

## Fleas, lice and mites on scrub hares (*Lepus saxatilis*) in Northern and Eastern Transvaal and in KwaZulu-Natal, South Africa

J.P. LOUW<sup>1</sup>, I.G. HORAK<sup>1</sup>, M. LOUISE HORAK<sup>1</sup> and L.E.O. BRAACK<sup>2</sup>

### ABSTRACT

LOUW, J.P., HORAK, I.G., HORAK, M. LOUISE & BRAACK, L.E.O. 1995. Fleas, lice and mites on scrub hares (*Lepus saxatilis*) in Northern and Eastern Transvaal and in KwaZulu-Natal, South Africa. *Onderstepoort Journal of Veterinary Research*, 62:133–137

Fleas, lice and mites were collected from 24 and 120 scrub hares at Pafuri and Skukuza, Northern and Eastern Transvaal, respectively, in the Kruger National Park, and from 34 scrub hares in the Hluhluwe region, north-eastern KwaZulu-Natal. *Ctenocephalides felis damarensis*, the only flea recovered, reached peak burdens on the hares at each locality during late winter or spring. Juvenile hares harboured significantly fewer fleas than did adult animals. The lice *Haemodipsus lyriocephalus* and *Haemodipsus setoni* were collected from hares at each locality, with *H. setoni* generally being the most abundant. *Listrophorus leporicolus* was found on hares at Skukuza and Hluhluwe, and mites of the genus *Cheyletiella* were collected from hares at Skukuza.

**Keywords:** Fleas, lice, mites, scrub hares, *Lepus saxatilis*, Transvaal, KwaZulu-Natal

### INTRODUCTION

The fleas, lice and mites infesting scrub hares (*Lepus saxatilis*) at five localities situated in the north-east, south-east and south-west of South Africa have been recorded by Louw, Horak & Braack (1993). They found that the flea *Ctenocephalides felis damarensis* reached peak abundance on hares at four of these localities during late winter or spring. There appeared to be no correlation between the seasonal abundance of the flea and the non-seasonal breeding cycle of the hares in the Eastern Transvaal. They were also able to resolve some of the confusion surrounding the identities of the louse species infesting scrub hares in South Africa.

The present paper records the abundance of fleas and lice and the presence of mites on scrub hares at two localities not previously surveyed, namely Pafuri in far north-eastern Northern Transvaal, and around Hluhluwe in north-eastern KwaZulu-Natal. It also records the parasite burdens of scrub hares around Skukuza, Eastern Transvaal, a region previously surveyed by Louw *et al.* (1993).

### MATERIALS AND METHODS

Scrub hares were collected at the three localities according to the schedule in Table 1 and were processed for ectoparasite recovery as described by Horak & Fourie (1991). Fleas were mounted in lactophenol, left to clear sufficiently to make observation of the various structures possible, and examined with a standard microscope. They were identified according to the descriptions by De Meillon, Davis & Hardy (1961). Lice were placed on filter paper, allowed to dry, and examined under a stereoscopic microscope

<sup>1</sup> Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, Onderstepoort, 0110 South Africa

<sup>2</sup> Scientific Services, Kruger National Park, Skukuza, 1350 South Africa

Accepted for publication 19 June 1995—Editor

TABLE 1 The localities at which scrub hares were collected, duration of the collection periods and numbers of scrub hares examined

Locality	Coordinates	Veld type (Acocks 1988)	Collection period	Collection intervals	Number of scrub hares collected on each occasion	Total number of hares examined
North-eastern Northern Transvaal						
Pafuri	23°27'S, 31°19'E	Mixed Bushveld	March 1992–April 1993	Bimonthly	2–5	24
North-eastern Eastern Transvaal						
Skukuza	24°58'S, 31°36'E	Lowveld	August 1992–July 1994	Monthly	5	120
North-eastern KwaZulu-Natal						
Hluhluwe	28°07'S, 32°03'E	Zululand Thornveld and Lowveld	April 1993–March 1994	Bimonthly	1–7	34

TABLE 2 Total numbers of fleas and lice recovered from scrub hares at three localities in South Africa

Locality	Number of scrub hares examined	<i>Ctenocephalides felis damarensis</i>				<i>Haemodipsus</i> spp.	
		♂	♀	X	Total	<i>H. lyriocephalus</i>	<i>H. setoni</i>
Pafuri	24	117	191	19	327 (20)	1 (1)	569 (14)
Skukuza	120	371	522	133	1 026 (102)	1 (1)	350 (33)
Hluhluwe	34	170	330	82	582 (31)	9 (2)	9 (1)

X = number of fleas damaged and impossible to determine subspecies or sex

( ) = number of hares infested

capable of 75x magnification. The descriptions of Ferris (1932) were used to identify the lice.

The mean numbers of fleas collected from the scrub hares and the percentage of animals infested on each occasion were plotted to graphically depict seasonal abundance and prevalence of infestation, respectively.

Monthly mean maximum and minimum atmospheric temperatures and total monthly rainfall were recorded only at Skukuza.

## RESULTS

The total numbers of fleas and lice collected from the hares are summarized in Table 2.

*Ctenocephalides felis damarensis*, the only flea species recovered, and the lice, *Haemodipsus lyriocephalus* and *Haemodipsus setoni*, were present at each of the three localities.

The seasonal abundance and prevalence of the fleas on the hares at the three localities are illustrated in Fig. 1–3.

Fleas were present in their largest numbers during August 1992 at Pafuri (Fig. 1), October 1992 and September 1993 at Skukuza (Fig. 2) and September 1993 at Hluhluwe (Fig. 3). With the exception of the hares at Pafuri, and during March 1994 at Hluhluwe

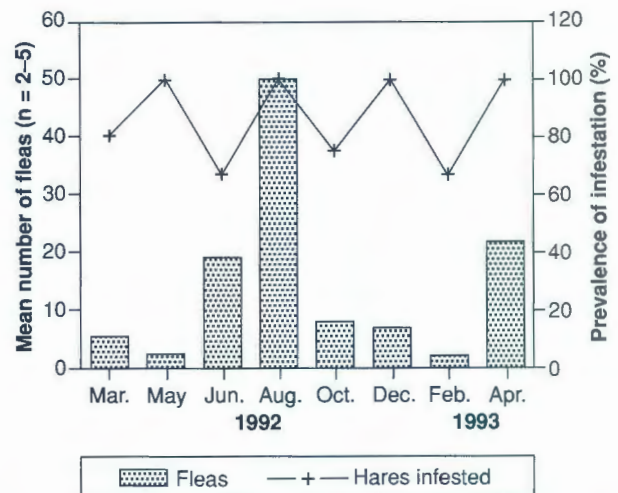


FIG. 1 The seasonal abundance and prevalence of *Ctenocephalides felis damarensis* on scrub hares at Pafuri, Kruger National Park, north-eastern Northern Transvaal

when only one hare was examined, the prevalence of flea infestations generally corresponded to their relative abundance.

No pattern of seasonal abundance was evident for the lice.

*Listrophorus leporicolus* was collected from nine hares at Skukuza and from 11 at Hluhluwe. Mites of the genus *Cheyletiella* were present on five hares at



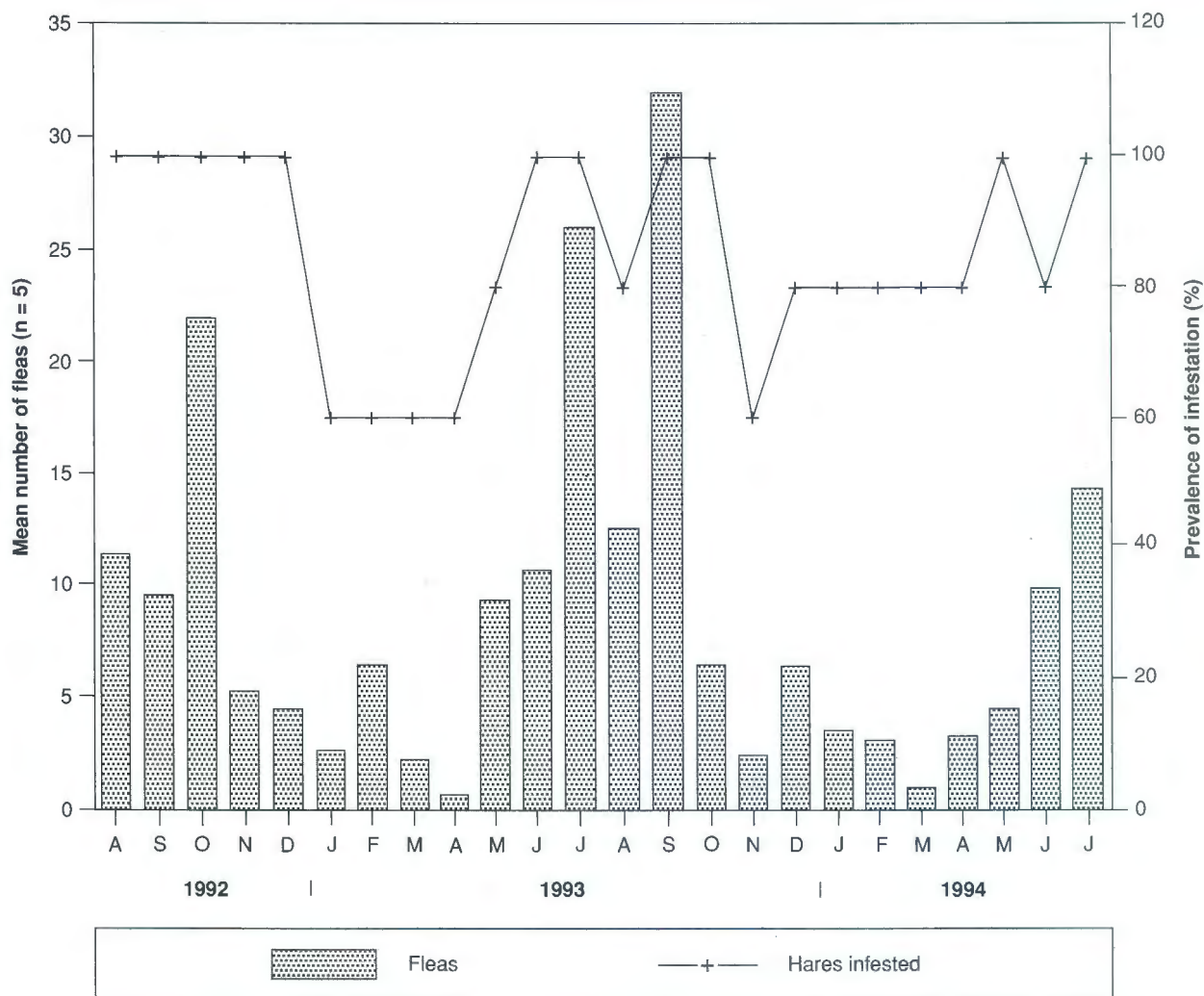


FIG. 2 The seasonal abundance and prevalence of *Ctenocephalides felis damarensis* on scrub hares around Skukuza, Kruger National Park, north-eastern Eastern Transvaal

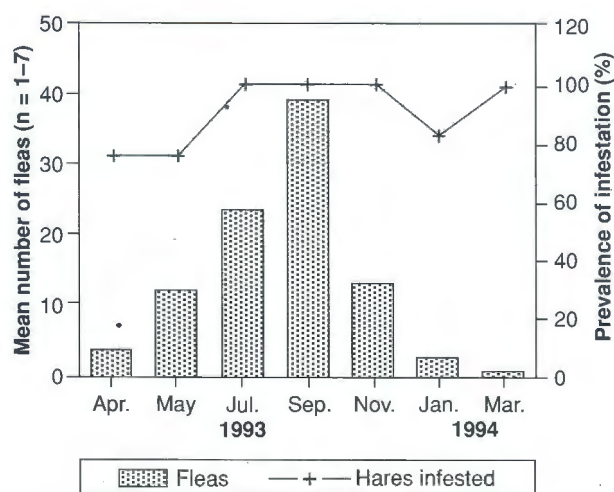


FIG. 3 The seasonal abundance and prevalence of *Ctenocephalides felis damarensis* on scrub hares around Hluhluwe, north-eastern KwaZulu-Natal

Skukuza. A specific diagnosis of this mite could not be made. No mites were recovered from hares at Pafuri.

The mean monthly maximum and minimum atmospheric temperatures and the total monthly rainfall recorded at Skukuza are graphically presented in Fig. 4. The highest mean maximum temperatures were recorded in December of both years, and the lowest minima in June 1993 and July 1994. Total rainfall from August 1992 to July 1993 was considerably higher than that during the corresponding period in 1993 and 1994.

### DISCUSSION

*Ctenocephalides felis damarensis* was the only flea recovered from scrub hares at the various localities. This is perhaps unusual because hares in the Hluhluwe area were collected from farms in close proximity

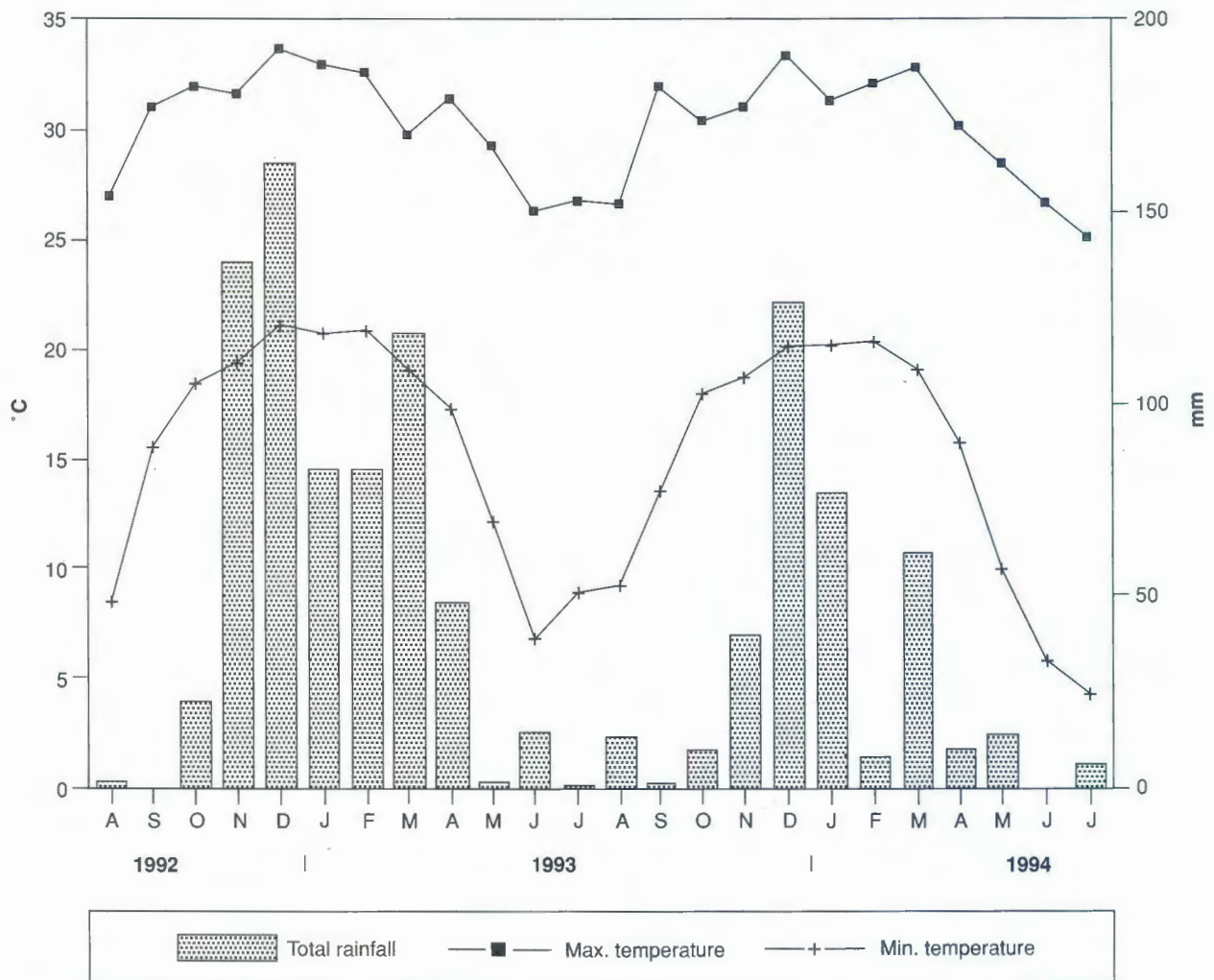


FIG. 4 Monthly mean maximum and minimum atmospheric temperatures and total monthly rainfall at Skukuza, Kruger National Park, north-eastern Eastern Transvaal

to human habitations where contact with fleas of domesticated animals was possible. In similar situations in Kenya and in the Eastern Cape Province, South Africa, hares were infested with *Echidnophaga gallinacea*, the stick-tight flea of chickens (Flux 1972; Louw *et al.* 1993).

The recovery of *C. felis damarensis* from scrub hares at yet two more localities (Pafuri and Hluhluwe), and this time in monospecific infestations, reinforces the opinion expressed by De Meillon *et al.* (1961) that this flea probably deserves the status of a species in its own right and not that of a subspecies of *C. felis*, the cat flea. If the findings in the present series of surveys and those conducted by Louw *et al.* (1993) are combined, the prevalence of *C. felis damarensis* on scrub hares varied between 63.6 and 91.2%, indicating that these animals must be regarded as preferred hosts of this flea.

The pattern of seasonal abundance of fleas in this study is similar to that reported for scrub hares at

other localities in South Africa (Louw *et al.* 1993). It is characterized by a rise in abundance and generally also in prevalence during winter and a peak during late winter or spring, followed by a sharp decline. In the Kruger National Park these are the cool, dry months (Fig. 4). In the Western Cape Province, where a similar pattern of seasonal abundance has been observed (Louw *et al.* 1993), these are the cool, wet months. This implies that fleas infesting scrub hares at these localities prefer the cooler months, or that the behaviour or resistance levels of hares during these months make them more prone to infestation.

According to Smithers (1983), scrub hares lie up in forms under bushes where there is some grass for additional shelter and they may return to the same form for a number of days. Flux (1972) states that these forms may be used continuously for a few weeks. This is more likely to happen during winter when they look for shelter against the cold, thus creating ideal conditions for reinfestation and thence an increase in flea numbers.



Juvenile hares, examined by Flux (1972) in Kenya, had fewer fleas than did adults. In this survey ten juvenile hares were examined at the three localities. Four of these harboured no fleas and the mean burden of the group comprised 2,3 fleas. Twenty-eight older hares were examined at the same times and at the same localities and only one of these harboured no fleas. The mean was 11,9 fleas. According to the Mann-Whitney U-test these differences were significant ( $P = 0,01$ ). It therefore seems that juvenile hares are either less susceptible to flea infestation or are not attractive to fleas.

At each of the seven localities in this and the earlier study conducted by Louw *et al.* (1993), in which the sexes of *C. felis damarensis*-infesting scrub hares were determined, female fleas outnumbered males. Subjecting the total flea population in these studies to a Chi-squared test, females (3116) outnumbered males (2117) significantly ( $P < 0,05$ ). Flux (1972) recorded 224 male and 460 female *Ctenocephalides felis strongylus* from hares he examined in Kenya and states that this sex ratio of approximately 1:2 seems normal. There are a number of possible explanations for the phenomenon. Firstly, there may be an inherent difference in the sex ratio, secondly, female fleas may live longer than males and, thirdly, male fleas may spend less time on their hosts than do females.

As in the previous study, only two louse species, *Haemodipsus lyriocephalus* and *Haemodipsus setoni*, were recovered from the hares (Louw *et al.* 1993). Both species were found at all localities, with *H. setoni* being the major species in the Kruger National Park. The level and prevalence of infestation with this louse were higher at Pafuri than at Skukuza.

## ACKNOWLEDGEMENTS

This study is part of the Wildlife Research Programme of the Faculty of Veterinary Science, University of Pretoria.

We wish to express our thanks to the National Parks Board of Trustees, who made the scrub hares in the Kruger National Park available, and to Messrs P.C. Hassard and C. Swanepoel, who placed hares on their farms at our disposal. Messrs André Uys and Stephen Horak assisted with the recovery of parasites from the processed material.

This research was funded by the Foundation for Research Development and Bayer Animal Health.

## REFERENCES

- ACOCKS, J.P.H. 1988. Veld types of South Africa with accompanying veld type map. 3rd ed. Memoirs of the Botanical Survey of South Africa, 57:146.
- DE MEILLON, B., DAVIS, D.H.S. & HARDY, FELICITY 1961. *Plague in southern Africa. 1. The Siphonaptera (excluding Ischnopsyllidae)*. Pretoria: Government Printer.
- FERRIS, G.F. 1932. Contributions toward a monograph of the sucking lice. V. *Stanford University Publications in Biological Science*, 2:273–413.
- FLUX, J.E. 1972. Seasonal and regional abundance of fleas on hares in Kenya. *Journal of the East Africa Natural History Society and National Museum*, 135:1–8.
- HORAK, I.G. & FOURIE, L.J. 1991. Parasites of domestic and wild animals in South Africa. XXIX. Ixodid ticks on hares in the Cape Province and on hares and red rock rabbits in the Orange Free State. *Onderstepoort Journal of Veterinary Research*, 58:261–270.
- LOUW, J.P., HORAK, I.G. & BRAACK, L.E.O. 1993. Fleas and lice on scrub hares (*Lepus saxatilis*) in South Africa. *Onderstepoort Journal for Veterinary Research*, 60:95–101.
- SMITHERS, R.H.N. 1983. *The mammals of the southern African subregion*. Pretoria: University of Pretoria.