

Gastrointestinal parasites of Emu (*Dromaius novaehollandiae* Latham, 1790) in Ostrich Nepal Pvt. Ltd Gongoliya, Rupandehi, Nepal

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ABSTRACT

Ostrich and Emu farming have been lunched with a very new concept to Nepalese market for their product in which parasitic diseases may cause significant effect to their production. In order to determine prevalence of gastrointestinal parasites of Emu, a total of 100 faecal samples were collected during the month of May/July 2015. All samples were microscopically examined by using direct smear and concentration techniques (floatation and sedimentation). Out of 100 faecal samples, 65% were found positive for gastrointestinal parasites. Overall, seven different species of gastrointestinal parasites including two protozoan, three nematodes and two cestodes were recorded. Among protozoan parasites, *Eimeria* sp. (30%) was more prevalent compared to *Entamoeba* sp. (10%). Among helminthes parasites, *Ascaris* sp. (15%) showed the higher prevalence rate followed by *Dromaestrogylus* sp. (10%), *Davainea* sp. (9%), *Raillietina* sp. (5%) and *Heterakis* sp. (5%). This study suggested that parasitic infection could be a serious problem in the farm hence needed to adopt appropriate control strategies in order to strengthen the successful emu production in Nepal.

Keywords: prevalence, *Eimeria*, *Entamoeba*, *Davainea*, *Raillietina*, *Dromaestrogylus*.

INTRODUCTION

Emu (*Dromaius novaehollandiae*) is second largest, flightless bird of the world belonging to the order, Ratite with flat breast bone (Jeffery, 1996; Patodkar *et al.*, 2009; Bennett *et al.*, 2013). They are only bird with gastrocnemius muscles in the back of the lower legs which facilitate them to run at the speed of 48 km/hr (Patodkar *et al.*, 2009). IUCN considered emu population trend to be stable and assesses their conservation status as being of least concern (Bird Life International, 2015).

In most part of the world ratite farming is a new field of livestock production (Nemejc, 2007). Just like ostrich farming, Emu farming has become popular and lucrative agricultural industry throughout the world (Orumbayer, 2015). Globally, the population of Emu is estimated to be around two million in which one million is spread between North America, Peru, India and China and about 750,000 in Australia (Orumbayer, 2015). In Nepal, there is only one Emu farming at Ostrich Nepal Pvt. Ltd. Gongoliya, Rupandehi which was established in 2008 AD for commercial purpose by importing eggs and bird from Australia.

Health problem in Emu mainly appear in chicks and juvenile stage (Warale *et al.*, 2014). Both

wild and captive Emu may be infected with their own specific parasite as well as external and internal parasites of other birds and animals (Nemejc & Lokesova, 2012). These problems in Emu can cause great economic losses (Tully & Shane, 1996). Usually careless management, high bird density as well as poor hygiene contribute to parasitic infection (Chang Reissig *et al.*, 2001). To the best of our knowledge gastrointestinal parasites of Emu has not been reported from Nepal yet. This study will help to develop control strategy against gastrointestinal parasites of Emu.

MATERIALS AND METHODS

The study was carried out at Ostrich Nepal Pvt. Ltd. Gongoliya-22, Tilottama Municipality, Rupendehi district, Nepal. Gongoliya is situated three kilometer east from Madhulia, Siddhartha highway. A total 1500 birds were reared in five different farms.

A total of 100 faecal samples were collected from the study area during the month of May/ July 2015. Faecal samples were preserved in 2.5% potassium dichromate for preserving both helminth eggs and protozoan cysts. Faecal samples were examined under the microscope at the laboratory of Central Department of Zoology Tribhuvan University, Kirtipur, Kathmandu. Both direct smear and concentration method (Floatation and Sedimentation) were followed. Identification of the parasitic oocysts, cysts, trophozoites and eggs were done along with the published literature (Forety, 2005; Teixeira, 2013).

RESULTS AND DISCUSSION

General prevalence of gastrointestinal parasites in Emu

The prevalence of gastrointestinal parasites in Emu was found to be 65%. Among 100 samples examined, 37%, 24% and 14% samples were found to be positive for protozoan, nematode and cestode parasites respectively (fig.1).

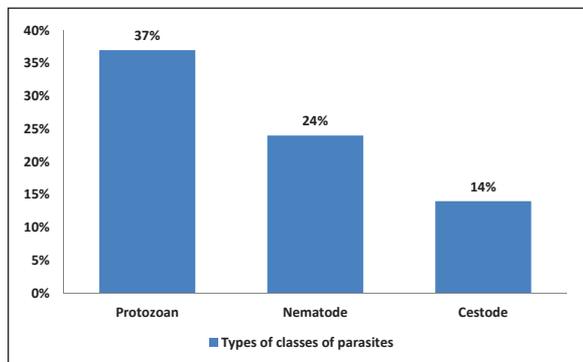


FIG. 1. Class-wise prevalence of gastrointestinal parasites in Emu.

A total of seven different gastrointestinal parasites were identified from Emu. Identified parasites includes two species of protozoan (*Entamoeba* sp. and *Eimeria* sp.), three species of nematodes (*Ascaris* sp., *Dromeastrongylus* sp. and *Heterakis* sp.) and two species of cestoda (*Davainea* sp. and *Raillietina* sp.) but trematodes were not observed during the study. Among

the protozoan parasites, highest prevalence rate was observed for the coccidian parasite, *Eimeria* sp. (30%) as compared to *Entamoeba* sp. (10%). The most prevalent helminth parasites was *Ascaris* sp. (15%) followed by *Dromaestrongylus* sp. (10%), *Davainea* sp. (9%), *Heterakis* sp. (5%) and *Raillietina* sp. (5%) (fig.2).

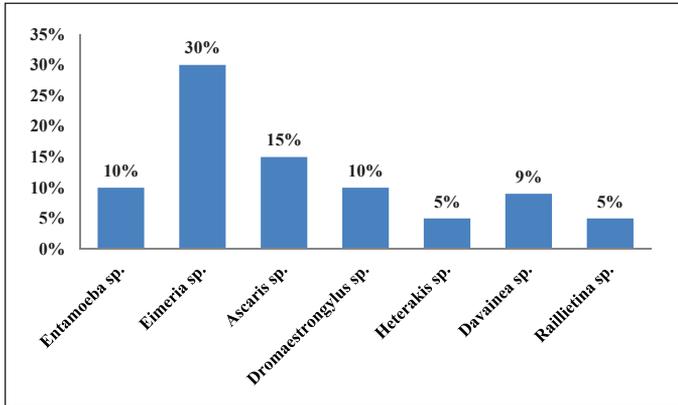


FIG. 2. Species-wise prevalence of gastrointestinal parasites in Emu.

In the present study, 48% of the samples were found to be positive for single infection followed by double (16%) and multiple infections (1%) (fig.3).

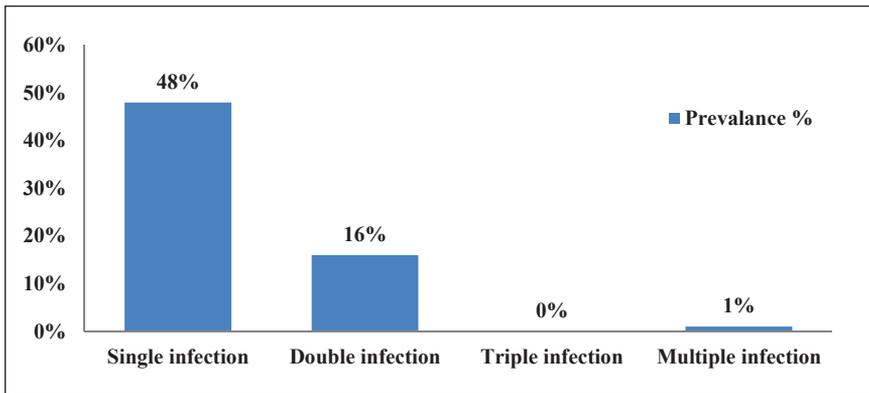


FIG. 3. Mixed gastrointestinal parasitic infection in Emu.

The prevalence of gastrointestinal parasites of Emu (*Dromaius novaehollandiae*) has been carried out for the first time from Nepal. The result revealed the high prevalence of gastrointestinal parasites in Emu. This high rate of gastrointestinal parasites may be due to the poor hygiene and sanitation and high bird density in the farm (Chang Reissig, 2001). Both protozoan and helminth parasites are transmitted mainly by contaminated water or food while the genus *Strongyloides* are transmitted by larvae present in the soil through skin penetration (Neves, 2005). Out of 100, 37 samples (37%), 24 samples (24%) and 14 samples (14%) were found positive for protozoan, nematodes and cestodes infections respectively. *Eimeria* sp. is the most common coccidian

parasites among juvenile Emu chick. Both *Isoospora* and *Eimeria* sp. have been recorded from Emu (Papini *et al.*, 2012; Teixeira, 2013). While only the prevalence of oocyst of *Eimeria* sp. (30%) was reported from present study. Ratites have been found susceptible with *Giardia* sp. (Ponce Gordo *et al.*, 2002; Foreyt, 2005). Cyst and trophozoites of *Giardia* sp. were identified in Emu (Teixeira, 2013) but these parasites were not found in present study. Cyst of *Entamoeba* sp. (10%) has been reported in present study as reported by Teixeira (2013).

Similarly, among the nematode, eggs of *Ascaris* sp. has been reported from study area as reported by Teixeira (2013). *Strongyloide* nematode i.e. *Dromeostrongylus* sp. is a parasites of intestine and major endoparasites of Emu (Foreyt, 2005). Eggs and larva of such type of *strongyloide* have been diagnosed in emu (Teixeira, 2013). Egg of *Dromeostrongylus* with prevalence rate (10%) was isolated in Emu during the study but no adult worms and larvae were recovered. *Heterakis dispar*, a nematode has been recorded in the alimentary canal of Ostrich of Iran (Eslami *et al.*, 2007) has also been reported in present study with prevalence rate of 5%.

Another host specific cestode parasites of Emu i.e. *Davainea* sp. has been isolated in small intestine of Emu (Foreyt, 2005). During the study egg of *Davainea* sp. has been reported from Emu and the prevalence was found to be (9%). Different types of *Raillietina* sp. were previously described from the small intestine of farmed and wild Emu from South Australia (O'Callegan *et al.*, 2003). In the study, *Raillietina* sp. has been also reported with prevalence rate (5%). But trematodes were not observed during the study. However, an adult fluke of *Fasciola hepatica* has been recovered from Emu (Vaughan *et al.*, 1997; Soares *et al.*, 2007). Out of 100 samples, single infection was found to be highest with 48% followed by double (16%) and multiple (1%).

Though, Emu are more parasites free and parasites are not common problems than other ratites but the result concluded that the parasitic burden in Emu of study area showed high. These can cause serious problems leading great economic losses. Thus, it is necessary to treat in order to get maximum benefit. The most scientific publications and articles all over the world are devoted to Ostriches but very few materials are focused on aspects of Emu on health care and related problems.

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