#### INDIAN ERIOPHYID STUDIES III

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TAXONOMY

ABSTRACT: In this paper 9 new species of Eriophyids collected from South India have been described with appropriate sketches. They are, Aceria boraginae; Aceria polygalae; Aceria dichotomae; Tegonotus cardiavagrans; Metaculus sapindiphagus; Vasates cassiae; Calepitrimerus asperrimae; Ditrymacus keiferi and Ditrimacus integrifoliae.

#### INTRODUCTION

In the present study three species of Aceria, one species in each of the genus Tegonotus, Metaculus, Vasates Calepitrimerus, and two species under Ditrimacus has been described as new to science. The genus Ditrimacus is a new record for the Indian region.

# Aceria boraginae, sp. nov. (Fig. 1)

This species is near Aceria cordiae Channa basavanna (1966) but could be differentiated from it by the shield pattern. The coxal area in this species are with markings while in E. cordiae it is smooth. It is also differentiated by shape of the female genital apodeme.

Female: Mites light brown, worm like, 220-230  $\mu$ m long, 50  $\mu$ m thick; rostrum 13  $\mu$ m long, evenly downcurved; antapical setae 3.5  $\mu$ m long. Shield 33  $\mu$ m wide, 22  $\mu$ m long; broadly triangular; median line not distinct, admedian broken at

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base; mid part of shield clear; one clear submedian along the border of shield and bent towards the anterior end; sides of shield with small broken lines, with 2 or 3 broken lines between admedians and submedians at the base of shield. Dorsal tubercles 12 µm apart, at the rear shield margin; dorsal setae 22 µm long, projecting backwards. Foreleg 25  $\mu$ m long; tibia 5.5  $\mu$ m long; tibial seta at basal 1/3rd, 5 µm long; tarsus  $6.5 \mu m$  long; claw  $6.5 \mu m$  long; feather claw 4 rayed. Hindleg 22  $\mu$ m long; tibia 5  $\mu$ m long; tarsus 5 µm long; claw 6.5 µm long. Coxae with all three setiferous tubercles; coxal area granular. Abdomen with 65 rings, uniformly microtuberculate; telosome with microstriations. Lateral seta 15  $\mu$ m long on ring 10; first ventral 44  $\mu$ m long on ring 24; second ventral seta 10 µm long on ring 38; third ventral setae 15  $\mu$ m long, very thick, on ring 6 from behind; caudal seta 72 µm long; accessory seta 6 µm long. Female genitalia 17 µm wide, 11 µm long; coverflap with 10-12 lines; genital seta 5  $\mu$ m long.

Male: 175  $\mu$ m long; 40  $\mu$ m thick; genitalia 13  $\mu$ m wide; genital seta 3  $\mu$ m long.

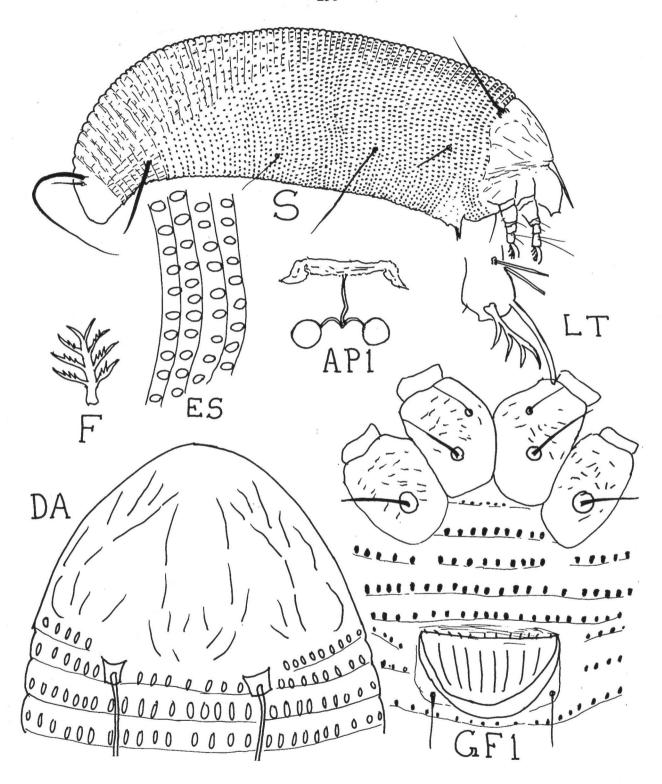


Fig. 1: Aceria boraginae.

Types: One holotype slide with females and 5 paratype slides with males and females collected by the author on 19.6.1978 near Pollachi along Kolinjamparai road, Tamil Nadu, India (Collection No. 290) on *Cordia* sp. (Boraginaceae).

Remarks: The mites cause erineal patches on the lower side of the leaf with protuberances on the upper side. The epidermal hairs of the erineum are closely packed.

# Aceria polygalae, sp. nov. (Fig. 2)

This species resembles Aceria neocynodonis (Keifer, 1960) but could be differentiated by the shield pattern; lesser number of lines on the female genital coverflap and larger size.

Female: Mites white, worm like 260-290 µm long; 59  $\mu$ m thick; rostrum 19  $\mu$ m long, evenly down curved, antapical seta 9 μm long. Shield 50  $\mu$ m wide and 38  $\mu$ m long with a clear pattern. Median line straight, admedians wavy, slightly converging anteriorly; first submedian and second submedian represented only in the anterior half of the shield with an oblique line joining both on either side at about the middle. Area between first and second submedians and lateral parts of shield with fine striations. Dorsal tubercles at the rear shield margin, dorsal seta 33 µm long, directed cauded. Foreleg 28 µm long; tibia 6 µm long; claw 8 µm long, slightly arched; feather claw 6 rayed; hindleg 24  $\mu$ m long; tibia 5  $\mu$ m long, tarsus 6 µm long, claw 10 µm long. Coxae broadly joined, coxal tubercles present. Abdomen with 70-75 rings, uniformly microtuberculate; microtubercules round and dot like at posterior 1/3 of each ring, becomes reduced in the posterior rings; telosome with microstriae. Lateral seta 45 µm long on ring 10; first ventral seta 55  $\mu$ m long on ring 24; second ventral seta 16  $\mu$ m long on ring 42; third ventral seta 31 µm long on ring 6 from behind; caudal seta 72 μm long; accessory seta 3  $\mu$ m long. Female genitalia 22  $\mu$ m wide;  $16 \mu m$  long; coverflap with 10-12 lines; genital seta 18 µm long.

Male: Not known.

Types: A holotype slide and three paratype slides all with females collected by the author on 26.6.1978 at Coimbatore, Tamil Nadu, India (Collection No. 291) on *Polygala chinensis* Linn. (Polygalaceae).

Remarks: The mites cause leaf curling; floral buds deformed into phyllody. Mites found within leaf curls and malformed buds.

## Aceria dichotomae, sp. nov. (Fig. 3)

This species resembles Aceria aguacalda (Keifer) (1966) but could be differentiated by the shield pattern, clear coxal area and double row of scorings on the female genital coverflap.

Female: Mites white, worm like, 180-190 μm long; 52 μm thick; rostrum 16 μm long; antapical setae 5 µm long. Shield 44 µm wide; 33 µm long with intricate pattern of wavy lines. Median line at rear half of shield, broken anteriorly and fades away; admedians wavy and converges anteriorly; submedian bent at rear end and broken into short strokes anteriorly. Second submedian at sides of shield, wavy and converages anteriorly. In between these main lines on the sides of shield there are large number of short, wavy lines giving a pattem of wavy lines. Dorsal tubercles at rear shield margin, 25 μm apart; dorsal setae 22 μm long, pointing backwards. Foreleg 28 µm long; tibia 5 μm long; tibial seta 1 μm long at about middle; tarsus  $6 \mu m$  long; claw  $6 \mu m$  long, slightly curved, tapering and blunt at tip; feather claw 6 rayed. Hindleg 26  $\mu$ m long, tibia 4  $\mu$ m long; tarsus 5  $\mu$ m long, claw 7  $\mu$ m long, similar to foreclaw. Coxae broadly joined, coxal area clear; all three setiferous tubercles at the anterior margin of forecoxae. Abdomen with about 65-68 rings, uniformly microtuberculate; microtubercles spaced wider dorseally than ventrally. Lateral seta 11  $\mu$ m long on ring 10; first ventral seta 60  $\mu$ m long on ring 20; second ventral seta 6 µm long on

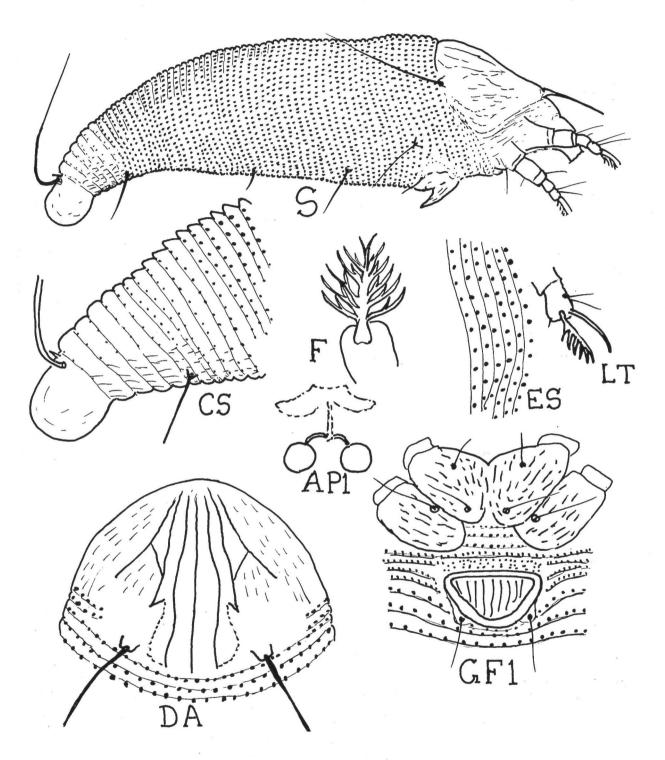


Fig. 2: Aceria polygalae.

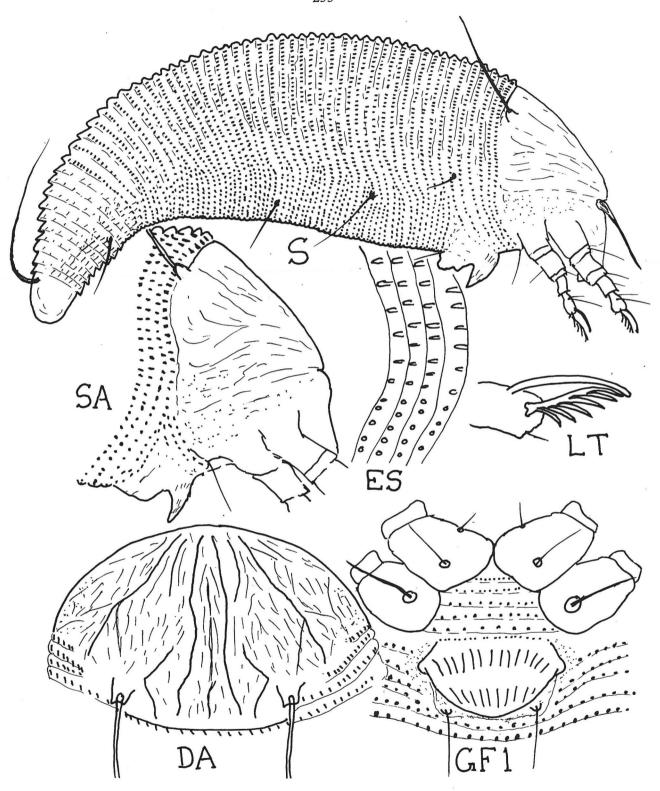


Fig. 3: Aceria dichotomae.

ring 33; third ventral seta 18  $\mu$ m long on ring 8 from behind; caudal seta 26  $\mu$ m long; accessory seta indistinct. Female genitalia close to coxae, 20  $\mu$ m wide and 11  $\mu$ m long; converflap with two rows of scorings; 14-16 in the anterior row and 10-12 in the posterior row; genital setae 9  $\mu$ m long.

Male: 155-160  $\mu$ m long; 45  $\mu$ m thick; genitalia 14  $\mu$ m wide and genital seta 7  $\mu$ m long and very thin.

Types: A holotype slide with females and 10 para type slides with females and males; collected by the author, on 1-7-1978 at the Botanic Garden, Tamil Nadu Agrl. University, Coimbatore, Tamil Nadu, India on Cordia dichotoma Forst. (Boraginaceae) (Collection No. 28).

Remarks: The mites were found in the tightly rolled edges of the leaves.

## **Tegonotus cardiavagrans**, sp. nov. (Fig. 4)

This species resembles *Tegonotus ignavus* Boczek, 1964, but could be differentiated by this admedian lines on the shiled; and the longer genital setae, apart from the measurements of the various structures.

Female: 180-190  $\mu$ m long, 50  $\mu$ m thick, slightly dorsoventrally flattened, yellowish. Rostrum 18  $\mu$ m long, curving forward and downward; antapical seta 5  $\mu$ m long. Shield 55  $\mu$ m wide, 45  $\mu$ m long with an anterior lobe overhanging rostrum; shield clear except for the faint representation of admedians; dorsal tubercles near rear shield margin; 15  $\mu$ m apart; dorsal setae 12  $\mu$ m long, pointing centrad and upward. Foreleg 30  $\mu$ m long; tibia 6  $\mu$ m long; tibial seta 4  $\mu$ m long at basal 1/3; tarsus 6  $\mu$ m long; claw 6  $\mu$ m long, curved and blunt at tip; feather claw 4 rayed. Hindleg 28  $\mu$ m long; tibia 5  $\mu$ m long; claw 6  $\mu$ m long. Coxae with all three setiferous tubercles; coxal area clear; first setiferous tuber-

cle placed more anteriorly. Abdomen with about 20 broad tergites with elongate microtuberculation; about 70 sternites with fine microtuberculation; lateral seta 20  $\mu$ m long on ring 10; first ventral seta 30  $\mu$ m long on ring 23; second ventral seta 10  $\mu$ m long on ring 42; third ventral seta 17  $\mu$ m long on ring 6 from behind; caudal seta 55  $\mu$ m long; accessory seta 2  $\mu$ m long and thin. Female genitalia a little away from coxal base; 22  $\mu$ m wide; 12  $\mu$ m long; coverflap without any lines; genital seta 40  $\mu$ m long and prominant.

Male: Not known.

Types: A holotype slide and 5 paratype slides all females. Collected by the author on 1.7.1978 at Botanic gardens Tamil Nadu Agrl. University, Coimbatore, Tamil Nadu, India on *Cordia* sp. (Boraginaceae). (Collection No. 293).

*Remarks*: The mites are vagrants on leaf under surface.

### Metaculus sapindiphagus, sp. nov. (Fig. 5)

This species resembles *Metaculus syzygii* Keifer (1962) but could be differentiated by the shield pattern, 5 rayed feather claw, clear coxal area and nongranular basal portion of the female genital converflap.

Female: 130-140  $\mu$ m long, 45  $\mu$ m thick; rostrum 15  $\mu$ m long pointing downwards; antapical seta 3  $\mu$ m long. Shield 40  $\mu$ m wide; 40  $\mu$ m long with a prominant blunt lobe over rostrum base. Median absent, admedians and submedians represented by broken lines; sides of shield clear. Dorsal tubercles 5  $\mu$ m long; 40  $\mu$ m apart, on the rear shield margin; dorsal seta 7  $\mu$ m long pointing backward. Foreleg 23  $\mu$ m long; tibia 6  $\mu$ m long, tibial seta 3  $\mu$ m long near middle; tarsus 5  $\mu$ m long; claw 6  $\mu$ m long, curved, knobbed at tip; feather claw 5 rayed. Hindleg 21  $\mu$ m long; tibia 5  $\mu$ m long; claw 6  $\mu$ m long. Coxae with a clear sternal line, coxal area clear, first setiferous tuber-

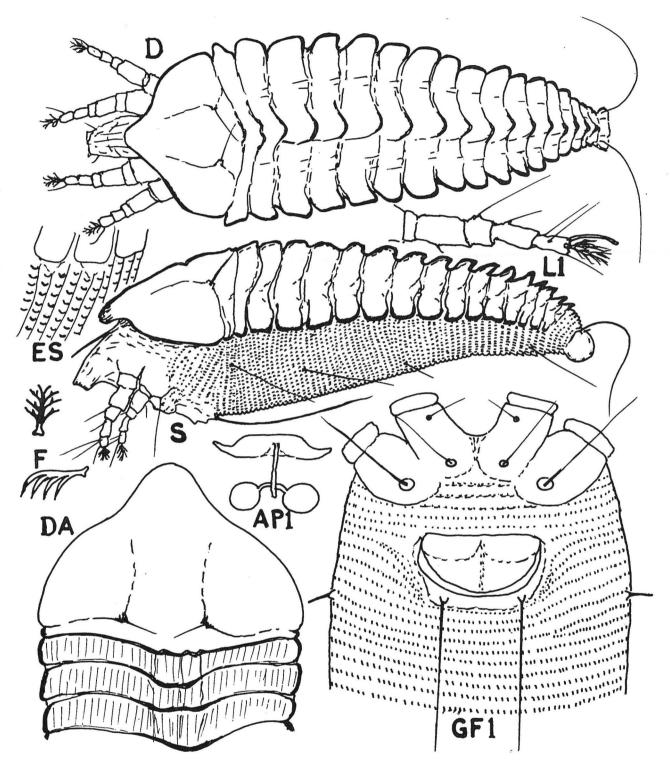
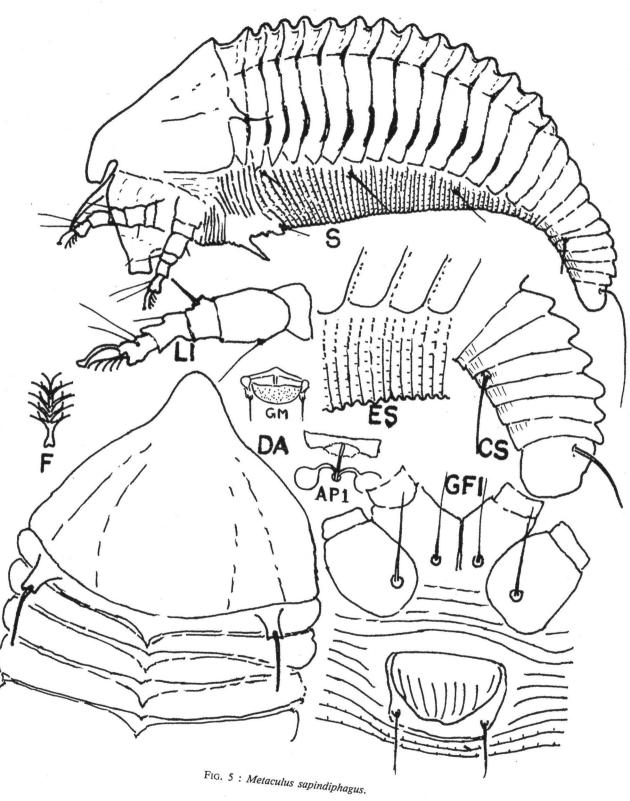


Fig. 4: Tegonotus cardiavagrans.



cles absent. Abdomen with 22 broad smooth tergites and 60 finely microtuberculate sternites; lateral seta 8  $\mu$ m long on ring 10; first ventral seta 30  $\mu$ m long on ring 25; second ventral seta 7  $\mu$ m long on ring 40; third ventral seta 12  $\mu$ m long on ring 6 from behind; caudal seta 35  $\mu$ m long; accessory seta 2  $\mu$ m long. Female genitalia 15  $\mu$ m wide; 10  $\mu$ m long, coverflap with 10-12 lines; genital seta 10  $\mu$ m long.

Male: 120-125  $\mu$ m long; 40  $\mu$ m thick; genitalia 15  $\mu$ m wide; genital seta 10  $\mu$ m long.

Types: A holotype slide with females and 3 paratype slides with males and females collected by the authors on 1.7.1978 at the Botanical Gardens, Tamil Nadu Agrl. University, Coimbatore, Tamil Nadu, India, on Sapindus saponaria Linn. (Sapindaceae) — Soap nut tree (Collection No. 295).

Remarks: The mites are under surface leaf vegrants.

# Vasates cassiae, sp. nov. (Fig. 6)

This species resembles *Vasates cannabicola* Farkas (1960) but could be differentiated by the anterior lines and cross lines on the shield; sides of the shield with scorings, six rayed feather claw, the cross lines at the base of the female genital coverflap and the number of longitudinal ribs on the coverflap.

Female: Dull white to creamy, worm like, a little dorsoventrally flattened; 170-180  $\mu$ m long, 50  $\mu$ m thick; rostrum 19  $\mu$ m long, evenly down-curved; antapical seta 8  $\mu$ m long. Shield 42  $\mu$ m wide, 37  $\mu$ m long, with a clear pattern of lines. Median line complete and fairly straight; admedians converge towards the anterior end with cross lines connecting with the median at three points fairly equidistant from each other. First submedian broken and represented in the anterior and middle of shield; second submedian curved,

converge towards the anterior end and joins with the first submedian. Third submedian forms the shield margin, converge acutely and from the overhanging portion over the rostrum. Dorsal tubercles near rear shield margin, 18 µm apart, prominant, 4 µm long; dorsal setae 16 µm long, projecting upwards and backwards. Foreleg 27  $\mu$ m long, tibia 7  $\mu$ m long, tibial seta 6  $\mu$ m long; tarsus 5  $\mu$ m long, claw 6  $\mu$ m long, slightly arched; feather claw 7 rayed. Hindleg 25  $\mu m$ long; tibia 5  $\mu$ m long; tarsus 5  $\mu$ m long; claw  $7 \mu m$  long. Coxae with all three setiferous tubercles, coxal area with fine striations and granulations. Tergites with about 42 rings, broad and with faint microtuberculation, sternites about 65 with fine dot like clear microtuberculation. Lateral seta 40 µm long on ring 10; first ventral seta 50  $\mu m$  long on ring 24; second ventral seta 14  $\mu m$ long on ring 40; third ventral seta 30  $\mu m$  long on ring 6 from behind; caudal seta 55  $\mu m$  long; accessory seta 3  $\mu$ m long. Female genitalia 20  $\mu$ m wide and 13  $\mu$ m long, coverflap with 12-14 lines; genital seta 20 µm long.

Male: Not known.

Types: A holotype slide and 10 paratype slides all females, collected by the author on 13.7.1978 at Tengumarahda, Coimbatore district, Tamil Nadu, India, on Cassia auriculata Linn. (Leguminosae) (Collection No. 297).

Remarks: Mites found as vagrants on the fruits causing rusting symptoms.

Other material studied: Collected on 27-3-1979 at Periakulam Fruit Research Station, tamil Nadu, India on the fruits of silk cotton tree, Ciba pentandra Linn. causing rusting symptoms.

# Calepitrimerus asperrimae, sp. nov. (Fig. 7)

This species is near *Calepitrimerus andropogo*nis Keifer (1944) but could be differentiated by the four rayed feather claw, coxal area with fewer

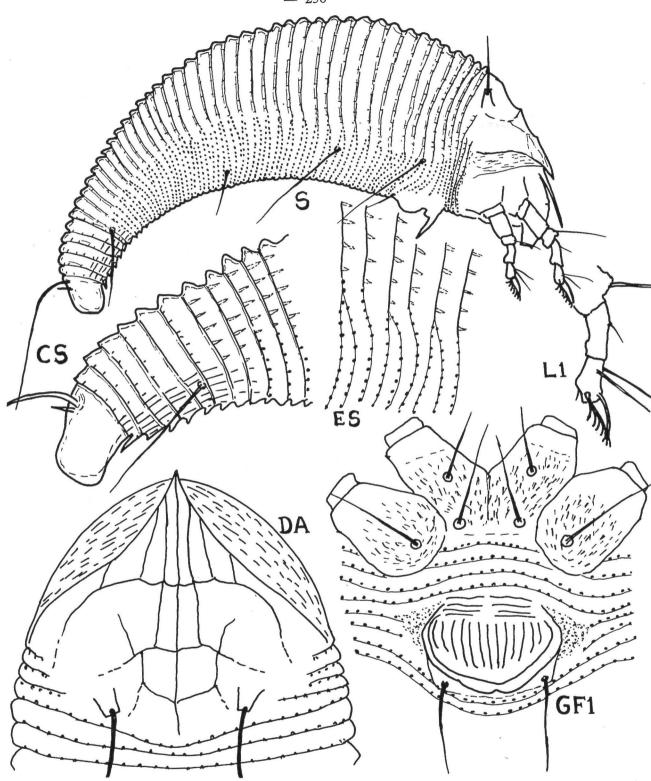


Fig. 6: Vasates cassiae.

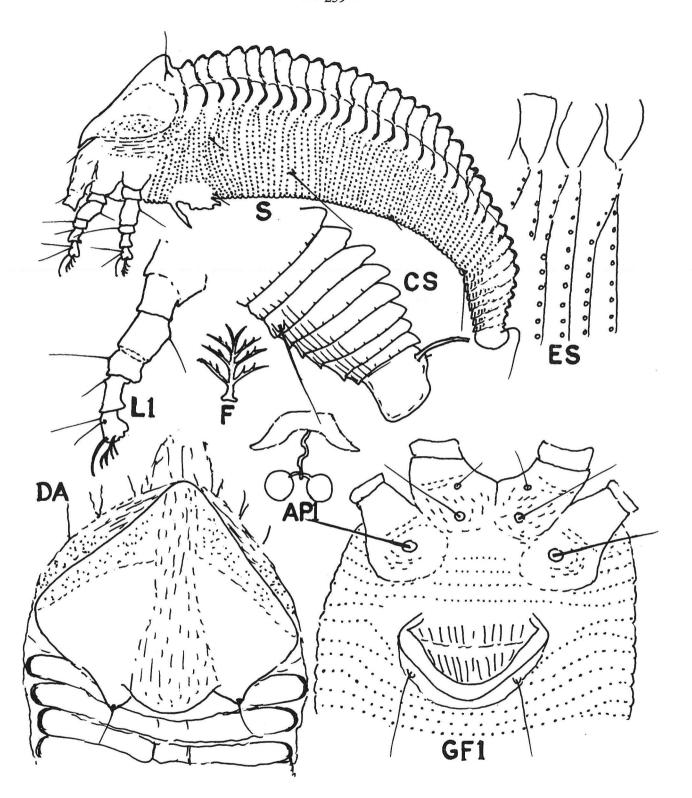


Fig. 7 : Calepitrimerus asperrimae.

granulations, and clear microtuberculation of the sternites, apart from the measurements.

Female: 180-190  $\mu$ m long; 50  $\mu$ m wide; rostrum 18 µm long, pointing obliquely downwards: antapical seta 5 µm long. Shield 40 µm wide, 35 µm long, a narrow shield lobe overhanging rostrum base, central area of shield with short scorings or lines, anterior margin granular; sides of shield granular. Dorsal tubercles at shield margin, 15 µm apart; dorsal seta 10 µm long pointing backward and outward. Foreleg 23 μm long; tibia 6 μm long; tibial seta 5 μm long; tarsus  $5 \mu m$  long; claw  $6 \mu m$  long, slightly curved; feather claw 4 rayed. Hindleg 21 µm long; tibia  $5 \mu m$  long; tarsus  $5 \mu m$  long; claw  $6 \mu m$  long. Coxae widely joined, all three setiferous coxal tubercles present, coxal area granular. Abdomen with about 30 smooth tergites, and 56 microtuberculate sternites; lateral seta 8 µm long on ring 8; first ventral seta 38 µm long on ring 20; second ventral seta 6 μm long on ring 34; third ventral setae 22  $\mu m$  long on ring 6 from behind; caudal seta 40 µm long; accessory seta 1 µm long. Female genitalia away from coxal base, 20  $\mu$ m wide, 13  $\mu$ m long; coverflap with two rows of scorings of 10-12 lines in each; genital seta  $10 \mu m$  long.

Male: Not seen.

Types: A holotype slide and 5 paratype slides all with females, collected by the author on 13-7-1978 at Tengumarahada, Coimbatore District, Tamil Nadu, India, (Collection No. 297) on Ficus asperrima Roxb. (Moraceae).

Remarks: Mites found in tender leaves as vagrants.

# **Ditrymacus keiferi**, sp. nov. (Fig. 8)

The genus *Ditrymacus* has been described by Keifer (1960) with the type species *Ditrymacus athiaesella* Keifer recorded from Algeria. In the

present study two more species have been collected and described. The following species differ from the type species by granular shield area and granular coxal area.

Female:  $165-170 \mu m \log ; 65 \mu m \text{ wide} ; \text{ ros-}$ trum 20 µm long with two spines; antapical seta 12  $\mu$ m long; thick and prominant. Shield 60  $\mu$ m wide, 42 µm long, triangular, anterior lobe over rostrum prominat, fairly big invagination or depression or pit on either side of the shield near shield margin opening up at the base of the dorsal tubercles. Dorsal tubercles 30 µm apart at shield margin, dorsal setae 5 µm long pointing upward and backward. Shield with admedians represented faintly; the whole shield area with fine dot like depression (seen under phase contrast as bright dots). Foreleg 28  $\mu$ m long; tibia 7  $\mu$ m long, tibial seta 3  $\mu$ m long at middle; tarsus 5  $\mu$ m long; claw 5 µm long, knobbed at tip, feather claw 4 rayed, broad, giving a bifid appearance. Hindleg 25  $\mu$ m long; tibia 6  $\mu$ m long, claw 5  $\mu$ m long; hind femoral and patellar seta small. Coxae with all three setiferous tubercles; coxal area with crosswise striations. Abdomen with 30 broad, smooth tergites, about 70 sternites with elongated faint microtubercles. Lateral seta 12  $\mu$ m long on ring 15; first ventral seta 30  $\mu$ m long on ring 28; second ventral seta 30  $\mu$ m long on ring 50; third ventral seta 22 μm long on ring 6 from behind; caudal seta 30 μm long; accessory seta absent. Female genitalia 20 µm wide; 15  $\mu$ m long; coverflap with two ranks of scorings, genital seta  $10 \, \mu m$  long.

Male: Not known.

Types: A holotype slide and 5 paratype slides all with females collected by the author on 20-11-1975 at Aliyamagar forest, Tamil Nadu, India (Collection No. 211) on an unidentified shrub.

Remarks: Mites are brown and found as under surface leaf vagrants. This species is named in honour of H. H. Keifer, Sacramento, California, for his maximum contribution on this group of mites.

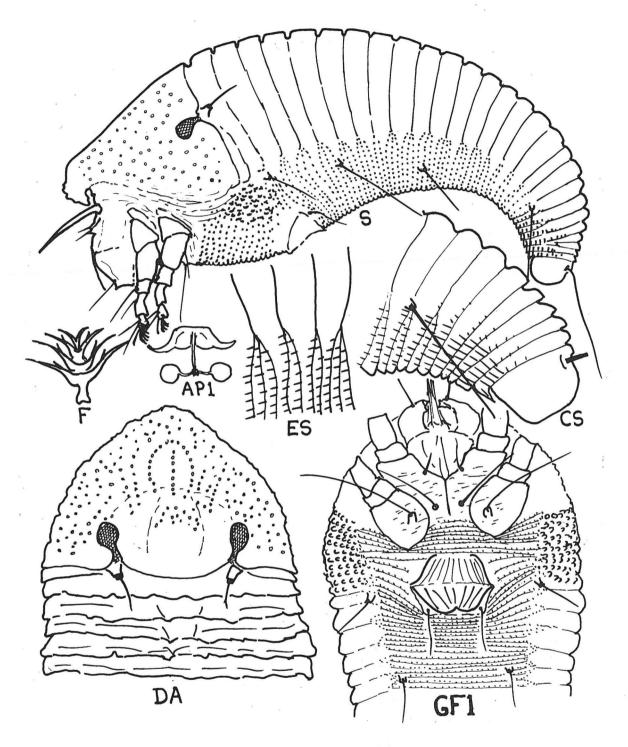


Fig. 8 : Ditrymacus keiferi.

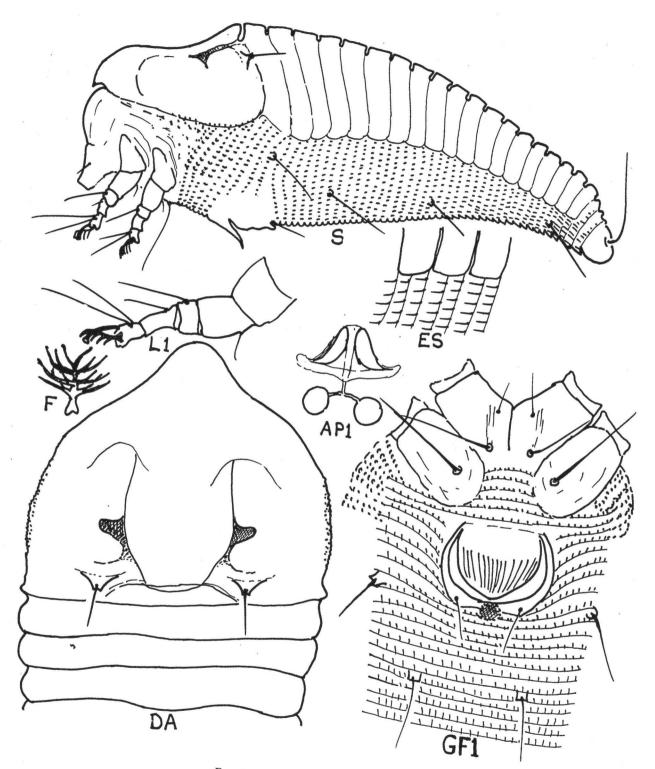


Fig. 9 : Ditrymacus integrifoliae.

## **Ditryimacus integrifoliae**, sp. nov. (Fig. 9)

This species could be differentiated from the type species by the opening of the shield pit at the base of the dorsal shield tubercles and by the single row of scorings on the female genital coverflap.

Female: 150-160 µm long, 60 µm wide; rostrum 15  $\mu$ m long pointing downwards; antapical seta 5  $\mu$ m long. Shield 55  $\mu$ m wide; 45  $\mu$ m long; dorsal tubercles at shield margin, 24 µm apart; dorsal setae 7  $\mu$ m long, pointing backwards. Dorsal shield pits near base of dorsal tubercles on either side of the admedian line which are represented in the basal 2/3 length, anteriorly ending in slight protuberences. Sides of the shield granular. Foreleg 24  $\mu$ m long, tibia 5  $\mu$ m long, tibial seta 4  $\mu$ m long; tarsus 5  $\mu$ m long; claw 4  $\mu$ m long, knobbed at tip, featherclaw 4 rayed. Hindleg 23  $\mu$ m long, tibia 4  $\mu$ m long; claw 4 μm long, all usual leg setation present. Coxae with a clear sternal line, all three setiferous coxal tubercles present, coxal area with a few scorings. Abdomen with about 24 broad smooth tergites and about 48 finely microtuberculate sternites. Microtubercles elongated, placed along the posterior margin of each ring. Lateral seta 25  $\mu$ m long on ring 8; first ventral seta 45 µm long on ring 12; second ventral seta 8 µm long on ring 25; third ventral seta 15  $\mu$ m long on ring 5 from behind; caudal seta 45 μm long; accessory seta absent. Female genitalia 20  $\mu$ m wide 15  $\mu$ m long; coverflap with about 16 lines; genital seta 8 µm long.

Male: Not known.

Types: A holotype slide and 7 paratype slides all with females collected by the author on 7-8-1977 at Deviar Cardamon Estates, Saithur Hills, Ramana-

thapuram District, Tamil Nadu, India at 1335 metres above MSL (Collection No. 265) on *Artocarpus integrifolia* Linn. (Moraceae). Jak tree.

*Remarks*: The mites are found in the buds and as under surface leaf vagrants.

#### Abbreviations used in the figures:

AP1 — Internal Female Apodeme.

CS — Side view of caudal end.

D — Dorsal view of mite.

DA — Dorsal view of anterior section of shield.

ES — Side skin structure.

GF1 — Female genitalia and coxae from below.

GM — Male genitalia.

L1 — Left foreleg.

LT - Left tarsus showing claw and feather claw in

side view.

S — Side view of mite.

SA — Side view of anterior end.

All types slides have been deposited in the Department of Entomology collections, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, South India.

#### REFERENCES

BOCZEK (J.), 1964. — Studies on Eriophyid mites of Poland III. — Annal. Zool., 22 (11): 221-236.

CHANNABASAVANNA (G. P.), 1966. — A contribution to the knowledge of Indian Eriophyid Mites. — Univ. Agri. Sci. Bangalore: 83-84.

FARKAS (H. K.), 1960. — Acta. Zool. Acad. Sci. Hung., 6 (3-4): 315-339.

Keifer (H. H.), 1944. — Eriophyid Studies XIV. — Bull. Calif. Dept. Agric., 33 (1): 27-28.

Keifer (H. H.), 1960. — Eriophyid Studies *B-1*. — Bur. ent. Calif. Dept. Agric.: 2-3 & 12-14.

KEIFER (H. H.), 1962. — Eriophyid Studies B-15. — Bur. ent. Calif. Dept. Agric.: 12—13.

Keifer (H. H.), 1966. — Eriophyid Studies *B-20.* — Bur. ent. Calif. Dept. Agric.: 4.

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### CORRIGENDA

### ACAROLOGIA, TOME XXIII:

M. MOHANASUNDARAM. — Indian Eriophyid studies III.

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Ditrymacus integrifoliae, sp. nov.