

**INCIDENCE AND INTENSITY  
OF *ONCHOCERCA FASCIATA* Railliet and Henry, 1910  
in local camels in Saudi Arabia**

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**SUMMARY.** *Onchocerca fasciata* Railliet & Henry, 1910, which occurs in subcutaneous nodules, shows a site preference to the anterior parts of its host, *Camelus dromedarius* L., i.e. the nuchal ligaments, neck, and shoulders. Although the incidence of infection was generally high (59 %), the infected camels did not exhibit any apparent disease. The intensity of infection ranged between 2 and 29, with a mean of 10.8 nodules per infected host.

**Fréquence et intensité de l'*Onchocerca fasciata* Railliet et Henry, 1910 chez les dromadaires en Arabie Séoudite.**

**RÉSUMÉ.** L'*Onchocerca fasciata* Railliet et Henry, 1910 qui se trouve à l'intérieur des nodules sous-cutanés, préfère les parties antérieures du *Camelus dromedarius* L. Ce sont les ligaments de la nuque et les épaules qui constituent les principaux foyers de localisation. Les dromadaires atteints ne présentent pas de symptômes. Le nombre de nodules varie entre 2-29, soit 10,8 nodules en moyenne par dromadaire.

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## Introduction

Although camels make an important source of meat for human consumption in the Kingdom of Saudi Arabia, very little effort has been devoted to study their endoparasites. To my knowledge, the available studies include those of El Bihari and Kawasmeh, 1980 ; Bain and Nasher, 1981 ; Kawasmeh and El Bihari, 1983 ; and Cheema, El Bihari, Ashour, and Ali, 1984. As for camel onchocerciasis, Bain and Nasher (loc. cit.) recorded *O. fasciata* in Saudi camels when they presented the first complete description of the nematode. Later, Cheema *et al.* (loc. cit.) surveyed the prevalence, distribution of microfilaria, lesions, and histopathology of this species in local and imported camels in the country.

The present study was carried out to determine the incidence and intensity of infection of *O. fasciata* in local camels only.

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## Material and methods

The camels examined during this study were slaughtered at Abha Abbatoir during various months of the years 1980 and 1981. All were males, 5 to 6 years old, and were born in Southwestern Saudi Arabia. Each camel was carefully and thoroughly examined for *Onchocerca* nodules. When the latter were found, their position was noted, their number recorded, and were collected, fixed and preserved in 70 % alcohol. The nodules were then digested in 2.0 % pepsin solution at 37° C. Those which contained no worms were discarded.

## Results

Nodules containing adult *O. fasciata* were mainly recovered from the nuchal ligaments (*fig. 1*). However, a few were occasionally found in subcutaneous tissues of the neck sides and shoulders. A total of 617 nodules were collected from the infected animals. The majority of these nodules (593) ranged in diameter between 15 and 38 mm, and the remaining 24 were 4 to 6 mm in diameter.

Calcified, degenerating, and complete females were obtained from 352 (57 %), 92 (15 %), and 173 (28 %) nodules, respectively. Fifty nine males were recovered from the periphery of 31 (5 %) nodules.



FIG. 1. — Skinned camel neck showing normal position of *Onchocerca fasciata* nodule (needle tip).

The overall incidence of infection of *O. fasciata* in Saudi camels was 59 %. Statistical analysis of the results showed that the rate of infection was highly significant ( $t = 4.5146606$ ,  $P < 0.001$ ). The monthly incidence of infection was variable, the lowest (40 %) being in May, 1980, whereas the highest (71.4 %) was observed in September, 1981. However, these variations did not seem to be seasonal (Table I).

The monthly intensity of infection, or the number of nodules per infected host was generally comparable during most months of the study period (Table I).

All camels were externally examined before they were slaughtered. None of the infected ones showed any signs of disease, and all were as healthy as the non-infected ones.

TABLE I. — Summary of the incidence and intensity of *Onchocerca fasciata* in *Camelus dromedarius*.

Month	No. of Camels		No. of nodules/host	
	examined	infected	range	mean
V 1980	5	2 (40)	4-11	7.5
VIII 1980	6	4 (66.7)	2-8	5.5
X 1980	6	3 (50)	6-14	10.0
XI 1980	7	4 (57.1)	4-15	9.75
XII 1980	8	5 (62.5)	7-15	10.6
I 1981	7	4 (57.1)	6-14	10.5
II 1981	10	6 (60)	5-22	13.0
III 1981	6	4 (66.7)	4-16	9.75
IV 1981	8	5 (62.5)	5-20	10.8
V 1981	10	7 (70)	5-18	10.0
VI 1981	6	3 (50)	5-17	11.0
IX 1981	7	5 (71.4)	4-21	12.2
X 1981	12	6 (50)	5-29	13.5
TOTAL	98	(58 (59))	2-29	10.8

Numbers in brackets indicate percent of infection.

## Discussion

The finding of *O. fasciata* nodules in the anterior parts of its host, a case which was also reported by Bain and Nasher (1981) and by Cheema *et al.* (1984) may indicate a site specificity for this nematode.

The prevalence of *O. fasciata* in local camels observed during this study (59 %) was higher than that reported by Cheema *et al.* (1984), which was 34.2 %. However, the present figure represents the incidence of infection in one region, whilst that of the above authors is derived from pooled figures obtained from nine different localities. This result may indicate that the parasite is more prevalent in South-western Saudi Arabia in relation to other localities in the country.

The intensity of infection was variable. However, it is not unlikely that very small nodules might have been overlooked during the examination of the camels.

As was mentioned earlier, all of the camels examined belonged to the same age and sex groups (5-6 years old males). The flesh of older camels is rather tough, and female camels are usually preserved for breeding, therefore such animals are not slaughtered for human consumption.

No attempt was made to discover the vector insect for this parasite. Cheema *et al.* (1984), who dismissed the role of *Simulium* spp. as a possible vector, assumed that *Culicoides* spp. might be candidates. Their assumption was based on the records of Crosskey and Büttiker (1982) who reported *Simulium* spp. only in certain areas in Southwestern Saudi Arabia. The known distribution of *Culicoides* spp. in the country, however, is also limited, and is confined to a number of localities north of latitude 25° N (Lane, 1983). Therefore, unless thorough surveys of these insects are carried out all over the country, and substantial numbers of both *Simulium* and *Culicoides* species are tested as being potential vectors; it is rather unreliable to make any speculations. Such surveys may also help reveal the vector of *Onchocerca volvulus* in Saudi Arabia, since human onchocerciasis has been reported in the country (Chumbley, 1980 and El-Rifaie and El-Rifaie, 1984).

It is worth mentioning that El Sinnary and Hussein (1981) reported finding *Onchocerca gutturosa* in camels in the Sudan. This species was never encountered during the present study.

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