

# OCCURRENCE OF GASTROINTESTINAL HELMINTHS OF BACTRIAN CAMEL IN IRAN

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## ABSTRACT

A systemic study on naturally acquired gastrointestinal helminth parasites of bactrian camel was carried out in Ardabil province, northwest of Iran, which is the main site of this species in Iran. The low population of this species reveals the importance of this animal in Iran. A total of 25 faecal samples (25% of population) were examined by Clayton lane method to determine the egg count of different types of nematodes in different age groups. Nematode eggs were found in 13 (52%) of the faecal samples (0-191 eggs/gm,  $51.96 \pm 13.82$ ). Bactrian camels were infected with *Nematodirus* (32%), *Strongyloides* (16%), *Trichuris* (32%), *Marshallagia* (28%) and *Moniezia* (28%). The age of the infected bactrian camels was significantly higher than the non-infected camels ( $p < 0.01$ ) and there was a significant correlation between age and the intensity of infection ( $r = 0.583$ ,  $p = 0.002$ ). No significant difference was found between the 2 sexes in the ratio of the affected camels and in the intensity of infection. The results of the current study showed that helminthic infection is a serious problem in camel of Iran.

**Key words:** Bactrian camel, gastrointestinal helminthes, Iran

Parasitism has been introduced as one of the major problems affecting the productivity and performance of camels (Anwar and Khan, 1994). Although gastrointestinal helminths cause injury to their hosts through a wide variety of mechanisms, mainly, reduction in voluntary food intake, loss of productivity and diarrhoea, subclinical and asymptomatic helminthosis causes a decrease in the performance of animals without notable clinical manifestation (Borji *et al*, 2010). It has been suggested that regular anthelmintic treatment increases the productivity of camels (Ballweber, 2009). The study of the parasite species occurring in a host is of paramount importance for planning an efficient control program and to prevent economic loss due to parasitic infection.

There appears to be no or scarce information about the gastrointestinal parasites of the bactrian camel in Iran. This study was therefore, undertaken to provide information about the prevalence rate and type of helminths in this species in Iran.

## Materials and Methods

Faecal samples were collected directly from the rectum of 25 clinically healthy 2 humped camels (*Camelus bactrianus*) from different parts of Ardabil province during the rutting season, from February to

March 2009. Camels were of both sexes, with different ages and had no anthelmintic treatment in given the previous year. The samples were preserved in ice during transportation to the laboratory.

Faecal egg counts (egg per gram of faeces: EPG) were determined by the Clayton Lane technique using a saturated solution of sucrose as the floating medium to assess the level of infestation (Anon, 1977). Nematode egg percentage was identified using standard parasitological criteria (Anon, 1977; Soulsby, 1982).

Statistical analysis was performed using SPSS12 (Illinois, Chicago). The Chi-square test was used for comparison of the infection rate between the 2 sexes. Comparison of the infection rate between the age groups was performed using Fisher's exact tests. Two sample t-tests were used to detect differences in the age and EPG between the 2 sexes. Correlation of the EPG and age was analysed by Pearson's correlation test. Analysis of variance (ANOVA) test was used to compare the EPG between the different age groups of 2 humped camels. Differences were considered significant at  $p < 0.05$ .

## Results

Overall, 12 male and 13 female camels were sampled and 13 cases (52%) were found positive for

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different types of helminths eggs in their faeces (Table 1). The nematode eggs recovered from the camels belonged to *Nematodirus*, *Strongyloides*, *Trichuris*, *Marshallagia*, *Stongyle type nematodes*. *Moniezia* eggs were also observed in samples from 7 camels.

Mean EPG was  $51.96 \pm 13.82$  (0-191 eggs/gr). The average ages (mean $\pm$ SEM) of the male and female camels were  $7.5 \pm 1.76$  and  $8.57 \pm 1.18$  years, respectively. There were no significant differences between male and female camels in the age, infection rate and the severity of infection (EPG).

The average ages (mean $\pm$  SEM) of the infected and non-infected camels were  $11.54 \pm 1.17$  and  $4.29 \pm 0.84$  years, respectively. The age of the infected camels was significantly more than the non-infected camels ( $p < 0.01$ ) and there was a significant correlation between age and the severity of the infection ( $r = 0.583$ ,  $p = 0.002$ ). The type and prevalence of helminths recovered from the sampled camels are given in Table 2.

Camels were divided into 3 groups according to their age as,  $G_1 < 2$  years,  $2 \text{ years} < G_2 < 5$  years, and  $G_3 > 5$  years. In the  $G_1$  group, consisting of 4 camels, none of the sampled camels were infected. In the  $G_2$  group, which consisted of 5 camels, one camel was infected. In the  $G_3$  group, which consisted of 16 camels, parasite eggs were recovered from 12 camels. The infection rate of the  $G_3$  group was significantly

higher than the  $G_1$  and  $G_2$  groups ( $p = 0.014$  and  $p = 0.47$ , respectively).

## Discussion

The available information about camel helminthes in Iran consists of a few studies that have been conducted on gastrointestinal helminthes of dromedary camels.

According to our results, 52% of sampled bactrian camels were infected. The prevalence of gastrointestinal helminths in bactrian camels were lower than the reported prevalence of 75.1% in the dromedary camel in Iran (Borji *et al*, 2010).

The coprological examination of bactrian camels showed that *Nematodirus* and *Trichuris* egg types were the most prevalent. Some of the gastrointestinal nematodes are fairly specific for the camels, although others are shared with other domestic ruminants (Ballweber, 2009). It seems that infection with the same parasites is due to grazing on common pastures. Parasitic infection can affect the performance and productivity of camels or may even result in death (Anwar and Khan, 1994). On the other hand, camels may have a role in the distribution of parasites among other domestic ruminants.

Temperature and moisture are the most critical determinants for survival of the *Trichostrongyle* eggs and larvae on pasture. The current study

**Table 1.** The prevalence of gastrointestinal helminthes in Iranian bactrian camel (*Camelus bactrianus*).

	Number of camels	Number of infected camels	Mean EPG	Recovered eggs (Genus)
All sampled camels	25	13	$51.96 \pm 13.82$	<i>Nematodirus</i> , <i>strongyloides</i> , <i>Trichuris</i> , <i>Marshallagia</i> and <i>Moniezia</i>
Male camels	12	6	$44.66 \pm 18.73$	<i>Nematodirus</i> , <i>strongyloides</i> , <i>Trichuris</i> , <i>Marshallagia</i> and <i>Moniezia</i>
Female camels	13	7	$58.7 \pm 20.7$	<i>Nematodirus</i> , <i>Trichuris</i> , <i>Marshallagia</i> and <i>Moniezia</i>
G1 (<2 years)	4	0	–	–
G2 (2 years< and 5 years<)	5	1	–	<i>Nematodirus</i> , <i>strongyloides</i> , <i>Trichuris</i>
G3 (5 years<)	16	12	$72.75 \pm 18.16$	<i>Nematodirus</i> , <i>strongyloides</i> , <i>Trichuris</i> , <i>Marshallagia</i> and <i>Moniezia</i>

**Table 2.** Prevalence of gastrointestinal helminths parasites recovered from Iranian bactrian camel (*Camelus bactrianus*).

Helminths	The number of infected camels	Prevalence (%)	Maximum and minimum egg counts (Per gram)
<i>Nematorirus</i>	8	32	48-53
<i>Strongyloides</i>	4	16	1-10
<i>Trichuris</i>	8	32	69-75
<i>Marshallagia</i>	7	28	41-49
<i>Moniezia</i>	7	28	20-30

were the same as the results of Borji *et al* (2010) study on helminthes of dromedary camels in the northeast of Iran. Radfar *et al* (2006) reported *Moniezia*, *Haemonchus*, *Stilesia* and *Dictyocaulous* infection in the slaughtered dromedary camels in the central part of Iran, which is partially different from our results. Infections with cestodes of the genus *Moniezia* are common and widespread in camels.

According to our results, the average age of the infected bactrian camels was significantly higher than non-infected camels and there was a significant correlation between the age and the severity of infection. An age dependent acquiring resistance to gastrointestinal nematodes has been proved in some species (Silva *et al*, 1998). Our results did not show a similar age dependent resistance in bactrian camels in Iran.

### References

Anon (1977). Manual of veterinary parasitological laboratory techniques. Technical Bulletin No. 18. London, Ministry of Agriculture, Fisheries and Food. pp 129.

- Anwar AH and Khan MN (1994). Parasitic fauna of camel in Pakistan. Proc. 3rd Annual Meeting for Animal Production Under Arid Condition 2:69-76.
- Ballweber LR (2009). Ecto- and Endoparasites of New World Camelids. Veterinary Clinics of North America Food Animal Practice 25:295-310.
- Borji H, Razmi GR, Movassaghi AR, Naghibi A and Maleki M (2010). A study on gastrointestinal helminths of camels in Mashhad Abattoir, Iran. Iranian Journal of Veterinary Research 11:174-179.
- Radfar MH, Ebrahimi Maimand A and Sharify A (2006). A report on parasitic infections in camel (*Camelus dromedarius*) of Kerman slaughter house. Journal of Faculty of Veterinary Medicine University of Tehran 61:165-168.
- Silva WW, Bevilaqua CML and Costa AL (1998). Natural evolution of gastrointestinal nematodes in goats (*Capra hircus*) in the semi-arid ecosystem of the Paraiba backwoods, northeastern Brazil. Veterinary Parasitology 80:47-52.
- Soulsby EJJ (1982). Helminths Arthropods and Protozoa of Domesticated Animals. 7th Edn., London, Bailliere Tindall. pp 231-250.