessitates integrated surveillance approaches. Stray cats, often overlooked in parasitic surveillance, may act as incidental or reservoir hosts, contributing to the cryptic circulation of parasitic nematodes (Alho *et al.*, 2017; Khedri *et al.*, 2024).

In summary this study reports the first confirmed case of *Pterygodermatites affinis* in a stray cat from India, indicating a notable expansion in the parasite's known host and geographic range. The discovery highlights the need for intensified monitoring of gastrointestinal helminths in urban stray animals, which may serve as under-recognized reservoirs of parasitic infections. Given the challenges posed by urbanization, inadequate sanitation, and increased human-animal contact, a comprehensive One Health approach integrating parasitological, molecular, and ecological surveillance is essential to assess the epidemiological patterns and potential health risks associated with *Pterygodermatites* spp. in urban India.

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## REFERENCES

- Alho, A.M., Lima, C., Colella, V., Correia, J.J., Lóia, F., de Carvalho, L.M., & Otranto, D. (2017). Prevalence of gastrointestinal parasites in stray cats in the metropolitan area of Lisbon, Portugal. *Journal of Feline Medicine and Surgery*, 19(5), 436-441.
- Anderson, R.C., Chabaud, A.G., & Willmott, S. (2009). *Keys to the Nematode Parasites of Vertebrates* (Archival Volume). CABI Publishing, Wallingford, UK.
- Baruš, V., Petavy, A.F., Deblock, S., & Tenora, F. (1996). On *Pterygodermatites* (*Multipectines*) *affinis* and other species of Multipectines (Nematoda: Rictulariidae). *Helminthologia*, 33(2), 93-100.
- Bouzid, M., Halai, K., Jeffreys, D., & Hunter, P.R. (2013). The prevalence of zoonotic gastrointestinal parasites in urban and peri-urban environments: A systematic review and meta-analysis. *International Journal for Parasitology*, 43(12-13), 901-911.
- Bowman, D. D. (2020). *Georgis' Parasitology for Veterinarians*. 11<sup>th</sup> edn., Elsevier.
- Erol, U., Sarimehmetoglu, O., & Utuk, A.E. (2021). Intestinal helminths of red foxes and molecular characterization of Taeniid cestodes. *Parasitology Research*, 120(8), 2847-2854.
- Feliu, C., Renaud, F., Catzeflis, F., Hugot, J.P., Durand, P., & Morand, S. (1997). A comparative analysis of parasite species richness of Iberian rodents. *Parasitology*, 106(5), 527-533.
- Hoppe, E.G.L., Lima, R.C.A., Tebaldi, J.H., & Nascimento, A.A. (2010). *Pterygodermatites* (*Multipectines*) *pluripectinata* n. sp. from the crab-eating fox *Cerdocyon thous*. *Journal of Helminthology*, 84(3), 312-316.
- Khedri, J., Sharifdini, M., Gholami, S., & Tavassoli, M. (2024). Helminth infections in stray cats: A case study from northern Iran. *Veterinary Parasitology: Regional Studies and Reports*, 47, 100853.
- Lahmar, S., Boufana, B., Boubaker, S.B., & Landolsi, F. (2014). Intestinal helminths of golden jackals and red foxes from Tunisia. *Veterinary Parasitology*, 204(3-4), 297-303.
- Reyes-Canul, M.A., González-Solís, D., & Torres-Castro, M. (2024). Emerging zoonotic parasites at the urban-wildlife interface: A One Health perspective. *Parasites & Vectors*, 17(1), 1-11.
- Scioscia, N.P., Navone, G.T., & Robles, M.R. (2016). New host records and distributional expansion of *Pterygodermatites* in wild canids from the Amazon biome, Brazil. *Parasitology Research*, 115(7), 2661-2667.
- Sundar, S.T.B., Ramanujadas, T., Kavitha, K.T., Ravi Latha, B., Nishanth, B., Palanivelrajan, M., & Sridhar, K. (2023). *Pterygodermatites cahirensis* in palm civet cat (*Paradoxurus hermaphroditus*): A case report. *Indian Journal of Veterinary and Animal Sciences Research*, 52(2), 122-128.
- Yue, D.M., Li, X.X., & Yang, Y.L. (1986). Life cycle of *Pterygodermatites* (*Paucipectines*) *affinis* in the cat. *Acta Zoologica Sinica*, 32(1), 90-95.

