

## PREVALENCE AND PATHOLOGY OF OESOPHAGOSTOMIASIS IN GOATS

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*(Received: March 3, 1988)*

Oesophagostomiasis is an important parasitic disease in goats mainly affecting productivity compared to mortality. There have been a few reports on the occurrence of the disease in goats from India (Bhalerao, 1933; Thapar, 1956; Alwar and Lalitha, 1961; Bhatia and Pande, 1961, Sathianesan and Peter, 1970), but the information on pathology of this condition is still lacking. Thus the present study deals with the prevalence of Oesophagostomiasis in goats, their intensity of infection, organ var distribution and pathologic features in order to establish the nature and extent of damage done to the host.

### Materials and Methods

In the course of examination of intestinal tracts (IT) of goats for parasitic infections at three slaughter houses of Calcutta during July to December, 1987, 145 IT considered to be naturally infected with oesophagostomiasis, were collected. Each of them were separately opened and the contents were repeatedly washed in normal saline to recover the worms. The recovered nematodes were fixed in 10% hot formalin, treated with lectophenol for overnight and identified as *Oesophagostomum columbianum* on the morphological basis. The identification was confirmed by the Zoological Survey of India, Calcutta.

In studying the intensity of infection, expression like light, medium, heavy and very heavy were used. Light infection indicated the presence of not more than 50, medium not more than 100, heavy not more than 200 and very heavy over 200 respectively.

The infected parts of IT showing gross lesions alone and those with the sites of penetration of worms were preserved in 10% neutral formal-saline for histopathological studies. Routine haematoxylin and eosin method of staining was performed. Duplicate sections were also stained by MacCallum Goodpasteur, Ziehl-Neelsen and methylene blue techniques for demonstration of bacteria present therein, if any.

### Results

The results showing the percentage, intensity and distribution of *O. columbianum* in different parts of intestines were detailed in Table-I. The maximum number of worms recovered from a single intestine was 494 and minimum 23. Medium infection was highest in the animals followed by light, heavy and very heavy. The results further showed that jejunum was the most commonly infected part of the IT.

In light and medium infections, the gross pathologic changes consisted of oedema and distention due to exudation of mucous. Heavy and very heavy infections revealed the presence of worms free or partly embedded in the mucosa with catarrhal exudate, necrotic foci at the points of attachment, thickening, atrophy and anaemia of the mucosa. Nodules varying in shape and sizes were also observed in the jejunum and ileum of some intestines.

Histopathologically, the presence of worms without any attachment to the mucosa was observed in light and medium infections. The changes were characterised by congestion, haemorrhages, sloughing or necrosis of lining epithelium, increase in the number of goblet cells, mild proliferation of connective tissue and infiltration of neutrophils, eosinophils and traces of mononuclear cells in the lamina propria (Fig.1).

Histopathologic changes in heavy and very heavy infection were disruption and atrophy of the secretory gland architectures due to wide spread necrosis and proliferation of connective tissue with eosinophil and mononuclear cellular infiltrations (Fig.2). Increase in the number and height of goblet cells was also evident in majority of cases. The muscularis mucosa was thickened due to hypertrophy. The nodular lesions in both submucosa and serosa were characterised by caseo-necrotic mass with presence of parasitic larvae, encircled by massive infiltration of degenerated eosinophils and mononuclear cells and finally encapsulated with narrow zone of connective tissue (Fig.3).

### Discussion

There has not been any authentic report on the prevalence of oesophagostomiasis in goats from West Bengal, though its occurrence has been reported from other parts of India (Bhalerao, 1933; Thapar, 1956; Alwar and Lalitha, 1961; Bhatia and Pande, 1961, Sathianesan and Peter, 1970). The percentage of infection (28.82%) recorded in this study was almost similar to those reported earlier (Rahman *et al.* 1975). The present results reflected the variations in the intensity and distribution of worms

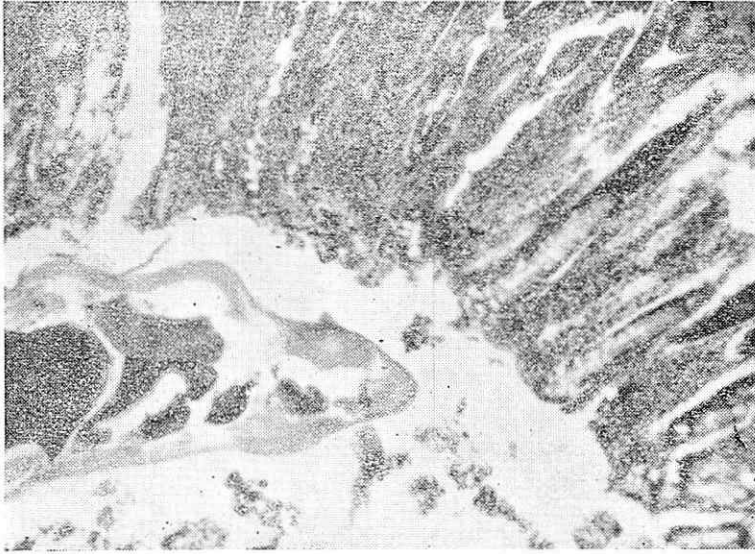


Fig. 1.

Ileum: The presence of parasites in the mucosa causing haemorrhages, necrosis of epithelium, increase in the number of goblet cells and cellular infiltrations. H & E x 100

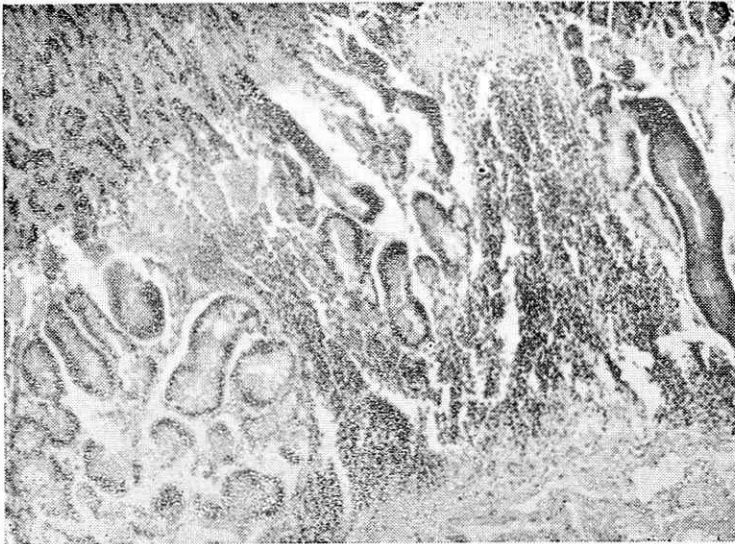


Fig. 2.

Jejunum: The presence of parasite in the submucosa with disruption, atrophy of secretory gland architectures, proliferation of connective tissue and massive cellular infiltrations. H & E x 100

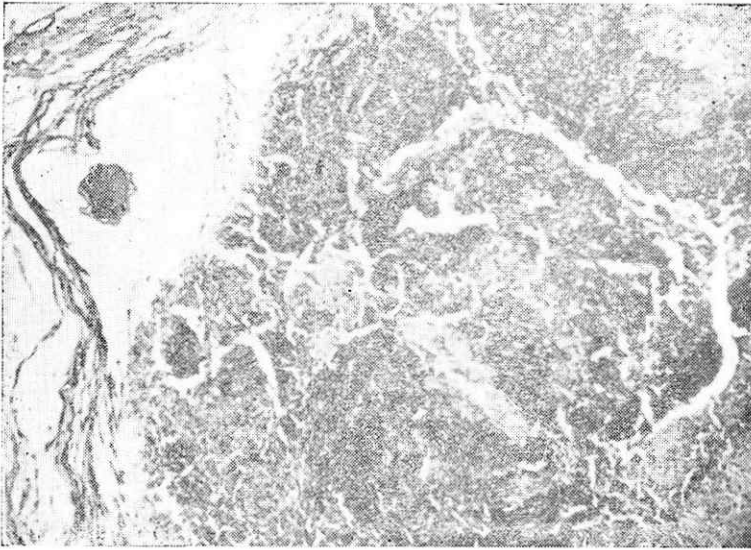


Fig. 3.

Jejunum: Nodular lesions containing caseo-necrotic mass with larva, degenerated cells and encapsulation. H & E x 80

in the IT. The results on the organwise distribution of worms indicated that they could penetrate into the mucosa at any point from the duodenum to the caecum thus confirmed the reports of Dash (1973). The highest distribution of worms recorded in the jejunum suggested that the nematodes interfere with the food absorption of the host thus affecting production.

The pathologic changes in *O. columbianum* were mostly necrotic and inflammatory in nature. Again, the inflammatory changes were acute catarrhal in the beginning and chronic catarrhal or productive type later on. The variations of lesions were probably due to different stages of infection. The early stage showed acute changes and long standing cases revealed chronic changes. The variations possibly also depended on the intensity of infection. Light and medium infections were indicated by mild damage whereas, heavy and very heavy infections were found to produce severe damage in the IT.

The nodule formation observed in the submucosa and serosa was also a characteristic pathognomonic lesion and the finding was in conformity with those reported earlier in sheep (Bhatnagar *et al.* 1978). It is quite possible that a local sensitivity is developed in animals repeatedly

Table I

Percentage, intensity and distribution of *O. columbianum* in intestinal tracts of goats

Total no. examined	No. infected with percentage	Range of No. of worms	Intensity of infection in the no. of animals				Organwise distribution			
			Light	Medium	Heavy	Very Heavy	Duodenum	Jejunum	Ileum	Caecum
510	145 (28.82%)	23-494	43	68	27	7	5.2	78.1	12.6	4.1

exposed to this nematode, and the subsequent entry of larvae into the submucosa evoked nodular lesions as also stated by Jones and Hunt (1983).

### Summary

An analysis of 510 intestinal tracts of goats showed the prevalence of *O. columbianum* in 28.82%. Medium infection was highest and jejunum was the most commonly infected part of the intestines. The pathologic changes were mostly necrotic and inflammatory in nature. Catarrhal enteritis and nodule formation were characteristic pathognomonic lesions in goats.

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