

IXODID TICKS AND LICE INFESTING RED DUIKERS AND BUSHPIGS IN NORTH-EASTERN NATAL

I. G. HORAK⁽¹⁾, J. BOOMKER⁽²⁾ and J. R. B. FLAMAND⁽³⁾

ABSTRACT

HORAK, I. G., BOOMKER, J. & FLAMAND, J. R. B., 1991. Ixodid ticks and lice infesting red duikers and bushpigs in north-eastern Natal. *Onderstepoort Journal of Veterinary Research*, 58, 281–284 (1991)

Eighteen red duikers, *Cephalophus natalensis*, from the Charters Creek Nature Reserve and 2 from Fannies Island Nature Reserve were processed for arthropod parasite recovery. They harboured 8 species of ixodid ticks and 2 lice species. All were infested with *Haemaphysalis parvata* and the nymphs of *Rhipicephalus muelhensi*.

Two bushpigs, *Potamochoerus porcus*, from the Ndumu Nature Reserve, 5 from the Eastern Shores Nature Reserve and 1 from Cape Vidal were examined for ectoparasites. They were infested with 8 ixodid tick species, of which *Rhipicephalus maculatus* was the most abundant, and with 1 louse species.

INTRODUCTION

Red duikers, *Cephalophus natalensis*, are small antelope that are limited to the thick scrub and evergreen forests of the eastern parts of Natal and a small area on the southern slopes of the Soutpansberg in the northern Transvaal (Smithers, 1983). They are considered rare and their status is precarious because of the rapid destruction of their natural habitat (Smithers, 1983). Very little is known about their ecology, but Pienaar (1963) and Heinichen (1972) state that they occur either singly or in temporary pairs, or a female may be accompanied by her offspring. These shy, secretive browsers are found near permanent surface water.

Bushpigs, *Potamochoerus porcus*, are chiefly nocturnal animals that occur in groups, or sounders, of up to 40 individuals. Sounders consist of a dominant board and sow, other sows, juveniles and piglets. They are usually associated with dense vegetation growth, such as forests, thickets, reed beds or heavy cover of tall grass. Like warthogs, bushpigs wallow in mud, probably as a means of temperature regulation and as protection against biting insects. They root in the same way as warthogs, generally making less use of hard ground. In areas where they are hunted, feeding will not commence before late at night but where they are afforded protection, they may be seen in the late afternoon and early morning. They consume a wide variety of plant matter, including fruits, *Acacia* pods and roots, and are known to be attracted to carrion (Smithers, 1983).

The ticks infesting red duikers and bushpigs have been listed by Theiler (1962) and Baker & Keep (1970) and the lice by Ledger (1980). Total tick collections have been made from 3 red duikers in the Charters Creek Nature Reserve (Horak, Keep, Flamand & Boomker, 1988). Two studies on the total numbers of arthropod parasites harboured by warthogs, *Phacochoerus aethiopicus*, have been conducted in southern Africa (Horak, Biggs, Hanssen & Hanssen, 1983; Horak, Boomker, De Vos & Potgieter, 1988), but no such work exists for bushpigs.

The present paper describes the total tick and lice burdens of red duikers and bushpigs examined in the north-eastern Natal nature reserves.

MATERIALS AND METHODS

Survey localities

Charters Creek (28° 14' S, 32° 25' E, altitude 0–100 m) and Fannies Island (28° 07' S, 32° 27' E, altitude 0–100 m) are nature reserves situated on the western shores of Lake St Lucia. The Eastern Shores Nature Reserve (27° 51'–28° 25' S, 32° 20'–32° 40' E, altitude 0–30 m) occupies an area of approximately 250 km² at the southern end of the Mozambique coastal plain, between the Indian Ocean to the east and Lake St Lucia to the west. Cape Vidal (28° 08' S, 32° 33' E) is a camp situated on the sea shore in the Eastern Shores Nature Reserve, almost opposite Fannies Island.

All these localities form part of the greater St Lucia Nature Reserve, the vegetation of which is classified as the Zululand Palm Veld subdivision of Coastal Thornveld and Coastal communities (Acocks, 1988). The annual rainfall varies between 650 and 1 000 mm, most of which falls in summer. Summers are hot and humid and winters are mild. Frost seldom occurs.

Ndumu Game Reserve (26° 50'–26° 56' S, 32° 09'–32° 21' E, altitude 30–100 m) is situated in the extreme north of Natal and comprises an area approximately 11 000 ha in extent. It falls within the Lowveld subtype of Tropical Bush and Savannah (Acocks, 1988). The rainfall varies from 500 to 750 mm *per annum* and falls mostly in summer. Summers are hot and humid and winters are mild. Frost does not occur.

Survey animals

Eighteen red duikers were shot in the Charters Creek Nature Reserve and 2 in the Fannies Island Nature Reserve. Two bushpigs were shot in the Ndumu Nature Reserve, 5 in the Eastern Shores Nature Reserve and 1 at Cape Vidal.

Parasite recovery

The animals were all processed for ectoparasite recovery as described by Horak, Meltzer & De Vos (1982). All the material collected was examined under a stereoscopic microscope and the arthropods collected, identified and counted. The red duikers were also processed for the recovery of helminths and these have been recorded separately (Boomker, Horak & Flamand, 1991).

⁽¹⁾ Faculty of Veterinary Science, University of Pretoria, Onderstepoort 0110

⁽²⁾ Faculty of Veterinary Science, Medical University of Southern Africa, Medunsa 0204

⁽³⁾ Natal Parks Board, P.O. Box 456, Mtubatuba 3935

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TABLE 1 Arthropod parasites recovered from 20 red duikers in 2 north-eastern Natal nature reserves

Arthropod species	Total number of arthropods recovered					Number of animals infested
	Larvae	Nymphs	Males	Females	Total	
Ixodid ticks						
<i>Amblyomma marmoreum</i>	38	8	0	0	46	11
<i>Haemaphysalis leachi</i>	2	0	0	0	2	1
<i>Haemaphysalis parvata</i>	1 388	608	476	116(10)	2 588	20
* <i>Rhipicephalus</i> spp.	15 194	—	—	—	15 194	20
<i>Rhipicephalus appendiculatus</i>	—	2	2	0	4	2
<i>Rhipicephalus maculatus</i>	—	226	0	0	226	11
<i>Rhipicephalus muehlensi</i>	—	3 246	2	0	3 248	20
<i>Rhipicephalus evertsi evertsi</i>	42	22	0	0	64	2
<i>Rhipicephalus</i> sp. (near <i>R. oculatus</i>)	0	0	2	0	2	1
Lice						
		Nymphs		Adults	Total	
<i>Damalinia</i> sp.		894		398	1 292	9
<i>Linognathus</i> sp.		2 676		1 016	3 692	14

* Undifferentiated larvae of *R. appendiculatus*, *R. maculatus* and *R. muehlensi*, which are almost indistinguishable when partially engorged

() = Number of maturing female ticks that should detach within 24 h, i.e. idiosoma of *H. parvata* > 2,5 mm in length

TABLE 2 Arthropod parasites recovered from 8 bushpigs in 3 north-eastern Natal nature reserves

Arthropod species	Total number of arthropods recovered					Number of animals infested
	Larvae	Nymphs	Males	Females	Total	
Ixodid ticks						
<i>Amblyomma hebraeum</i>	2	2	6	2	12	3
<i>Haemaphysalis parvata</i>	6	2	0	0	8	1
<i>Rhipicephalus appendiculatus</i>	0	3	2	2	7	2
<i>Rhipicephalus follis</i>	0	0	2	12	14	1
<i>Rhipicephalus maculatus</i>	329	386	2 273	988(54)	3 976	8
<i>Rhipicephalus muehlensi</i>	0	43	0	2	45	3
<i>Rhipicephalus simus</i>	0	0	2	0	2	1
<i>Rhipicephalus zumpti</i>	0	0	81	58(8)	139	6
Lice						
		Nymphs		Adults	Total	
<i>Haematopinus latus</i>		186		114	300	4

() = Number of maturing female ticks that should detach within 24 h, i.e. idiosoma of *R. maculatus* and *R. zumpti* > 6,0 mm in length. The other female ticks had not yet reached this stage of maturation

RESULTS

Red duikers

The animals from the 2 reserves harboured the same parasite species in similar numbers and their burdens have been combined in Table 1.

The red duikers were infested with 8 ixodid tick species of which *Rhipicephalus* spp. larvae (*Rhipicephalus appendiculatus*, *Rhipicephalus maculatus* and *Rhipicephalus muehlensi*) were the most abundant and, together with all stages of development of *Haemaphysalis parvata* and the nymphs of *R. muehlensi* the most prevalent. No patterns of seasonal abundance could be established because the animals were not shot at regular intervals. Two lice species were also recovered.

Bushpigs

The parasite burdens of the bushpigs from the various localities have been combined and summarized in Table 2.

Eight species of ixodid ticks were recovered. Of these *R. maculatus* was the most abundant and prevalent. Four animals were infested with the louse *Haematopinus latus*.

DISCUSSION

The small size of red duikers and their habitat preference make them ideal hosts for the immature stages of many tick species. Their size also precludes them as hosts for adult ticks of many species as these

appear to prefer larger animals (Horak, Potgieter, Walker, De Vos & Boomker, 1983). In contrast bushpigs, like warthogs, carry few immature ticks and are mainly infested by adults (Horak, Boomker, De Vos & Potgieter, 1988). This could be due to host preference or the thickness of their hides or their grooming habits or a combination of all 3 factors.

With the exception of *Amblyomma hebraeum*, *R. appendiculatus* and *Rhipicephalus simus*, the tick species recovered from the bushpigs differed from those recovered from warthogs in the eastern Transvaal Lowveld (Horak, Boomker, De Vos & Potgieter, 1988). This, however, is related to the geographic distributions of the ticks rather than host preference.

***Amblyomma hebraeum*:** The immature stages of this tick have a particularly wide host range (Theiler, 1962; Horak, MacIvor, Petney & De Vos, 1987). Their virtual absence in the present survey and on common reedbuck, *Redunca arundinum*, examined in the same region (Horak, Keep, Flamand & Boomker, 1988) indicates that these reserves lie on the edge of this tick's distribution in this particular region.

***Amblyomma marmoreum*:** The adults feed almost exclusively on tortoises, while the immature stages can be found on many host species (Theiler, 1962; Norval, 1975; Horak, MacIvor, Petney & De Vos, 1987). The small numbers on the red duikers are thus not unexpected.

***Haemaphysalis parvata*:** The immature stages are not easily distinguishable from those of *Haemaphysalis silacea*, which also occurs in this region (Horak, Keep, Flamand & Boomker, 1988). Because we recovered the adults of only *H. parvata* in the present survey we have assigned the immature stages to this species as well.

Theiler (1962) states that *H. parvata* is a central and west African tick that ranges into the forested highlands of eastern Africa. She questions whether the only record for South Africa that she lists from Durban may not be due to a recent introduction. Horak, Keep, Flamand & Boomker (1988) surmised that it was more widespread than Theiler had thought and the present results confirm this. They felt that the bushbuck was a favoured host of this species, and red duikers must now also fall within this category.

***Rhipicephalus appendiculatus*:** Very few ticks of this species were recovered from common reedbuck in the Eastern Shores Nature Reserves, but fairly large numbers were present on these animals in the Charters Creek Reserve (Horak, Keep, Flamand & Boomker, 1988). Their virtual absence on the red duikers and bushpigs in the present survey could be due either to host preference or to the very dense vegetation both species prefer as habitat.

***Rhipicephalus follis*:** Although this tick is fairly widespread in the eastern half of the country (Horak, Keep, Spickett & Boomker, 1989; Horak, Fourie, Novellie & Williams, 1991), with the possible exception of eland, it is never encountered in large numbers (Horak *et al.*, 1991). Only 1 of the bushpigs was infested.

***Rhipicephalus maculatus*:** Buffaloes appear to be the preferred hosts of all stages of development (Horak *et al.*, 1983). The immature stages may also be found on red duikers, nyala, *Tragelaphus angasi*, and bushpigs (Baker & Keep, 1970; Horak, Potgieter, Walker, De Vos & Boomker, 1983). Judging by the present findings, the latter animals are also excellent hosts of the adults.

***Rhipicephalus muelhensi*:** Nyala are the preferred hosts of all stages of development (Horak, Potgieter, Walker, De Vos & Boomker, 1983). Red duikers, probably because they share the nyalas' habitat, may harbour large numbers of immatures. Even though bushpigs share the same habitat they harbour few specimens of this species.

Rhipicephalus simus prefers monogastric animals such as zebras, carnivores and warthogs (Horak, De Vos & De Klerk, 1984; Horak, Jacot Guillarmod, Moolman & De Vos, 1987; Horak, Boomker, De Vos & Potgieter, 1988). The small number recovered from only 1 of the bushpigs is probably more a reflection of the tick's geographic distribution than host preference.

***Rhipicephalus zumpti*:** Baker & Keep (1970) have recorded this tick from black rhinoceros in Natal. According to them it is prevalent in Mozambique, but rare in Zululand. However, Clifford & Anastos (1962) have synonymized *R. zumpti* with *Rhipicephalus reichenowi*, which in turn has been synonymized with *Rhipicephalus planus* (Morel, 1980). Nevertheless it may yet prove to be a valid species. The presence of *R. zumpti* on 6 of the 8 bushpigs not only indicates that they are preferred hosts, but that the tick might not be rare in the north-eastern regions of Natal and Zululand.

No specific identifications of the lice on the red duikers were made. *Damalinea* species have not previously been recorded from this host (Ledger, 1980). The *Linognathus* species recovered seemed to belong to the *L. breviceps* group, but there is controversy concerning the identities of lice belonging to this group (Ledger, 1980). *Haematopinus latus*, recovered from the bushpigs, fairly closely resembles *Haematopinus phacochoeri* which parasitizes warthogs (Ledger, 1980).

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