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### Short communication

## Prevalence of rare *Eimeria canis* from the non descript dogs of Mathura, Uttar Pradesh, India

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#### ABSTRACT

A wide range of parasites particularly helminths, arthropods and protozoans affect dogs but when it comes to intestinal coccidians, their number is scanty. *Eimeria canis* is perhaps the most under reported parasite of dogs. The present paper deals with the prevalence of *E.canis* in dogs with no possible history of deworming from Mathura region, India. Finally, the morphology of the parasite, present scenario, reasons for under reporting vis-à-vis future projections are being described.

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### 1. Introduction

Dogs are the perhaps the oldest companion animal reared by man. Besides, they are kept as pets, for hunting, as guards, draught animals, for food, or for commercial purposes and perform a range of cultural, social, and economic functions in society. Based on genetic fossil and DNA evidences, the earliest records of domestication of dogs dates as early as 100000 years ago (Savolainen *et al.*, 2002; Lindbald-Toh, 2005) and were firstly domesticated in East Asia, possibly China (Savolainen *et al.*, 2002). Parasitic diseases, particularly gastrointestinal helminths and protozoan have been incriminated as the major impediment to dog health worldwide (Smith, 1991). Parasite factors, host factors and environmental factors are the major key risk factors affecting epidemiology of helminthosis and other Gastro-Intestinal Track (GIT) parasites (Wakelin, 1984; Thrusfield, 2005). Most of the parasitic infections affecting dogs are sub clinical and many of these parasites are with immense zoonotic potential, thus causing a health risk to humans (Khante *et al.*, 2009). A wide range of parasites particularly helminths, arthropods and protozoans affect dogs but when it comes to intestinal coccidians, their number is

countable on finger tips. *Eimeria canis* is perhaps the most under reported parasite of dogs. The parasite is though worldwide but very little literature is available worldwide. In order to access the prevalence of naturally occurring *Eimeria canis* in mongrel dogs, a study was conducted regarding the copro examination of nondescript dogs, with no possible history of deworming, residing in areas in and around the Campus of Veterinary University, Mathura, and Uttar Pradesh, India.

## 2. Materials and methods

Freshly voided faecal samples of 54 identified, free living, stray, non descript dogs of either sex and different age groups were collected and brought to the laboratory of Department of Parasitology, DUVASU, Mathura for coprological examination and kept at 4°C till examination. The samples were examined by direct faecal smear method; simple flotation and sedimentation techniques to detect parasitic oocysts and/or eggs.

## 3. Results and discussion

Out of the total of 54 faecal samples examined 4 samples were found to be positive for oocysts of *Eimeria canis*. The overall prevalence was found to be 7.4 %. The rare oocysts were identified based on the morphology described elsewhere (Levine and Levens, 1981 ). The oocysts were ovoid to ellipsoidal, 17-45 x 11-28 µm, with a fairly thick, rough, 2-layered, colorless to pink or red oocysts wall, with micropyle at one end (Fig. 1).



Fig. 1. *Eimeria canis* oocyst (Arrow depicting the polar cap).

The genus *Eimeria* represents the most abundant genus within both protozoan and metazoan organisms comprising of more than 1,700 named *Eimeria* species based on qualitative and quantitative traits of their sporulated oocyst and their host specificity (Duszynski and Upton, 2001). Eimerian parasites are generally considered to be highly host specific both under natural conditions and in farmed and/ or domesticated animals (Hiepe and Jungmann, 1983; Rommel, 2000). Host systematic and geographic origin is commonly used criteria in their taxonomy. The validation and existence of *Eimeria canis* has been a subject of debate since long. Earlier, it was postulated that *E. canis* is not a valid species but is an Eimerian that results due to carnivorism by the felines (Wenyon, 1923). Of late, because of its sporadic but worldwide prevalence, it was concluded that *E.canis* is a valid species. The first record of this Eimerian oocysts dates back to 1922 by Brown, Stammers and Balfour. The protozoan was named *E. canis* by Wenyon, 1923 and was thought to be a mixture of *E. stiedai* and *E. perforans* of the rabbit. Thereafter, the parasite was found in sporadic cases worldwide (Nieschulz, 1924; Tubangui, 1931; Choquette and Gelinias, 1950; Swai et al., 2010 ). The prevalence of the organism is very much variable. Choquette and Gelinias (1950) reported the prevalence as high as 16.8% from Montreal. Dubey and coworkers found *Eimeria canis* oocysts in the feces of 9% in adult coyotes *C. latrans* in Montana (Levine and Levens, 1981 ). Of late, Swai et al. (2010) reported the occurrence of *E.canis* from non descript dogs for the first time from Tanzania. An interesting record about the prevalence of *E.canis* is that virtually all the reported cases are from canines with no history of deworming or any other medication. The sensitivity of the eimerian to various medications used for other purposes could be an attributing factor in this regard.

#### 4. Conclusion

In conclusion, above cited description on the Eimerian coccidiosis in canines, that often goes unnoticed because of lack of investigation has been an eye opener for the academicians, field veterinarians as well as researchers to further investigate host parasite interactions with emphasis on differences between experimental and naturally acquired infections, magnitude of the disease, its pathogenesis and pathophysiological impact on health of the host, improved diagnostic for specific diagnosis of the disease exhibiting non specific signs/symptomatology through critically planned *in vivo* as well as *in vitro* studies. In canines, well planned experimental studies are therefore warranted to elucidate the precise reasons for underreporting/documentation of prevalence of *E. canis* from different parts of the country, pathogenic significance of the sporozoan in animals acquiring a primary and/or trickle doses of infections from the environment vis-a-vis *in vivo* per os infections with sporulated oocysts, the impact of concurrent infectious diseases a host is likely to be exposed and effect of various factors including stress, predisposing the animal to canine coccidiosis. The advent of molecular biological techniques may improve the efficiency of detection of these infections. The parasite, so far neglected, needs adequate attention for detailed investigation about the parasitic disease. It would be interesting to precisely investigate through well planned experimental studies to elucidate (a) effective integrated therapy aiming at complete elimination of the pathogens from the host; (b) prevalence of the disease, epizootiological predisposing factors; (c) pathophysiological impact of the disease on the host health, feed intake and nutrient utilization; (d) mechanism of *in vivo* migration and access of the pathogen to host body defense and multiplication of the pathogen there in; and (e) immunological tissue response of the host to the parasite.

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