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NOTES ON AFRICAN HAEMAPHYSALIS TICKS. XIV. DESCRIPTION OF ADULTS OF *H. (RHIPISTOMA) PARALEACHI* SP. N., A CARNIVORE PARASITE OF THE *H. (R.) LEACHI* GROUP (IXODOIDEA: IXODIDAE)

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ABSTRACT: *Haemaphysalis (Rhipistoma) paraleachi* sp. n. is described from males and females taken from a civet, *Viverra civetta* (Schreber), in Cameroun. This tick is a large-sized member of the *H. (R.) leachi* group with a 5/5 or 6/6 dental formula; moderately long, curving ventral spurs of palpal segment 3; and numerous, mostly medium-sized scutal punctations. It is widely distributed in Africa. Adults parasitize small- and medium-sized carnivores. Immatures probably feed chiefly on rodents but cannot be identified with confidence until laboratory-reared samples from known parents are available for study.

Haemaphysalis (Rhipistoma) paraleachi sp. n. is described from adults taken from a civet, *Viverra civetta* (Schreber), in Cameroun. A member of the *leachi* subgroup of the *H. (R.) leachi* group of African carnivore parasites, this new species is related to *H. (R.) leachi* (Audouin) 1827, *H. (R.) moreli* Camicas, Hoogstraal, and El Kammah (1972), and *H. (R.) punctaleachi* Camicas, Hoogstraal, and El Kammah (1973).

Data are presented herein only for adult *H. (R.) paraleachi* parasitizing medium-sized carnivores in Africa. Immature stages probably feed chiefly on rodents but cannot be identified with confidence until laboratory-reared samples from known parents are available for study.

***Haemaphysalis (Rhipistoma) paraleachi* sp. n.**
Large African carnivore haemaphysaline
(Figs. 1-20)

Holotype: Male, from civet, *Viverra civetta* (Schreber), Nanga-Eboko (4°41'N, 12°22'E), 200 m altitude, Cameroun, 1956, P.-C. Morel (HH42,293); deposited in Rocky Mountain Laboratory (RML110,051).

Allotype: Female, data and depository as for holotype.

Paratypes: Total: 20♂, 4♀, with same collecting data as holotype and allotype. Paratypes are deposited in

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the collections of J.-L. Camicas (ORSTOM), P.-C. Morel, and the Rocky Mountain Laboratory.

DESCRIPTION

Male (Figs. 1, 2, 5-12)

Length from palpal apices to posterior body margin 3.48 to 3.99 (avg 3.81) mm; *breadth* 1.71 to 1.88 (avg 1.79) mm. *Color* brownish yellow.

Capitulum (Figs. 5-7): *Basis capituli* dorsally ca. 1.6 (1.5-1.8) times as broad (anteriorly) as long (including cornua), external margins straight or slightly diverging anteriorly; cornua elongately triangular, apices narrowly pointed, ca. 0.5 times as long as base of basis capituli. *Basis capituli* ventrally as illustrated, setae three to five pairs posteroexternal, one pair hypostomal. *Palpi* broadly salient (*leachi* type; dorsal external profile as in *leachi*); combined palpal breadth 2 times breadth of basis capituli; each palpus ca. 1.5 times as broad as long (from posterior margin of segment 2, excluding spur, to apex of segment 3). Segment 1 a narrow pedicle, minute dorsally, seta single ventrally. Segment 2 ca. 2.1 times as broad as long; posterodorsal margin proximally curving anteriorly, distally forming a sharply triangular, elevated, posteriorly directed spur with external profile continuing anteriorly in a diverging, mildly concave line to sharply pointed posteroexternal juncture; posteroventral margin proximally concave, distal spur elongately triangular, arising nearer insertion than dorsal spur; external profile longer than dorsally; internodorsal margin mildly bulging anteriorly; dorsointernal setae number one or two; ventrointernal setae number five to seven, fringed; dorsal and ventral setae number five and six, respectively. Segment 3 broadly triangular, 1.8 times as broad as long, ca. 0.6 times as long as 2; posterodorsal margin curving; ventral spur robust, slightly curving, bluntly pointed apex at ca. level of midlength of segment 2; setae five dorsally, four ventrally, three or four from interoventral margin posteriorly. *Hypostome* (Fig. 7) as long as or slightly longer than palpi, 1.9 to 2.1 times as long as broad; profile rectangular, apex broadly rounded; corona ca. 0.25 times as long as denticle files, hooklets dense. Dental formula 5/5 (17 specimens) or 5.5/5.5 (3 specimens), denticles in files of seven or eight.

Scutum (Fig. 1) 1.8 to 2.0 times as long as broad; anterior emargination broad, deep; scapulae pointed;

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margins convex to indentation at level of coxae II, thence mildly convex to level of spiracular plates (bordered by narrow area of soft integument), posteriorly rather narrow. *Lateral grooves* deep, distinct, extending anteriorly to level of coxae II, posteriorly enclosing one festoon (festoon 2 may be partially enclosed). *Cervical pits* narrow, deep, short, converging; *cervical grooves* shallow, diverging, length variable. *Punctations* numerous; mostly medium sized, discrete, well separated; some small, superficial; none in narrow posteromedian line. *Festoons* number 11.

Venter (Fig. 2) and *genital area* (Fig. 8) as illustrated. *Spiracular plates* (Fig. 9) 1.8 times as long as broad; outline subovate; dorsal projection triangular.

Legs (Figs. 1, 2, 10–12): *Coxae* (Fig. 10) I to IV spur each small, broadly triangular, extending somewhat beyond coxal margin; setae long, number (excluding anteroexternal group) 15 to 20 on I, eight to 12 each on II to IV. *Trochanter* I dorsal shield (Fig. 1) moderately large, triangular; trochanters ventrally (Fig. 10) lacking spurs. *Femur* IV (Fig. 11) ventrointernal setae number eight or nine, each ca. 0.6 times as long as breadth of femur at point of insertion. *Tarsi* (Fig. 12) II to IV short, stout; dorsal surfaces tapering from pseudosuture; ventral surfaces each with a small apical hook and a slight subproximal ridge. *Claws* size moderate. *Pulvilli* large, reaching curvature of claws.

Female (Figs. 3, 4, 13–20)

Differs from male chiefly in size and sexual characters. *Length* (unfed) 3.59 to 3.93 (avg. 3.87) mm; *breadth* 1.77 to 1.88 (avg. 1.82) mm.

Capitulum (Figs. 13–15): *Basis capituli* dorsally 2.5 times as broad as long (including cornua); external margins slightly diverging anteriorly; cornua broadly triangular, bluntly pointed, ca. 0.25 times as long as base of basis capituli; porose areas elongately oval, tilted, moderate sized, widely spaced. *Basis capituli* ventrally as illustrated. *Palpi* similar to those of male, except as follows. Combined palpal breadth 1.6 times breadth of basis capituli. Each palpus ca. 1.1 times as broad as long; external profile more elongate; apex narrower. Segment 2 posteroventral margin almost straight from insertion to ca. midbreadth, thence abruptly diverging (no spur) anteriorly to sharply pointed posteroexternal junction; external profile may be mildly convex; internodorsal margin more strongly bulging anteriorly, dorsointernal and ventrointernal setae number two or three and seven to nine, respectively. Segment 3 length and breadth equal; length equalling that of segment 2; ventral spur apex at or only slightly posterior to level of intersegmental suture. *Hypostome* (Fig. 15) dental formula 5/5 (3 specimens) or 6/6 (2); denticles in files of 10 to 12.

Scutum (Fig. 3) ca. 1.3 times as long as broad; anterior emargination broad, deep; scapulae pointed; margins diverging (convex) to level of coxae II, mildly converging to level of coxae III, posteriorly obtusely converging to narrow, rounded median area. *Cervical grooves* long, narrow, converging to level of coxae II, thence diverging. *Punctations* essentially as in male anteriorly but somewhat larger and deeper (small punctations rare or absent).

Dorsum (Fig. 3) and *venter* (Figs. 4, 16, 17) as illustrated. *Genital operculum* (Fig. 16) elongate, laterally subparallel, posteriorly rounded. *Spiracular plates* (Fig.

17) broadly subovate; dorsal projection broadly triangular.

Legs (Figs. 3, 4, 18–20) as in male, except as follows. *Coxae* III and IV spurs relatively somewhat larger; setae (excluding anteroexternal group) number ca. 14 on I, six to 10 each on II to IV.

Nymph and larva

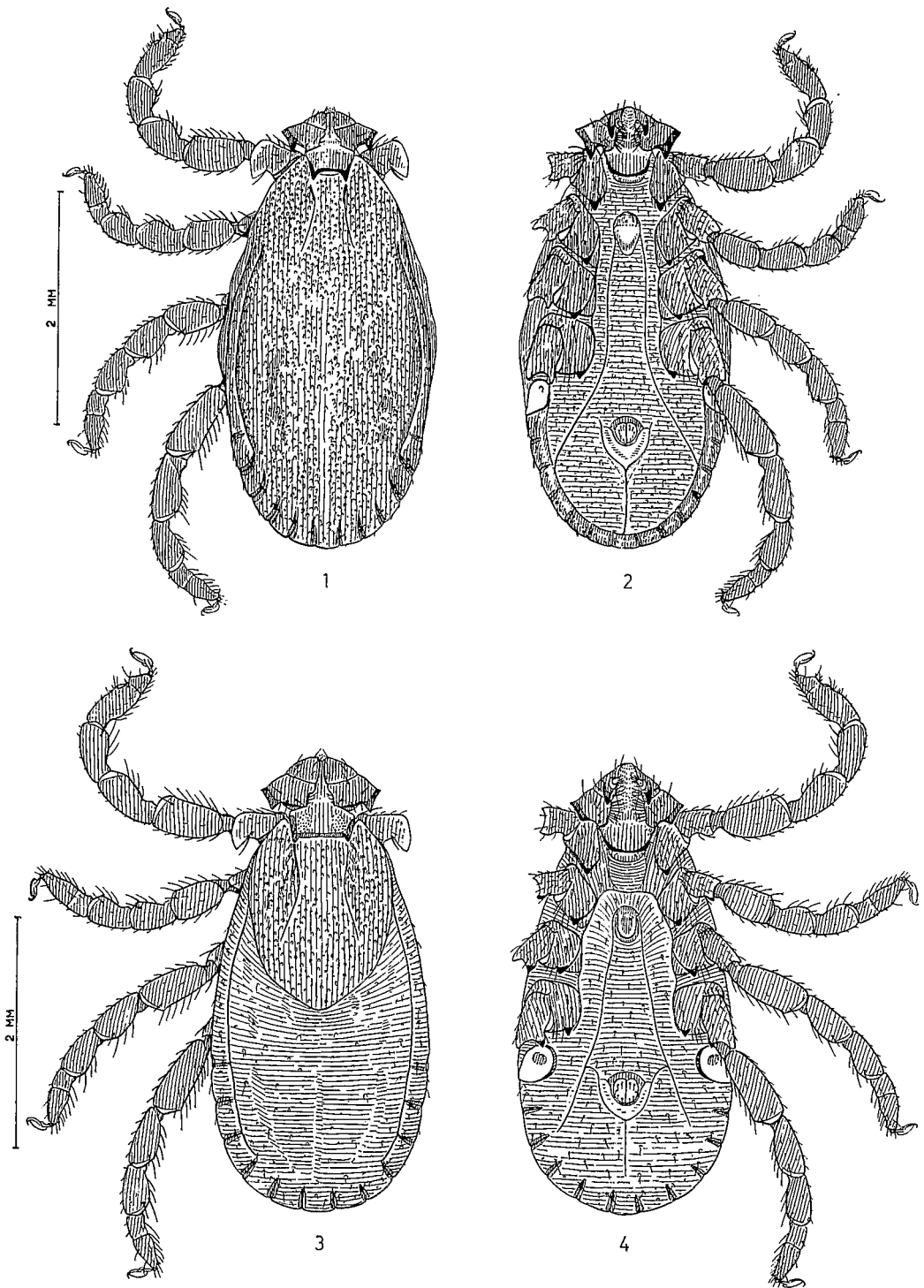
These stages are unknown from laboratory-reared materials, which are required for accurately associating immature and adult stages.

DIAGNOSIS (ADULTS)

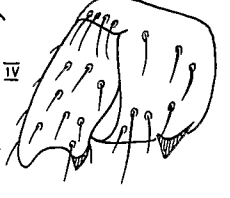
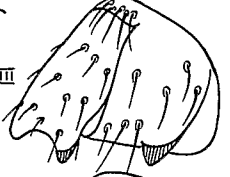
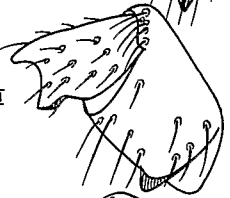
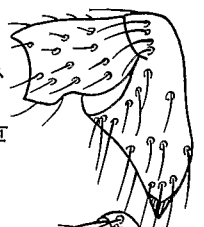
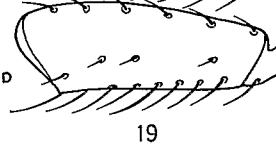
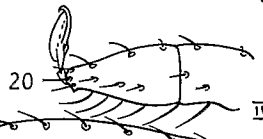
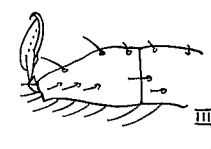
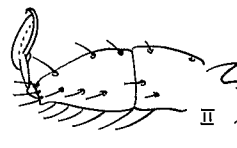
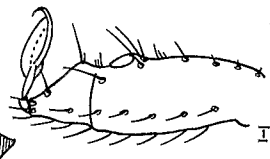
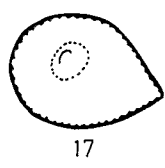
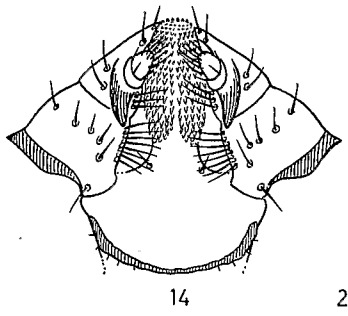
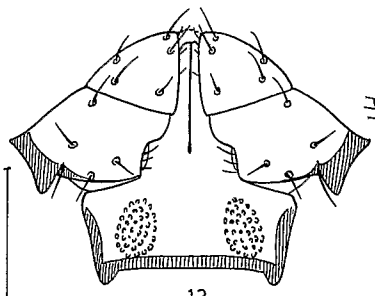
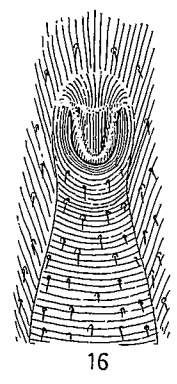
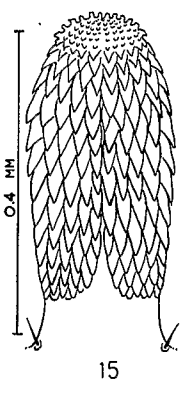
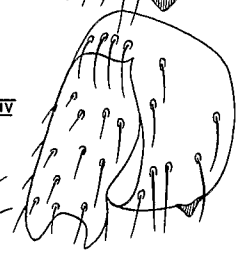
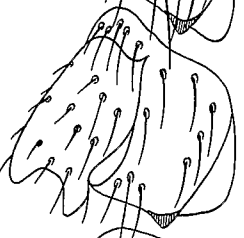
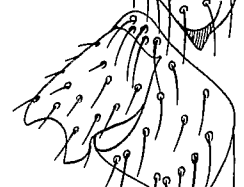
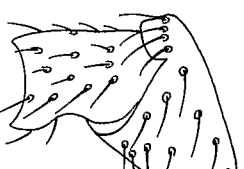
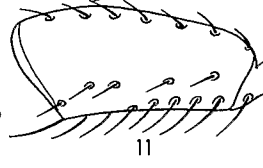
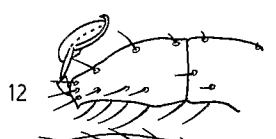
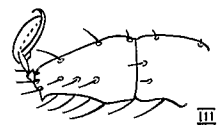
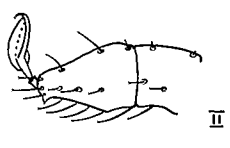
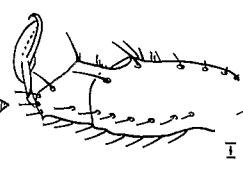
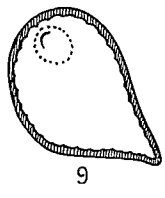
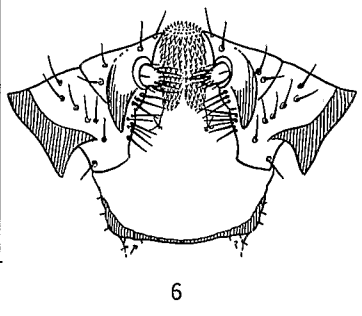
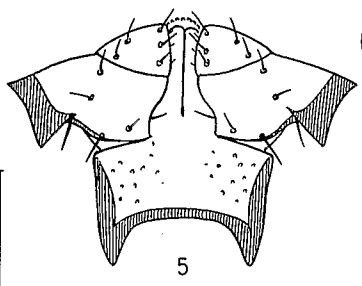
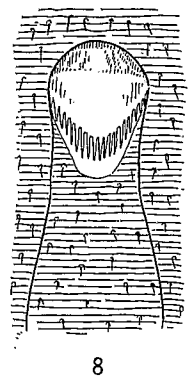
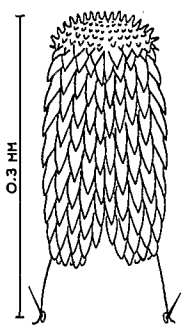
A large, elongate haemaphysaline (subgenus *Rhipistoma*; group *leachi*, subgroup *leachi*) (total length [mm]: ♂, avg. 3.81 [3.48–3.99], ♀, avg. 3.87 [3.59–3.93]; breadth: ♂, avg. 1.79 [1.71–1.88], ♀, avg. 1.82 [1.77 to 1.88]). *Basis capituli* dorsally ca. 1.6 (♂) or 2.5 (♀) times as broad as long; external margins essentially straight (♂) or slightly diverging anteriorly (♀); cornua elongately (♂) or broadly (♀) triangular, ca. 0.5 (♂) or 0.25 (♀) times as long as base of basis capituli; porose areas (♀) oval, tilted, widely spaced. *Palpi* broadly salient (*leachi* type), 2.0 (♂) or 1.6 (♀) times as broad as basis capituli; each palpus ca. 1.5 (♂) or 1.1 (♀) times as broad as long. Segment 1 ventral seta single. Segment 2 posterodorsal margin proximally curving anteriorly, distally as a large triangular spur; posteroventral margin (♂) proximally concave, medianly as a large spur or (♀) proximally almost straight, medianly abruptly diverging anteriorly; internodorsal margin anteriorly mildly (♂) or strongly (♀) bulging; dorsointernal setae number one or two (♂) or two or three (♀); ventrointernal setae number five to seven (♂) or seven to nine (♀). Segment 3 ca. 0.6 times as long as 2 (♂) or as long as 2 (♀); ventral spur robust, curving, bluntly pointed apex at midlength of segment 2 (♂) or near intersegmental suture (♀). Hypostome dental formula 5/5 or 5.5/5.5 (♂) or 5/5 or 6/6 (♀); denticles in files of seven or eight (♂) or 10 to 12 (♀). *Scutum* (♂) 1.8 to 2.0 times as long as broad; margins convex to indentation at level of coxae II, thence mildly convex to level of spiracular plates, posteriorly narrowly rounded; lateral grooves long, deep, enclosing one festoon (festoon 2 may be partially enclosed); punctations numerous, discrete, mostly medium size, some small, superficial. *Scutum* (♀) ca. 1.3 times as long as broad, margins convex to level of coxae II, mildly converging to level of coxae III, posteriorly obtusely converging to narrow, rounded median area; punctations as in ♂ but somewhat larger and deeper. *Genital operculum* (♀) elongate, posteriorly rounded. *Spiracular plates* subovate, dorsal projections triangular. *Coxa* I to IV spur each small, broadly triangular (III and IV spurs relatively larger in ♀); setae (excluding anteroventral group) on I number ca. 15 to 20 (♂) or ca. 14 (♀), on II to IV number eight to 12 (♂) or six to 10 (♀). *Femur* IV ventrointernal setae number eight to 10. *Tarsi* short, each with a small apicoventral hook. *Pulvilli* large, reaching curvature of claws.

RELATED SPECIES

Haemaphysalis (*R.*) *paraleachi* is easily differentiated from the three other species constituting the *leachi* subgroup of the *H. (R.) leachi* group (*leachi* [Hoogstraal, 1958], *moreli* [Cam-



FIGURES 1-20. *Haemaphysalis (Rhipistoma) paraleachi* sp. n., paratypes, Cameroun (HH42,293). 1, 2. Male, dorsal and ventral views; 3, 4. Female, dorsal and ventral views. 5, 6. Male capitulum, dorsal and ventral views. 7. Male hypostome, ventral view. 8. Male genital area. 9. Male spiracular plate (A = anterior; D = dorsal). 10. Male coxae and trochanters I to IV. 11. Male femur IV, internal view. 12. Male tarsi I to IV, external view. 13, 14. Female capitulum, dorsal and ventral views. 15. Female hypostome, ventral view. 16. Female genital area. 17. Female spiracular plate. 18. Female coxae and trochanters I to IV. 19. Female femur IV, internal view. 20. Female tarsi I to IV, external view.



icas et al., 1972], and *punctaleachi* [Camicas et al., 1973]) by the 5/6 or 6/6 dental formula (4/4 in other species) and by larger avg. size (mm) (δ : 3.8×1.8 [*paraleachi*], 2.6×1.2 [*leachi*], 2.0×0.9 [*moreli*], 2.7×1.3 [*punctaleachi*]).

In *leachi*, other characters differing from those in *paraleachi* are on the palpi (segment 3 ventral spurs longer), scutum (margins laterally subparallel in male, posteriorly more angular in female), punctations (larger and deeper in both sexes), spiracular plates (large, with small dorsal projections), and pulvilli (shorter).

In *punctaleachi*, other characters differing from those in *paraleachi* are on the basis capituli (external margins diverging), palpi (female segment 2 posteroventral margin broadly angular proximally, segment 3 ventral spurs straight, more acutely pointed in both sexes), and male scutum (broadly rounded posteriorly; punctations dense, only medium sized).

In *moreli*, other characters differing from those in *paraleachi* are on the palpi (segment 2 internodorsal margin strongly bulging in both sexes;

posterodorsal margin broadly triangular proximally; segment 3 posterodorsal margin forming an angular projection at internal juncture, this projection especially pronounced in female), male scutum (shagreened), female operculum (broadly subtriangular), spiracular plates (outlines differing), and legs (setae many fewer and shorter; coxae IV spurs reduced to rounded ridges; pulvilli shorter).

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