

Aberrant migration of *Ascaridia galli* in a Myna (*Acridotheres tristis*)

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Abstract. The normal habitat of the parasitic stages of *Ascaridia galli* is in the small intestine of poultry but the exact life cycle is poorly understood. At necropsy, in retroperitoneal of a common Myna (*Acridotheres tristis*) that was presented for autopsy, high number larvae of nematodes were found. After taking samples, the larvae were subjected to parasitological examination. Larvae were identified *Ascaridia galli* that characterized by the presence of three large lips and the oesophagus has no posterior bulb. This report clearly showed that few larvae of *Ascaridia galli* could penetrate the small intestine and were positioned in the abdominal cavity at post infection. It was far more common that the larvae were localized within the epithelium or in the lumen of the crypts. It is therefore suggested that at least in this case “extra intestinal migratory phase” is a more appropriate term to be used for the *A. galli* larval localization as compared to the term “non migratory phase” currently used in many textbooks.

Keywords: *Ascaridia* spp.; *Acridotheres tristis*; Aberrant migration.

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Introduction

Ascaridia spp. has been found to be a common parasite of various birds in most parts of the world because its direct life cycle and the environmental resistance of its eggs favour infections under these conditions (Soulsby, 1982). Infections with *Ascaridia* spp. may cause, in addition to direct losses, reductions in growth rate, weight loss, reduced feed conversion rates and damage to the intestinal mucosa, leading to blood loss and secondary infections (Ackert and Herrick, 1928). In addition to these serious consequences, infections may interfere with behavior, social

rank. *Ascaridia* spp. may also play a role in transmission of *Salmonella* infections resulting in disease and economic losses (Kaufmann, 1996). The lifecycle of *Ascaridia* spp. is direct and the infective stage is eggs and infection takes place by ingestion of the infective eggs which with food or water. The eggs hatch in the intestine of the host and the larvae reach maturity in six to eight weeks in the intestinal mucosa with no out- migration of intestinal tract when they are swallowed by the birds (Ackert, 1931). On this background, this article describes an aberrant migration of *Ascaridia galli* in a Myna.

Case History

A two year-old common Myna (*Acridotheres tristis*) was presented for autopsy to Veterinary Teaching Hospital, School of Veterinary Medicine, Ferdowsi University of Mashhad. The history presented by the owner revealed that the bird was caged alone; its diet consisted of commercial chicken layer's pellets, fruits and vegetables. Necropsy was done and in abdomen cavity high number nematodes was found (figure 1). The worms were fixed in 10% buffered formalin and submitted to the Parasitology examination. The nematodes were cleared immediately and identified up to genus level (Yamaguti, 1961). Moreover, to identify whether the larvae or adult worm found in the gastrointestinal tracts, the proventriculus to the cloaca were removed and were also subjected to parasitological examination.



Figure 1. Larvae of *Ascaridia galli* in abdominal cavity of Myna

Result and discussion

The nematodes that were collected in this case were identified as *Ascaridia galli* by the presence of three large lips and the oesophagus has no posterior bulb. After opening of gastrointestinal tract by scissor, few number of *A. galli* adult were recovered in small intestine.

Despite substantial research on other aspects of *Ascaridia galli*, the early larval phase of the life cycle is still not fully understood. There is agreement that the small intestine is the normal habitat of the larvae, but whether or not the larvae have an invasive phase in the lamina propria of the tunica mucosa, i.e. a true

histotrophic phase, is not clear. Only few researchers have examined the early larval phase (Ackert, 1923; Ackert, 1931; Todd and Crowds, 1952; Tugwell and Ackert, 1952; Herd and McNaught, 1975). In the study by Todd and Crowds (1952) larvae were located in both lumen and the mucosa, whereas Ackert (1923) found that larvae of *A. galli* were localized deeply among the intestinal villi and penetrated the intestinal Lieberkühn glands, but the exact age of these larvae was not stated. Moreover, the duration of this initial phase has been a subject of discussion. Some authors mention that the histotrophic phase has a duration of 3–54 days before the larvae move to a final phase in the lumen (Permin and Hansen, 1998), while other authors mentioned that the larvae live in the mucosa for several days up to weeks (Ackert, 1923; Tugwell and Ackert, 1952; Herd and McNaught, 1975). This was supported in the textbooks by Soulsby (1982) and Kaufmann (1996). On the other hand Lapage (1956) described in his book that the newly hatched larvae live in the contents of the small intestine, but later bury their head in the intestinal crypts, and afterwards leave the intestinal mucosa to live in the intestinal lumen as adults.

This report clearly showed that few larvae of *Ascaridia galli* could penetrate the small intestine and were positioned in the abdominal cavity at post infection. It was far more common that the larvae were localized within the epithelium or in the lumen of the crypts. It is therefore suggested that at least in this case “extra intestinal migratory phase” is a more appropriate term to be used for the *A. galli* larval localization as compared to the term “non migratory phase” currently used in many textbooks.

To achieve a better understanding of the life cycle of *A. galli*, studies of the localization of the larvae in the initial phase of the infection are needed. This knowledge may be relevant for studies of population biology and immunity, e.g. parasite turnover after infection with genetically marked cohorts of eggs as suggested by Katakam et al. (2010), or local immune response in the intestine e.g. Degen et al. (2005) and Schwarz et al. (2011).

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