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Concomitant infection of *Trichuris globulosa* and *Trichostrongylus* spp. in a dromedary camel

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Abstract
Parasitic infection is a major cause of losses in livestock production including camel in the tropical countries. A three year old male camel was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Tirunelveli with a history of dullness, depression, diarrhea for the past one week. Haematological examination revealed eosinophilia. The faecal sample was collected for identification of intestinal parasitism. Coprology revealed heavy infection of *Trichuris globulosa* and presence of *Trichostrongyles* spp. Fenbendazole at the dose rate of 20mg/kg b.wt was given as an initial dose followed by 10mg/kg b.wt twice in three weeks and the animal had recovered completely post treatment.

Keywords: Camel, coprology, haematological examination, *Trichuris globulosa, Trichostrongylus* spp

Introduction
The single humped camel (*Camelus dromedarius*) is an economically important multipurpose animal in arid and semi-arid areas of the world. Camel is used as a mean of transport, milk and meat in different parts of the world [1]. There are almost twenty million dromedaries found mainly in the areas from western India via Pakistan through Iran to northern Africa and Australia [2].
In camel husbandry, due to the introduction of semi-intensive system of camel farming and sedentary life style and typical browsing habit, it is less prone to the helminthic infestations but due to improper hygiene practices, there are chances of several parasites to infect the camels. The common gastro-intestinal nematodes of camel are *Haemonchus, Nematodirella, Nematodirus, Trichuris, Trichostrogylus, Strongyloides, Ostertagia, Marshallagia, Cooperia* and *Camelo strongylus* [3]. In a review about the parasitic diseases of camels in Iran, provides knowledge on various parasitic fauna, deworming and tick control programme for camels [4].

Case history
A three year old male dromedary camel was brought to the Veterinary Clinical Complex, with the history of severe diarrhea for the past one week. On clinical examination the animal was dull, depressed and lethargic. Blood sample was collected in the EDTA containing vial to study the complete blood count. The fecal matter was loose in consistency which the animal voided during examination was collected in a plastic container for coprology. Faecal samples were qualitatively assessed by sedimentation technique [5]. The report on faecal examination in camel are very limited and also the knowledge on the camel helminthes are very poor in Southern India. The clinical signs due to intestinal parasitism in camel and morphological characteristics of *Trichuris globulosa* and *Trichostrongylus* eggs were presented in this report.

Results and Discussion
The faecal examination of the dromedary camel revealed heavy infection of
Trichuris globulosa (eggs of Whip worm) with infestation of *Trichostrongylus* eggs. The gastrointestinal helminthic eggs were identified based on the morphology as a thick shelled, barrel shaped eggs with the presence of a globular or button - like enlargement at the both the end and confirmed it as *Trichuris globulosa* (Fig.1).The other one was an oval, thin-shelled eggs with cells inside were identified as *Trichostrongylus spp* (Fig.2). On searching the various fields, 5-8 numbers of *Trichuris globulosa* (Fig.3) and few scattered *Trichostrongylus* eggs (Fig.4) were found [5, 6].

In a mixed helminthic infection with contribution of *Trichuris* spp. (50%), *Strongyloides* spp. (32.14%), *Trichostrongylus* spp. (10.71%) etc., in the large and small intestine of migratory camel [7]. *Trichostrongylus probolurus* and *Trichostrongylus colubriformis* are two other parasites with high prevalence was stated by authors and they also recorded this genus as dominant worms of GI tract especially in the small intestine [8].

The blood picture revealed eosinophilia in response to the severe gastrointestinal parasitism. The dromedary camel brought to the veterinary clinical complex exhibited the clinical signs like dullness, depression due to verminous diarrhea. The clinical symptoms for the heavy parasitic infection showed anorexia, tough hair coat, anemia and edematous swellings of lower body parts [3]. In general, parasitism in camels is a combination of infections. Debility in this case may be due to the contribution by *Trichostrongylus* spp. infestation. The large numbers of eggs may cause a level of irritation sufficient to result in diarrhea sometimes accompanied by the passage of mucus and blood [9].

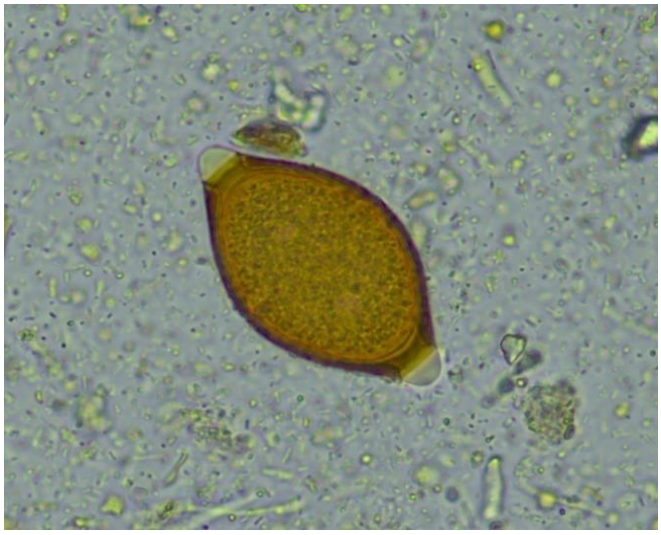

Fig 1: Egg - *Trichuris globulosa* - Thick shelled, barrel shaped, globular or button - like enlargement at both ends.

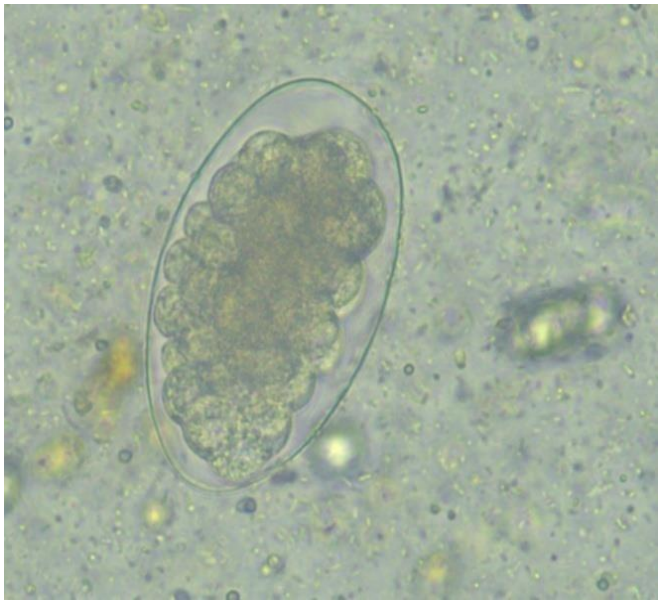

Fig 2: Egg - *Trichostrongylus* spp – Thin shelled, oval shaped with segmented yolk

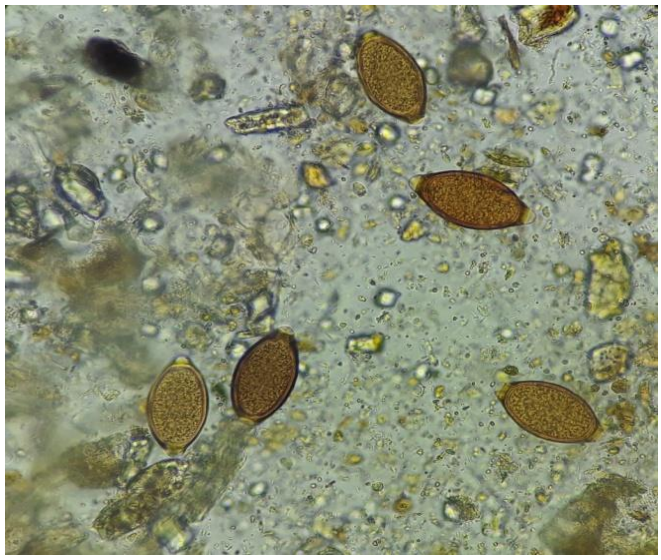

Fig 3: Eggs – Heavy presence of *Trichuris globulosa*

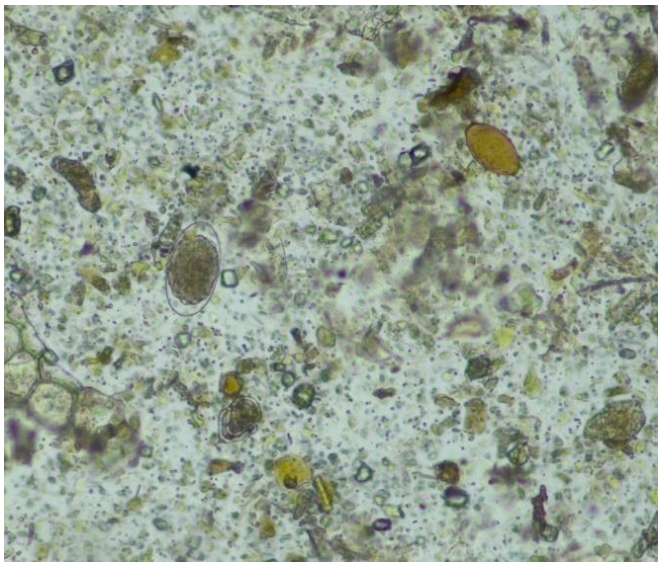

Fig 4: Eggs – Concomitant infection - *Trichuris globulosa* (Right) *and Trichostrongylus* spp (Left)

As a therapeutic measure, fenbendazole was given @ 20mg/kg b.wt as initial high dose with a follow up dose of 10mg/kg b.wt for twice in three weeks interval. The animal had an uneventful recovery after a month and coprology revealed negative for intestinal parasitic ova. Haemorrhagic colitis due to severe whipworm infection and suggested fenbendazole, a broad spectrum probenzimidazole anthelmintic as a therapeutic agent for treatment of gastrointestinal nematodes in camels [10].

Conclusion

The reduction in food intake, loss of productivity, diarrhea and also predisposition of animals to other infectious diseases were done to the host by the gastrointestinal helminthes. However, the clinical manifestation of helminthiosis will be subclinical or asymptomatic in which animals appear normal but the performance is not up to their full potential. So routine faecal examination and deworming should be carried out regularly in camel husbandry management similar to other livestock.

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