



RESEARCH ARTICLE

HEAVY INFESTATION OF PHOENICOLEPSIS NAKURENSIS IN A FLAMINGO
(PHOENICOPTERUS RUBER) IN VAN

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ABSTRACT

The material of this study was consisted of a major flamingo brought to the animal hospital on June, 2013 with complaints of weakness, anorexia and diarrhoea. During the clinical examination, animal died and later autopsy was performed. Macroscopically; sanguineous exudates in abdominal cavity, hyperaemic intestinal serosa with thickened and smooth loops were observed. In the epithelium, erosions and ulcerations were observed. In addition to these macroscopical findings, adult parasites were observed in the intestinal lumen. After autopsy, tissue samples were acquired in 10% formalin solution and intestinal content were sent to laboratory for histopathological examination. Hyperaemia on the intestinal serosa and enteritis characterized with oedema and haemorrhage were determined according to the histopathological examination. Villous atrophy in the intestinal epithelium was determined as a result of necrosis, erosion and ulceration. After parasitological examination, adult form and eggs of *Phoenicolepis nakurensis* were observed. As this is the first case reported in our country and this parasite may be an important reason for death caused by enteritis in flamingos; it is concluded that taking this parasite into consideration will be beneficial.

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INTRODUCTION

Migratory birds such as flamingos use a variety of regions as migratory route. One of these routes include Lake Erçekin Van. Lake Erçek hosts thousands of these kinds of birds during their migration to Africa. Every year, approximately 3000 flamingos visit the lake and stay there between June and August. Lake Erçek is located at 20 km east of Lake Van in 38° 28' N 43° 20' E coordinates. It is an important bird area according to national and international marshy grouping and accepted as group B marshy region (Kear, 1985; Adizel and Durmus, 2009). Endoparasites are common in wild birds but rarely cause death. However, when animals are infected with another pathogens or become stressed, parasites may become more problematic and cause death (La Sala and Martorelli, 2007). Despite a paucity of studies regarding the effects of helminth infection on sea birds, it is suggested to research the serious effects of helminths (Woog et al., 2011).

Phoenicolepis nakurensis is a cestode belong to Hymenolepididae family and mostly found in Anseriformes and Phoenicopteriformes birds. These cestodes have a scolex with four large round or oval unarmed suckers, retractile rostellum with a single crown of eight skrjabinoid hooks with rudimentary guard and slightly curved two pairs of longitudinal excretory vessels ventral to the genital ducts and few testes.

There is not any distinct neck. In all proglottides, width is longer than length except the last gravid proglottides which are longer than the width (Jones and Khalil, 1980). The adult forms are especially present in the intestines and lead to several symptoms. However there are not sufficient studies performed on helminth infections on flamingos. The importance of this case is its being the first reported *P.nakurensis* case in flamingos, evaluating the histopathological findings in detail and pointing out that this parasite may be an important reason for enteritis in flamingos and may lead to death.

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CASE REPORT

The material of this study was consisted of a major flamingo brought to the animal hospital on June, 2013 with complaints of weakness, anorexia and diarrhoea. During the clinical examination, animal died and later sent to pathology laboratory in order to perform autopsy. Tissue samples obtained for histopathological examination were fixed in 10% buffered formalin, embedded in paraffin blocks and cut into 4µm sections. Sections are stained with hematoxylin and eosin and examined microscopically. For parasitological examination, intestinal content and tissue were sent to parasitology laboratory inside 70% alcohol. In the laboratory, at first whole gastrointestinal tracts were examined macroscopically. Abdominal cavity was filled with sanguineous exudates. When small intestines were examined, numerous hymenolepid cestodes were found together with haemorrhagic enteritis. There were erosions and ulcers in the intestinal surface where parasites firmly attached.

Later on, a number of 35 parasites were collected from the intestinal content and sent to laboratory for parasitological classification. Adult form and gravid strobila of *Phoenicolepis nakurensis* are given on Fig. 1-A. Parasite eggs are given on Fig. 1-B. According to the classification; these cestodes were belong to the Hymenolepididae because of having a scolex with four suckers and a single crown of rostellar hooks. *P. nakurensis* is characterized by the size and shape of the hooks, scolex and strobila (Figs. 1-C,D). Measurements of certain morphological properties of *P. nakurensis* can be found in this study: Length 2.0 - 2.5mm, width 0.101 - 0.120 mm, scolex 104 - 110 µm x 147 - 152 µm, rostellum 231-240 µm x 35-38 µm, suckers 73-75 µm x 102-103 µm, rostellar sac (180-195 µm x 40-55 µm) extending into the first few segments behind the scolex. There is not any distinct neck. Rostellar hooks skrjabinoid 95-100 µm long with a rudimentary guard and curved blade (Figs. 1-C,D).

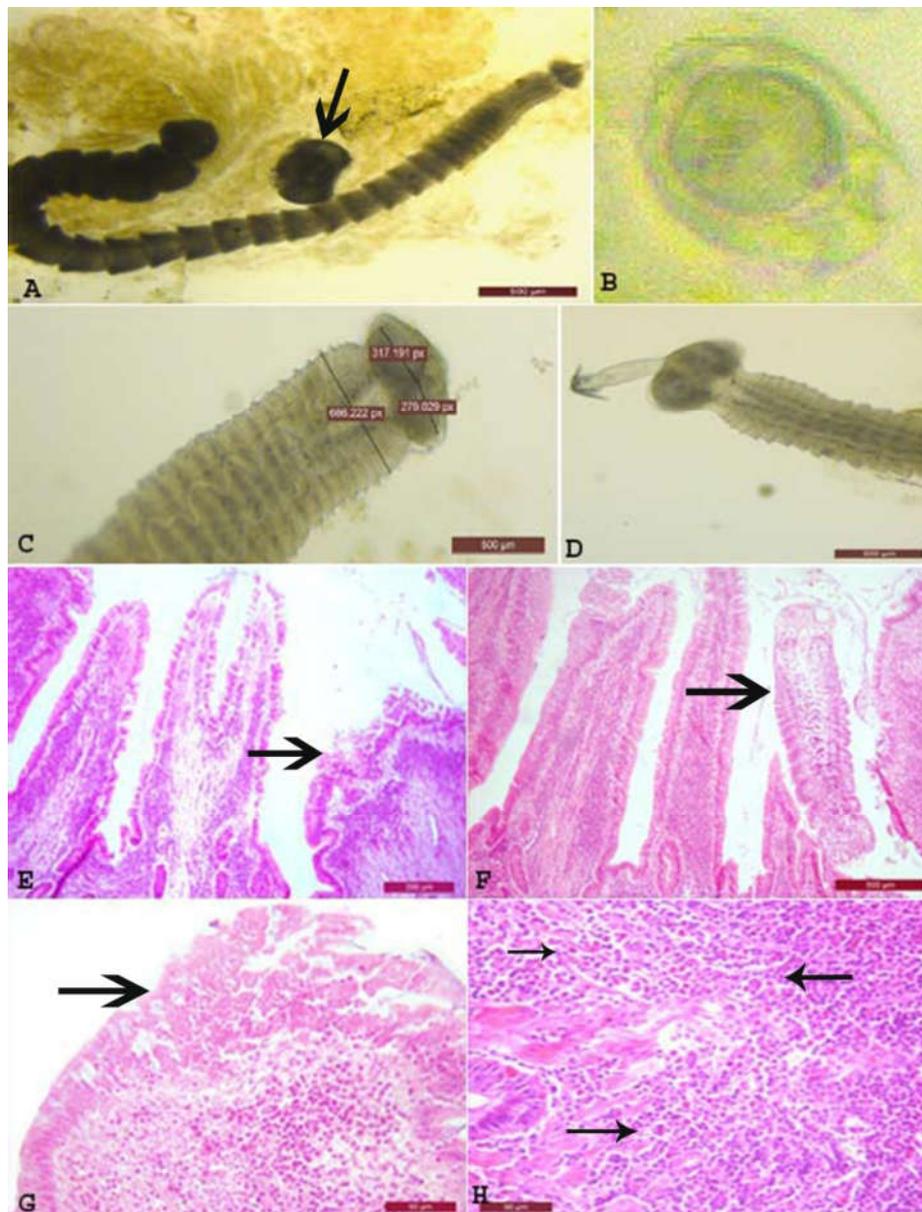


Figure 1. A. Mature parasite and last gravid strobila (arrow). B- Eggs spindle shaped C-D- Appearance of scolex and rostellum. E-necrosis and erosion in intestinal epithelium. E,G- Partial villous atrophy in intestinal epithelium due to necrosis, erosion and ulceration (arrow) Bar: 50µm. F- Parasite hold firmly to the intestinal epithelium (arrow), Bar: 500µm. H- Numerous lymphoplasmacytic cells infiltration, eosinophils and erythrocytes in inflammation area (arrows), H&E, Bar: 50µm

All proglottides are wider than length except last gravid proglottides which are longer than width. Eggs have spindle shape with the size of 17-19x7-9 μm (Fig. 1-B). After the parasitological examination, the parasites are specified as *P.nakurensis* (Jones and Khalil, 1980). *P. Nakurensis* in the major flamingo detected in this study was the first case recorded in Turkey. In histopathologic examination, oedematous haemorrhagic enteritis, thickening and hyperemia observed in intestinal serosa. Partial atrophy in intestinal villi was formed depending on necrosis, ulceration and erosion of intestinal epithelia (Figs. 1-E,G). In the examination of histopathological sections, parasites were observed to be firmly attached to small intestines. Cestodes deeply embedded at the base of the crypts between intestinal villi (Fig. 1-F). Parasites attached to the intestinal epithelium were often surrounded by mixed inflammatory infiltrates consisting of lymphoplasmacytic cells and erythrocytes (Fig. 1-H).

DISCUSSION

According to various studies, endoparasites in wild birds were reported frequently and may cause death (Shaw and Kocan, 1980; Farias and Canaris, 1986; Poynton *et al.*, 2000; La Sala and Martorelli, 2007). There are limited studies on histopathological effects of intestinal helminths in wild birds. Therefore, it is thought important to report the case and present the histopathological findings. La Sala and Martorelli (2007) identified that severe lesions and obstruction caused by *Proflicollis chasmagnathi* in Olrog's gulls. In a Houbana bustard infected with acanthocephalan *Mediarhynchus taeniatus* and the cestodes *Otiditaenia conoideis* and *Hispuniolepis falsata*, damages in mucosa of the large intestine were observed (Jones *et al.*, 1996). Histological studies made by Bahrami *et al.* (2012) showed a visible vascular congestion and a massive lymphoplasmacytic infiltration inside the smooth muscular layer of the small intestine of infected pigeons with various helminths. In the current case, intestinal lesions caused by heavy *Phoenicolepis nakurensis* infestation and histological findings were determined. These findings were found similar to the findings mentioned above. The parasite fauna of flamingos (*Phoenicopterus* spp.) is poorly known. Cestodes of the genus *Amabilia*, *Cladogynia*, *Sobolevicanthus* and *Gynandrotaenia* were found incidentally in free-ranging flamingos in Yucatan, Mexico (Aguirre *et al.*, 1991). *Cladogyniaspp.* and *Leptotaenia inischnorhyncha* were found in flamingos in Greece (Papazahariadou *et al.*, 2008). Jones and Khalil (1980) reported from Lake Nakuru, Kenya. *Gynandrotaenia stammeri*, *Cladogynia phoeniconaiadis*, *Flamingolepis tengizi*, *F. dolguschini*, *P. nakurensis* and *Striatofilaria phoenicopteri* species in lesser flamingo. Threlfall (1981) was detected *Echinostoma revolutum*, *Orchipedum sp.*, *Tetrameres coccinea*, *Polymorphus obtusus*, *Leptotaenia ischnorhyncha*, *Hymenospheanacanthus cirrostylifera*, *Flamingolepis sp.* species and also one unidentified species from Hymenolepididae family in American flamingos. This the first *P.nakurensis* case in our country seen in flamingos living in Lake Erçek. Jones and Khalil (1980) report that *Flamingolepis* species are most common Hymenolepid cestodes in flamingos. *P. nakurensis* belongs to *Hymenolepididae* family, however it is distinguished from *Flamingolepis* genus by sucker and hook characters of rostellum and also with specific structure of their strobila.

In *F. tengizi* fine hairs are present on rostellum and in *F. dolguschini* a distinctive neck is present and its strobila structures are different from *P. nakurensis*. Properties of parasite identified in the current study are given in Figure 1.

Conclusion

As a result; Lake Erçek in Van is an important migration centre for flamingos and as this is the first case report regarding the flamingos in this region; its concluded that this parasite should be taken into consideration because of enteritis and death in flamingos.

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