

***Pharyngomyia picta* (Meigen, 1824) (Diptera: Oesteridae) larvae in a Sambar Deer (*Rusa unicolor*) from Wayanad, Kerala, India**

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Abstract

The present paper describes the occurrence of *Pharyngomyia picta* larvae in a Sambar deer from Muthanga Wildlife Sanctuary, Wayanad, Kerala, India. This forms the second report of occurrence of *P. picta* from India. The larvae were recovered from the anterioventral aspect of brain, concae and trachea.

Key words: Sambar deer, *Pharyngomyia picta*, Wayanad, India

Introduction

The Sambar Deer (*Rusa unicolor*) is a large deer native to the Indian sub-continent and Southeast Asia. Sambar deer is found in India, Myanmar, Thailand, Indochina, the Malay Peninsula, southern China, Taiwan and the islands of Sumatra and Borneo in Indonesia. Currently, seven subspecies of sambar deer have been recognised. The subspecies found in India is *R. u. unicolor*. The subspecies of sambar deer in India and Sri Lanka are the largest of the genus with the largest antlers both in size and in body proportions. Sambar deers are prone to various ectoparasites like ticks (38 species), lice, biting flies (tabanid flies and midges), keds, throat bot flies (*Pharyngomyia* and *Cephenemyia*), warble flies and mange (Haigh *et al.* 2002).

Pharyngomyia picta commonly called as deer throat bot fly is one of several species of nasopharyngeal bot flies known to parasitize deer. *P. picta* infects the naso-olfactory and pharyngeal cavities of deer. They occur in variety of cervids like Red Deer (*Cervus elaphus*), Sika Deer (*Cervus nippon*), Roe Deer (*Capreolus capreolus*), Fallow Deer (*Dama dama*) and Elk (*Alces alces*) (Curlik *et al.* 2004). The



Fig. 1. Third stage larvae in the nasal canal of the sambar deer

occurrence of this bot fly has been reported mostly from European countries (Ruiz Martinez and Palomares 1993). There is only one case report from India and the whole South Asia (Radhakrishnan *et al.* 2012). The present case is the second report from India.

Materials and Methods

An adult Sambar Deer was noticed in the forest of Muthanga Wildlife Sanctuary, Wayanad, Kerala, India in a very weak condition and it was being chased by stray dogs. The deer was rescued and brought to the Clinical complex, College of Veterinary and Animal Sciences, Pookode. The animal could not be saved. A detailed post-mortem examination was conducted at the Department of Veterinary Pathology, College of Veterinary and Animal Sciences, Pookode on February 4th, 2012. Fly larvae

(maggots) were recovered from locations within the turbinate bones, concae, tracheal lumen and brain. The maggots were collected and identified.

Results

Deep dog bite wounds about seven numbers were observed on the skin of left lateral neck region, left hind leg, perineum and tail base of the animal. Large maggots were found wriggling out of the nostril. On longitudinal section of the head more than twenty larvae were found inside the concae and turbinate bones (Figure 1). One larvae was found in the antero-ventral aspect of the brain posterior to the ethmoid bone. Six larvae were found in the tracheal lumen. The larvae were identified as *Pharyngomyia picta*. The maggots were 26-30 mm in length and 5-7 mm in width. The larvae

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were characterised with well defined spines concentrated on the anterior part of the segments. More number of regular rows (6-8 rows) of spines were seen on the ventral surface than that in dorsal surface. Chitinised cuticular hood-like structures covered both anterior spiracles giving the false impression that these third stage larvae possessed eyes. Distinct dark brown spots were present on the posterior aspect of the last segment of the third instars just above the two broad, flat, porous crescent shaped posterior spiracular plates.

Mild congestion of the mucosa in the nasal passage and turbinate was noticed. Other necropsy findings observed were right ventricular dilatation of heart, hydropericardium and ascites.

Discussion

This is probably the second record on the occurrence of *Pharyngomyia picta* from India. Muthanga wildlife sanctuary is about 350 kms away from the place of first report (Thekkady range).

There were many reports of larvae of *Cephenemyia* sp. causing extreme discomfort and/or death in Red Deer. However, reports regarding the occurrence of infestation due to larvae of *Pharyngomyia* sp. were very few. The larvae may occasionally penetrate the skull and enter the brain, causing pain and death. Normally, *Cephenemyia* or *Pharyngomyia* infestations do not cause death but frequently cause destruction and dislodgement of host tissues. In this case, penetration of the larvae to the brain might have caused discomfort to the animal and would have made it an easy prey for the stray dogs.

Bot fly larvae (*Oestridae*, *Diptera*) develop for about six months period in the nasal cavity and later in the pharynx of the host. In

deer, two species occur viz. *Cephenemyia* sp. and *Pharyngomyia* sp. (Sugar *et al.* 1974). Mixed infections in Red Deer due to these species were also reported in Europe (Fuente *et al.* 1998). Larval instars of *Pharyngomyia* species mainly develop in nasal cavities (conchae, sinuses) or, in some genera, pharyngeal, oesophageal and tracheal regions. Later, pupariation will take place in sandy soil or perhaps, in case of *Pharyngomyia*, even in nasal cavities (Anderson 2012).

First stage larvae of *Pharyngomyia* sp. are deposited in the nostrils of deer and afterwards they migrate to the trachea and lungs, where they remain for the whole winter period. The larvae develops slowly in the lungs, after which there is tremendous growth. Following the winter period, the first stage larvae start migrating towards the head region through the trachea. In the head region, it moults to second and third stage larvae (Radhakrishnan *et al.* 2012). The migratory activity of the larvae causes nasal discharge, sneezing, coughing and restlessness. Sugar (1974) reported that immediately after the death of the deer, there will be presence of first stage larvae in the trachea and nearby areas. Current study showed the presence of third stage larvae in the trachea after the death of the animal.

Conclusion

Post-mortem examination of a sambar deer revealed larvae of *Pharyngomyia* sp. in the nasal cavity, brain and trachea. The finding is believed to be the second of its kind from the whole South Asia. This report indicates that there can be further spread of the larval/ fly infestation to the entire southern part of Indian subcontinent. The larval infestation may precipitate stress in the deer population.

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References

- Angulo-Valadez, C.E., P.J. Scholl, R. Cepeda- Palacios, P. Jacquet & P. Dorchie (2010). Nasal bots. . . a fascinating world!. *Veterinary Parasitology* 174: 19–25.
- Anderson, J.R. (2012). Corrected misidentification of first instars of the bot flies *Cephenemyia apicata* and *C. jellisoni*, with a review of the biology and life history of both species. *Medical and Veterinary Entomology* 26: 194–200.
- Bueno-de la Fuente, M.L., V. Moreno, J.M. Pérez, I. Ruiz-Martinez & R.C. Soriguer (1998). Oestrosis in red deer from Spain. *Journal of Wildlife Diseases* 34: 820–824.
- Colwell, D.D., M.J.R. Hall & P.J. Scholl (2006). *The oestrid flies: biology, host-parasite relationships, impact and management*. Wallingford, CAB International, pp. 240–242.
- Curlik, J., V. Letkova, J. Ciberej, P. Lazar, M. Goldova, A. Kocisova, L. Kosuthova, M. Travnicek, M. Bhide, J. Posivak, and D. Konjevic (2004). The occurrence of the genera *Hypoderma*, *Cephenemyia* and *Pharyngomyia* in deer in the Slovak Republic. *Folia Veterinaria* 48(2): 92–94.
- Haigh, J.C., C. Mackintosh & F. Griffin (2002). Viral, parasitic and prion diseases of farmed deer and bison. *Review of Science Technique, Off. Int. Epiz.* 21(2): 219–258.
- Kettle, D.S. (1995). *Medical and veterinary entomology*. 2nd edition. CAB international, Oxon pp 292–312.
- Leslie, D.M. Jr. (2011). *Rusa unicolor* (Artiodactyla: Cervidae). *Mammalian Species* 43: 1–30.
- Pape, T. (2001). Phylogeny of Oestridae (Insecta: Diptera). *Systematic Entomology* 26: 133–171.
- Radhakrishnan, S., K.G. Ajithkumar, R. Ravindran & K. Rajagopal (2012). First record in South Asia of deer throat bot fly larvae *Pharyngomyia picta* (Meigen, 1824) (Diptera: Oestridae) from Sambar deer (*Rusa unicolor*), a new host record. *Tropical Biomedicine* 29(2): 265–269.
- Ruiz Martinez, I. & F. Palomares (1993). Occurrence and overlapping of pharyngeal bot flies *Pharyngomyia picta* and *Cephenemyia auribarhis* (Oestridae) in red deer of southern Spain. *Journal of Parasitology* 47: 119–127.
- Sugar, L. (1974). The occurrence of nasalthroat bot flies (Oestridae) in wild ruminants in Hungary. *Parasitologia Hungarica* 7: 181–189.