Endoparasitic infections in Indian peacocks (*Pavo cristatus*) of Veterinary College Campus, Mathura

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Abstract A survey was made to determine the prevalence of endoparasites in free range blue peacocks living in and around the premises of College of Veterinary Sciences and Animal Husbandry, Mathura. Faecal samples of peacocks were collected randomly and brought to the divisional laboratory for faecal sample examination. During the coprological examination, eggs and oocysts of cestodes and coccidia belonging to *Eimeria* and *Isospora* species were identified, respectively based on the morphology and micrometry of these parasitic stages. The present study has generated an important data regarding the else while parasitologically neglected national bird of India.

Keywords Cestode · *Isospora* · *Eimeria* · *Pavo cristatus*

Introduction

Pavo cristatus (Galliformes: Phasianidae), the green peacocks and the national bird of India, are large, colorful and charming birds of the entire poultry world with South Asia, particularly India, being having the highest diversity of peacock species. They usually suffer from parasitic infections, which are among most common sanitary problems affecting wild birds, occurring mostly as subclinical conditions but may also cause mortality (Freitas et al. 2002). The pathology of diseases in peacocks, especially parasitic

diseases is less known in India, but it is an accepted fact that most diseases resemble the ones encountered in turkeys. Amongst parasitic diseases, protozoan diseases especially coccidiosis tops the list of parasites affecting birds worldwide, resulting in poor growth, diarrhoea and high mortality, particularly in young birds.

The coccidia of birds are divided into two genera—*Isospora* and *Eimeria* which parasitize the intestinal mucosa and till now five species of *Eimeria* and one species of *Isospora* have been described from India (Banik and Ray 1961, 1964; Mandal 1965; Bhatia and Pande 1966; Ray 1966). Besides the coccidiosis, there has also been a report of single cestode species in peacocks (Sloss et al. 1994). The present study presents the prevalence of coccidian and cestode infections of peacock in small ecological niche of Veterinary College Campus, Mathura and its possible significance in affecting other birds vis-à-vis future projections.

Materials and methods

Freshly defecated faecal droppings of 27 identified, free range *P. cristatus* individual birds of either sex and different age groups were collected and brought to the departmental laboratory, 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 (Soulsby 2005). Later on, quantitative faecal sample examination, in terms of oocysts per gram of faeces (opg) was done using modified McMaster's egg counting technique (Soulsby 2005). The oocysts were repeatedly examined for micrometry (Sloss 1992). The species identification was based on the morphology of the oocysts and eggs (Pellerdy 1965).

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Results and discussion

Most of the faecal droppings collected were semi solid and moist while few were diarrhoeic and darker in colour. All the samples were found to be positive for at least one or more type of *Eimeria* spp. oocysts and all the known species of *Eimeria* affecting peacock in India were observed in the present study along with the solely known species of *Isospora* (Plate 1). The micrometry of the oocysts and parasitic eggs revealed that regarding the size of oocysts the range varied from 14–28 × 13–24 μm and for cestode egg it was 45–65 × 30–55 μm, respectively (Table 1). The opg count was found to be variable ranging from 2,200 to 15,000 (avg. 8862.96 ± 684.49). Besides these protozoan oocysts, two types of cestode eggs were also found (Plate 2) in the study, having characteristic

hexacanth embryo. One of the cestode egg was completely oval and thick walled while the other was slightly oval with one end flattened. As per the literature, there are scanty reports of only type of unknown species of cestode affecting peacocks (Sloss et al. 1994) but there seems to be no published report of the oval egg with flattened one side. This seems to be the pioneer documentation of such type of cestode egg affecting peacock from India but further studies are required for establishment of this new finding.

In a study carried out by Titilincu et al. (2009) it was found that besides a few countable species of nematodes affecting peacocks, eight species of *Eimeria*, one each of *Isospora*; *Cryptosporidium* and cestode was encountered. As regards India, five *Eimeria* spp. viz. *E. pavonina* (Banik and Ray 1961); *E. mandali* (Banik and Ray 1964); *E. pavonis* (Mandal 1965); *E. mayurai* (Bhatia and Pande

Plate 1 Oocysts of *Eimeria mandali*, *E. mayurai*, *E. patnaiki*, *E. pavonina*, *E. pavonis* and *Isospora mayuri* (×40)

Table 1 Micrometry of the different oocysts and cestode eggs

Species	Shape	Size (μm)	References
<i>E. mandali</i>	Spherical	14–20 × 14–18	Banik and Ray (1964)
<i>E. mayurai</i>	Ellipsoid	23–27 × 13–16	Ray (1966)
<i>E. patnaiki</i>	Spherical	17–19 × 13–17	Bhatia and Pande (1966)
<i>E. pavonina</i>	Ovoid	20–28 × 16–20	Banik and Ray (1961)
<i>E. pavonis</i>	Ovoid	20–25 × 18–20	Mandal (1965)
<i>I. mayuri</i>	Spherical	20–27 × 18–24	Pellerdy (1965)
Cestode egg	Completely ovoid	50–60 × 40–55	Sloss et al. (1994)
Cestode egg	Ovoid with one end flattened	45–65 × 30–34	New finding but needs more investigation

Plate 2 Cestode eggs hexacanth embryos inside (×40)

1966) and *E. patnaiki* (Ray 1966) have been described besides *Isospora mayuri* affecting peacock (Pellerdy 1965). Coccidiosis is known to cause serious mortality in galliform birds in captivity (Rommel 2000) but in the current study, despite the presence of such a higher number of oocysts, the birds were healthy suggesting that the infection might be subclinical.

In conclusion, above cited description on parasitic infections in Indian peacock, that often goes unnoticed due to lack of investigation studies regarding the presence of parasites, will serve as an eye opener for the academicians, field veterinarians as well as researchers that will further help in investigation of these parasitic infections and their impact on health of the birds. Further, more detailed parasitological studies are needed and future research on game-bird population dynamics should not neglect protozoan infections, particularly the ones caused by coccidian parasites, which are of great importance for species conservation.

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