

NOTES ON AFRICAN *HAEMAPHYSALIS* TICKS. XV. *H. (RHIPISTOMA) NORVALI* SP. N., A HEDGEHOG PARASITE OF THE *H. (R.) SPINULOSA* GROUP IN ZIMBABWE (ACARINA: IXODIDAE)<sup>(1, 2)</sup>

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ABSTRACT

HOOGSTRAAL, H. & WASSEF, HILDA Y., 1983 Notes on African *Haemaphysalis* ticks. XV. *H. (Rhipistoma) norvali* sp. n., a hedgehog parasite of the *H. (R.) spinulosa* group in Zimbabwe (Acarina: Ixodidae). *Onderstepoort Journal of Veterinary Research*, 50, 183-189 (1983).

The male, female, nymph, and larva of *Haemaphysalis (Rhipistoma) norvali* sp. n., are described and compared with other members of the *H. (R.) spinulosa* group. Adult *H. (R.) norvali* parasitize the southern African hedgehog, *Erinaceus frontalis* Smith, in Matabeleland, Zimbabwe. Immatures were reared on a laboratory rabbit.

A tick related to *Haemaphysalis (Rhipistoma) spinulosa* Neumann (Hoogstraal, 1964) is described from adults parasitizing the southern African hedgehog, *Erinaceus frontalis* Smith, in Bulawayo District, Matabeleland, Zimbabwe. The immature stages are described from larvae and a nymph, reared on a laboratory rabbit, originating from eggs deposited by a female paratype. This species is named for the collector, R. Andrew I. Norval, in recognition of his superb contributions to the knowledge of ticks of southern Africa and their biomedical relationships.

*Haemaphysalis (Rhipistoma) norvali* sp. n.

Norval's southern African hedgehog haemaphysaline (Fig. 1-35)

Holotype

Male, from southern African hedgehog, *Erinaceus frontalis* Smith, Bulawayo (28°36'E, 20°12'S), Matabeleland, Zimbabwe, 4 February 1981, R. A. I. Norval (3712) (HH45,978). Deposited in the Rocky Mountain Laboratory, Hamilton, Montana, U.S.A. (RML116, 138).

Allotype

Female (slightly fed), data and depository as for holotype.

Paratypes

Total 37 ♂, 6 ♀, 1 nymph (N) (F), 21 larvae (L) (F); adults from the same host species in the Bulawayo District as holotype and allotype, and by the same collector.

With same data as holotype and allotype: 22 ♂, 1 ♀, 1 N, 21 L. From Matopos National Park, 8 March 1973: 8 ♂, 1 ♀ (HH45,975; RAIN2486). From Kumalo (28°30'E, 20°10'S), 23 September 1972: 2 ♂ (HH45,976; RAIN2491). From Victoria Falls road (28°30'E, 20°5'S), 24 January 1979: 5 ♂, 4 ♀ (HH45,977; RAIN2495). Paratypes are deposited in the collections of the Rocky Mountain Laboratory; Veterinary Research Laboratory, Harare, Zimbabwe; Veterinary Research Institute, Onderstepoort, Republic of South Africa; and Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM), Bondy, France.

DESCRIPTION

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

*Length* (20 specimens measured) from palpal apices to posterior scutal margin 1,61 to 1,99 (mean 1,84) mm; *breadth* 0,86 to 0,94 (mean 0,92) mm. *Colour* yellowish brown.

*Capitulum* (Fig. 5-7). *Basis capituli* dorsally 2,25 times as broad as long (including cornua); external margins diverging anteriorly; cornua small, c. ¼ as long as base of basis capituli, broadly triangular, apices blunt. *Basis capituli* ventrally as illustrated; setae minute, number 1 pair posthypostomal, 5 pairs external. *Palpi* broadly salient, combined breadth 1,75 times breadth of basis capituli; each palpus 1,1 times as long (including spur) as broad. Segment 1 dorsally a short, narrow pedicle, single seta adjacent to spur of segment 2; ventrally undifferentiated from segment 2, seta single. Segment 2 1,78 times as broad as long; posterodorsal margin essentially straight (mildly concave) from insertion to c. ⅔ of breadth, thence forming a short, broadly triangular spur; spur external margin continuing anteriorly to obtusely angled posteroexternal juncture; posteroventral margin forming a broadly triangular spur close to insertion, spur almost as long as posterodorsal spur; internodorsal margin broadly bulging anteriorly; dorsointernal setae number 2 (short); ventrointernal setae number 5-6; surface setae number 2 dorsally, 4 ventrally, 1 laterally. Segment 3 broadly subtriangular, apex more or less bluntly rounded; 1,4 times as broad as long, 0,8 times as long as 2; ventral spur apex blunt, at level of ⅓ of length of segment 2; setae number 4 dorsally, 1 ventrally, 2 laterally, 3 internoventrally posterior to insertion of segment 4. *Hypostome* (Fig. 7) shorter than palpi, c. 2 times as long as broad; apex gradually rounded; corona c. ½ as long as denticle files; dental formula 4/4, denticles in equal-length files of 6 or 7.

*Scutum* (Fig. 1) c. 1,8 times as long as broad; anterior emargination broad, moderately deep; scapulae bluntly angled; margins slightly broadening from scapulae to indented level of spiracular plates, thence gradually converging; posteriorly broadly rounded. *Cervical pits* small, deep. *Cervical grooves* short, shallow or obsolete. *Lateral grooves* narrow, distinct, extending to level of coxa III, enclosing 1 festoon. *Punctations* moderately numerous (as illustrated) irregularly scattered, small, obscure, a few with a minute seta. *Festoons* number 11.

*Venter* (Fig. 2, 8, 9) integumental setiferous punctations scattered as illustrated. *Genital area* (Fig. 8) as illustrated. *Spiracular plates* (Fig. 9) subrectangular, junctures rounded, c. 1,2 times as long as broad; dorsal projection elongately triangular, apex blunt.

*Legs* (Fig. 1, 2, 10-12) size moderate. *Coxa* (Fig. 10) I to IV spurs short, broadly triangular, extending only slightly beyond coxal margins; I and II spurs somewhat larger than III and IV spurs; setae long, number (excluding anteroexternal group) c. 13, 10, 12, 10 on I-IV,

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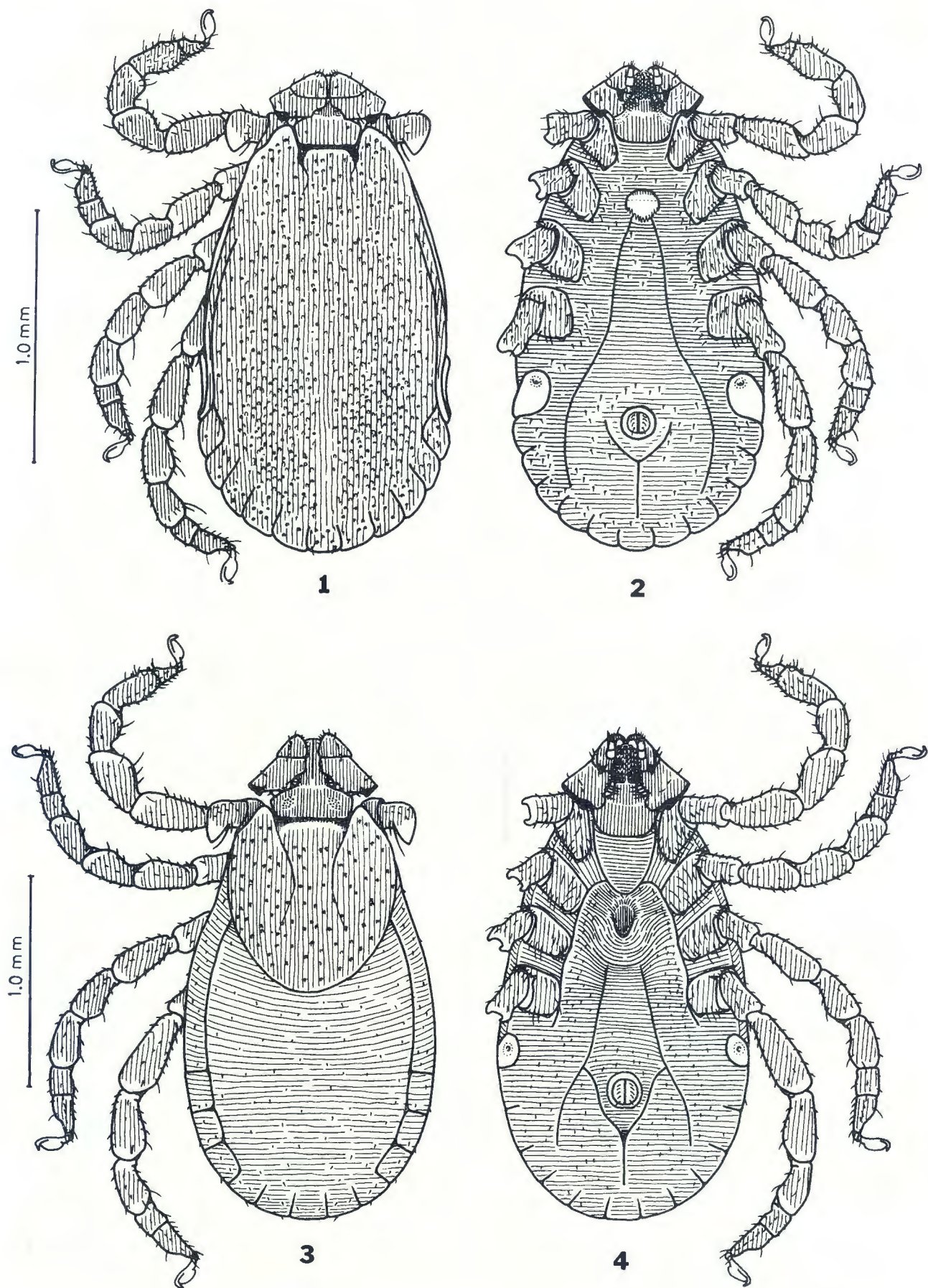


FIG. 1-4 *Haemaphysalis (Rhipistoma) norvali* sp. n., paratype male, allotype female (HH45.978), (1, 2) male, dorsal and ventral views; (3, 4) female, dorsal and ventral views

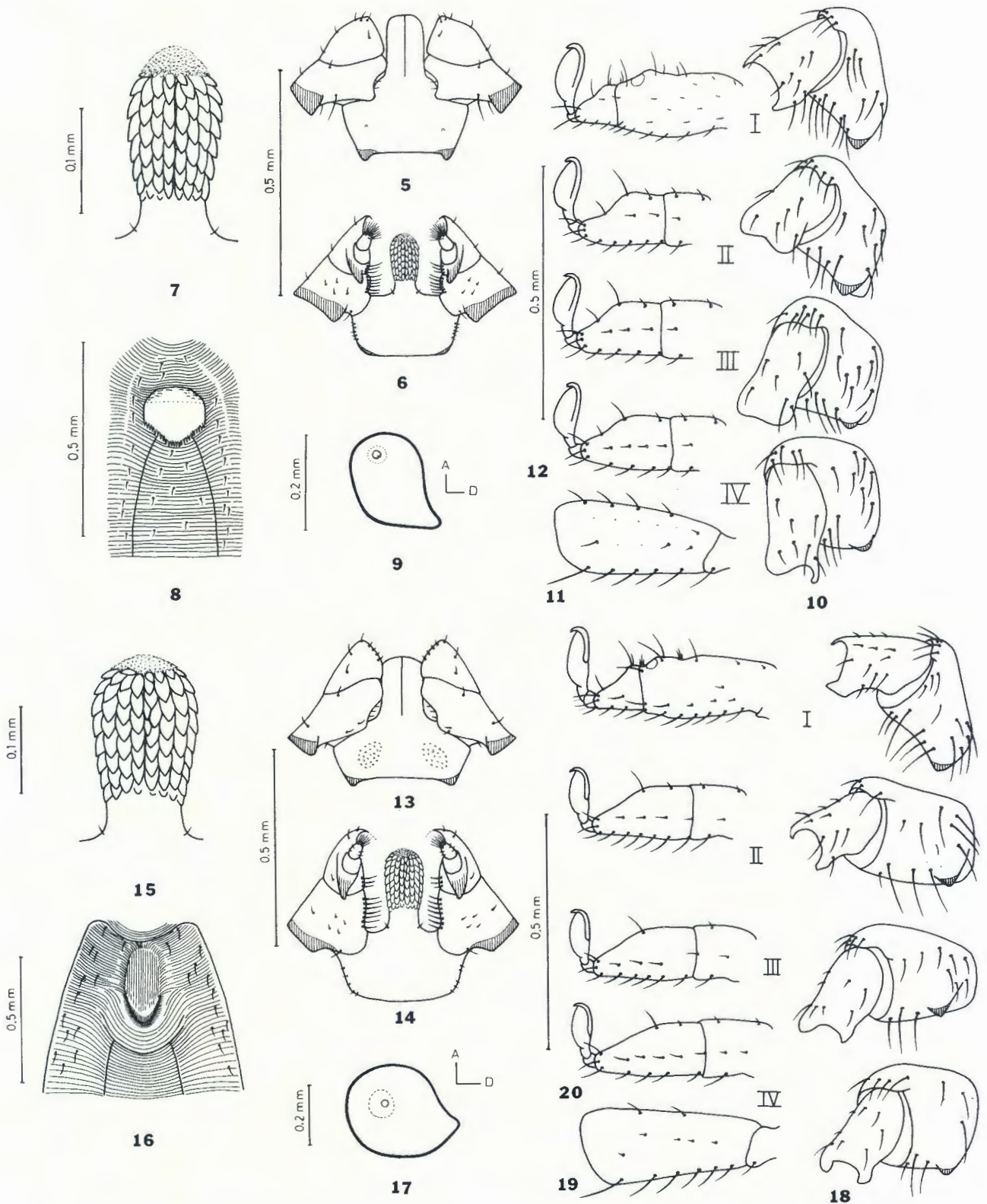


FIG. 5-20 *Haemaphysalis (Rhipistoma) norvali* sp. n., paratype male, allotype female (HH45.978). (5, 6) male capitulum, dorsal and ventral views; (7) male hypostome, ventral view; (8) male genital area; (9) male spiracular plate (A = anterior; D = dorsal); (10) male coxae and trochanters I to IV; (11) 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

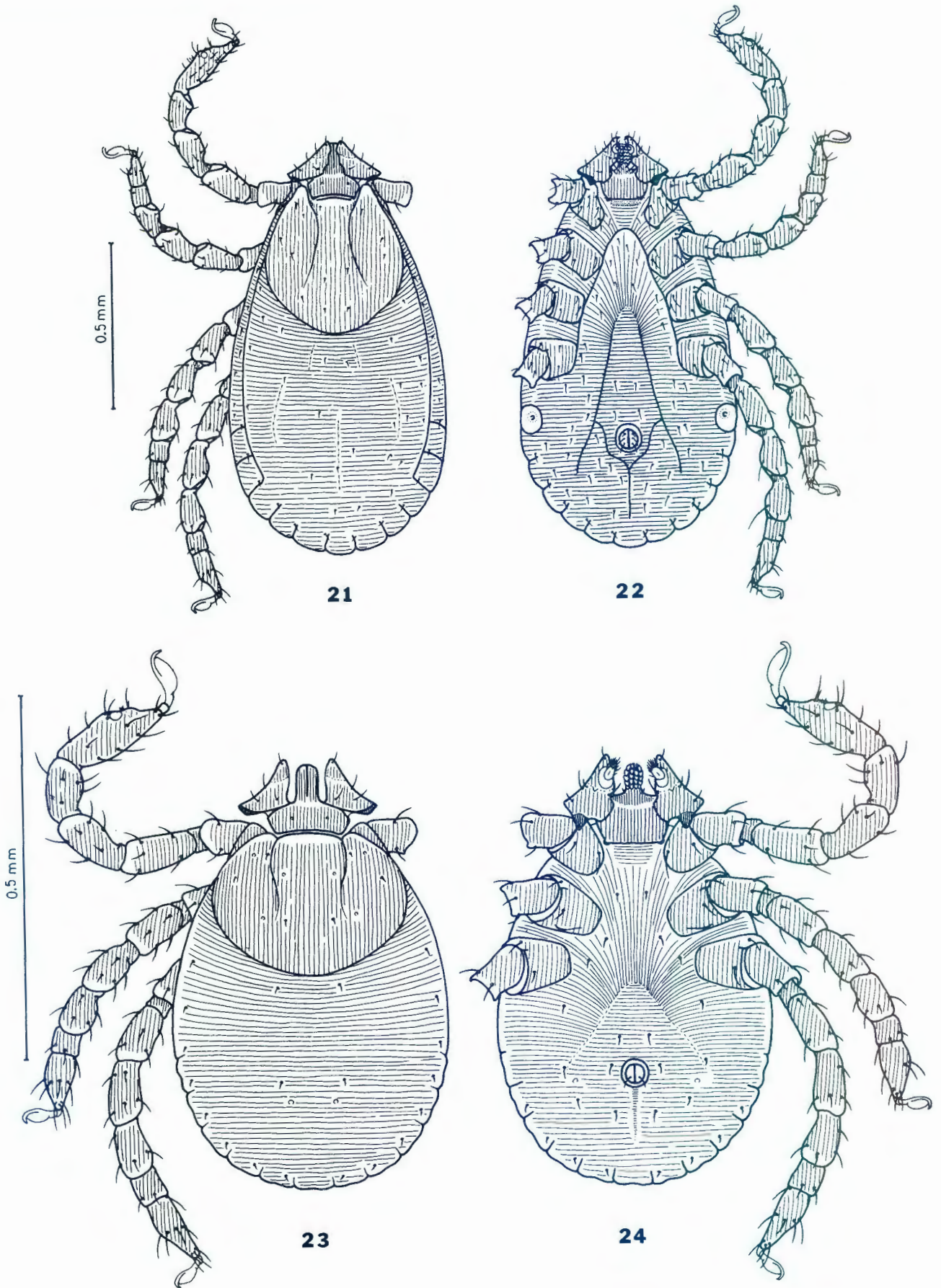


FIG. 21-24 *Haemaphysalis (Rhipistoma) norvali* sp. n., paratype nymph and larva (HH45.978), (21, 22) nymph dorsal and ventral views; (23, 24) larva dorsal and ventral views

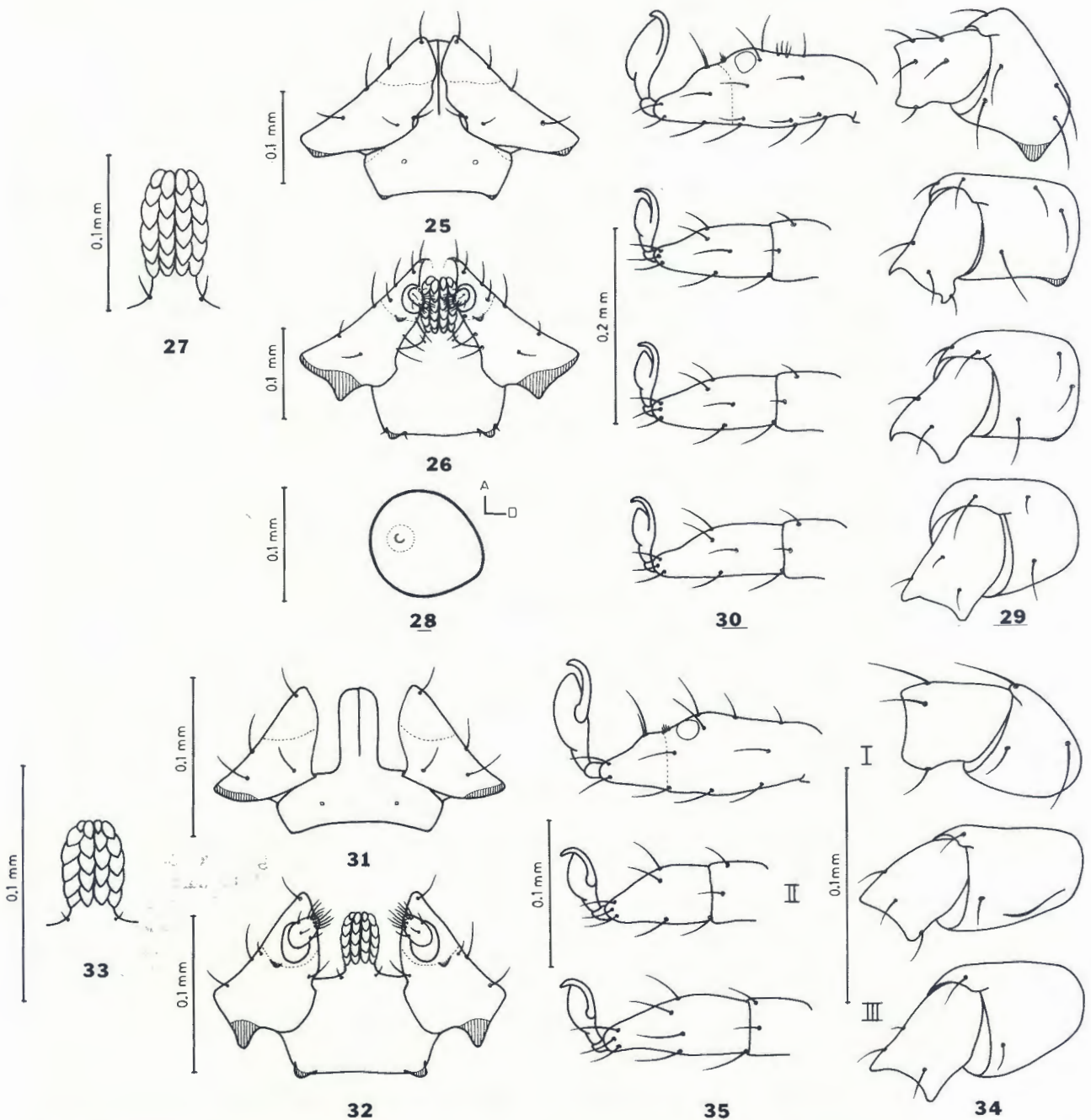


FIG. 25-35 *Haemaphysalis (Rhipistoma) norvali* sp. n., paratype nymph and larva (HH45,978), (25, 26) nymph capitulum, dorsal and ventral views; (27) nymph hypostome, ventral view; (28) nymph spiracular plate; (29) nymph coxae and trochanters I to IV; (30) nymph tarsi I to IV, external view; (31, 32) larva capitulum, dorsal and ventral views; (33) larva hypostome, ventral view; (34) larva coxae and trochanters I to III; (35) larva tarsi I to III, external view

respectively. *Trochanter* I dorsal plate triangular (Fig. 1); trochanters ventrally (Fig. 10) lacking spurs. *Femur* IV (Fig. 11) ventrointernal setae short, number 5. *Tarsi* (Fig. 12) II to IV short, stout, dorsal surfaces flat proximally, abruptly tapering distally. *Claws* large. *Pulvilli* large, reaching curvature of claws.

#### Female (Fig. 3, 4, 13-20)

The female differs from the male in sexual characters and size but is quite similar in diagnostic details. *Length* (slightly fed allotype) 2,18 mm; *breadth* 1,13 mm.

*Capitulum* (Fig. 13-15). *Basis capituli* dorsally 3,5 times as broad as long; external margins diverging anteriorly; cornua short, broadly triangular, apices blunt; porose areas small, oval, tilted, widely spaced. *Basis capituli* ventrally as illustrated, setae as in male. *Palpi* differing from those of male as follows. Combined breadth 1,6

times breadth of basis capituli, each palpus 1,3 times as long as broad. Segment 2 approximately as long as broad; posteroventral margin forming an obtuse angle in place of posteroventral spur of male; dorsointernal and ventrointernal setae number 3 and 7, respectively; surface setae number 4 dorsally, 5 ventrally. Segment 3 apex more narrowly angled than in male; 1,3 times as broad as long; 0,6 times as long as 2; ventral spur shorter than in male, apex at level of intersegmental suture; setae number 6 dorsally, 1 apically, 2 ventrally, 3 from inter-ventral margin posterior to insertion of segment 4. *Hypostome* (Fig. 15) 1,7 times as long as broad; apex, corona, and dental formula as in male, denticles in files of 8-9.

*Scutum* (Fig. 3) 1,1 times as long as broad; anterior emargination broad, moderately deep; scapulae narrowly angled; margins convex, posteriorly gradually rounded.

*Cervical grooves* anteriorly converging; posteriorly superficial, diverging to posterior  $\frac{1}{2}$  of scutal length. *Punctations* numbers as in male in same area but size moderate, deep, more regularly scattered, setae larger. *Dorsum* (Fig. 3) and *venter* (Fig. 4, 16, 17) as illustrated. *Genital operculum* (Fig. 16) broadly V-shaped, apically rounded. *Spiracular plates* (Fig. 17) subcircular; dorsal projection shorter than in male.

*Legs* (Fig. 3, 4, 18–20) essentially as in male but coxal spurs II and III slightly shorter; setae number c. 15, 11, 11, 6 on coxa I–IV, respectively. *Femur* IV (Fig. 19) ventrointernal setae number 6.

#### Nymph (Fig. 21, 22, 25–30)

*Length* 1,26 mm; *breadth* 0,7 mm (single unfed specimen). *Capitulum* (Fig. 25–27). *Basis capituli* dorsally 3,2 times as broad as long (including cornua), external margins diverging anteriorly; cornua minute, apices blunt. *Basis capituli* ventrally with short, broadly rounded cornua flanked on each side by a seta; posthypostomal setae short. *Palpi* broadly salient posteriorly, combined breadth 1,9 times that of basis capituli. Segment 1 minute dorsally, undifferentiated ventrally, setae lacking. Segment 2 1,7 times as broad as long; posterodorsal margin straight forming a very short spur-like angle distally, external juncture obtuse, external profile beyond junction long, acutely converging; posteroventral margin forming a triangular spur at about midlength, spur apex at level of c.  $\frac{1}{2}$  of anterior length of basis capituli, external profile of spur continuing anteriorly as an arc to recurving juncture near level of posterior  $\frac{1}{2}$  of segmental length; internodorsal margin slightly bulging anteriorly; dorsointernal and ventrointernal setae number 1 and 2, respectively; surface setae number 2 dorsally, 1 ventrally, 1 laterally. Segment 3 triangular, 0,7 times as long as 2; ventral spur minute; setae number 1 apically, 1 dorsally or laterally, 2 ventrally, 1 apicoventrally, 1 ventrointernally. *Hypostome* (Fig. 22, 27) shorter than palpi, 1,9 times as long as broad; apex blunt; dental formula 2/2, denticles in files of 6.

*Scutum* (Fig. 21) 1,08 times as long as broad; anterior emargination broad, moderately deep; scapulae narrowly rounded; margins diverging to level of coxae III, thence rounded and converging, posteriorly gradually rounded. *Cervical grooves* extending to posterior  $\frac{1}{2}$  of scutal midlength, converging anteriorly, diverging posteriorly. *Punctations* small, few, some setiferous. *Dorsum* (Fig. 21) and *venter* (Fig. 22, 28) as illustrated. *Spiracular plates* (Fig. 28) subcircular.

*Legs* (Fig. 21, 22, 29, 30). *Coxae* (Fig. 29) I spur broadly triangular, apex blunt, extending somewhat beyond coxal margin; II spur smaller; III and IV lacking spurs. *Tarsi* (Fig. 30) moderately long, flat dorsally, gradually tapering distally. *Claws* moderately large. *Pulvilli* reaching to or almost to curvature of claws.

#### Larva (Fig. 23, 24, 31–36)

The larva is easily associated with the nymph in diagnostic details. All specimens are laboratory reared.

*Length* (6 specimens measured) from palpal apices to posterior body margin 0,55 to 0,61 (mean 0,58) mm; *breadth* 0,37 to 0,41 (mean 0,39) mm.

*Capitulum* (Fig. 31–33). *Basis capituli* dorsally c. 6 times as broad as long; external margins diverging; cornua obsolete, posteroexternal junctures slightly bulging. *Basis capituli* ventrally with cornua (as in nymph but lacking adjacent setae), posthypostomal setae short. *Palpi* outlines, proportions, and other details essentially as in nymph, except as follows. Segment 2 posterodorsal margin mildly convex, lacking distal spur-like angle; dorsointernal seta lacking; internodorsal margin not

bulging. Segment 3 setae single dorsally and ventrally. *Hypostome* (Fig. 33) essentially as in nymph except denticles in files of 5.

*Scutum* (Fig. 23) 1,2 times as broad as long. Outline and details as illustrated.

*Legs* (Fig. 23, 24, 31–35). *Coxae* (Fig. 34) spurs obsolete. *Trochanter* I dorsal shield minute; trochanters ventrally lacking spurs. *Tarsi*, *pulvilli*, and *claws* as illustrated.

#### DIAGNOSIS (ADULTS)

A small haemaphysaline (subgenus *Rhipistoma*; *spinulosa* group) [total length (mm): ♂ mean 1,84 (1,61 to 1,99), ♀ (single slightly fed specimen) 2,18; breadth: ♂ mean 0,92 (0,86 to 0,94), ♀ (1,13)]. *Basis capituli* dorsally 2,3 (♂) or 3,5 (♀) times as broad as long; cornua broadly triangular, c.  $\frac{1}{4}$  as long as base of basis capituli, apices blunt; porose areas (♀) small, oval, tilted, widely spaced. *Palpi* c. 1,8 (♂) or 1,6 (♀) times as broad as basis capituli, each palpus c. 1,1 (♂) or 1,3 (♀) times as long as broad. Segment 1 dorsally a short narrow pedicle, seta single; ventrally undifferentiated, seta single. Segment 2 posterodorsal margin essentially straight to  $\frac{2}{3}$  of breadth, thence forming a short broadly triangular spur; posteroventral margin forming a similar broadly triangular spur (♂) or an obtuse angle in place of spur (♀); internodorsal margin bulging anteriorly; dorsointernal setae number 2 (♂) or 3 (♀); ventrointernal setae number 5–6 (♂) or 7 (♀). Segment 3 ventral spur extending to (♀) or slightly beyond intersegmental suture (♂); internodorsal setae number 3. *Hypostome* dental formula 4/4; denticles in files of 6–7 (♂) or 8–9 (♀). *Scutum* (♂) c. 1,8 times as long as broad; punctations moderately numerous, small, obscure, irregularly scattered, few with a minute seta (♂). *Scutum* (♀) 1,1 times as long as broad, margins convex, posteriorly gradually rounded; cervical grooves anteriorly converging; posteriorly superficial, diverging to posterior  $\frac{1}{2}$  of scutal length; punctation numbers as in male in same area but size moderate, deep, more regularly spaced, setae larger. *Genital operculum* (♀) broadly V-shaped, apically rounded. *Spiracular plates* subrectangular, junctures rounded; dorsal projection elongately triangular, apex blunt (♂); or subcircular, dorsal projection shorter (♀). *Coxa* I to IV spurs short, broadly triangular, extending slightly beyond coxal margins; I and II spurs somewhat longer than III and IV spurs, setae number (excluding anteroexternal group) c. 13, 10, 12, 10 on coxae I–IV, respectively (♂); II and III spurs slightly shorter, setae number 15, 11, 11, 6 on coxa I–IV, respectively (♀). *Femur* IV ventrointernal setae number 5 (♂) or 6 (♀). *Tarsi* short, stout. *Pulvilli* large, reaching curvature of claws.

#### SPECIES RELATIONSHIPS

*H. (R.) norvali* is related to *H. (R.) spinulosa* Neumann (redescribed by Hoogstraal, 1964). Among differences between the 2 species are the following: *Basis capituli* (♂, ♀) with cornua c.  $\frac{1}{2}$  as long as base (*spinulosa*) or c.  $\frac{1}{4}$  as long as base (*norvali*). Palpal segment 2 posteroventral margin proximally deeply concave and extended into elongate spur (♂, ♀, *spinulosa*) or straight to short, broadly triangular spur (♂) or obtuse angle (♀) (*norvali*). Palpal segment 3 ventral spur reaching to or almost to midlength of segment 2 (♂), or well beyond intersegmental suture (♀), apices sharp (*spinulosa*); or reaching only slightly beyond intersegmental suture, apices blunt (♂, ♀, *norvali*). Scutal punctations (♂) numerous, most medium size, distinct, evenly distributed (*spinulosa*), or

moderately numerous, small, obscure, irregularly scattered (*norvali*). Coxal spurs small (♂) to moderate size (♀) (*spinulosa*) or minute (♂, ♀, *norvali*).

Further details on the *H. (R.) spinulosa* group, and the hosts, distribution, and biomedical properties of individual species will be published in separate reports in this series.

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REFERENCE

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