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ON THE OCCURRENCE OF IXODES PETAURISTAE WARBURTON, 1933 IN TAMILNADU

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The species *Ixodes petauristae* was described by Warburton (1933) on examination of a single female specimen obtained from a flying squirrel, *Petaurista petaurista philippensis* Link in Ceylon The male was unknown until Rao (1955) reported male and female individuals of *Ixodes kerri* from *P. p. philippensis* in the Bombay State, which is now held to be a synonym of *I. petauristae* and *I. ceylonensis* Kohls (Rajagopalan, 1965). *Ixodes ceylonensis* originally reported by Kohls (1950) from the mongoose and *Rattus rattus kandianus* in Ceylon, was described in its adult (male) nymph and larval stages by Rajagopalan and Boshell (1966) from several rodents in Mysore, South India. The adults of *I. petauristae* were mentioned as common ectoparasites of *Ratufa indica* and *P. p. philippensis* by Rajagopalan (1965). The nymph and larva of *I. petauristae* were reported from shrews, rats, mice and squirrels in the forests of Mysore and descriptions given for the first time by Rajagopalan (1965). Successful rearing of the nymphs in the laboratory was described by him earlier (1963). The occurrence of *I petauristae* ticks from the Malabar giant squirrels and flying squirrels from Tamil Nadu state is reported for the first time.

MATERIALS AND METHODS

Of the four Malabar giant squirrels, *Ratufa indica maxima* examined in the Venniar Coffee estates (Madurai Dist.), three harboured four females, four nymphs and one larval tick. One flying squirrel *P. p. philippensis* from the same area had three females and one nymph which were subjected to detailed examination. Two flying squirrels *P. p. philippensis* examined in the Kumbum Valley (Madurai Dist) and in Yercaud hills (Salem Dist) had no ticks on them Two Grizzled giant sqirrels, *Ratufa macroura dandolena* in the Dharmapuri forest area were also without ticks.

RESULTS AND DISCUSSION

The body including capitulum of engorged females measured 11.0 mm x 5 5 - 6 mm and that of adult females measured 6 7.5 mm × 3.5 mm. The nymphs and larvae measured 2 5 mm x 1.5 mm; 1.5 mm × 0.8 mm respectively. The colour was Chestnut brown and the scutum was chocolate brown. The surface of dorsum was finely striated and

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had two prominent internal accessory grooves. The scutum was longer than broad and measured 2.5 mm x 1.8 mm. Coarse punctations were abundant in the lateral and cervical fields and absent in the posterior 2/3 of the median field.

Fine punctations were numerous in tne anterior part of the the median field but few and scattered in the posterior part. The surface of venter was finely striated and slightly hairy. Genital aperture was slightly posterior to the level of the IV coxae. Genital grooves extended posteriorly beyond the level of the anus Anal groove was horse-shoe shaped and slightly divergent. The legs we e long and moderate in size. Thc tarsi were long and abruptly narrowed subapically. All the coxae were flattened. Coxa I had two well developed nearly equal, flat, pointed spurs (recalling those of *Rhipicephalus* and very unusual in *Ixodes*) and slightly overlapped Coxa II. Coxa II to IV had each one short, but prominent spur on the posterior margin with slightly salient posterior borders Coxae II to IV had prominent hump like projection on the antero lateral aspect. The spiracles were large and almost circular The capitulum was about 2½ times as long as broad. The base was slightly broader than long. Porose areas were large, roughly triangular, slightly depressed and were close together. The palps were slender, 4½ times as long as broad, outer border nearly straight with a slight concavity but inner border was convex. Article I was visible both dorsally and ventrally and article II was about 3 times as long as article III. The hypostome was pointed and had rows of 2 teeth and about 12 teeth in each file (Dentition 2/2).

No males of these ticks were recovered from any of the hosts which finding is corroborated by Nuttall's (1911) observation that the *Ixodes* male is not found on the "Wandering host", but is found only in the nest However, Rao (1955) was able to collect one male attached to the body of one of the two females (probably in 'copulation') which he obtained from one of the two flying squirrels.

Nuttall (1911) observed that in the genus *Ixodes*, certain species had adaptation according to the habits of the hosts upon which they were parasitic. In the specics which usually occurred on wandering hosts, both sexes were found upon the host and were characterised as a rule by the possession of hyp stomes with prominent teeth It is essential for their propagation that both sexes should be carried upon the host, which is wandering without a fixed habitat. In those species occurring on hosts with more or less fixed habitat like the Malabar giant squirrel and the Giant flying squirrel, living in nests and tree holes respectively, the males are rarely or never found on the host, but should be sought for in the habitat (nest or tree hole).

In these species of ticks, the male hypostome was found to be slightly armed or practically unarmed, whereas in the females they were considerably well armed, illustrating sexual dimorphism based on their biology.

The possible role of this species of *Ixodes* in the transmission of human disease has recently been elucidated. Boshell, Goverdhan and Rajagopalan (1968 a, b, c) reported on their attempts to infect larvae of *I petauristae* by feeding them on shrews and a white-tailed rat infected with Kyasanur Forest Disease virus and the successful transmission of the virus by the bite of the emerging nymphs.

In this study, *I petauristae* has been encountered on and reported from previously known hosts, for the first time from Tamil Nadu.

SUMMARY

The occurrence of *Ixodes petauristae* Warburton, 1933 parasitizing the Malabar giant squirrel, *Ratufa indica maxima* and the flying squirrel *Petaurista P-philippensis* is reported for the first time in Tamil Nadu. The morphological features of the female ticks are furnished. The biology of the ticks and their medical importance in the possible transmission of Kyasanur Forest Disease are briefly discussed.

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REFERENCES

Boshell, M. J., Goverdhan, M. K. and Rajagopalan, P. K. (1968 a, b, c) *Indian J. Med Res* 56 (4) Suppl. 541, 589 & 614.

Kohls, G. M. (1950) *J. Parasit.* 36 : 319.

Nuttall, G. H. F. (1911) Notes on biology of *Ixodes* in Ticks – A monograph of the Ixodoide a Part II by Nuttall, G.H F., Warburton C., Cooper, W. F. and Robinson L. E.; Cambridge Univ. Press.

Rajagopalan, P. K. (1963) *Indian J. Malariology* 17 : 259.

Rajagopalan, P. K. (1965) *J. Bombay Nat. Hist Soc.* 62 (1) : 174.

Rajagopalan, P. K., and Boshell, M. J. (1966) *J. Parasit.* 52 (6) : 1203.

Rao, T. R. (1955) *J Bombay Nat. Hist. Soc.* 52 : 860.

Warburton, C. (1933) *Parasitology* 24 : 558.