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#### Parsani HR

Department of Veterinary  
Parasitology, College of  
Veterinary Science & Animal  
Husbandry, Kamdhenu  
University, Sardarkrushinagar,  
Gujarat, India

#### Shyma KP

Department of Veterinary  
Parasitology, College of  
Veterinary Science & Animal  
Husbandry, Kamdhenu  
University, Sardarkrushinagar,  
Gujarat, India

#### Jeemi A Patel

Department of Veterinary  
Parasitology, College of  
Veterinary Science & Animal  
Husbandry, Kamdhenu  
University, Sardarkrushinagar,  
Gujarat, India

#### Mit K Patel

Department of Veterinary  
Parasitology, College of  
Veterinary Science & Animal  
Husbandry, Kamdhenu  
University, Sardarkrushinagar,  
Gujarat, India

#### Nabanita Ganguly

Department of Veterinary  
Parasitology, College of  
Veterinary Science & Animal  
Husbandry, Kamdhenu  
University, Sardarkrushinagar,  
Gujarat, India

#### Corresponding Author:

#### Parsani HR

Department of Veterinary  
Parasitology, College of  
Veterinary Science & Animal  
Husbandry, Kamdhenu  
University, Sardarkrushinagar,  
Gujarat, India

## Patho-morphological study of parasitic infections in donkeys of North Gujarat

**Parsani HR, Shyma KP, Jeemi A Patel, Mit K Patel and Nabanita Ganguly**

#### Abstract

Post-mortem of 12 donkeys revealed parasitic infections in all animals and prevalence of parasitic infection by necropsy in donkeys revealed *Parascaris equorum*, *Gasterophilus intestinalis*, *G. haemorrhoidalis*, *Habronema muscae*, *Oxyuris equi*, *Strongylus vulgaris*, *S. edentatus*, *S. equinus*, *Triodontophorus* sp., *Cyathostomum* sp. *Setaria equi* and *Strongyloides westeri* in 50.00, 33.33, 25.00, 16.66, 33.33, 16.66, 75.00, 100.00, 83.33, 75.00, 33.33 and 25.00 per cent animals, respectively. In the present investigation prevalence of trematode and cestode infection was not recorded due to unavailability of intermediate host.

**Keywords:** Donkey, post-mortem, parasites, Gujarat

#### Introduction

Donkey is the most simple and unselfish member of equidae family. Donkeys need little attention and small quantities of ration. As such, they can sustain and work on poor forage with little rest. As a result, they are considered to the excellent pack animal and the beast of burden employed for transporting heavy loads in the hills, desert and plain area in India, Egypt, Sudan, Somaliland, Persia and China. Even today the stoic, hardworking donkey is often misunderstood by its owner and unfortunately often by the veterinarians worldwide. Donkeys are vulnerable to an array of diseases of biological origin particularly parasitic infections. Parasitic infections are common and varied and exercise great influence on performance and draft ability of donkey.

However data on endoparasites from equine populations that reflect the impact of chemotherapy on parasite populations are sporadic. More over reports on occurrence of internal parasites in equids at necropsy also vary from animals selected for testing the efficacy of parasiticides and probably with little or no previous treatment, to animals with unknown parasite control measures at diagnostic laboratories. Further no much information post-mortem examination revealing the occurrence of parasitic infections of donkeys in Gujarat state. Therefore the present study on patho-morphology of different organs affected by parasitic infection in donkeys is communicated.

#### Materials and Methods

A total of 12 donkeys which died due to some or the other reasons during the course of study were subjected to detailed post-mortem examination. In systematic necropsy examination the gross lesions in different organs were recorded and helminths were collected in normal saline and cleaned overnight by dipping into lactophenol and identified as per key of Lichtenfels (1975)<sup>[9]</sup> and Georgi (1985)<sup>[5]</sup>.

Infected tissues were collected and fixed in 10 per cent formal saline for histopathological examination. After fixation of tissue, small pieces of the tissue were washed in running water overnight, dehydrated in ascending grades of alcohol, cleared through xylene and embedded in paraffin. The paraffin sections were cut at a thickness of 5  $\mu$  and were stained with hematoxylin and eosin (H&E) as described by Lillies (1965)<sup>[10]</sup>, mounted with DPX and examined under microscope under high power for presence of parasitic stage and histopathological changes.

#### Results and Discussion

In the present investigation post-mortem of 12 donkeys revealed parasitic infections in all animals which is in agreement with Eysker and Pandey (1989)<sup>[3]</sup> who reported 100 per cent

parasitic infection in donkey from Zimbabwe during necropsy. Prevalence of parasitic infection by necropsy in donkeys revealed *Parascaris equorum*, *Gasterophilus intestinalis*, *G. haemorrhoidalis*, *Habronema muscae*, *Oxyuris equi*, *Strongylus vulgaris*, *S. edentatus*, *S. equinus*, *Triodontophorus* sp., *Cyathostomum* sp. *Setaria equi* and *Strongyloides westeri* in 50.00, 33.33, 25.00, 16.66, 33.33, 16.66, 75.00, 100.00, 83.33, 75.00, 33.33 and 25.00 per cent animals, respectively which was more or less in agreement with Lyons *et al.* (1985) [11], Krecek *et al.* (1989) [8], Pandey and Gabaret (1993) [14] and Gawor (1995) [4].

In the present investigation prevalence of trematode and cestode infection was not recorded due to unavailability of intermediate host.

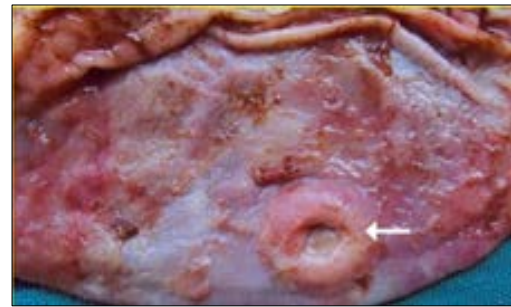
In the present investigation stomach showed varying degree of ulceration (Figs. 1, 2, 3 and 4) due to feeding habit of *Gasterophilus larvae* and congestion of mucosa due to *Habronema* sp. infection as described by Soulsby (1986) [17] which is responsible for colic in equine.

In the present study small intestine showed haematoma (Figs. 5, 6 and 7) and congestion of mucosa due to ascaris worm infection. Urquhart *et al.* (1987) [18] who reported that *Parascaris equorum* causes impaction and perforation leading to fatal peritonitis.

Similarly large intestine showed congestion and haemorrhagic spots (Figs. 9), nodule (Figs. 8 and 11), abscess (Fig. 10) and ulcer (Figs. 12) formation due to feeding of strongyles. Presence of *Setaria equina* worm on large intestine (Fig 13). Histopathological study of intestine revealed disruption of epithelium of intestinal villi (Fig. 14) surrounded by inflammatory cell predominantly eosinophilic infiltration (Soulsby, 1986) [17].

Gross examination of liver showed affected hepatic parenchyma characterized by dark brown haemorrhagic area on liver surface (Fig. 15), while microscopic study revealed diffused areas occupied by large number of erythrocyte leucocytes and few fibrin strands. Similar findings have been reported by Purushottam and Rajan (1985) [15] and Dhote *et al.* (1992) [2]. Haemorrhages in the present finding may be due to acute parasitic infection causing endothelium damage or rupture of the blood vessels. As a result of increased vascular permeability there was probably escape of erythrocytes and plasma component at the affected site, which gave dark brown colour of the liver. Hepatic lesions are produced by the parasite during its migration. Therefore, the lesions caused by migrating parasite were far more extensive and destructive. In the present study majority of lesions hence were caused by migrating larvae, producing grayish white discolouration of liver surface. Histopathologically, these areas were identifiable as fibrous strand due to damage of liver parenchyma (Fig. 16). Similar observations have also been made by other worker (Pandey, 1987 and Alam *et al.*, 2003) [13, 1].

Gross changes in the lungs showed pulmonary emphysema with white raised areas (Fig. 17), microscopically characterized by dilatation and distension of alveoli with occasional rupture of its wall along with compensatory atelectasis (Fig. 18). The pathomorphological lesions of pulmonary emphysema were also described by Shiran *et al.* (1986) [16] and Naik *et al.* (1991) [12].



**Fig 1:** Gastric ulcer



**Fig 2:** Gastric ulcer due to bots



**Fig 3:** Congestion of gastric mucosa



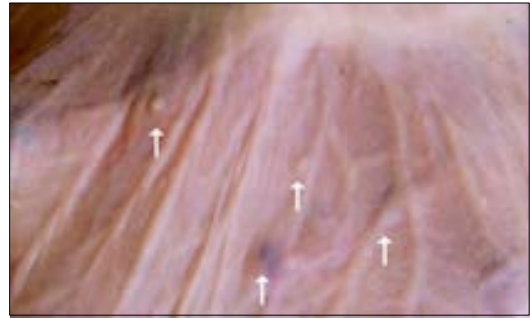
**Fig 4:** Bots and *Habronema* sp. on gastric mucosa



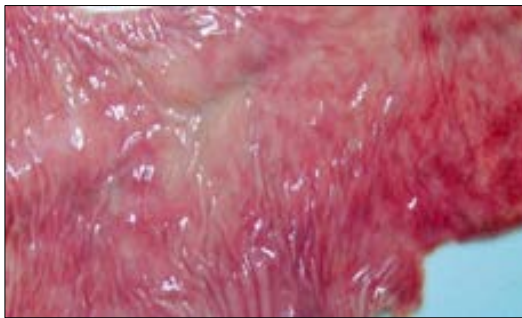
**Fig 5:** Small intestine packed with *P. equorum*



**Fig 6:** Haematoma due to *P. equorum*



**Fig 11:** Arrested larvae and nodule due to strongyles



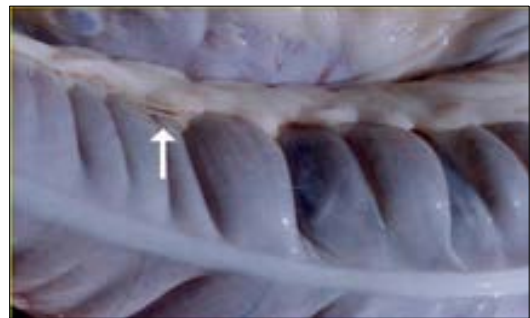
**Fig 7:** Congestion of intestinal mucosa



**Fig 12:** Ulcer due to strongyles



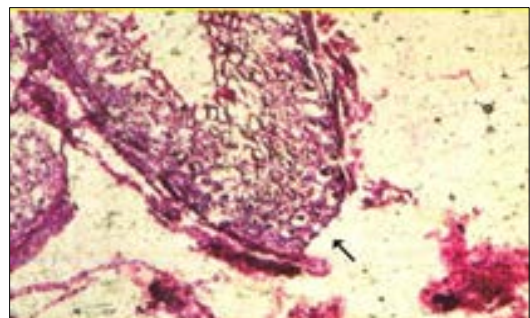
**Fig 8:** Nodule formation due to strongyles



**Fig 13:** Setaria equine worm on intestine



**Fig 9:** Hemorrhages due to strongyles



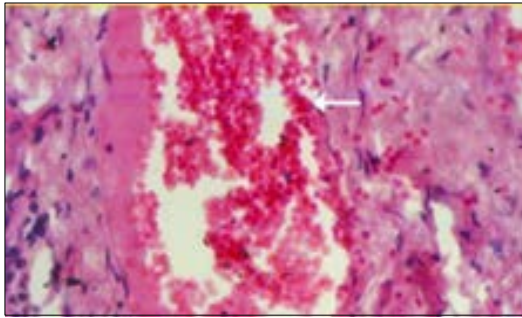
**Fig 14:** Disruption of intestinal villi due to feeding of strongylus



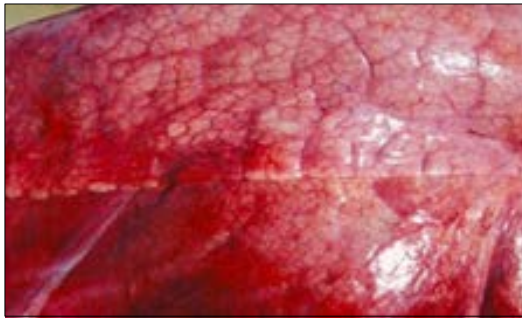
**Fig 10:** Abscess due to strongyles



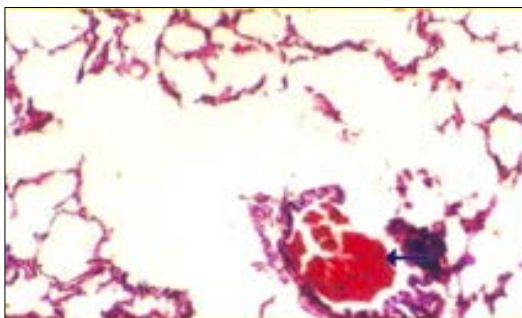
**Fig 15:** Haemorrhagic spot on liver surface due to larvae migration



**Fig 16:** Haemorrhages and eosinophilic infiltration in liver by H & E (40X)



**Fig 17:** Lung having pulmonary emphysema



**Fig 18:** Atelectasis of alveoli (40X)

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