Ixodid ticks on domestic dogs in the Northern Cape Province of South Africa and in Namibia

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ABSTRACT

The objective of this study was to determine the species composition of ixodid ticks infesting domestic dogs in the northwestern region of the Northern Cape Province of South Africa and in Namibia. Ticks were collected from February 2008 to January 2009 from dogs presented for a variety of reasons at a veterinary clinic in the Northern Cape Province and at 3 clinics in Namibia. The ticks collected at each place were pooled separately for each month at each locality. Eleven ixodid tick species were collected from dogs in the Northern Cape Province and new locality records for *Haemaphysalis colesbergensis* and *Ixodes rubicundus,* new locality and host records for *Hyalomma glabrum,* and a new host record for *Rhipicephalus neumanni* are reported. Six tick species were collected from dogs at the 3 clinics in Namibia. The most numerous species on dogs in both countries was *R. sanguineus.* The present results increase the total number of ixodid tick species collected from dogs in South Africa from 25 to 28.

Keywords: dogs, ixodid ticks, Namibia, Northern Cape Province, South Africa.

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Surveys to determine the species composition, host spectrum and geographical distribution of ticks infesting domestic and wild animals in South Africa have been conducted since the 1940s. Because domestic dogs are readily available and usually easy to handle, they have been included in a large number of these surveys. Horak and co-workers collected a total of 25 tick species during 7 surveys conducted on dogs in South Africa[4,9,12,13,16,18,20]. The present surveys were initiated when a veterinarian in the Northern Cape Province and 3 in Namibia expressed their willingness to participate. No systematic surveys of the ticks infesting dogs have been conducted in these regions before.

The towns in which ticks were collected from dogs were Springbok (29°40′S, 17°52′E), Northern Cape Province, South Africa, and Rosh Pinah (27°58′S, 16°45′E), Mariental (24°37′S, 17°58′E) and Gobabis (22°26′S, 18°57′E) in Namibia. The veterinarians, or their assistants, collected ticks from dogs presented at their clinics for any of a variety of reasons from February 2008 to January 2009. Ticks were collected at Gobabis for only 7 months before the veterinarian involved moved to another locality. The ticks were stored in 70 % ethanol and those collected at each clinic were separately pooled for each month. The ticks were sent to the Faculty of Veterinary Science, University of Pretoria, where they were identified and counted under a stereoscopic microscope.

Eleven tick species, of which 3 have not previously been recorded on dogs, were collected in the Northern Cape Province (Table 1), increasing the number of species collected from dogs in South Africa to 28. Six species were taken from the dogs in Namibia (Table 2).

Four species belonging to the genus *Haemaphysalis* were identified on the dogs in the Northern Cape Province. *Haemaphysalis colesbergensis* has recently been described from domestic cats and a dog, caracals (*Caracal caracal*) and a wild cat (*Felis silvestris*) in arid Karoo-like regions of the Eastern, Western and Northern Cape provinces of South Africa[2]. The present collection from a dog in the northwestern Northern Cape Province extends the known geographical distribution of this tick. The arid climate and shrub-like vegetation in the Springbok region is not unlike that in the regions in which *H. colesbergensis* had previously been collected.

Haemaphysalis elliptica is one of the most regularly encountered ticks on domestic dogs and large wild felids in South Africa[12,14,16] and its status as a valid species

Table 1: **Ticks collected from domestic dogs at Springbok, Northern Cape Province, South Africa (February 2008 – January 2009).**

Tick species	Number of ticks collected				No. of months during which tick spp. were present
	NN	MM	FF	Total	
Haemaphysalis colesbergensis	0	1	2	3	1
Haemaphysalis elliptica	0	0	3	3	2
Haemaphysalis spinulosa	0	1	1	2	1
Haemaphysalis zumpti	0	5	32	37	5
Haemaphysalis sp.	0	0	1	1	1
Hyalomma glabrum	0	5	11	16	2
Hyalomma truncatum	0	4	4	8	4
Ixodes rubicundus	0	4	9	13	3
Rhipicentor nuttalli	0	1	6	7	4
Rhipicephalus gertrudae	0	2	5	7	4
Rhipicephalus neumanni	0	1	1	2	1
Rhipicephalus sanguineus	30	193	210	433*	12

NN = nymphs; MM = males; FF = females.
*Excluding 2 larvae.

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Table 2: **Ticks collected from domestic dogs at Rosh Pinah, Mariental and Gobabis, Namibia (February 2008 – January 2009).**

Tick species during which	Number of ticks collected				No. of months tick spp. were present
	NN	MM	FF	Total	
Haemaphysalis sp.	0	1	0	1	1
Hyalomma rufipes	1	0	0	1	1
Hyalomma truncatum	0	1	0	1	1
Rhipicentor nuttalli	0	0	1	1	1
Rhipicephalus follis	0	1	0	1	1
Rhipicephalus gertrudae	0	2	0	2	2
Rhipicephalus sanguineus	88	411	393	892*	12

NN = nymphs; MM = males; FF = females.
*Excluding 43 larvae.

distinct from *Haemaphysalis leachi,* with which it had been confused previously, has recently been confirmed[3]. Only 2 collections of *H. elliptica* were made from dogs in the Northern Cape Province, while none were made in Namibia. The taxonomic status of ticks identified as *H. spinulosa* in this and other surveys in South Africa is doubtful. The adults have been collected from dogs and cats and smaller species of wild carnivores[27]. *Haemaphysalis zumpti* infests smaller wild carnivores[27] and has also been encountered on domestic dogs[12,13].

Hyalomma glabrum has recently been reinstated as a valid species and is the only *Hyalomma* species with a strictly southern hemisphere distribution[1]. The adults (as *Hyalomma marginatum turanicum* as it was previously known) infest large wild and domestic herbivores and the immature stages infest hares and ground-frequenting birds[1,15]. Dogs are thus a new host record for this tick. Its geographical distribution (as *H. marginatum turanicum*) has previously been mapped[17] and the town of Springbok represents a new locality record, considerably to the north of the current most northwesterly record[11].

The collection of a nymph of *H. rufipes* from a dog in Namibia is unusual, in that the immature stages of this tick normally infest hares and ground-frequenting birds[10,25]. Although the adults of *H. truncatum* prefer large herbivores as hosts[15], they are fairly frequently encountered on dogs, on which they may cause extremely painful penetrating wounds[5].

Most early records of the adults of *Ixodes rubicundus* are from domestic and wild ruminants and caracals[11,16,23,27]. More recently, however, a total of 40 adult ticks were collected from domestic dogs in surveys in the Free State and Western Cape provinces, South Africa[12,18]. The presence of adult ticks on dogs at Springbok in the present survey should therefore not be considered unusual. Springbok lies to the northwest of the currently accepted distribution range of *I. rubicundus*[17,22] and can thus be considered a new locality record. The 3 collections from dogs at Springbok were made during the winter months of June, July and August, a seasonal pattern similar to that observed on sheep in the Northern Cape Province[11].

The adults of *Rhipicentor nuttalli* are apparently common on dogs in the Clanwilliam district of the Western Cape Province in late summer[24]. They have also been collected from various wild carnivores[14] and are also common on South African hedgehogs (*Atelerix frontalis*)[27]. Infestation of dogs may result in paralysis[21].

Rhipicephalus follis and *R. gertrudae* are similar morphologically and in their host preferences[28]. The adults infest large monogastric animals such as equids, suids, canids and felids, but are also encountered on cattle and sheep[7,11,12,15,27]. Their immature stages utilise murid rodents as hosts[6,19]. In the most recent comprehensive list of tick/host records for *R. gertrudae,* only 3 collections of adult ticks of this species were reported from domestic dogs[28]. Published records now exceed 80 collections.

The adults of *R. neumanni* attach to the feet of sheep (and probably other cloven-hooved animals) and this may lead to lameness in infested sheep[26]. Adult ticks have, however, apparently not previously been collected from domestic dogs[28].

In South Africa all stages of development of *R. sanguineus* feed on domestic dogs[28], and are associated with anthropogenic structures[8]. Infestations of other host species are rare, and probably only occur on animals closely associated with dogs or utilising the same sleeping quarters, or they could be mistaken identifications of *Rhipicephalus turanicus,* of which some specimens are remarkably similar to *R. sanguineus*[28]. The large number of collections currently recorded suggests that the dogs were confined to the properties of their owners or were chained or kennelled there at night[4]. The exceptionally large variety of tick species, other than *R. sanguineus,* collected at Springbok is an indication that a number of the dogs sampled there were from farms, or were allowed to roam fairly freely.

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REFERENCES

1. Apanaskevich D A, Horak I G 2006 The genus *Hyalomma* Koch, 1844. I. Reinstatement of *Hyalomma* (*Euhyalomma*) *glabrum* Delpy, 1949 (Acari, Ixodidae) as a valid species with a redescription of the adults, the first description of its immature stages and notes on its biology. *Onderstepoort Journal of Veterinary Research* 73: 1–12
2. Apanaskevich D A, Horak I G 2008 Two new species of African *Haemaphysalis* ticks (Acari: Ixodidae), carnivore parasites of the *H.* (*Rhipistoma*) *leachi* group. *Journal of Parasitology* 94: 594–607
3. Apanaskevich D A, Horak I G, Camicas J-L 2007 Redescription of *Haemaphysalis* (*Rhipistoma*) *elliptica* (Koch, 1844), an old taxon of the *Haemaphysalis* (*Rhipistoma*) *leachi* group from East and southern Africa, and of *Haemaphysalis* (*Rhipistoma*) *leachi* (Audouin, 1826) (Ixodida, Ixodidae). *Onderstepoort Journal of Veterinary Research* 74: 181–207
4. Bryson N R, Horak I G, Höhn E W, Louw J P 2000 Ectoparasites of dogs belonging to people in resource-poor communities in North West Province, South Africa. *Journal of the South African Veterinary Association* 71: 175–179
5. Burr E W 1983 Tick toxicosis in a crossbred terrier caused by *Hyalomma truncatum. Veterinary Record* 113: 260–261
6. Fourie L J, Horak I G, Van den Heever J J 1992 The relative host status of rock elephant shrews *Elephantulus myurus* and Namaqua rock mice *Aethomys namaquensis* for economically important ticks. *South African Journal of Zoology* 27: 108–114
7. Fourie L J, Kok D J, Heyne H 1996 Adult ixodid ticks on two cattle breeds in the south-western Free State, and their seasonal dynamics. *Onderstepoort Journal of Veterinary Research* 63: 19–23
8. Horak I G 1982 Parasites of domestic and wild animals in South Africa. XIV. The seasonal prevalence of *Rhipicephalus sanguineus* and *Ctenocephalides* spp. on kennelled dogs in Pretoria North. *Onderstepoort Journal of Veterinary Research* 49: 63–68
9. Horak I G 1995 Ixodid ticks collected at the Faculty of Veterinary Science, Onderstepoort, from dogs diagnosed with *Babesia canis* infection. *Journal of the South African Veterinary Association* 66: 170–171
10. 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
11. Horak I G, Fourie L J 1992 Parasites of domestic and wild animals in South Africa. XXXI. Adult ixodid ticks on sheep in the Cape Province and in the Orange Free State. *Onderstepoort Journal of Veterinary Research* 59: 275–283
12. Horak I G, Matthee S 2003 Parasites of domestic and wild animals in South Africa. XLIII. Ixodid ticks of domestic dogs and cats in the Western Cape Province. *Onderstepoort Journal of Veterinary Research* 70: 187–195
13. Horak I G, Emslie F R, Spickett A M 2001 Parasites of domestic and wild animals in South Africa. XL. Ticks on dogs belonging to people in rural communities and carnivore ticks on the vegetation. *Onderstepoort Journal of Veterinary Research* 68: 135–141
14. Horak I G, Braack L E O, Fourie L J, Walker J B 2000 Parasites of domestic and wild animals in South Africa. XXXVIII. Ixodid ticks collected from 23 wild carnivore species. *Onderstepoort Journal of Veterinary Research* 67: 239–250
15. Horak I G, Fourie L J, Novellie P A, Williams E J 1991 Parasites of domestic and wild animals in South Africa. XXVI. The mosaic of ixodid tick infestations on birds and mammals in the Mountain Zebra National Park. *Onderstepoort Journal of Veterinary Research* 58: 125–136
16. Horak I G, Jacot Guillarmod A, Moolman L C, De Vos V 1987 Parasites of domestic and wild animals in South Africa. XXII. Ixodid ticks on domestic dogs and on wild carnivores. *Onderstepoort Journal of Veterinary Research* 54: 573–580
17. Howell C J, Walker J B, Nevill E M 1978 Ticks, mites and insects infesting domestic animals in South Africa. Part 1. Descriptions and biology. Department of Agricultural Technical Services, Republic of South Africa. *Science Bulletin* No. 393
18. Jacobs P A H, Fourie L J, Kok D J, Horak I G 2001 Diversity, seasonality and sites of attachment of adult ixodid ticks on dogs in the central region of the Free State Province, South Africa. *Onderstepoort Journal of Veterinary Research* 68: 281–290
19. Matthee S, Horak I G, Beaucournu J-C, Durden L A, Ueckermann E A, McGeoch M A 2007 Epifaunistic arthropod parasites of the four-striped mouse, *Rhabdomys pumilio,* in the Western Cape Province, South Africa. *Journal of Parasitology* 93: 47–59
20. Nyangiwe N, Horak I G, Bryson N R 2006 Ixodid ticks on dogs in the eastern region of the Eastern Cape Province, South Africa. *Onderstepoort Journal of Veterinary Research* 73: 305–309
21. Perchman G E 1976 *Rhipicentor* infestation in the dog: a case report. *Rhodesian Veterinary Journal* 7: 15–16
22. Spickett A M, Heyne H 1988 A survey of Karoo tick paralysis in South Africa. *Onderstepoort Journal of Veterinary Research* 55: 89–92
23. Stampa S 1959 Tick paralysis in the Karoo areas of South Africa, *Onderstepoort Journal of Veterinary Research* 28: 169–227 + 1 map
24. Theiler G 1962 The Ixodoidea parasites of vertebrates in Africa south of the Sahara (Ethiopian region). Project S 9958. Report to the Director of Veterinary Services, Onderstepoort. 260 pp. Mimeographed
25. Van Niekerk J, Fourie L J, Horak I G 2006 Birds as hosts of immature ixodid ticks in Free State Province, South Africa. *Onderstepoort Journal of Veterinary Research* 73: 123–130
26. Walker J B 1990 Two new species of ticks from southern Africa whose adults parasitize the feet of ungulates: *Rhipicephalus lounsburyi* n. sp. and *Rhipicephalus neumanni* n. sp. (Ixodoidea, Ixodidae). *Onderstepoort Journal of Veterinary Research* 57: 57–75
27. Walker J B 1991 A review of the ixodid ticks (Acari, Ixodidae) occurring in southern Africa. *Onderstepoort Journal of Veterinary Research* 58: 81–105
28. Walker J B, Keirans J E, Horak I G 2000 *The genus* Rhipicephalus *(Acari, Ixodidae): a guide to the brown ticks of the world.* Cambridge University Press: Cambridge