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STUDIES ON THE ERIOPHYID MITES
(ACARINA : ERIOPHYOIDEA) OF INDIA
V : NEW SPECIES OF TEGOLOPHUS KEIFER
FROM WEST BENGAL WITH KEY TO INDIAN SPECIES

BY S. MONDAL * AND S. CHAKRABARTI *

ERIOPHYIDAE FROM INDIA

ABSTRACT : Two new species of Tegolophus Keifer viz., Tegolophus spondiallus infesting Spondias mangifera Willd and Tegolophus vitexis infesting Vitex negundo Linn. are described from West Bengal, India. Relationships of these two new species with other known species have been discussed. Account of the genus Tegolophus has also been provided with a key to 7 species occurring in India.

INTRODUCTION

During the survey of Eriophyid mites from North East India, a number of representatives belonging to the genus Tegolophus Keifer (1961) have been collected. These mites are known to be leaf vagrants having a fusiform body characterised by the dorsal tubercles with setae situated on rear shield margin, directed posteriorly and by a longer mid-dorsal and two shorter lateral thanosomal ridges.

Nineteen species are so far known from different parts of the world. Among these, 5 species are known from India.

Out of these Indian species, Tegolophus bambusae Channa, Basavanna (1966) infesting Bambusa vulgaris Schrad. is known from Karnataka state (South India) and rest 4 species viz., Tegolophus indica Chakrabarti and Mondal (1979) infesting Artocarpus heterophyllus Lamak., Tegolophus calotropi Chakrabarti and Mondal (1979) infesting Calotropis procera R. Br., Tegolophus ficusi Mondal and Chakrabarti (1979) infesting Ficus infectoria Roxb. and Tegolophus nerii Mondal and Chakrabarti (1979) infesting Nerium odoratum Soland are known from West Bengal (North East India).

In this paper additional accounts of two new species viz., Tegolophus spondiallus and Tegolophus vitexis have been provided from West Bengal. So the genus Tegolophus now embodies 21 species of which 7 species are found in India. A key for separating the Indian species is also provided.

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Tegolophus spondiallus sp. nov.
(Figs. 1A-1I)

- **Female**: 137.8-182.0 μm long, 52.0-67.6 μm wide, fusiform, pale yellow in colour. Rostrum 28.0-31.5 μm long, projecting diagonally down; antapical seta 9.0 μm long. Shield subtriangular, smooth with well developed anterior lobe, 50.63-61.88 μm long and 56.25-60.50 μm wide; shield design with a pattern of longitudinal and oblique lines forming a network laterally; median line faint; admedian lines originate from posterior lateral margin of the apical cell, diverging up to 0.2 portion from anterior margin of the shield, then converge up to 0.4 portion where they are connected with each other by a cross line, afterwards they diverge up to 0.8 portion and move parallel to meet the rear shield margin inner to the dorsal tubercles; submedian line single and parallel to the lateral shield margin. Lateral shield with a number of indistinct cells; one curve transverse line and two longitudinal oblique lines present in between the admedians and submedians forming 1 subtriangular, 1 triangular and 2 trapezoidal cells on either side. Dorsal tubercles placed at rear shield margin, 25.68-31.54 μm apart; dorsal seta 7.88-11.25 μm long, directed caudad. Forelegs 31.5-40.5 μm long from the base of trochanter; femur 9.0-10.13 μm long, with seta 13.5 μm long; patella 4.0-4.5 μm long, with seta 24.75-28.13 μm long; tibia 7.88-9.5 μm long, with a tibial seta 6.75 μm long at the middle; tarsus 6.75-7.88 μm long with two setae, each 22.5-24.75 μm long; claw 7.88-10.13 μm long, moderately arched and without knob; featherclaw simple, 4-rayed. Hindlegs 28.13-34.88 μm long from trochanter base; femur 7.88-9.0 μm long, with seta 10.13 μm long; patella 3.38-4.30 μm long, with a seta 14.63-15.75 μm long; tibia 6.75 μm long, without hind tibial seta; tarsus 6.75-7.88 μm long with two setae, each 22.5-28.13 μm long; claw 7.88 μm long. Anterior coxae connate with prominent median suture; anterior coxae ornamented with dotted lines and posterior coxae ornamented with irregular faint curved lines; first coxal tubercles situated just below the level of anterior coxal approximation and 6.75-11.25 μm apart; second coxal tubercles situated nearly on the transverse axis connecting the third coxal tubercles; second coxal tubercles 5.63 μm apart and third coxal tubercles 22.5 μm apart; first coxal seta 6.75-11.25 μm long; second coxal seta 14.63-20.25 μm long; third coxal seta 22.5 μm long.

Abdomen with about 27-29 tergites and 75-78 sternites; tergites with more conspicuous margin and without microtubercules; three ridges, one middorsal and the other two subdorsals present; sternites with less conspicuous margins and smaller microtubercules set along the rear margins; last few sternites are with indistinct microstriations. Lateral seta 14.63-16.88 μm long, on about sternite 9; first ventral seta 50.0-56.25 μm long, on about sternite 28; second ventral seta 7.88-13.50 μm long, on about sternite 46; third ventral seta 22.5-28.13 μm long, on about sternite 72; caudal seta 70.0-78.75 μm long; accessory seta missing. Female genitalia 22.5-24.75 μm wide, 11.25-14.63 μm long; coverflap with about 14-16 longitudinal stripes; genital seta 16.88-19.13 μm long.

- **Male**: Common; 137.8 μm long; genitalia 15.75 μm wide; seta 13.5 μm long.

- **Distribution**: India: West Bengal.

- **Holotype**: ♀, on (slide No. 101/53/78), India: West Bengal: 24-Parganas, Sagar Island, 7.viii.78, collected from Spondias mangifera Willd (Family: Anacardiaceae), (Coll. S. MONDAL and A. ROY). **Pratypes**: Many ♀♀, ♂♂, on 3 slides (Nos. 102/53/78 to 104/53/78), collection data as in the holotype.

- **Relation to the host plant**: Mites were collected in fairly large number from ventral surface of leaves. Maximum population was noticed during July-September. Due to infestation leaves turn yellowish. No other appreciable damage was noticed.

- **Remarks**: Tegolophus spondiallus sp. nov. in having broad tergites and narrow sternites, 4-
Fig. 1 (A-I): Tegolophus spondialis, sp. nov., female (A-H) and male (I).

rayed featherclaw coupled with the absence of microtubercles on tergites, comes close to *Tegolophus australis* Keifer (1964), *T. hassani* Keifer (1959), *T. artocarpi* Keifer (1977), *T. indica* Chakrabarti and Mondal (1979), *T. ficusi* Mondal and Chakrabarti (1979), *T. nerii* Mondal and Chakrabarti (1979) and *T. vitexis* sp. nov. But from all these species, *T. spondiallus* can be distinguished by its shield design and very long first ventral seta besides other characters.

*Tegolophus vitexis* sp. nov.  
(Figs. 2A-21)

**Female** : 130.0-169.0 μm long, 44.2-52.0 μm wide; fusiform; pale yellow. Rostrum 22.5-30.5 μm long, projecting diagonally down; antapical seta 6.75 μm long. Shield 31.5-38.25 μm long, 50.0-56.25 μm wide, subtriangular with prominent and blunt anterior lobe; shield design with a pattern of longitudinal lines; median line straight, present only on posterior 0.3 portion of shield and connected with the admedianes of either side as in the figure; admedian lines sinuate, originates from either side of the apex of anterior lobe, running posteriorly and meet the rear margin; submedian line single, arises from the lateral 0.25 part of the shield and forms an arc and meet the rear margin of shield inner to the dorsal tubercles; a semicircular ridge arises from posterior shield margin outside the tubercles and cross submedian and admedian lines at 0.4 portion of the shield; inner part of the shield is elevated and smooth, outer part is depressed and with longitudinal discontinuous lines specially on the lateral margin. Dorsal tubercles placed at rear margin, 22.5-24.75 μm apart; dorsal setae 19.13-33.75 μm long, directed caudad. Forelegs 31.5-33.75 μm long from the base of trochanter; femur 9.0-10.13 μm long, with seta 10.13-12.38 μm long; patella 4.5-5.63 μm long, with a patellar seta 24.75-28.13 μm long; tibia 6.75-7.88 μm long, with a seta 5.63 μm long, at about 1/3; tarsus 6.75-7.88 μm long, with two setae each 16.88-19.13 μm long; claw 6.75-7.88 μm long, moderately arched, without knob; featherclaw simple and 4-rayed. Hindlegs 27.0-29.35 μm long; femur 6.75-9.0 μm long, with a seta 11.25-15.75 μm long; patella 3.35-4.5 μm long, with a seta 10.13-16.88 μm long; tibia 4.5-5.63 μm long, without hind tibial seta; tarsus 5.63-7.88 μm long, with two setae, each 19.13-22.5 μm long; claw 6.75-9.0 μm long. Anterior coxae broadly contiguous, with prominent median suture; both the coxae ornamented with curved lines; first coxal tubercles just below the anterior coxal approximation and 9.0 μm apart; second coxal tubercles well ahead of first and second coxal junction and 10.13 μm apart; first coxal seta 11.25 μm long; second coxal seta 16.88-24.75 μm long; third coxal seta 33.75 μm long; third coxal tubercles 22.5-31.5 μm apart. 

Abdomen with smooth tergites and microtuberculate sternites; tergites form three longitudinal ridges: the mid-dorsal ridge broad, bounded on either side by a shallow furrow; the subdorsals are not as long as the mid-dorsal. Microtubercules rounded, bead like set on rear margins. Lateral seta 22.5-28.13 μm long, on about sternite 12; first ventral seta 45-50 μm long, on about sternite 24; second ventral seta 25.88-28.13 μm long, on about sternite 41; third ventral seta 28.13-33.75 μm long, on about sternite 60; caudal seta 56.25-90 μm; accessory seta absent. Female genitalia 13.5-21.38 μm wide, 12.38-14.63 μm long; coverflap with 13-15 longitudinal stripes; genital seta 16.88-25.88 μm long.

**Male** : Common; 148.75 μm long; genitalia 16.88 μm wide; seta 13.5 μm long.

**Distribution** : India : West Bengal.

**Holotype** : ♂, on (slide No. 105/46/78), India : West Bengal : 24-Parganas, Shyamnagar, 24.iv.78 from *Vitex negundo* Linn. (Family : Verbenaceae), (Coll. A. Roy).

**Paratypes** : Many ♀♂, σσ, on 2 slides (Nos. 106/46/78 to 107/46/78), collection data as in the holotype; many ♀♀, σσ, on slide (No. 108/64/79), collected on 21.vi.79 from the same plant and locality.
FIG. 2 (A-I) : *Tegolaphus vitexis* sp. nov., female (A-H) and male (I).

A. — Internal female genitalia.  
B. — Lateral view of mite.  
C. — Anterior dorsum of mite.  
D. — Side view of skin structure.  
E. — Featherclaw (empodium).  
F. — Female genitalia.  
G. — Foreleg.  
H. — Second leg.  
I. — Coxae and male genitalia.
Relation to host plant: This species infest *Vitex negundo*, a medicinally important plant. Mites were found among hairy outgrowths on ventral surface of tender leaves. Apparently no damage symptom has been noticed. Mites were collected in large numbers specially during the months of March-July.

Remarks: *Tegolophus vitexis* sp. nov. is included in the same group that *Tegolophus spondiallus* sp. nov. This species is also very distinct in its shield design, coxal structure and long and stout dorsal seta. In having laterally granulated shield, *T. vitexis* sp. nov. is very close to *T. australis* Keifer, *T. ficusi* Mondai and Chakrabarti and *T. nerii* Mondal and Chakrabarti but otherwise this species is a distinct one.

**KEY TO THE INDIAN SPECIES OF TEGOLOPHUS KEIFER**

1. Abdomen with broad smooth tergites and narrow microtuberculate sternites .......................... 2
   Abdomen with narrow microtuberculate tergites and sternites ........................................ 6

2. Lateral shield partly or completely with granules or dotted lines .................................. 3
   Lateral shield without any granules or dotted lines. .......................................................... 5

3. Dorsal tubercles conspicuous and extended over tergites; dorsal setae very long (15.0-33.0 μm) ...... 4
   Dorsal tubercles short and not extended over tergites; dorsal seta small (4.24-6.36 μm); lateral shield with dotted lines on anterior half only ........................................ T. *ficusi* Mondal and Chakrabarti.

4. Median line faint; submedian line three; claw knobbed .............. *T. nerii* Mondal and Chakrabarti.
   Median line prominent on posterior 0.33 portion of the shield; submedian line single; a semicircular arched line divide the shield into outer and inner portion ........................................ T. *vitexis* sp. nov.

5. Shield with lateral and central disc; scorings on genital coverflap arranged in two ranks; first ventral seta small (5.4-10.8 μm) ........................................ *T. indica* Chakrabarti and Mondal.
   Shield without any discs; shield design with longitudinal lines forming network; median line faint; scorings on genital coverflap arranged in one rank; first ventral seta very long (50.56.25 μm) ............. *T. spondiallus* sp. nov.

6. Featherclaw 6-rayed; shield design with longitudinal lines without forming any network; microtubercles on tergites minute and bead like and those on sternites very prominent; lateral shield not granulated. 
   Feather claw 4-rayed; shield design represents a network; microtubercles very prominent on tergites and sternites; lateral shield granulated. ................. *T. calotropi* Chakrabarti and Mondal.

The type slides of the new species are deposited in the collection of the Entomology Laboratory, Department of Zoology, University of Kalyani.

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