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Short Communication

Gross and histopathological changes in intestine of sheep associated with trichuriosis

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Abstract

Gross and histopathological changes associated with trichuriosis were studied in 125 caecum and colon samples of sheep collected from Chennai, Kancheepuram and Tiruvallur districts of Tamil Nadu. Out of 125, five showed worms in the mucosa of caecum and colon. The worms were identified as *Trichuris ovis*. Grossly, *T. ovis* were found attached to the caecal mucosa which showed congestion, thickening, oedema and raised nodules of >5 mm diameter. Sections of caecum stained with haematoxylin and eosin revealed thickened mucosa with large number of eosinophil infiltration, increased goblet cells,hyperplasia of glandular epithelium, stunting and fusion of villi with heavy mononuclear cell infiltration.

Keywords: Trichuriosis, Gross lesions, Histopathology, Sheep.

Whipworms are widespread soil-transmitted helminths which occur in an extensive host range including humans (*Trichuris trichiura*), pigs (*T. suis*), sheep, goats and bovines (*T. ovis* and *T. discolor*), dogs (*T. vulpis*) and non-human primates (*Trichuris* spp.) (Saha and Bhowmik, 1998; Cutillas *et al*., 2007; Zainab and Khan, 2016) causing significant diseases and economic losses (Jex *et al*., 2011). Heavy infection of *T. ovis* causes anemia and death (Soulsby 1982; Taylor *et al.,* 2007). This paper reports the gross and histopathological changes in intestine of sheep associated with trichuriosis.

A total of 120 intestine samples (caecum and colon) from Chennai, Kancheepuram and Tiruvallur districts, were collected from individual animals after slaughtering for meat purpose and five samples were collected during necropsy at Department of Veterinary Pathology, Madras Veterinary College, Chennai, Tamil Nadu. The worms in the caecum and colon were collected and identified (Soulsby, 1982; Taylor *et al*., 2007).

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Intestine samples were collected in 10% formal saline and kept for 24 h for proper fixation. The fixed samples were dehydrated in ascending grades of alcohol, hardened, cleared, embedded in paraffin and sectioned at 5µ thicknesses for light microscopy and stained with haematoxylin and eosin (H&E) following standard histopathological procedures (Stevens and Wilson, 1996).

In the present study, out of 125 samples examined, five showed worms in the mucosa of caecum and colon. The worms were identified as *Trichuris ovis*. Overall prevalence of trichuriosis was 4.0%. Out of 5 animals with *Trichuris* infection, only one sheep showed mixed infection with *Oesophagostomum columbianum*. Soundararajan and Iyue (2003) reported 7.22% of *Trichuris* spp. in sheep at Tamil Nadu. Satish *et al.* (2018) observed *Trichuris* eggs in 1.69% of the faecal sample of sheep and goats at Tamil Nadu.

On gross examination, adult *T. ovis* were found attached to the caecal mucosa. The area of attachment of worms showed congestion, thickening and oedema

(Fig. 1a). In mixed infections with *Oesophagostomum* spp., adult *Trichuris* spp. were found attached to round irregular, hard, fibrotic, raised nodules of >5 mm diameter in the caecum (Fig. 1b). These gross lesions were in accordance to that of Zainab and Khan (2016) who reported that infection of *T. ovis* in large intestine causes thickening of mucosa, congestion, haemorrhagic spots, ulcers and nodule formation with thickening of the caecal valve.

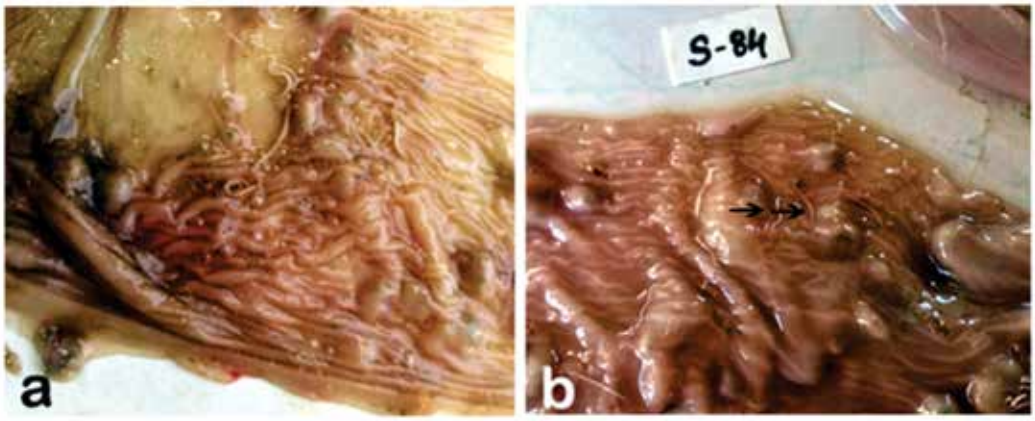

Fig. 1. Sheep- Trichuriosis associated oedematous and thickened caecal wall (a) with adult *Trichuris* (b, arrow) attached to the mucosa with round to irregular, hard, fibrotic, raised nodules of *Oesophagostomum* sp.

On histopathological examination, the section of caecum revealed *T. ovis* worms with thick eosinophilic cuticle and basophilic internal organs. There was hyperplasia of glandular epithelium which was indicated by dark basophilic staining of goblet cells (Fig. 2a), severe stunting and fusion of villi with heavy mononuclear cell infiltration (Fig. 2b) and section of two worms seated on the mucosa in a round eosinophilic capsule was found in colon (Fig. 2c) and caecum. This is in accordance to that of Kumar and Lal (1987) and Zainab and Khan (2016) who reported inflammatory cells around adult worms embedded in mucosa. Ileiv *et al.* (2017) found cellular infiltrations by macrophages, lymphocytes, neutrophils, and single eosinophil around the parasite body. Pittman *et al* (2010) reported petechical haemorrhages in the mucosal epithelium of large intestine of pigs due to *T. suis* whereas Kirkova and Dinev (2005) observed extensive local infiltration in the intestinal mucosa of dogs due to *T. vulpis.*

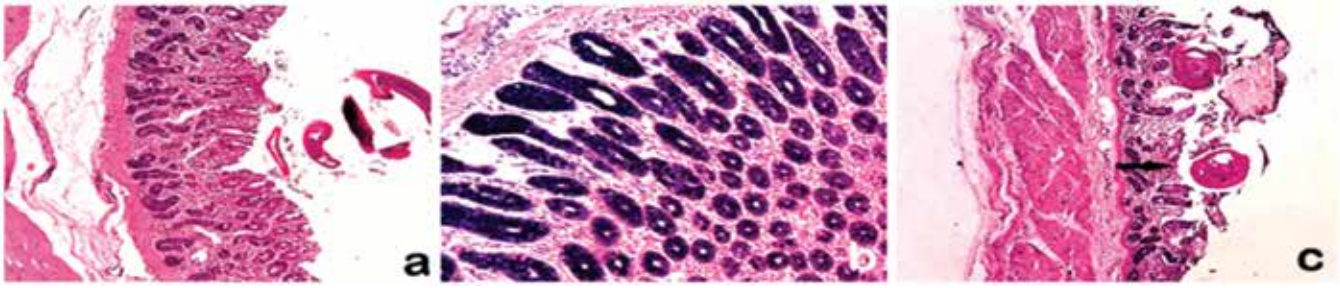

Fig. 2. Sheep-Colon-Trichuriosis-Parasite with hyperplasia of crypts(a, 40x). Crypt hyperplasia with moderate amount of plasma cells and lymphocytes (b, 100x).Cross section of pair of worms (arrow) in the mucosa (c, 40x).

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