

HISTOPATHOLOGY OF CROW (*CORVUS SPLENDENS* VIEILLOT) INTESTINE INFECTED WITH ACANTHOCEPHALAN, *CENTRORHYNCHUS AMINI* KHAN ET AL., 2010

NASIRA KHATOON¹, ALY KHAN², F.M. BILQEES³ AND MUTI-UR-RAHMAN¹

¹Department of Zoology, University of Karachi, Karachi-75270, Pakistan,

²Crop Diseases Research Institute, PARC, University of Karachi, Karachi, Pakistan

³Al-Haseeb, A-314, Block-D, North Nazimabad, Karachi-74700, Pakistan

*Corresponding author e-mail: nasira_parvez@yahoo.com

ABSTRACT

The tissue damage caused to the intestine of crow (*Corvus splendens* Vieillot) by acanthocephalan, *Centrorhynchus amini* Khan et al., 2010, is described based on 6-8 microns thick histological sections stained with haematoxylin and eosin and mounted permanently in Canada balsam by usual method. Photographs of infected intestine were prepared in support of the observation and are presented here. The most important feature recorded was complete damage to the thickness of the intestinal wall, including villi, crypt glands and muscular layers. Dislocation of muscles and prominent penetration tunnels were recorded. Shrinkage of muscle fibres resulted in the formation of small inter-spaces. Large lesion was observed between crypt gland and muscular portion. Moreover, lamina propria was destroyed due to penetration of proboscis of the worm.

KEYWORDS: Corn, Acanthocephala, *Centrorhynchus amini*, Intestine, Histopathology.

INTRODUCTION

Information regarding histopathology of acanthocephalan parasites of birds is scarce from Pakistan. Although thirty-two spiny headed worms have been reported from Pakistan (Amin, 2013). Some of the more recent regional contributions to the histopathology of acanthocephalan in birds include those of McDonald (1998); Bilqees et al. (2003); Radwan (2012); La Sala et al. (2013) and Khatoon et al. (2013).

McDonald (1998) during examination of pied stilts revealed the presence of acanthocephalan *Polymorphus* (Palaeacanthocephala: Polymorphidae) causing severe damage to host intestine, which would probably have resulted in its death within a short period of time. Bilqees et al. (2003) reported damage caused in the intestine of kite infected with acanthocephalan parasite *Mediorhynchus nickoli* Khan et al., 2004. The infected intestine revealed extensive damage to tissue, including erosion of the villous epithelium, necrosis of crypt glands and villi, vacuolation and hyaline degeneration of muscle fibres, formation of granulomatous lesions in the muscular and serosal layers. Radwan (2012) reported the pathological manifestation of the acanthocephalan, *Sphaerirostris picae* in the small intestine of hooded crow. The proboscis of the worm pierced the mucosal epithelium, its lamina propria and reached the external muscularis causing compression and erosion of villar epithelium, shortening and abrasion of the intestinal villi and destruction of crypt glands apposing the everted worm proboscis. A marked increase in the number of goblet cells in villi and crypt glands was observed. La Sala et al. (2013) stated that the mortality of chicks of olog's gull (*Larus atlanticus*) were related to inflammatory enteritis alongwith granulomatus peritonitis caused by acanthocephalan *Profilicollis chasmagnathi*. Complete intestinal perforation was observed in 85% and 97.3% of the studied chicks in 2005 and 2006, respectively. Khatoon et al. (2013) described the tissue damage caused to the intestine of owl (*Strix leptogrammica* Temminck) with *Polymorphus mohiuddini*. The prominent features reported were hyperplasia of crypt glands, inflammatory cells and a number of giant cells were present. Shrinkage of muscular layer and ulceration was observed. The goal of the present study was to observe the histological changes caused by *Centrorhynchus amini* Khan et al., 2010 to the intestine of crow (*Corvus splendens* Vieillot) from Sindh, Pakistan.

MATERIALS AND METHODS

Selected portion of infected intestine of crow was removed upon death, fixed in 10% formalin and processed for histological study by usual methods. 6-8 microns thick, sections were stained with haematoxylin and eosin were used for this study. Photomicrographs were taken with Nikon (Optiphot-2) photographs and Fuji colour film was used. Selected photographs are presented here in support of observations.

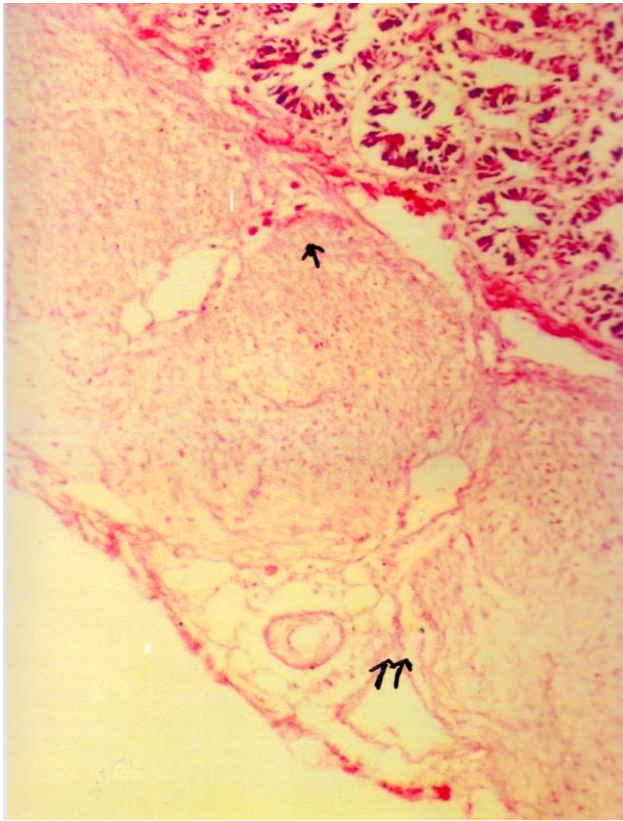


Fig. 1. Section showing damage to muscular layers. Note dislocation of muscles (arrow) and penetration tunnels (double arrow) (X50).

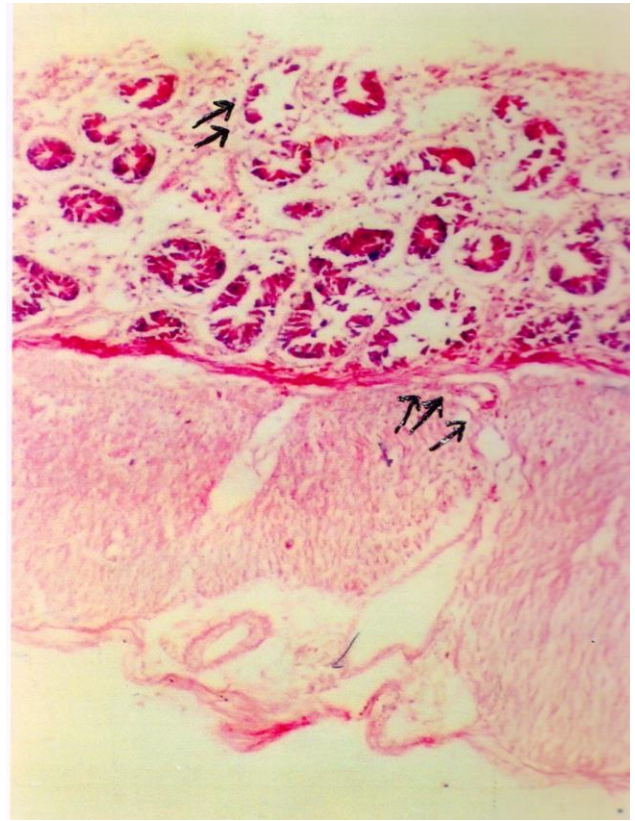


Fig. 3. Section showing several penetration tracks (arrow) the crypt glands (double arrow) are destroyed and villi completely absent (triple arrow) (X50).

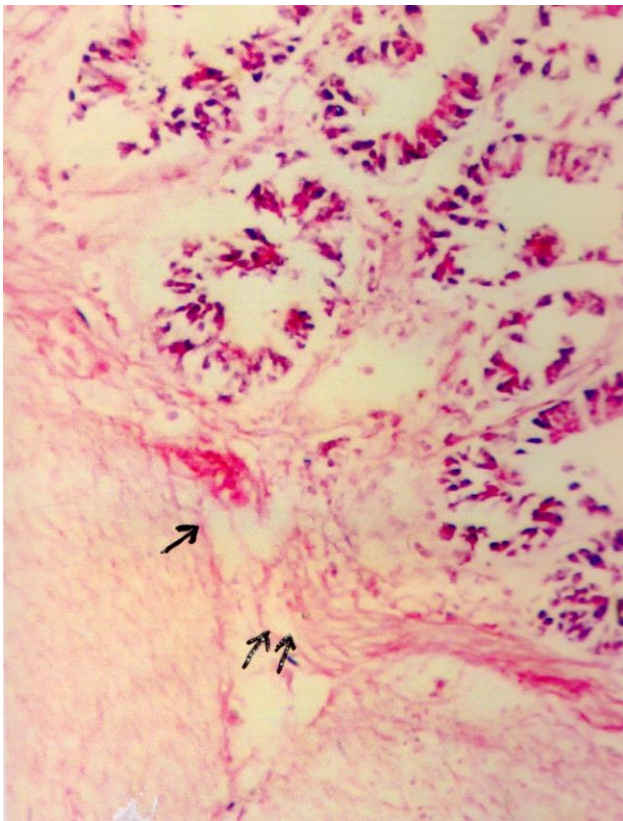


Fig. 2. Part of section showing muscular damage at higher magnification (arrow) and large lesion (double arrow) due to penetration of parasite (X100).

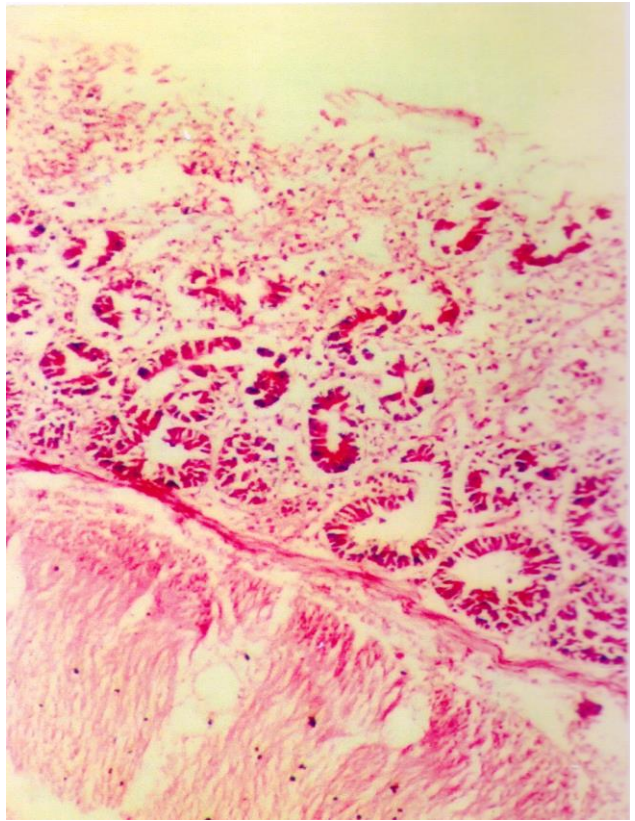


Fig. 4. Shrinkage of muscle fibres, villi and crypt glands (X100).

RESULTS AND DISCUSSION

Histological section of the acanthocephalan (*Centrorhynchus amini* Khan *et al.*, 2010) revealed that severe damage occurred to the whole thickness of the intestinal wall including villi, crypt glands and muscular layer. Severe damage to muscular layers was observed. Dislocation of muscles and penetration tunnels were obvious (Fig. 1). Close to the intestinal wall large lesion was observed between the crypt glands and muscular portions which contained to lower part as penetration track of acanthocephala (Fig. 2). Muscular damage was obvious in all sections including shrinkage of muscle fibres resulting into small spaces in-between. The most obvious structure recorded were penetration tracks due to the penetration of proboscis of acanthocephala (Fig. 3). Section at higher magnification indicated more prominent damage to muscle fibres, villi and crypt glands (Fig. 4).

Histopathology of infected intestine of birds is reported by other workers also. Moore and Bell (1983) observed peritonitis and inflammation by the *Plagiorhynchus cylindraceus* attachment of proboscis which was also observed in the present study. As the proboscis embedded into the intestinal mucosa it teared the lamina propria in crow. Similar observations were made by Krasnoshehekov and Lisitsyna (2009) during the migration of cystacanths in the intestine of *Lacreta agilis*. Granulomatous lesions in the muscular layer was not observed in the present study although it was reported in owl (Bilqees *et al.*, 2003). Damage to the whole thickness was previously reported in a marine fish *Muraenox cinereus* (Bilqees & Fatima, 1992). It is concluded that these reactions may be due to cell mediated immunity leading to reduction in the absorptive area available for the digestive and absorptive functions of the bird similar to the findings of Sanil *et al.* (2010).

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