CONCURRENT INFESTATION OF *HAEMOPROTEUS* AND *MENACANTHUS STRAMINEUS* IN AN INDIAN PEACOCK (*PAVO CRISTATUS*)

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SUMMARY

A two-year-old Indian peacock (*Pavo cristatus*) was brought to the Department of Veterinary Clinical Complex, Lala Lajpat Rai University of Veterinary and Animal Sciences (LUVAS), Hisar, Haryana by the Wildlife Department, Hisar for clinical examination. Bird had history of anorexia, torticollis, wing paralysis and yellowish-green diarrhoea since three days. Physical examination revealed weakness, dehydration, pallor mucous membranes, intense itching, erythema and whitish dry crust like lesions on ears, around eyes and face. Faecal examination did not reveal any parasitic cyst or ova. Skin scrap test was conducted using tape method and showed infestation of lice confirmed as *Menacanthus stramineus*. Blood sample was collected from wing vein for haematological examination. Thin blood smear stained with Giemsa staining method revealed presence of haemoprotozoon confirmed as *Haemoproteus rileyi* as per morphological characters.

Keywords: Haemoproteus, Indian peacock, Menacanthus

Birds due to their living habitat are frequently subject to internal as well as external parasites. The Indian peacock commonly known as the Indian blue peafowl, a national bird of India and listed as least concern species in the Red List of International Union for Conservation of Nature (Bird Life International, 2008), probably owing to its widespread distribution along streams with good vegetation, agriculture fields and close to human habitation in semi-feral conditions, protection from people on religious grounds ((Johnsgard, 1986, Ramesh and Mcgowan, 2009). It is an omnivore medium sized bird of the family Phasianidea, order Galliformes. Peafowls are hosts for a wide range of ectoparasites such as ticks, mites, lice, fleas, flies and Trombiculid and certain endoparasites. These parasites are mainly found on feathers, intestines, lungs and in blood (Ashraf et al., 2002, Jassim and Hadi, 2019). The pathogens get transferred from infected to healthy birds through arthropod vectors, bird lice species and ticks. Parasitic infestation leads to increase in body temperature, respiratory distress, lateral recumbency and inability to fly (Ponnudurai et al., 2011). Generally, wild birds are resistant to pathogenic effects of parasites when present in low intensity. However, when a large number of parasites or there is co-infection with other blood parasites, this might have a determinate effect on the wild population. The present study reports the concurrent infestation of Haemoproteus and Menacanthus species and their effects on an Indian peacock.

A two-year-old Indian peacock was brought by the state wildlife officials, Hisar to the Department of

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Veterinary Clinical Complex, LUVAS, Hisar with the history of anorexia, torticollis, wing paralysis and yellowish-green diarrhoea. Physical examination of the bird revealed weakness, dehydration, pallor mucous membranes, intense itching, erythema and whitish dry crusty-like lesions on ears, face and around eyes. Body temperature was normal (99.4 °F). Faecal sample was collected using rectal swab and sent for examination of any endoparasites as per suggested clinical signs. Skin scraps were collected from affected part of the body by tape method to rule out any ectoparasitic infestation. Blood sample was collected from wing vein in EDTA coated blood vials for complete blood examination i.e. Haemoglobin (Hb), Packed cell volume (PCV), White blood cells (WBC) count, Red blood cells (RBC) count, Differential leucocytic count (DLC), Mean corpuscular volume (MCV), Mean corpuscular haemoglobin (MCH) and Mean corpuscular haemoglobin concentration (MCHC) (Wakenell, 2010). Thin blood smear was also prepared and stained with Giemsa stain to check the presence of any haemoprotozoon. Microscopic examination was performed as per the standard procedures described by Soulsby (1982).

The complete blood profile of the examined peacock is given in Table 1. The haematological examination revealed decrease in Hb, PCV, MCH and MCHC. Values of TEC and MCV were also on the lower side of the average value. The anaemic changes in the study bird were observed as normocytic hypochromic type that might be associated with blood loss anaemia due to presence of both *Haemoproteus* and *Menacanthus* species. WBC count

Table 1				
Haemogram of Indian p	eacock (Pavo	cristatus))

Parameter	Affected animal	Reference range (Samour et al., 2010)	
Total erythrocyte count (×106/µl)	2.26	1.79–3.51	
Haemoglobin (g/dL)	9.7	11.60–17.90	
Packed cell volume (%)	30.4	32.0-46.0	
MCV(fL)	134.8	131.0–196.8	
MCH (pg)	42.9	50.90-73.70	
MCHC (g/dL)	31.9	34.10-38.90	
Total leucocyte count (×103/ μ l)	30.65	3.80-18.90	
Differential leucocyte count			
Heterophils (×103/µl)	22.07	1.01-13.20	
Lymphocytes (×103/µl)	7.66	1.27-10.20	
Monocytes (×103/µl)	0.06	0.00-0.50	
Eosinophils (×103/ μ 1)	0.03	0.00-0.074	
Basophils (×103/ μ 1)	0	0.00-0.040	
Haemoprozoan parasite	Haemoproteus rileyi		
Ectoparasitic infection	Menacanthus stramineus		

was found increased indicative of leucocytosis and absolute heterophilia in blood circulation caused by inflammation, resulting from parasitic infections as observed in the present study. Al-Saffar and Al-Mawla (2008) at Mosul province of Iraq and Saeed *et al.* (2009) at Sudan also reported blood loss anemia, leucocytosis and heterophilia due to heavy infection with parasites (lice, cestodes and other parasites) in birds.

Blood smear examination of Giemsa stained thin blood smear revealed erythrocytic cytoplasm containing numerous young macro and few micro gametocytes of *Haemoproteus*. Macrogametocyte showing pigmented granules (8-10 in no.) and the laterally displaced nucleus of RBC were seen (Fig. 1). Macrogametocytes were seen grown around the nucleus and enclosing the erythrocytic nuclei but not encircling it completely. Fully grown macrogametocytes showed the lateral displacement of the erythrocytic nucleus. The macrogametes showed dark



Fig. 2. Microgametocyte (arrow) with pigmented granules on extremity and macrogametocytes (star) displacing RBC nucleus towards one side. Giemsa stain X1000



Fig. 1. Macrogametocyte showing pigmented granules (8-10 in no.) and the laterally displaced nucleus of RBC (star). Giemsa stain X1000



Fig. 3. *Menacanthus stramineus* showing double row of bristles (star) per segment. X100

colour cytoplasm, compact nucleus with defined nuclear membrane and pigmented granules that were found dispersed throughout the gametocyte. The microgametocytes had specific halter shape, pale colour cytoplasm, diffused nucleus and pigmented granules that were collected on the extremity of the gamete (Fig. 2). Based on thin blood smear examination and morphological characters, it was confirmed to be Haemoproteus rilevi infection in a free ranged Indian peacock. Similar type of haemoprotozoa infection of Indian peacock was also observed previously by other researchers (Malkani, 1936, Ponnudurai et al., 2011). Gametocytes of the Haemoproteus rileyi that we found in our study contained pigmented granules (usually around 10 numbers) which are in agreement with earlier report (Valkiunas, 2004). The pigmented granules were round to oval in shape with 0.5 to 1 µm in size. The infection is generally nonpathogenic in nature but can cause clinical disease in stressed condition or even fatal in younger birds (Malkani, 1936, Soulsby, 1982, Ponnudurai et al., 2011).

The skin scrapings collected from the affected parts of the body like face, around ears and eyes using tape method revealed infestation of a large, yellow coloured, dorso-ventrally flattened wingless ectoparasite with body divided into head, thorax and abdomen. The head was distinctly narrow anteriorly but it bulges widely at the posterior. All legs were found ending in paired claws. Abdomen was seen broadly rounded at the posterior. Spiracles were visible at dorsal edge of abdominal segments. The morphological characters, presence of two rows of bristles on each thoracic and abdominal segment and morphometry (Length 2218 µm, Width 460 µm) confirmed the same as Menacanthus stramineus lice (Fig. 3). Khursheed et al. (2014) also reported Menacanthus stramineus infestation in peafowl of Bahawalpur Zoo, Punjab, Pakistan.

Faecal sample was found negative for any parasitic cyst or ova. Proper and early diagnosis is important for necessary therapeutic management of the bird. Treatment was given with oral supplements to be mixed in drinking water at least thrice a day comprising of multivitamins such as vitamin A and B-complex. In addition, oral supplementation of antioxidants such as vitamin E and selenium as immunity enhancer and better management of bird house to minimize the ectoparasites was advised. Control of vectors in the bird house with appropriate acaricidal compounds such as pyrithroids was also suggested to the wildlife officials.

The available literature indicates that this is the first report in India depicting the concurrent infection of *Haemoproteus rileyi* and *Menacanthus stramineus* that leads to anaemic changes in Indian peacock.

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