



International Journal of
**Zoological
Research**

ISSN 1811-9778



Academic
Journals Inc.

www.academicjournals.com

Two New Species of Ixodid Ticks (*Acarina: Ixodida*) from Kerala, India

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Abstract: Considering the lacunae of knowledge on the tick fauna of Kerala, South India, a three year study was carried out to understand the species diversity, distribution pattern and systematic details of the ixodid ticks infesting our domestic animals. Attention was also focussed on the damage symptoms induced by individual tick species to respective host animals including man. During the study period, 3758 host animals representing 12 species and 12 genera were examined for the presence of ticks. Results of the taxonomic analysis revealed a total of 19 species including 2 subspecies belonging to 6 genera and one subgenus of the family Ixodidae. Of these, 2 new species *viz.*, *Haemophysalis knobigera* and *Nosomma keralensis* infesting buffalo are described here with detailed illustrations. The unique features of *H. knobigera* include the presence of a small knob like spur on cox-I, cornua less than the size of basis capitulum and ventral palpal spur reaching near to mid length of palpal segment 2. The specific characters of *N.keralensis* include features like less ornamented and more stout body and spurs on coxa I equal in length.

Key words: *Haemophysalis*, *Nosomma*, knob, *Arina*, *Ixodida*

INTRODUCTION

The basic research on *Haemophysalis* ticks was the monographic treatment by Nuttall and Warburton (1915) and *Nosomma monstrosus*, the only species representing the genus was recorded from India, Bangladesh and Vietnam (Nuttall and Warburton, 1908; Hiregoudar, 1969; Naithani, 1975). The first major work on the taxonomy of Indian ticks was that of Sharif (1928), who made a revision on the Ixodid ticks of India. Subsequent taxonomic keys provided by Trapido *et al.* (1964) and the check list prepared by Geevarghese *et al.* (1997) further helped to enrich our knowledge on Indian Ixodid ticks. A world list of valid tick species was provided by Horak *et al.* (2002) which included 683 species of ixodid ticks, 183 species of argasid ticks and one species of Nuttalliellid tick. Barker and Murrell (2004) while conducting systematic and evolutionary studies of ticks, listed 899 valid species of ticks.

MATERIALS AND METHODS

Actively feeding and partly fed ticks were collected directly from the body of the host animals. The developmental stages and adults of ticks were collected from grazing grass field, forest vegetation and temporary resting places of animals using tick flags and tick drags. The taxonomic studies were carried out by using fresh and alcohol preserved specimens. The illustrations were prepared of fresh specimen using stereo Binocular microscope. To study the finer details part of the specimens were dehydrated, cleared and mounted in Hoyer's medium.

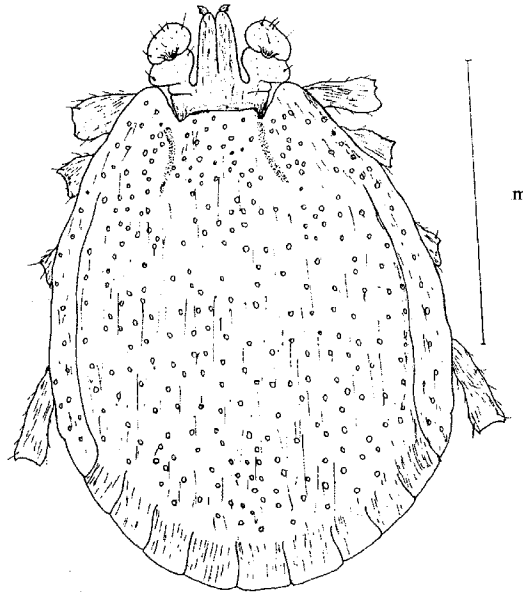
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Haemaphysalis knobigera sp. nov.

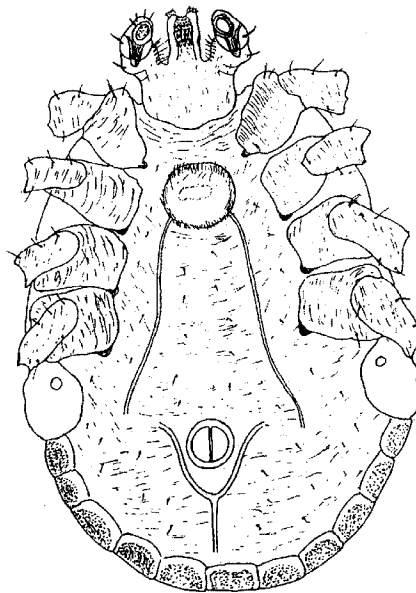
Figure 1(a-g).

Colour

Yellowish to brownish yellow

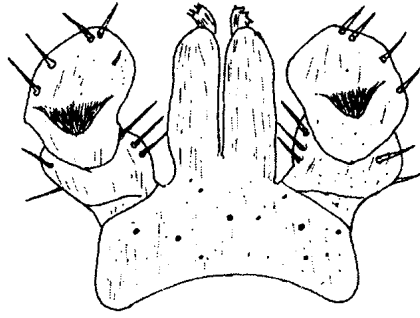


(a) Dorsal view

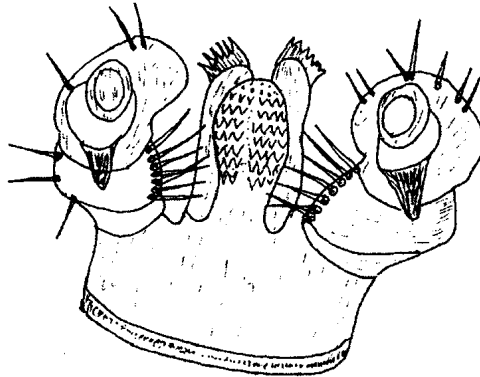


(b) Ventral view

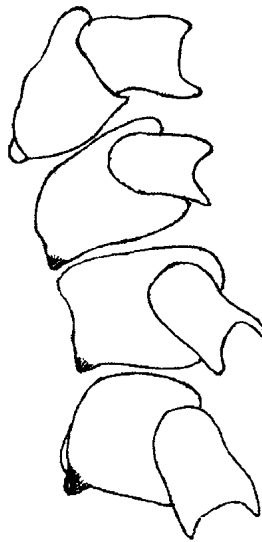
Fig. 1: Continued



(c) Capitulum - dorsal view



(d) Capitulum - ventral view

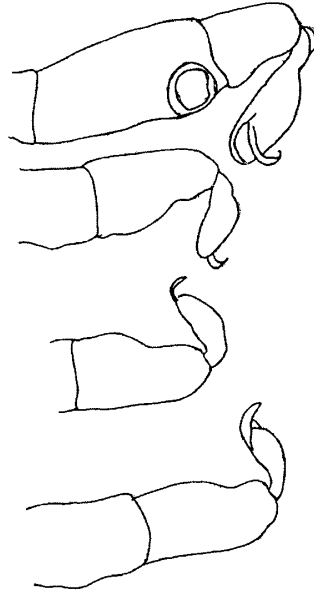


(e) Legs - coxae and trochanter I-IV

Fig. 1: Continued



(f) Spiracle



(g) Tarsus I-IV

Fig. 1: *Nosomma keralensis* sp. nov

Measurements

Length: 2.00 mm (2.00-2.2 mm)

Width: 1.1 mm (1.00-1.2 mm)

Dorsum

Basis capitulum rectangular, breadth including cornua more than 1.2 times greater than length, lateral margins almost straight. Posterior margin slightly concave; surface with few punctuations. Cornua moderately long; less than the size of basis capitulum. Palpi conical, lacking baso-lateral salience. Palpal segment II without lateral salience. Median ridge like dorsal palpal spur (Fig. 1a-c). Hypostome reaching apex of palpi; cheliceral teeth protrude well above the level of palpi.

Scutal outline elongate-oval; width approximately 2/3 of length, widest at level of coxa IV. Lateral margins gradually rounded, posterior margin bluntly rounded. Lateral grooves of medium length; cervical grooves formed by moderate pits and shallow indistinct grooves. Punctuations moderate and numerous. Fестоons 11, well separated.

Venter

Segment 3 ventrally with a spur reaching mid length of segment 2. Infra-internal setae 7. Hypostomal dental formula 4/4 (Fig. 1d).

Coxa I with a small knob like internally directed spur. Coxae II to IV with small spurs (Fig. 1e). Trochanter without ventro-lateral spur. Tarsi stout, tapering gradually to the distal end, claws and pulvilli long and strong (Fig. 1g). Anal groove posterior to anus, well marked. Spiracle plate elongate, oval (Fig. 1f). Genital groove prominent, not reaching upto festoons, Anal groove with lateral arms almost reaching genital grooves and basal arm almost reaching median festoon. Integument with few scattered small setae.

Distribution

Kerala, India.

Host

Cow and Goat

Material Examined

Holotype-♂ collected from cow, Chelari Cattle market, Malappuram district, coll. K. Prakasan on 2-4-2002, presently deposited in the Acarology Division, Department of Zoology, University of Calicut.

Paratypes-14 ♂♂ and 12 ♀♀ from cow, 18 ♂♂ from goat Chelari cattle market, Malappuram district, coll. K.Prakasan on 9-4-2002, deposited in Acarology Division, Department of Zoology, University of Calicut.

Remarks

The present specimen resembles *H. intermedia* in general characters. However, the species has been given the status of a new taxon by the possession of the following characters which are unique.

- Cornua less than the size of basis capitulum
- Ventral palpal spur reaches near to mid length of palpal segment 2
- Coxa 1 with small knob like spur.

***Nosomma keralensis* sp. nov**

Male (Fig. 2a-f)

Colour

Brownish in both sexes

Measurements

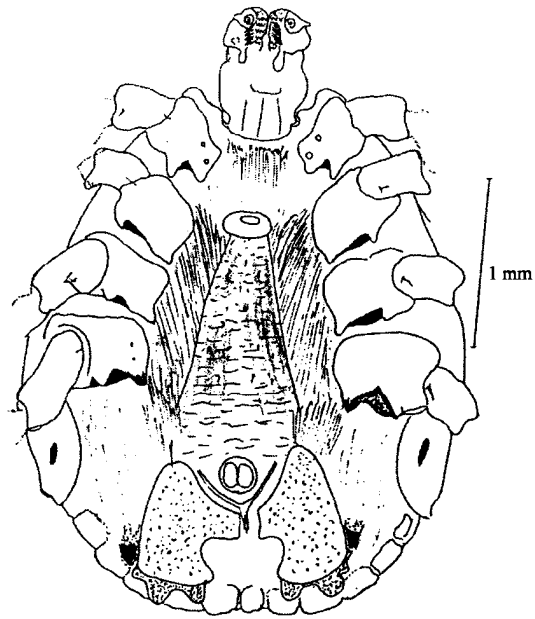
Length: 3.6 mm (3.4-3.7 mm)

Width: 2.2 mm (2.1-2.3 mm)

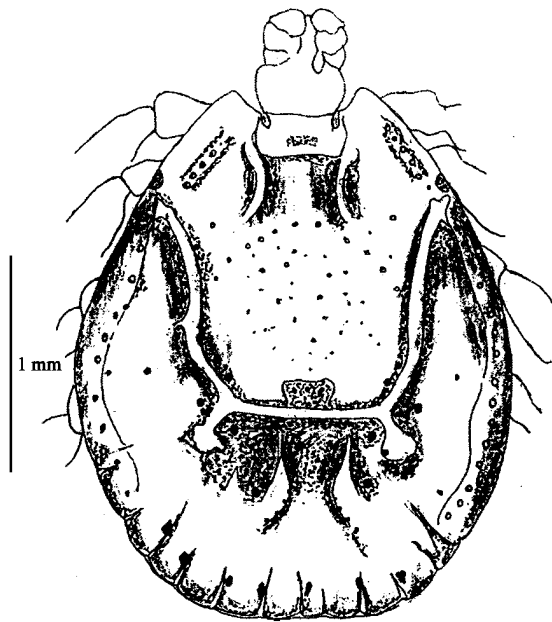
Dorsum

Capitulum short and stout. Basis capitulum rectangular, twice as broad as long (Fig. 2a-c). Cornua strong and prominent. Palpal segments broader than long. Article 1 visible dorsally; without lobe like internal projection. Article 3 broader than long, with a strong external process.

Scutum brownish; whitish ornamental secretion present, but less visible and becomes completely lost on preservation in alcohol punctations less numerous, large deep, unequally distributed. Cervical



(a) Dorsal view

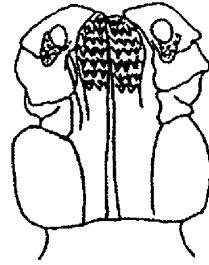


(b) Ventral view

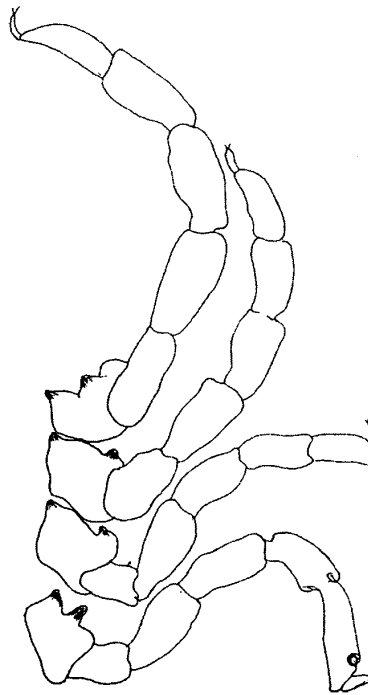
Fig. 2: Continued



(c) Capitulum - Ventral view



(d) Legs - I-IV



(e) Capitulum - Dorsal view

Fig. 2: Continued



(f) Spiracle

Fig. 2: *Nosomma keralensis* sp. nov

grooves short and deep. Lateral grooves extend from the region of coxa II to the region of spiracle. A row of punctuation along the lateral margin from scapular region to festoons. Pseudoscutum well marked by deeply developed furrow; punctations small and shallow. Posteromedian groove narrow and poorly developed make. Eyes prominent by coloured. Festoons 2, separated by well marked sutures. Scutal pattern less complex.

Venter

Venter light brown coloured. Palpal segments bear rows of thick densely arranged setae in the infra-internal margin. Hypostomal dentition 3/3. Palpal article III with moderately strong, ventral retroverted spur (Fig. 2d).

Coxa I with two well separated spurs; more or less equal in length, internal one more broader: coxae II to IV with two small subequal spurs. Spurs on coxa IV more developed than those on II and III. Tarsus IV with two ventral spurs, of which the distal one considerably stronger than the other (Fig. 2e).

Ventral plates represented by adanal, accessory and subadanal shields. Adanal shield trilobed, middle lobes come close to each other behind the anal groove. Accessory shield less developed and poorly chitinised. Subanal plate trilobed; two internal lobes prominent and large, external one small and less visible. Spiracle comma shaped; tail end short and broad (Fig. 2f).

Distribution

Kerala, India.

Host

Buffalo

Materials Examined

16 ♂♂ and 7 ♀ from buffalo, at the Chelari Cattle Market, Malappuram district, Kerala. Coll. K. Prakasan, on 2-09-2002, presently deposited in the Acarology Division, Department of Zoology, University of Calicut.

Remarks

The present species of *Nosomma* resembles the other known species of the genus collected during the study. Viz., *N. monstrosum* in the possession of short stout capitulum, presence of ventral plates, rectangular shape of basis capitulum etc. But it can be easily separated from the above species by the possession of less ornamented body, less complex scutal pattern and presence of large but few punctations.

The new species stands unique from all the congeners described so far on the basis of the following characters:

- less ornamented body
- More stout body
- Spurs on coxa I equal in length

Subanal shields trilobed; lobes often show size difference; external one smaller, middle one projects beyond the posterior margin in some specimens.

ACKNOWLEDGMENT

The first author is grateful to Dr. G. Geevarghese, Dy. Director, NIV, Pune, Dr. M.S. Jagannath, University of Agricultural Science, Bangalore for the help rendered by them in the identification of tick specimen involved in the study and provision of the related literature.

REFERENCES

- Barker, S.C. and A. Murrell, 2004. Systematic and evolution of ticks with a list of valid genus and species names. *Parasitology*, 129: 515-536.
- Geevarghese, G., S. Fernandes and S.M. Kulkarni, 1997. A check list of Indian ticks (Acari:Ixodoidea). *Ind. J. Anim. Sci.*, 67: 566-574.
- Hiregoudar, L.S., 1969. On the occurrence of the tick *Nosomma monstrosus* in Gujarat State. *Ind. Vet. J.*, 46: 175-176.
- Horak, I.G., J.L. Camicas and J.E. Keirans, 2002. The Argasidae, Ixodidae and Nuttalliellidae (Acari:Ixodida): A world list of valid tick names. *Exp. Applied Acarol.*, 28: 27-54.
- Naithani, R.C., 1975. Ticks (Ixodidae) of domesticated animals in Barielly and some studies on *Hyalomma hyalomina kumari* Sharif, 1928, Ph.D Thesis, Agra University.
- Nuttall, G.H.F. and C. Warburton, 1908. On a new genus of Ixodoidea together with a description of eleven new species of ticks. *Proc. Camb. Phil. Soc.*, 14: 324-420.
- Nuttall, G.H.F. and C. Warburton, 1915. Ticks a monograph of the ixodidae. Part III. The genus *haemaphysalis*. Cambridge University Press, Cambridge, pp: 349-550.
- Sharif, M., 1928. A revision of the Indian Ixodidae with special reference to the collections in the Indian museum. *Rec. Ind. Museum*, 30: 217-344.
- Trapido, H., M.G.R. Varma, P.K. Rajagopalan, K.R.P. Singh and M.J. Rebello, 1964. A guide to the identification of all stages of the *Haemaphysalis* ticks of South India. *Bull. Ent. Res.*, 55: 249-270