

RESEARCH COMMUNICATION

Attachment preferences of *Hyalomma truncatum* and *Hyalomma marginatum rufipes* ticks (Acari: Ixodidae) on two sheep breeds

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ABSTRACT

FOURIE, L.J. & KOK, D.J. 1995. Attachment preferences of *Hyalomma truncatum* and *Hyalomma marginatum rufipes* ticks (Acari: Ixodidae) on two sheep breeds. *Onderstepoort Journal of Veterinary Research*, 62:211–213

Hyalomma ticks were collected from Merino and black-headed Dorper sheep and their attachment preferences determined. The preferred site of attachment for *Hyalomma marginatum rufipes* on both Dorper and Merino sheep was the anogenital and inguinal areas (75–76%). On Dorper sheep, *H. truncatum* attached predominantly to the anogenital and inguinal areas (67,7%). On Merino sheep, most adults of this species attached to the feet (26%). Almost equal percentages also attached to the anogenital/inguinal and brisket areas (21,6 and 22,9%, respectively). These differences should be considered when pour-on acaricides are applied to different breeds of sheep.

Keywords: Attachment preferences, *Hyalomma truncatum*, *Hyalomma marginatum rufipes*, sheep, ticks

INTRODUCTION

The results of four studies on ticks infesting sheep in South Africa showed that 25 tick species, belonging to eight genera, can infest these animals (Fourie, Horak & Marais 1988; Walker 1990; Horak, Williams & Van Schalkwyk 1991; Horak & Fourie 1992). Only eight species are considered to be of veterinary and economic importance (Fourie *et al.* 1988; Walker 1990). These are *Amblyomma hebraeum*, which can transmit *Cowdria ruminantium*, the cause of heartwater in sheep, goats and cattle (Howell, Walker & Nevill 1983); two *Hyalomma* spp. which, owing to their large

mouthparts, cause wounds that may be invaded either by bacteria, resulting in the formation of abscesses, lameness and footrot, or by the larvae of the screwworm, *Chrysomya bezziana* (Walker 1991); *Ixodes rubicundus* and *Rhipicephalus evertsi evertsi*, both of which transmit toxins which can cause paralysis (Gothe & Bezuidenhout 1986; Fourie, Petney, Horak, & De Jager 1989); *Rhipicephalus glabroscutatum* and *Rhipicephalus neumanni* which can cause foot abscesses and lameness (Maclvor & Horak 1987; Walker 1990), and *Rhipicephalus lounsburyi*, whose feeding adults are believed to have a deleterious effect on sheep (Walker 1990). Apart from *R. evertsi evertsi*, *Hyalomma marginatum rufipes* and *Hyalomma truncatum* are the most widely distributed ticks in South Africa.

Chemical control measures currently being employed for the control of ticks on sheep include the belly bath, spraying, plunge-dip and pour-on acaricide treatments (Spickett & Fivaz 1992). The latter is perhaps the most popular method in extensive farming systems in view of the ease of application and the fact that it is suitable for both winter and summer seasons. Published reports on pour-on acaricide treatments for sheep have indicated that the efficacy of the various compounds depends on their concentration, the volume used, the distribution of ticks on the sheep and the site of acaricide application (Henderson & Stevens 1987; Liebisch & Beder 1988).

In South Africa, the recommended site of application for all the pour-on compounds registered for use against the Karoo paralysis tick (*I. rubicundus*) is the ventral aspect of the sheep, where this tick generally attaches. Interspecific differences in the attachment sites of this tick on various host species have nevertheless been recorded (Fourie & Van Zyl 1991). Topical application of pour-on compounds, specifically on woolled sheep breeds such as the Merino, is not effective (Fourie, unpublished data 1991).

Published data on the attachment sites of *Hyalomma* spp. on different sheep breeds, are lacking. The aim of this study was to determine the preferred attachment sites of *H. marginatum rufipes* and *H. truncatum* on black-headed Dorper and Merino sheep. This would enable the efficacy of pour-on compounds to be maximized by applying them on or close to body areas where most of the ticks attach.

MATERIALS AND METHODS

The study was conducted on the farm Preezfontein, near Fauresmith in the south-western Free State, South Africa. Ticks were collected from Merino ($n = 20$) and black-headed Dorper ($n = 20$) sheep at approximately 14-day intervals from January 1992 to December 1994. Ticks were also collected from 10–30 Merino sheep at 14-day intervals from September 1993 to January 1994 on the farm Welbekend in the Jagersfontein area, south-western Free State. A single collection of ticks on about 40 black-headed Dorper sheep was done during April 1995 on the farm Sandtfontein near the town of Petrusville in the Northern Cape. The ages of the sheep from which ticks were sampled varied from 8–36 months. Ticks were located on nine body regions by careful visual examination, removed from each with forceps and placed in labelled vials for later identification and quantification.

The data are expressed as percentages. No distinction was made between male and female ticks. The sites of attachment of the two *Hyalomma* species, both within and between sheep breeds, were compared with the aid of a binomial test for proportions.

RESULTS

A total of 2103 *Hyalomma* ticks (907 *H. marginatum rufipes* and 1196 *H. truncatum*) were collected from the sheep. The percentage attachment of these two species on the various body regions is summarized in Table 1. In general, the differences in their sites of attachment varied significantly both within and between the two sheep breeds. The preferred site of attachment for *H. marginatum rufipes* on both Dorper and Merino sheep was the anogenital and inguinal areas (75–76%) followed by the hindleg (16%) for Dorper, and brisket (13,6%) for Merino sheep. On Dorper sheep, *H. truncatum* attached predominantly to the anogenital and inguinal areas (63,7%) followed by the feet (7,6%). On Merino sheep most *H. truncatum* ticks attached to the feet (26%). Almost equal percentages attached to the anogenital/inguinal and brisket areas (21,6 and 22,9%, respectively).

DISCUSSION

Several studies have already shown that interspecific differences in attachment sites for ticks exist between various breeds of domestic hosts (Evans 1952; Fourie & Van Zyl 1991) and between domestic hosts and natural hosts (Bloemer, Zimmerman & Fairbanks 1988). It has been inferred that the nature of the host pelage may influence the attachment-site preference of individual tick species (Fourie & Van Zyl 1991), as may the seasons (Evans 1952). Our results indicate that, especially in the case of *H. truncatum*, major differences exist between its attachment-site preferences in Dorper and Merino sheep. These differences should be considered when pour-on acaricides are applied to sheep of different breeds. The effects of season and host age on the sites of attachment of *Hyalomma* ticks to sheep should also be ascertained to maximize control efforts.

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TABLE 1 Percentage attachment of *Hyalomma marginatum rufipes* and *Hyalomma truncatum* ticks to various body regions of two sheep breeds. Groups divided by a solidus (for a particular attachment site) are not significantly different

Group	Head/neck	Anogenital/ inguinal	Brisket	Front leg	Hind leg	Udder	Belly	Flank	Feet
<i>H. marginatum rufipes</i>									
1. Dorper	0,0	76,1	3,1	0,4	16,0	2,1	1,5	0,0	0,8
2. Merino	0,5	75,6	13,6	2,6	2,1	2,1	0,0 ^b	0,2	3,3
<i>H. truncatum</i>									
3. Dorper	0,2	63,7	6,0	0,9	0,1	6,9	3,2	0,2	7,6
4. Merino	0,5	21,6	22,9	18,1	5,1	5,0	0,8	0,0	26,0
Statistical analysis	^a	1/2	^c	1/3; 2/3	^c	1/3; 3/4	1/3; 1/4	^a	^c

^a No statistical analysis conducted (sample sizes too small)

^b Excluded from statistical analysis

^c All groups significantly different ($P < 0,05$)

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