HISTOMONIASIS AND INCIDENTAL FINDING OF *Schistosoma mansoni* IN TURKEY BIRDS

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ABSTRACT. This report describes the parasitological and pathological information retrieved from the samples submitted to Regional Veterinary Laboratory, Bukit Tengah, Penang (MVKBT) following an episode of histomoniasis in a small scale poultry farm. Liver and ceca from two dead turkey birds, water (n=5) and freshwater snails (*Pomacea* sp, n=7) were stored between 4°C to 10°C until analyzed. Soil samples (n=7) were preserved in 5% formalin and kept at room temperature prior to further testing. The soil samples were filtered through laboratory test sieves before the filtrates at each level were examined using direct microscopy. Portions of the liver were processed using routine paraffin technique for histopathological examination and found positive for Histomoniasis. Results from direct microscopy of the liver samples revealed *Schistosoma mansoni ova, Sarcocystis* sporocysts and *Fasciola* sp. *Heterakis* sp ova were detected from cecal content. Four out of seven soil samples were positive for *Sarcocystis* sporocysts, *Coccidia* oocyst, *Strongyles* ova and nematod larva. Water and freshwater snail samples were negative for cercaria of *Schistosoma mansoni*. This case was concluded as Histomoniasis, Sarcocystosis and helminthiasis with incidental finding of *Schistosoma mansoni*.

Keywords: liver, histomoniasis, turkey, *Schistosoma mansoni, Sarcocystis*

INTRODUCTION

The Perlis State Veterinary Services was contacted in early January 2014 by a small scale turkey farmer to advise him regarding the mortality of a number of newly purchased turkeys. The turkeys (n=29) were kept in a mixed farming practice farm with various species of animals including village chicken, ducks, geese and twelve cats. All of them shared the same free-ranging compound. The mortality in the turkeys began after three days upon arrival of the birds from Penang. Neither mortality nor morbidity was noted in the other animals in the farm. This paper describes the findings retrieved from the liver, ceca specimens submitted to Regional Veterinary Laboratory Bukit Tengah, Penang (MVKBT) for confirmation of Histomoniasis. In addition, parasitological information of

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the water, soil, and freshwater snails of the affected farm were also documented.

MATERIALS AND METHODS

Two adult dead turkey birds were examined; liver and ceca of the birds were sampled for confirmation of histomoniasis. Water (n=4), soil (n=7) and freshwater snails (n=7) from the farm compound were also sampled. All samples were stored between 4°C to 10°C and sent to MVKBT for direct microscopic examination with exception to the soils samples. The soil samples were preserved in 5% formalin (Albonico *et al*., 2013) and kept at room temperature until analysed. The soil samples were filtered through 75 µm and 45 µm laboratory test sieves before the filtrates at each level were examined using direct microscopy. Portions of the liver were processed using routine paraffin technique for histopathological examination. Direct microscopy of the samples and photomicrographs were performed using light microscope (Olympus BX41, Japan) mounted with camera head (Olympus DP 20, Japan).

RESULTS AND DISCUSSION

Grossly, necrotic foci with alternating pattern of pale and hemorrhagic circle were observed on the liver (Figure 1). Histopathologically, numerous trophozoites which were characterized by pale eosinophilic and surrounded by narrow rims of clear spaces were noted in liver parenchyma(Figure 2). Those findings were consistent with histomoniasis or Blackhead Disease. The finding of *Heterakis* sp. (Figure 3), the intermediate host of *Histomonas meleagridis* in the cecal content of the dead turkeys had supported the diagnosis of histomoniasis. *Histomonas meleagridis* causes acute caecal and liver damage in Galliformes (Wei *et al*. 2011). Life cycle of this protozoa is complex, however, Hu *et al*., 2004 demonstrated that histomoniasis could spread through a

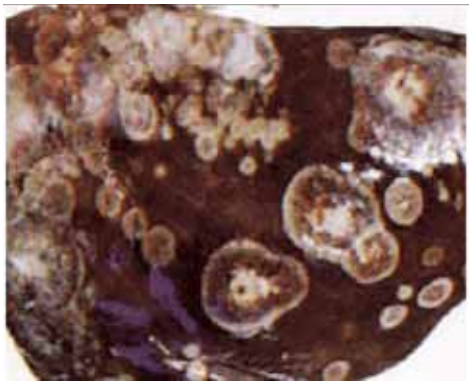

Figure 1. Hepatic histomoniasis.

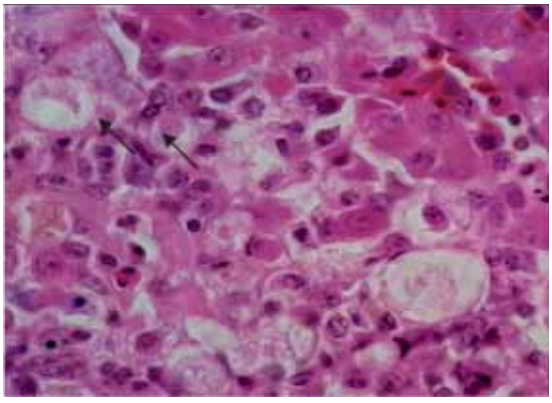

Figure 2. Oval-shaped histomonad (black arrows) in liver parenchyma. HE, x1000.

flock of turkey by phenomenon of cloacal drinking. Interestingly, they also found that direct transmission from bird to bird is not possible in chickens (Hu *et al*., 2006). It is highly suggestive that direct transmission may occur in turkeys which subsequently accelerate the Histomoniasis rate in the turkeys flock, thus explained the high mortality witnessed in turkeys whilst; none of the other Galliformes reared in the farm was affected. The situation experienced in this farm was consistent with statement made by McDougald, 2005 in his review paper of Histomoniasis; "… mortality in turkey could reach 100%, whereby in chickens many outbreaks pass unnoticed". Direct examination of the fluid from squashed liver specimen revealed, *Fasciola* sp. and also *Sarcocystis* sp. sporocysts. In addition, an oval ovum with lateral spine (Figure 4) which closely resembles ova of *Schistosoma mansoni* was detected. Sarcocystis is a protozoon that causes sarcocystosis in birds and mammals. Many species of mammals can act as intermediate hosts for sarcocystis including cattle, sheep, and goats. Definitive hosts include human, domestic dogs and cats. Geese, domestic chickens can act as intermediate hosts. In Malaysia, *Sarcocystis* sp. have been reported in wildlife, for instance, civet cat, squirrel and terrapin (Fazly *et al*., 2013).

Schistosoma or blood fluke is a snail-transmitted trematodes. *Schistosoma japonicum* that cause human intestinal schistosomiasis in Asia was documented to be present in certain area of Malaysia (IAMAT, 2012). However, *Schistosoma mansoni* which also lead to similar disease in Africa, the Americas and the Middle East (Akinwale *et al*., 2013) had not been discovered in Malaysia. Successful transmission of these parasite between their various intermediate (freshwater snails) and final hosts (human) may also involve free swimming stages (cercaria) and the encystment of larvae on aquatic vegetation (Woodruff and Upatham, 1992). Therefore, further investigation was

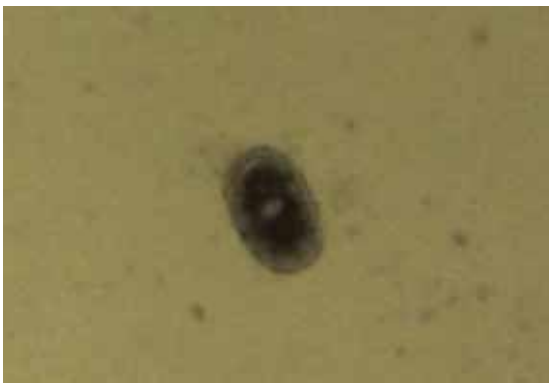

Figure 3. Ovum of *Heterakis* sp.

Figure 4. *Schistosoma mansoni* ovum

performed on water, soil and freshwater snails sampled from the farm compound. Four out of seven soil samples were positive for *Sarcocystis* sp. sporocysts, strongyles ova, nematode larva and coccidia oocysts. Cercaria of the *Schistosoma mansoni* was not detected from water and snail samples. The snails were identified as *Pomacea* sp. Based on this investigation, it can be concluded that the finding of *Schistosoma mansoni* in this case was incidental. Nevertheless, enviromental sampling techniques described by Worrell *et al*. 2011 could be followed to increase the chance for detection of *Schistosoma* spp in future sampling. Overall, the findings on multiparasitic infection in the farm described, indicates the need for a better flock health and farm management system to be put in place

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