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Medicinal management of Strongyloidiasis in murrah calves

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Abstract
Livestock plays an important role in Indian rural economy and is a prime agricultural subsector. Endoparasites infections in domestic animals cause huge economical losses to the farmers. Nematodes like *Strongyloides* spp. are obligate gastrointestinal parasites of vertebrates. The larvated eggs of the *Strongyloides* spp. are expelled in the faeces of the host animals. The current study describes the clinical signs, diagnosis via microscopic faecal examination and medicinal management of *Strogyloides* spp. infection in Murrah calves. The infected calves were successfully treated with Piperazine and Levamisole.

Keywords: *Strogyloides*, piperazine, levamisole, murrah, infection, calves

1. Introduction
Murrah buffalo is an important integrant of the profitable dairy industry of Haryana state of India. Endoparasitic infections are one of the main hindrance in the profit earning dairy industry of the developing countries including India. Along with the infected animals, helminths also adversely affect the human populations rearing these animals. Endoparasites cause huge economical losses to the dairy farms as they are responsible for digestive problems, reduction in production, reduction in weight gain, poor reproductive performance and mortality in the infected animals [1]. Erroneous animal husbandry practices, adverse climatic conditions and poor pasture management are responsible for the higher incidence and severity of the parasitic diseases in domestic animals [2]. Although most of the helminth infections in domestic animals are asymptomatic but heavy worm load may cause poor growth and digestive disturbances like constipation, diarrhoea and dysentery. Nematodes like *Strongyloides* spp. are obligate gastrointestinal parasites of vertebrates. Diagnosis of the *Strongyloides* spp. infections is mainly done by microscopic examination of the host faeces for *Strongyloides* spp. eggs or the first stage larvae (L1). The eggs of *Strongyloides* spp. are thin walled, larvated and ellipsoid in shape [3]. The main aim of the current study was to evaluate the clinical signs, diagnosis and medicinal management of Strongyloidiasis in Murrah calves.

2. History and Clinical findings
Two Murrah calves with an age of 2 months and 3.5 months were reported to Government Veterinary Hospital, Imlota, Charkhi Dadri (Haryana) with a complaint of frothy shooting diarrhoea since 2-3 days. Grossly, faeces of the calves were foamy and watery. Body condition of both the calves was emaciated.

2.1 Clinical signs and diagnosis
The body temperatures of the calves were 99.6 °F and 101.2 °F. Haemoglobin values of the calves were 10.8 g/dl and 12.2 g/dl. Increase in the respiratory rate and heart rate was also observed (Table 1). Diagnosis was based on the microscopic faecal examination under the 10X magnification (Fig. 1) and the 40X magnification (Fig. 2). Microscopic examination revealed the presence of thin walled larvated eggs which were ellipsoid in shape [3]. Reference values of the above mentioned parameters were taken from the literature [4].

Table 1: Physiological parameters and haemoglobin values of the affected calves

Parameter	1st calf	2nd calf	Normal Values [4]
Age	3.5 months	2 months	-
Temperature (^{0}F)	101.2	99.6	101-102
Respiration rate / minute	31	37	12-16
Heart rate / minute	64	68	40-60
Haemoglobin (g/dl)	12.2	10.8	8.5-12.5

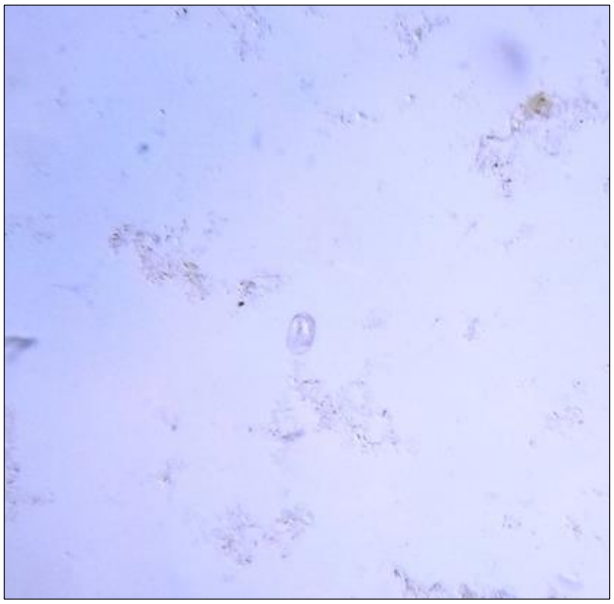

Fig 1: *Strongyloides* spp. egg seen under 10X magnification

Fig 2: *Strongyloides* spp. egg (thin walled, larvated and ellipsoid in shape) seen at 40X

3. Treatment

Both the calves were treated with Piperazine hexahydrate @ 300 mg / kg body weight orally and with Levamisole hydrochloride @ 7.5 mg / kg body weight subcutaneously. The calves were also given antidiarrheal powder – Neblon® (Indian Herbs) 10 grams twice a day orally for consecutive 3 days as a supportive therapy.

4. Results and Discussion

Significant improvement was seen in the affected calves from 3rd day post-treatment. Faeces of both the calves were again examined on 7th day post treatment and were found negative for *Strongyloides* spp. eggs. Post-therapeutic remission of clinical signs confirmed complete recovery. The affected calves were successfully treated with Piperazine hexahydrate and Levamisole hydrochloride. Aforementioned combination of these broad spectrum anthelmintic drugs is active against a wide range of larval and adult *Strongyloides* spp. [5].

Strongyloides spp. eggs are larvated and are expelled in the faeces. In the host faeces the eggs hatch to release the L1s. These L1s may develop *via* L2 – L4 stages into rhabditiform male and female worms which are the free-living adult generation [3]. These free-living adults mate and the female lays eggs which hatch to release the L1s which moult *via* an L2 into infective filariform L3 stage. These infective L3 stages are long lived and can persist in the environment until they encounter a suitable host [3].

The prevalence of *Strongyloides papillosus* in buffalo calves aging 10 days to 6 months was 28.45% in Punjab which adjoins Haryana [6]. Cases of *Strongyloides papillosus* infection during the monsoon season (July) in the neonatal calves of up to one month age were also reported in an organised buffalo herd of Haryana [7]. Hence, scheduled frequent deworming is advised in the prevalent areas of helminthic infections for enhanced growth and productivity of the animals.

5. Conclusion

Strongyloidiasis generally causes minor health problems especially in young ruminants but it significantly affects the growth and productivity of the animals causing remarkable economic losses to the farmers. Combination of Piperazine and Levamisole is a proven broad spectrum anthelmintic combo and its efficacy against *Strongyloides* spp. is proved by the current study. Regular deworming is advised in the prevalent areas of *Strongyloides* spp. infections for better productivity of the animals.

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