

IXODES (AFRIXODES) DRAKENSBERGENSIS N. SP. FROM DOMESTIC AND WILD ANIMALS IN NATAL, REPUBLIC OF SOUTH AFRICA

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ABSTRACT

CLIFFORD, C. M., THEILER, GERTRUD & BAKER, MAUREEN, 1975. *Ixodes (Afrixodes) drakensbergensis* n. sp. from domestic and wild animals in Natal, Republic of South Africa. *Onderstepoort J. vet. Res.* 42 (1), 33-40 (1975)

Ixodes (Afrixodes) drakensbergensis n. sp., is described from females, males, nymphs and larvae collected on a drag at Giant's Castle Nature Reserve, Natal, Republic of South Africa; it was also taken from an eland in the same area and from goats and a cow in the adjacent Tank Area 118. The occurrence of *I. (A.) drakensbergensis* on domestic animals suggests that it may be of economic importance in this area. Information is provided to separate the new species from other closely related *Ixodes* species that occur or may occur in this region.

INTRODUCTION

During the past few years several lots of ticks of the genus *Ixodes* have been collected from various places in Natal. Among those collected from two localities (Giant's Castle Nature Reserve and Tank Area 118) west of Pietermaritzburg, were males, females, nymphs and larvae which represent a new species, *Ixodes (A.) drakensbergensis*. This new species occurs on domestic stock and may prove to be of economic importance. In addition it resembles *I. pilosus* and *I. rubicundus*, which also occur in this region, and *I. cavipalpus*, which may do so, and thus creates a problem in the identification of these ticks from domestic and wild animals.

We provide detailed descriptions of all stages of *I. drakensbergensis* and information to allow its separation from other *Ixodes* species that occur or may occur in this area.

DESCRIPTION

Holotype ♀ from drag, Forest edge 1859 m, Giant's Castle Game Reserve, Natal, Republic of South Africa, 8-9-66, W. Trauseld (RML 62 654). Allotype and paratypes same data as for holotype. Holotype, allotype and paratypes deposited in the collection of the Veterinary Research Institute, Onderstepoort. Additional paratypes are in the Rocky Mountain Laboratory and British Museum (NH) collections. Data for additional specimens are given in Table 1 and the collecting localities are shown in Fig. 1.

All measurements in millimeters. Numbers in parenthesis following measurements indicate number of specimens included.

TABLE 1 *Ixodes (A.) drakensbergensis* from Natal, Republic of South Africa

No. ticks				Specific locality	Host or source	Date	Collector
L	N	♀	♂				
GIANT'S CASTLE							
47	13	14	15	—	Eland.....	28/6/66	W. Trauseld
57	35	8	12*	Forest edge 1 859 m.....	Drag.....	8/9/66	W. Trauseld
—	—	35	5	Grassland 1 920 m.....	Drag.....	8/9/66	W. Trauseld
31	24	1	3	Eastern gully 2 286 m.....	Drag.....	9/66	W. Trauseld
—	—	3	—	—	Drag.....	18/11/66	W. Trauseld
—	13	2	2	Gable gully 2 438 m.....	Drag.....	21/11/66	W. Trauseld
—	11	2	2	Forest edge 1 920 m.....	Drag.....	25/11/66	W. Trauseld
TANK AREA 118							
—	—	—	1	—	Bovine.....	8/6/65	M. Baker
3	—	3	1	—	Goat.....	29/6/65	M. Baker
—	—	—	1	—	Drag.....	27/7/65	M. Baker
—	—	1	—	—	Goat.....	10/8/65	M. Baker
—	1	—	—	—	Goat (ear).....	5/4/66	M. Baker
18	13	5	—	—	Goat (feet and legs)...	17/5/66	M. Baker
2	5	1	—	—	Goat (ear).....	17/5/66	M. Baker
—	—	1	1	—	Goat.....	17/5/66	M. Baker
1	—	4	1	—	Goat.....	28/6/66	M. Baker
4	—	—	—	—	Goat (muzzle).....	28/6/66	M. Baker
6	1	1	—	—	Goat (legs).....	28/6/66	M. Baker
1	2	8	3	—	—	—	M. Baker

* Type lot.

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FIG. 1 Distribution of *Ixodes (Afrinoxodes) drakensbergensis* n.sp. and other morphologically similar species

Female (Fig. 2-5)

Description based on unengorged holotype except where otherwise indicated. *Body*. 2,60 long (excluding capitulum), 1,50 wide; partially engorged specimen off goats 10,60 long, 7,20 wide. *Body setae* long, white, evenly distributed over entire idiosoma. *Capitulum*. Length from palpal apices to posterior margin of cornua 1,00; width at level of cornua 0,55. *Basis capituli* dorsally with lateral margins diverging, porose areas oval, separated by a distance of less than the width of 1 area; distinct cornua lacking, posterior margin gently concave. *Basis capituli* ventrally slightly constricted at midlength; *auriculae* distinct chisel-shaped structures extending posterolaterally; transverse suture present; posterior margin broadly rounded. *Palpi* ca. 3 times as long as wide, 0,64 long, 0,20 wide, segments 1 and 4 small, 2 larger than 3, combined length 0,59. *Hypostome* rounded, 0,53 long, 0,20 wide, dental formula 3/3 apically, then 2/2 to base, corona indefinite. *Scutum* 1,33 long, 1,30 wide. *Emargination* shallow. *Scapulae* short, pointed. *Lateral carinae* present as figured. *Cervical grooves* distinct, convergent anteriorly thence divergent, not reaching posterior scutal margin. *Puncta* small, scattered over scutal surface. *Setae* numerous and long, some equal in length to those on idiosoma, distribution as figured. *Legs*. Coxa I with small triangular internal spur, coxa IV with small external spur; coxae I-III with prominent syncoxal areas; each coxa with several long white setae. *Trochanters* I-IV each with small spur. *Tarsus* I 0,78 long, metatarsus I 0,45; tarsus IV 0,60, metatarsus IV 0,49. *Spiracular plate* nearly round, greatest diameter ca. 0,31. *Genital aperture* situated at level of coxae IV. *Anal groove* horseshoe-shaped.

Male (Fig. 6-9)

Description based on allotype male. *Body*. 2,18 long (excluding capitulum), 1,16 wide. *Outline* oval, inner margin of marginal body fold smooth. *Capitulum*. Length from palpal apices to posterior margin 0,48. *Basis capituli* width greatest near insertion of palpal segment 1, 0,29; lateral margins divergent; posterior margin broadly rounded, cornua absent. *Basis capituli* ventrally with concave posterior margin and diverging lateral margins; transverse ridge with mesial triangular lobe and 2 smaller triangular ridges laterally. *Palpi* short, broad, broadly rounded apically; 0,33 long, 0,16 wide; suture between segments 2 and 3 distinct. *Hypostome* 0,25 long; dentition from apex arranged as 4 to 5 transverse rows of 4/4 to 3/3 crenulations followed by a pair of strong, posterolaterally directed basal teeth. *Scutum* oval, 2,00 long, 1,03 wide. *Pseudoscutum* and *lateral carinae* absent. *Cervical grooves* distinct, parallel anteriorly and then diverge to level of ca. 1/3 of scutal length. *Puncta* small, numerous and randomly distributed over entire scutal surface. *Setae* long, white and scattered over entire dorsal body surface, longest and most numerous on marginal body fold. *Venter*. Median plate more than 3× as long as anal plate, other plates as figured. Numerous white setae scattered over entire ventral surface, these setae shorter than those on dorsal surface. *Legs*. Similar to ♀ with triangular internal spur on coxa I and small triangular external spur on coxa IV. Coxae I-III with strong syncoxal areas. *Trochanters* each with a small spur. *Tarsus* I 0,65 long, metatarsus I 0,30; tarsus IV 0,55 long, metatarsus IV 0,33. *Spiracular plate* oval, greatest diameter ca. 0,34. *Genital aperture* situated at level of coxa III. *Anal and genital grooves* as figured.

Nymph (Fig. 10 and 11)

Measurements based on 9 unengorged, mounted paratypes except where otherwise indicated. Information gained from the study of a series of unmounted paratypes is also included in the following description. *Body*. 0,107-0,250 long (excluding capitulum), 0,600-0,730 wide. Area posterior of scutum covered with numerous long white setae (ca. 0,170 long). *Capitulum*. Length from palpal apices to posterior margin of basis 0,250-2,295 width at level of cornua 0,195-0,230. *Basis capituli* dorsally with slight posterolaterally directed cornua. *Basis capituli* ventrally constricted near midlength, posterior margin broadly rounded; *auriculae* as prominent posterolaterally directed spurs. *Palpi* clavate, 0,215-0,260 long, segments 2 and 3 much longer than 1 and 4, their combined length 0,190-0,225 (2); segment 1 fused with basis, without protrusions. *Setae* segment 1 with 1 ventral; segment 2 with 3 ventral and 5 dorsal; segment 3 with 5 ventral and 8 dorsal; segment 4 with ca. 13. *Hypostome* rounded; length 0,145-0,165 (2); dental formula 3/3 at apex, then 2/2 to base, ca. 10 denticles in file 1, 9 in file 2 and 1-3 in file 3. *Scutum*. Outline as illustrated; 0,500-0,560 long (2), 0,490-0,600 wide (2). *Emargination* absent. *Scapular angles* small and blunt. *Surface* smooth with a few scattered hairs and puncta. *Setae* on scutum very short in relation to setae on idiosoma. *Lateral carinae* distinct. *Cervical grooves* distinct, almost parallel anteriorly, thence diverging slightly and almost reach the posterior scutal margin. *Legs*. Coxa I with moderate internal spur; Coxae II-IV each with distinct triangular external spur; internal margin of coxae II and III sclerotized, but definite spurs lacking; setae number 7 on I, 5 on II, 5 on III and 3 on IV.

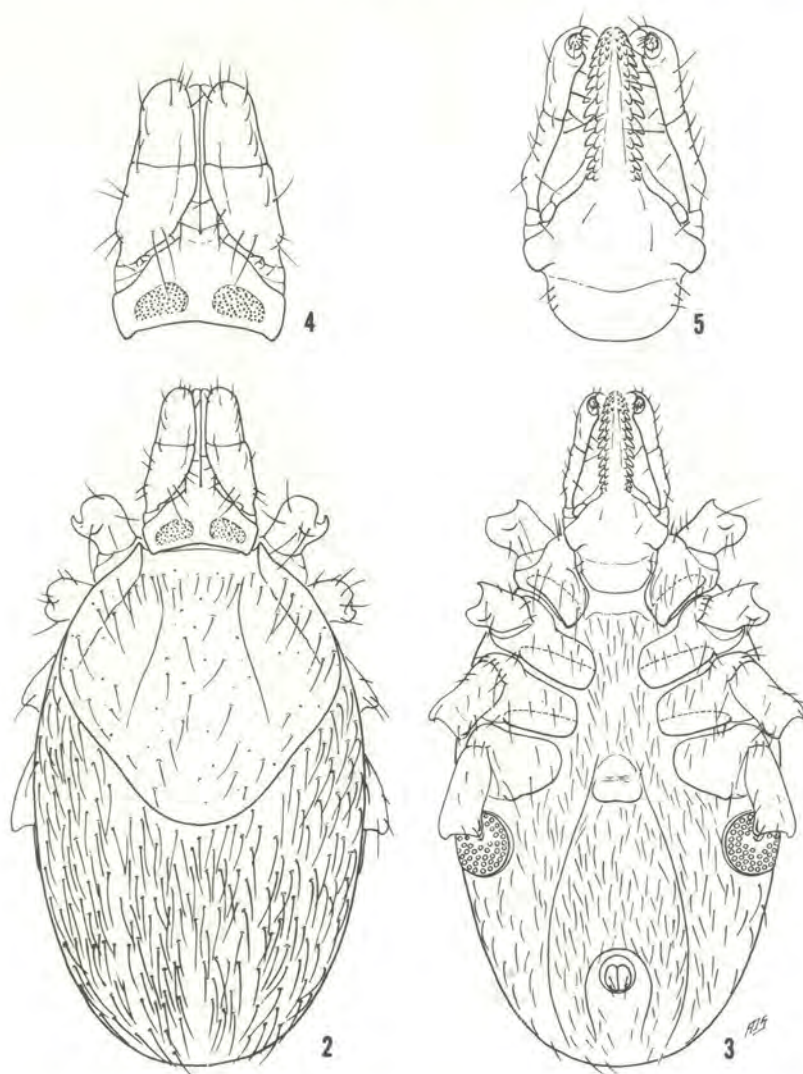


FIG. 2-5 *Ixodes (Afrixodes) drakensbergensis*, n.sp., ♀ (2,3) dorsal and ventral views; (3,4) capitulum, dorsal and ventral views

Tarsus I 0,370-0,420 long (8); metatarsus 0,160-0,195 long (8); tarsus IV 0,295-0,340 (7); metatarsus IV 0,200-0,230 (8). *Spiracular plate* rounded, greatest dimension ca. 0,152 (2). *Anal groove* horseshoe-shaped, arms do not reach posterior margin of body. Anal valves with 3 pairs of setae.

Larva (Fig. 12 and 13)

Terminology according to Clifford & Anastos (1960). *Body*. Oval, broadest near midlength; 0,510-0,560 long (12) (excluding capitulum), 0,400-0,450 wide (12). *Sensilla sagittiformia* absent. *Setae* 4 central dorsal pr, Cd₁ 0,074-0,096 (11), Cd₂ 0,040-0,056 (10); 9 marginal dorsal pr, Md, 0,084-0,108 (12); Mdg 0,040-0,056 (11); 3 supplementary pr; 3 sternal pr St, 0,038-0,054 (6); 3 preanal pr Pa₁ 0,040-0,044 (7); 8 premarginal pr; 4 marginal ventral pr, Mu₁ 0,048-0,060 (10). *Anal groove* indistinct, not encircling anus anteriorly. *Capitulum* triangular, 0,128-0,148 long (10); 0,112-0,118 wide (10). *Basis capituli* dorsally with posterior margin nearly straight; cornua absent. *Basis capituli* ventrally indented near midlength; posterior margin broadly rounded, auriculae as distinct posterolaterally directed projections. *Palpi* fusiform, 0,124-0,140 long (10), 0,040-0,048 broad (10); segments 2 and 3 fused, combined length 0,072-0,090; setae number 12-13 on segment 4;

1 ventrally, 6 dorsally on segment 3; 2 ventrally and 4 dorsally on segment 2, 0 on segment 1. *Hypostome* blunt, denticle portion 0,080-0,090 long (11), 0,040-0,060 wide (11); dental formula 3/3 apically, 2/2 to base, 7-8 denticles in file 1, 6-7 in file 2, 1-3 in file 3. *Posthypostomal setae* 2 pr, Ph₁ 0,019-0,028 (3), Ph₂ 0,021-0,032 (3); distance between setae of pr 1, 0,048-0,052 (4); between setae of pr 2, 0,035-0,044 (6). *Scutum*. Outline as illustrated; 0,220-0,290 long (12), 0,310-0,340 broad (12). *Cervical grooves* converging anteriorly, then diverging sharply nearly reaching the posterior scutal margin (seen best on unmounted specimens). *Setae* 4 pr. Sc_a 0,016-0,027 (10), Sc₄ 0,020-0,040 (10). *Sensilla* 5 pr plus 1 median. *Legs*. Coxa I with weak broadly rounded internal spur and small rounded external spur; II and III each with a sclerotized internal ridge and a small external spur; coxa I with 3 setae, II with 3 and III with 2. *Trochanters* lack spurs. Tarsus I 0,224-0,244 long (11); dorsally with 4 prehalleral and 6 posthalleral setae; ventrally and laterally with 3 groups of 4 setae each.

DISTRIBUTION (FIG. 1) AND HOSTS (TABLE 1)

I. drakensbergensis has been collected from 2 areas. First, Tank Area 118: 29° 35' S., 29° 50' E. Altitude 1 500-1 650 m. This is an overgrazed native

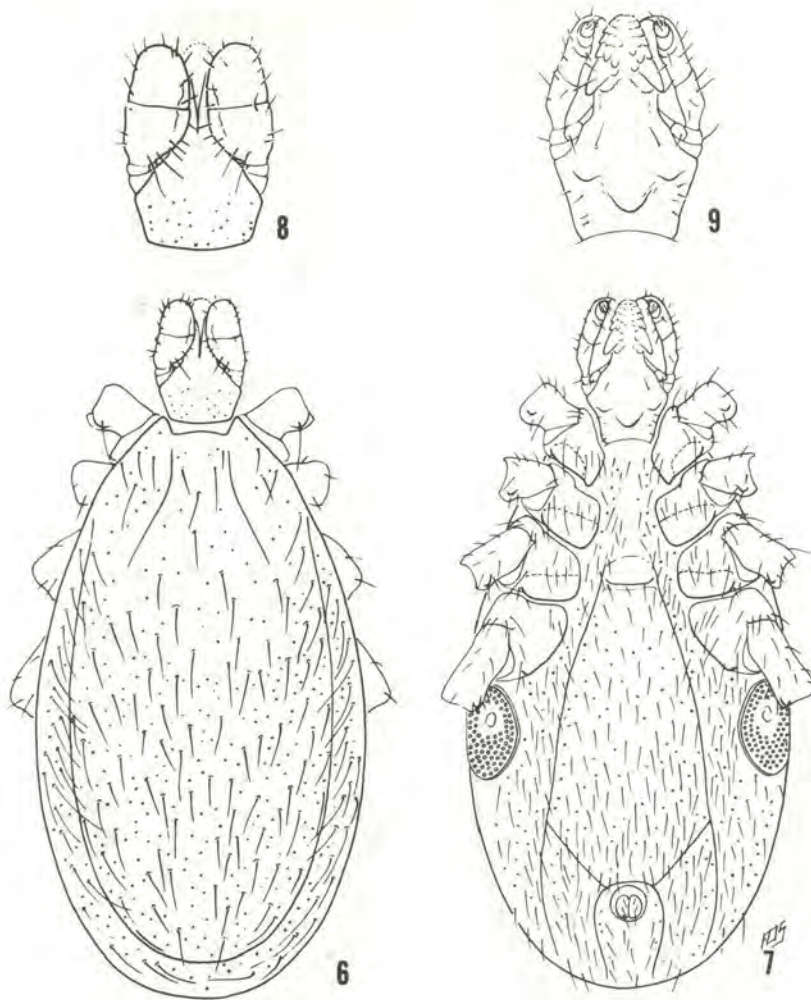


FIG. 6-9 *Ixodes (Afrixodes) drakensbergensis*, n.sp., ♂ (6,7) dorsal and ventral views, (8,9) capitulum, dorsal and ventral views

area with no cattle movements where regular dipping is practised. The winters are very harsh, with snow virtually every year, and the annual rainfall is 1 000-1 270 mm. There is short sour grass on the plateau with scrub brush grass on the hillside. There is no wild game, only hares and mice. Second, Giant's Castle Nature Reserve: 29° 16' S., 29° 30' E. Altitude varies between 1 350 and 2 750 m. The winters are very harsh with snow every year. The area is characterized by bare mountain crags, grass-covered plateaux and hillsides intersected by rivers and kloofs. Natural forest and scrub growth cover the kloofs and border part of the rivers.

It is of interest that specimens determined as *I. pilosus* have been recovered from dogs and by drags at Fitchet's farm "Good Hope," No. 962 (29° 38' S., 29° 58' E.), and from cattle at Lambert's farm "Keerom", No. 1190 (29° 50' S., 30° 14' E.). Altitude 1 200-1 350 m. The winters here are again harsh. Both these collecting areas are well managed dairy farms with extensive artificial pastures and good sour grass cover, intersected by a belt of dense natural forest abounding in rodents, hares and small antelopes. A single female of *I. pilosus* was also found in a lot from Giant's Castle Nature Reserve. *I. rubicundus* was recorded on an eland at the nearby Loteni Nature Reserve (29° 25' S., 29° 28' E., with physiography similar to that of Giant's Castle) which also

places this species in the general region. *Ixodes cavipalpus*, the other species which could be confused with *I. drakensbergensis*, has been reported from the Northern Transvaal and Rhodesia (Theiler, 1962).

Host information on the new species is incomplete. All active stages have been taken by dragging at both the Giant's Castle and Tank Area 118 locations and have in addition been found on goats in the latter area. The single record from an eland at Giant's Castle suggests that a much wider host range for *I. drakensbergensis* may be disclosed if more collections are made. The finding of all active stages of *I. drakensbergensis* on goats suggests a possible difference in the life-cycle of the new species from that of *I. pilosus*, *I. rubicundus* and *I. cavipalpus*. Host data available for the last 3 species indicate that adults feed on larger domestic and wild animals and the immature stages feed on a variety of small animals, often rodents. Small carnivores, the hyrax and rodents present in the area need to be checked as possible hosts for immatures of *I. drakensbergensis*.

SPECIES RELATIONSHIPS

The sources of the material used for comparison with *I. drakensbergensis* are as follows: *I. pilosus*—29♂, 39♀ off Springbok, Stellenbosch Dist., Cape Prov., 29 March 1971, C. Stuart, and nymphs and larvae reared by W. O. Neitz. Both lots were sent by

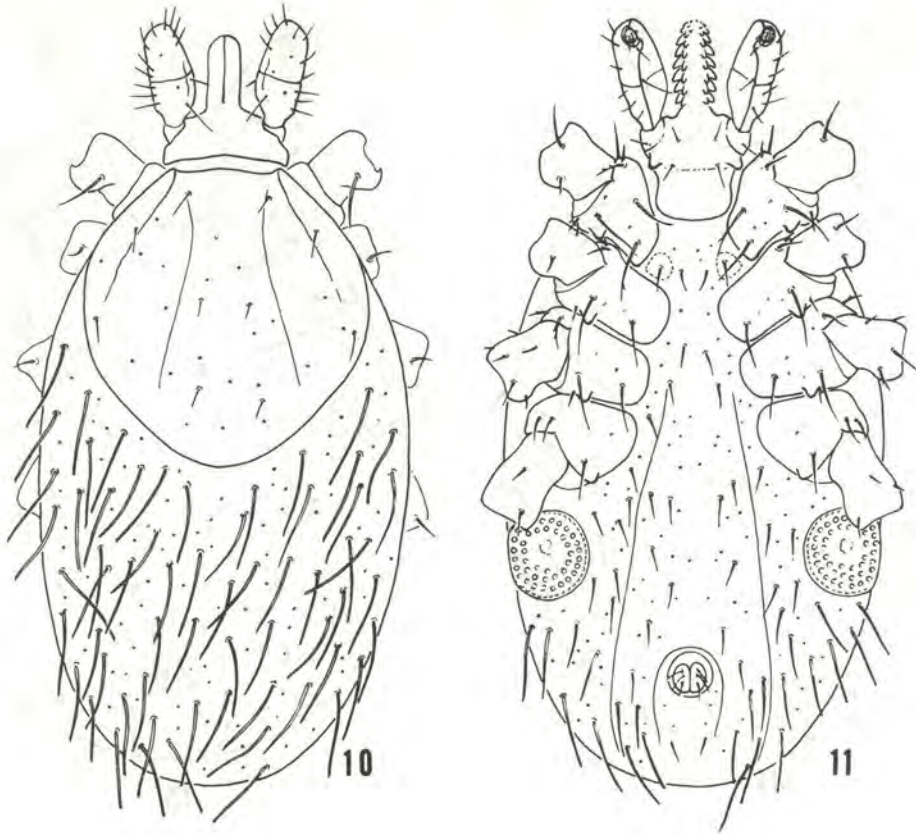


FIG. 10, 11 *Ixodes (Afrixodes) drakenbergensis*, n.sp., nymph, dorsal and ventral views

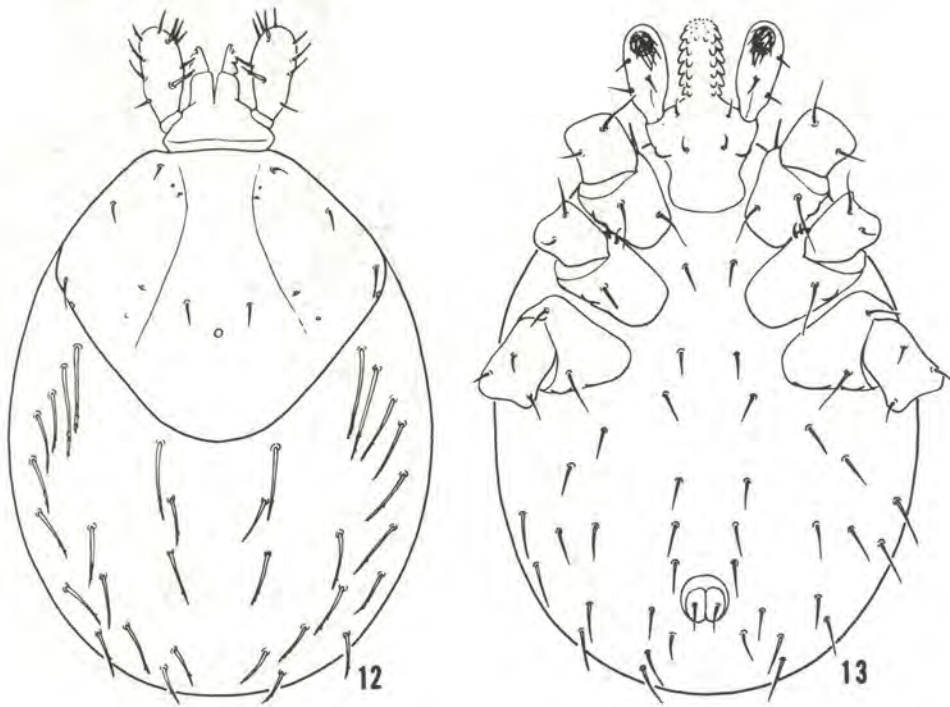


FIG. 12, 13 *Ixodes (Afrixodes) drakensbergensis*, n.sp., larva, dorsal and ventral views

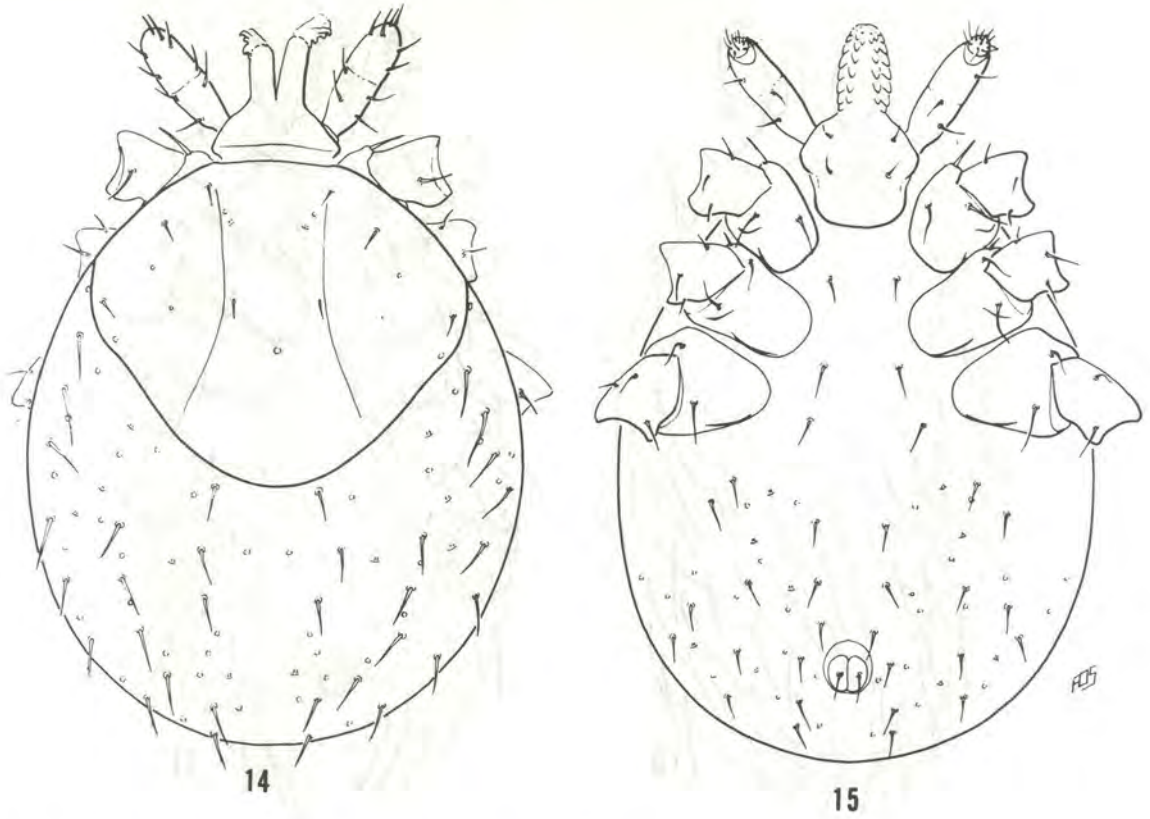


FIG. 14, 15 *Ixodes (Afrixodes) pilosus*, larva, dorsal and ventral views

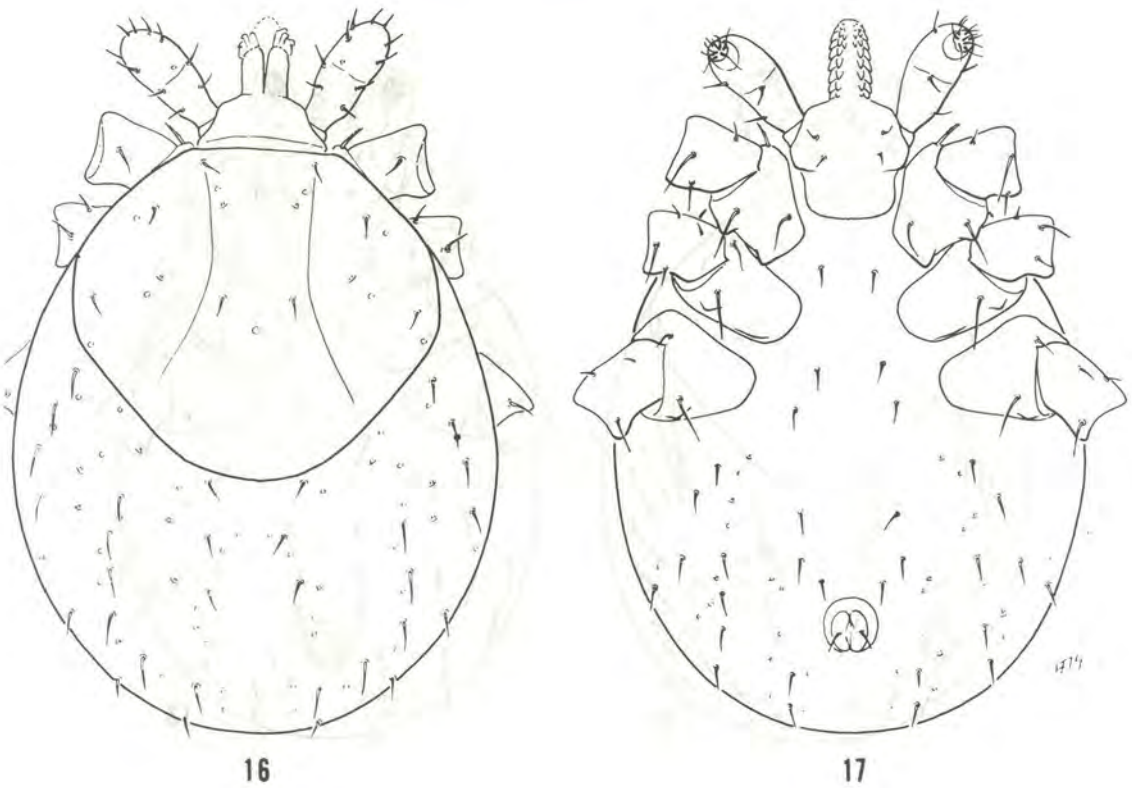


FIG. 16, 17 *Ixodes (Afrixodes) rubicundus*, larva, dorsal and ventral views

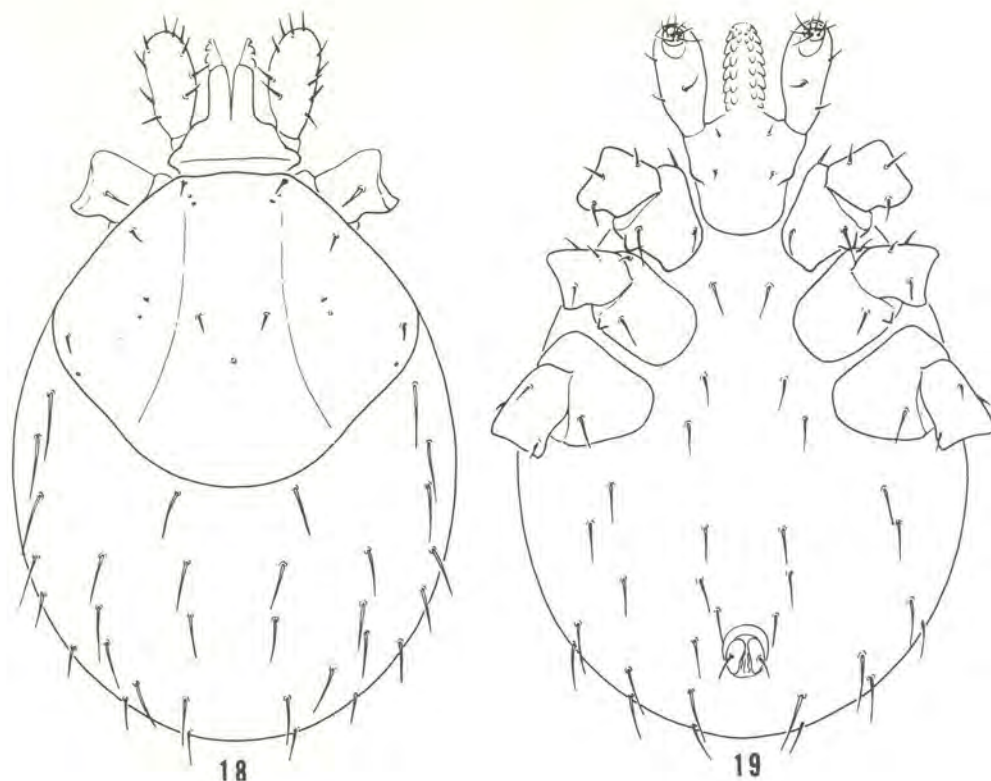


FIG. 18, 19 *Ixodes (Afrixodes) cavipalpus*, larva, dorsal and ventral views

Jane Walker (Onderstepoort Veterinary Research Laboratories). *I. rubicundus*—7♂, 5♀ off Cape wild cat, "Highland Home" farm, Robertson Dist., Cape Prov., 31 January 1969; 6♂, 2♀, 15 N, 21 L, reared at Onderstepoort by W. O. Neitz; and nymphs and larvae reared by W. O. Neitz.

I. cavipalpus—4♂, 8♀ from pasture and cattle, Salisbury area, Rhodesia; 6♀ off cows, Salisbury, Rhodesia, December 1960 and larvae reared by K. Jooste from a female collected near Salisbury.

Additional specimens of all these species were examined during this study; however, the above material furnished the basis for our comparison with *I. drakensbergensis*.

Females of *I. drakensbergensis* can be separated from those of *I. pilosus*, *I. rubicundus* and *I. cavipalpus* by the long setae on the anterior lateral margins of the scutum and the evenly distributed long setae on the idiosoma. *I. pilosus* also has long setae on the idiosoma, but they are distributed in two lateral patches and are shorter than those of the new species.

Males of the new species are also characterized by the numerous long setae on the dorsal body surface which are lacking in *I. pilosus*, *I. rubicundus* and *I. cavipalpus*.

Comparison of chaetotaxy is the easiest way to separate the immature stages of these 4 species. Nymphs of *I. drakensbergensis* have dorsal body setae that are nearly twice as long and numerous as those of *I. pilosus* and *I. rubicundus*. Nymphs of *I. cavipalpus* were not available for study. Although the number of body setae is similar in the larvae of all 4 species, those of *I. drakensbergensis* are longer

than those of *I. pilosus*, *I. rubicundus* or *I. cavipalpus* (compare Fig. 12–19). The difference in length is least between *I. drakensbergensis* and *I. cavipalpus*; therefore other features such as Cd_1 being longer than Cd_2 in *I. drakensbergensis* but about equal in length in *I. cavipalpus*, may be utilized.

In addition to chaetotaxic characters several other features will allow the separation of the various stages of these 4 species, i.e.:

Females.—Comparison of the shape of and structures on the scutum, the shape of the auriculae, the configuration of the anal grooves and a comparison of the coxal and trochanteral spurs. *Males*.—Shape of the body, shape of teeth on hypostomae and configuration of the transverse ridge on the basis venter. *Nymphs*.—Comparison of the shape of the scutum, basis capituli (dorsally) and the auriculae. *Larvae*.—Shape of the scutum and auriculae.

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