

New species of *Alliphis* and *Eviphis* (Acari, Eviphididae) from Tamil Nadu, India

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Summary

Four new species of Eviphididae mites are recorded on coprinid beetles from Tamil Nadu, India. The mites are: *Alliphis trichiensis* sp. nov., *A. serrochaetae* sp. nov., *Eviphis ramosae* sp. nov. and *E. spatulaesetae* sp. nov. These are phoretic mites.

Introduction

During a study of mites associated with coprinid beetles, four new species of mites two each in the genera *Alliphis* Halbert and *Eviphis* Berlese were discovered. The adult mites were found firmly attached to the innerside of elytra and lateral sides of ventral abdomen. Halbert (1923) recorded *Alliphis halleri* from the decayed roots of henbane and under the bark of cut pine logs in Ireland. Karg (1963) in a review of the genus observed the *Alliphis* spp. were found in top soil and also on coprophilous beetles particularly the Scarabaeidae. Costa (1963) figured and described *A. halleri* collected from *Copris hispanus* L. in Israel and Christie (1983) described *A. necrophilus* from British burying dung beetles. Samsinak and Daniel (1978) noted that *A. halleri* is the most numerous member of the genus, having been recorded on

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Geotrupes stercorarius (L.) in Central Europe, on *C. hispanus* in Israel and on *G. laevistriatus* Motschulsky in Japan. This paper presents the descriptions of four new eviphid mites from South India for the first time. The type and paratype slides are deposited in the Acarology Collections of the Department of Agricultural Entomology, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, India. All measurements are in micrometers. The setal nomenclature follows that of Christie (1983).

***Alliphis trichiensis* sp. nov.**

(Figs. 1-4)

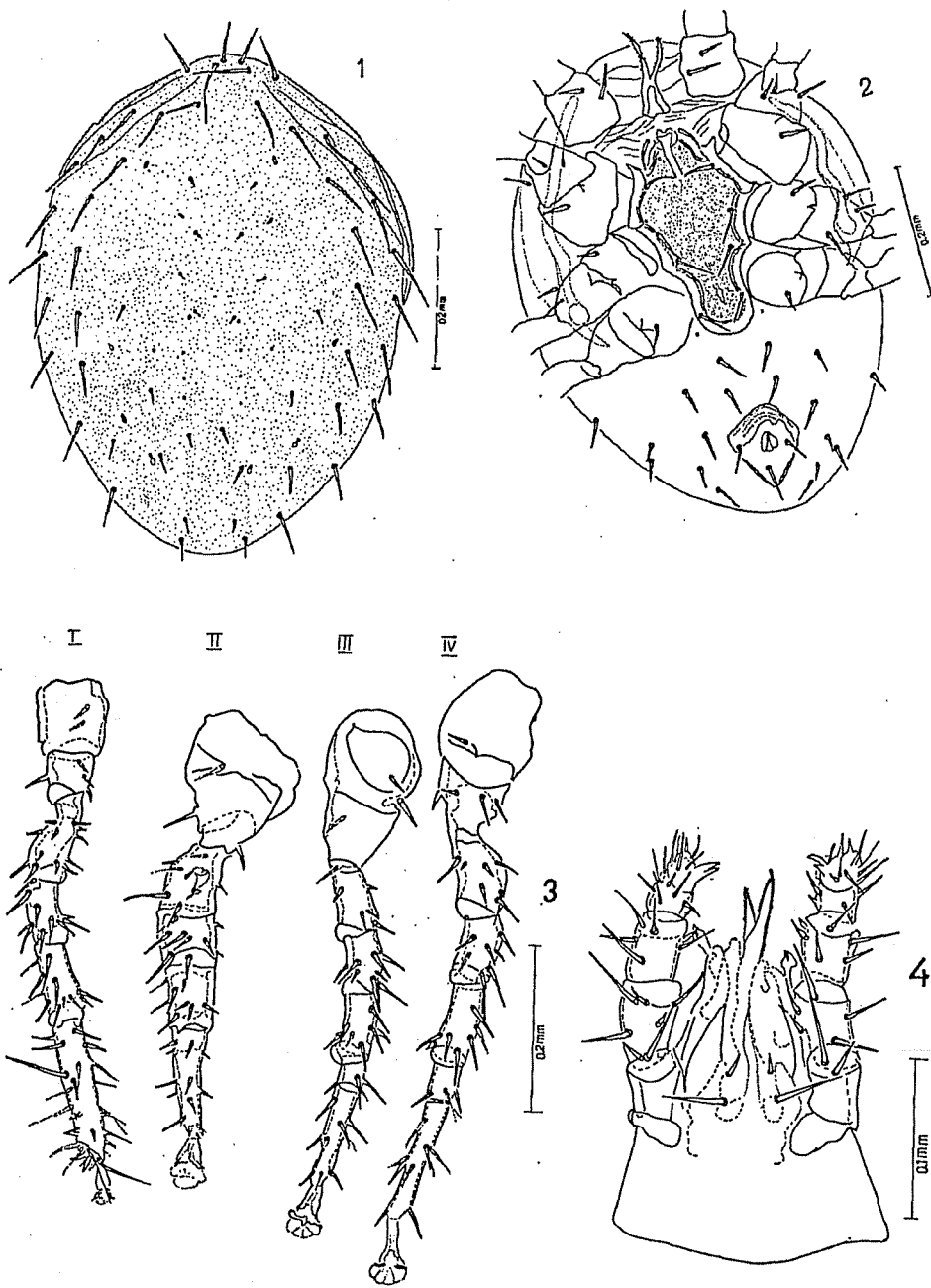
Diagnosis: This new species is very close to *Alliphis halleri* Costa (1963) and *A. necrophilus* Christie (1983) but it can be easily differentiated by the large size and location of dorsal chaetotaxy. *A. trichiensis* differs from *A. halleri* by having a prominent spur on the femora of legs II which are lacking in *A. halleri*. The body size of *A. trichiensis* is twice as that of *A. halleri* and *A. necrophilus*, probably the largest male species so far described under the genus *Alliphis*.

Male dorsum: The oval dorsal shield covers the whole dorsum; 767 long and 578 wide. The dorsal shield bears 30 pairs of simple long acicular setae; those setae on the anterior and marginal area are long (74-95) and those at the middle and posterior edge of idiosoma are short, small (32); vertical setae are lancet shaped and the dorsal shield exhibits weak reticulate pattern.

Venter: The venter with a well developed sternogenital shield; 336 long and 210 wide at the anterior margin. It bears 5 pairs of long setae and ornamentation not evident. The anal shield 122 long and 107 wide with a pair of paranal and an adanal setae; anal shield has an irregular pattern of sclerotization. The opisthogastric membrane has 10 pairs of setae measuring 54 long. The peritreme extends posteriorly to the anterior margin of coxae IV.

Gnathosoma: The gnathosoma as shown in figure (4). Spermatodactyl present on the movable digit of the chelicerae. It has a short stalk and a terminal process. The tritosternum has a broad base with pilose laciniae.

Legs: All the legs are long with a terminal claw and an empodium. The legs I-IV, 714, 630, 683 and 788 long respectively. The femora of



Figures 1-4. *Alliphis trichiensis* sp. nov. 1. Dorsal view of adult male, 2. Ventral view of adult male, 3. Legs I-IV, 4. Gnathosoma.

legs II and IV bear spurs. The spur on femur II is very large and prominent on the ventral side, but on leg IV the spur is not evident and it may remain as a stout seta.

Leg chaetotaxy - Leg I, 2-4-11-10-11-24; Leg II, 1-2-9-8-8-16; Leg III, 2-1-6-8-7-12 and Leg IV, 1-3-7-7-6-12.

Types: The holotype male marked on slide, India: Tamil Nadu: Trichy, 28.XI.1992. ex. *Catharsius capucinus* coll. K. Ramaraju (No. 30/3), five paratype slides all with males collection, data same as holotype.

The mite species is named after the type locality.

Relationship to host: These reddish brown coloured mites were found attached to the venter of abdomen and legs of the host coprinid beetle and hence the relationship is purely phoretic.

Alliphis serrochaetae sp. nov.

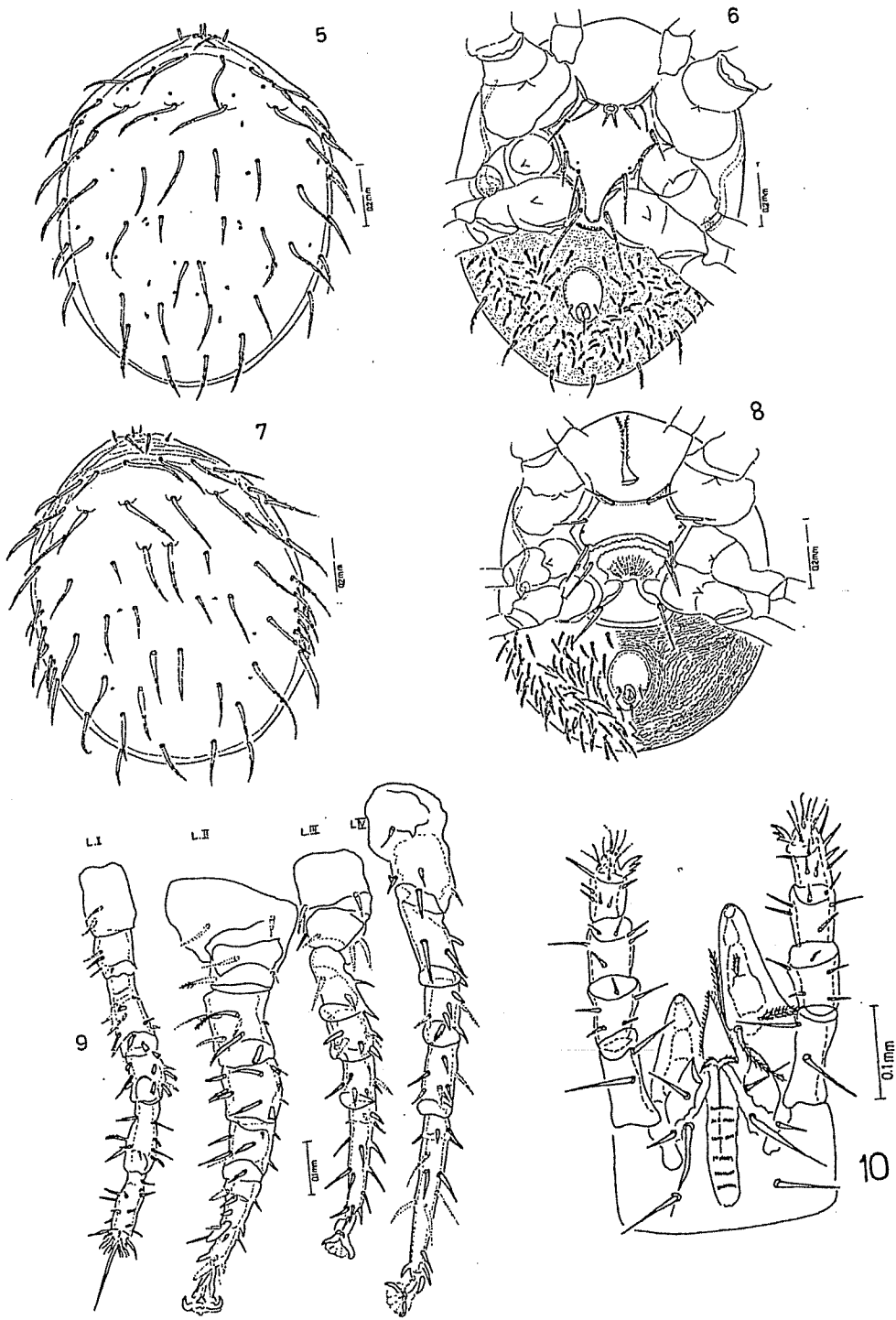
(Figs. 5-10)

Diagnosis: This new species is very close to *A. halleri* Costa (1963), *A. necrophilus* Christie (1983) and *Alliphis trichiensis* sp. nov. in many aspects, but it can be differentiated from all of them by the presence of long pectinate dorsal setae in both male and females and the ventral opisthogastric integument with many pectinate setae, which is absent in all other species.

Male dorsum: Dorsal shield single, almost oval covering the entire dorsum, 1155 long and 640 wide; dorsal shield weakly reticulate, bears about 30 pairs of long (162-216) pectinate setae; the vertical setae small, lancet shaped and closely approximated.

Venter: The sternogenital shield 368 long and 315 wide; posterior portion of the sternal shield narrow. It bears 5 pairs of subequal setae; setae St_5 longer (216) than others. The ventrianal shield 168 long and 126 wide with a pair of paranal and a long adanal seta. The opisthogastric integument bears nearly 70 pairs of small (54) pectinate setae flanking the anal shield. The peritreme extends posteriorly to the level of anterior coxae IV.

Female dorsum: The dorsal shield round, covering the entire dorsum, 1050 long and 788 wide. Dorsal shield with poor reticulations; striation pattern more distinct anteriorly and along the peritremal shield. Body surface deeply punctated with 30-34 pairs of very long (179) pectinate setae.



Figures 5-10. *Alliphis serrochaetae* sp. nov. 5. Dorsal view of adult male, 6. Ventral view of adult male, 7. Dorsal view of adult female, 8. Ventral view of adult female, 9. Legs I-IV, 10. Gnathosoma.

Venter: The sternogenital shield 368 long and 315 wide; posterior portion of the sternal shield narrow. It bears 5 pairs of subequal setae; setae St₅ longer (216) than others. The ventrian shield 168 long and 126 wide with a pair of paranal and a long adanal seta. The opisthogastric integument bears nearly 70 pairs of small (54) pectinate setae flanking the anal shield. The peritreme extends posteriorly to the level of anterior coxae IV.

Female dorsum: The dorsal shield round, covering the entire dorsum, 1050 long and 788 wide. Dorsal shield with poor reticulations; striation pattern more distinct anteriorly and along the peritremal shield. Body surface deeply punctated with 30-34 pairs of very long (179) pectinate setae.

Venter: The sternal shield much broader (325) than long (105) with three pairs of setae; setae St₁-St₃ are simple and approximately equal in length (105). The metasternal setae also long, stout and inserted on small shields. The genital shield well developed with a round posterior margin. A pair of long (198) setae arise on the wall of genital shield. The anal shield almost subequal in length and width (105); with a pair of paranal and a long adanal setae. The outer integument bears 80-85 pairs of small pectinate setae surrounding the anal shield. The peritreme extends beyond coxae III.

Gnathosoma: The gnathosoma 350 long; the hypostomal setae simple, C₃ longer than C₁, C₂ and C₄. The tritosternum has broad base with a bifid pilose laciniae. Cheliceral sclerites strong with arthrodistal process at the base; palpal apophyses 3 tined.

Legs: All legs long, broad with stout spines and spurs. Legs I-IV measure 735, 845, 735 and 998 long respectively. Leg chaetotaxy - Leg I, 2-4-12-10-9-24; Leg II, 2-3-7-10-8-14; Leg III, 2-4-4-6-7-15 and Leg IV, 1-4-4-7-7-14.

Types: The holotype adult female marked on slide with an allotype male, India: Tamil Nadu: Madurai, 28.X.1992. ex. *Catharsius molossus* (Coprinae: Coleoptera) coll. K. Ramaraju (No: 28/3); two paratype slides with females and males, collection data same as holotype.

The mite species is named after the dorsal body setal (serrate or pectinate) character.

Relationship to host: Pale brown coloured mites found attached to the ventral abdominal region and mouthparts by their legs and chelicerae and hence the association may be a simple phoresy.

***Eviphis ramosae* sp. nov.**

(Figs. 11-17)

Diagnosis: This new species is differentiated from other known species by the presence of long dorsal setae and leg chaetotaxy.

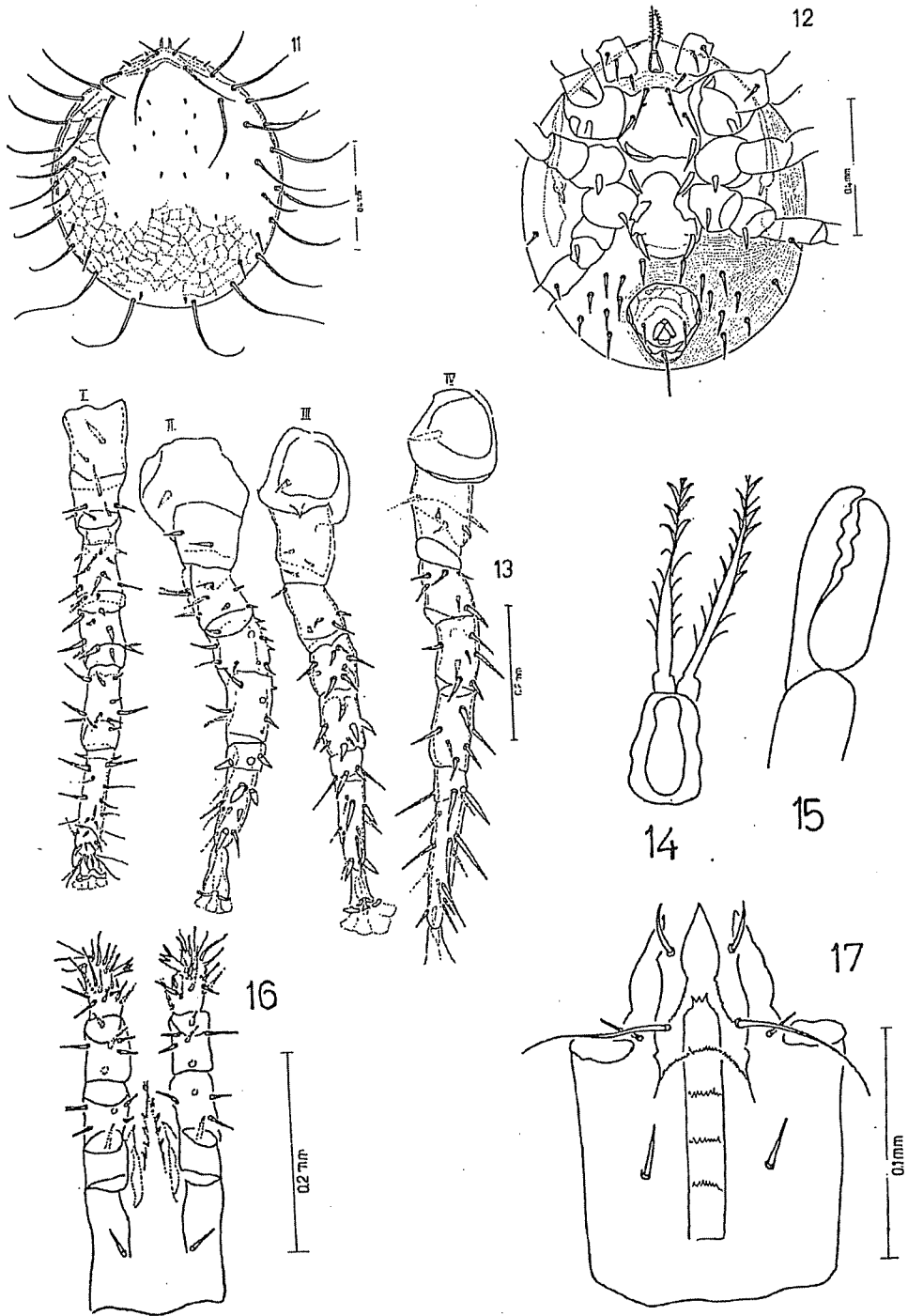
Female dorsum: The dorsal shield round covering entire dorsum; 914 long and 777 wide. Dorsal shield finely reticulated, pattern more pronounced on the posterior of opisthosoma and bears 32 pairs of simple setae; vertical setae lancet shaped; setae on the anterior and lateral margins of the dorsal shield very long measuring (263) and those in the centre are very minute.

Venter: The sternal shield much broader (231) than long 189, with three pairs of setae; setae St_1 and St_2 are simple and long measuring 135 and 89; St_3 much broader and stout (81). A pair of lyriform pores present in the anterior portion of sternal shield. The metasternal setae also broad stout and inserted on small shields. The genital shield 231 long and 168 wide and has a round posterior margin. A pair of broad stout setae arise on the wall of genital shield. The anal shield 210 long and 189 wide at the anterior margin; with a pair of paranal (70) and a long adanal setae (135). The outer integument bears 9 pairs of long setae (76). The peritreme extends beyond coxae IV.

Gnathosoma: The gnathosoma measures 378 long and 126 wide at base; the hypostomal setae C_1 (27) long, stout, C_2 very long (76), C_3 short and simple. The tritosternum has broad base with a bifid pilose laciniae. Cheliceral sclerites strong with 3-4 teeth; palpi with 3 tined apotele.

Legs: All legs are long broad with stout setae and spurs. Legs I-IV measures 735, 683, 683 and 840 long respectively. Leg chaetotaxy: Leg I, 2-6-12-10-11-24, Leg II, 1-2-8-9-8-12; Leg III, 1-3-5-8-7-16 and Leg IV, 1-6-6-7-6-16.

Types: The holotype adult female marked on the slide; India: Tamil Nadu, Madurai; 28.VIII.1991. ex. *Onthophagus ramosus* (Scarabaeidae, Coleoptera), K. Ramaraju coll. (No. 13/1); five paratype slides with collection data same as that of holotype.



Figures 11-17. *Eviphis ramosae* sp. nov. 11. Dorsal view of adult female, 12. Ventral view of adult female, 13. Legs I-IV, 14. Tritosternum, 15. Chelicera, 16. Gnathosoma-dorsal view, 17. Gnathosoma-ventral view.

The mite species is named after the host species.

Relationship to the host: Large reddish brown coloured mites were isolated from the scarabaeid beetle collected from the light trap during a routine survey. These mites were found alive firmly attached to the innerside of the elytra and lateral sides of ventral abdomen. In all cases, the adult female mites with developing larvae and eggs inside their bodies were found firmly attached to the host appendages by their toothed chela, and hence the relationship proved to be a simple phoresy.

***Eviphis spatulaesetae* sp. nov.**

(Figs. 18-21)

Diagnosis: This new species is differentiated from other known species by the presence of long spatulate dorsal setae and leg chaetotaxy.

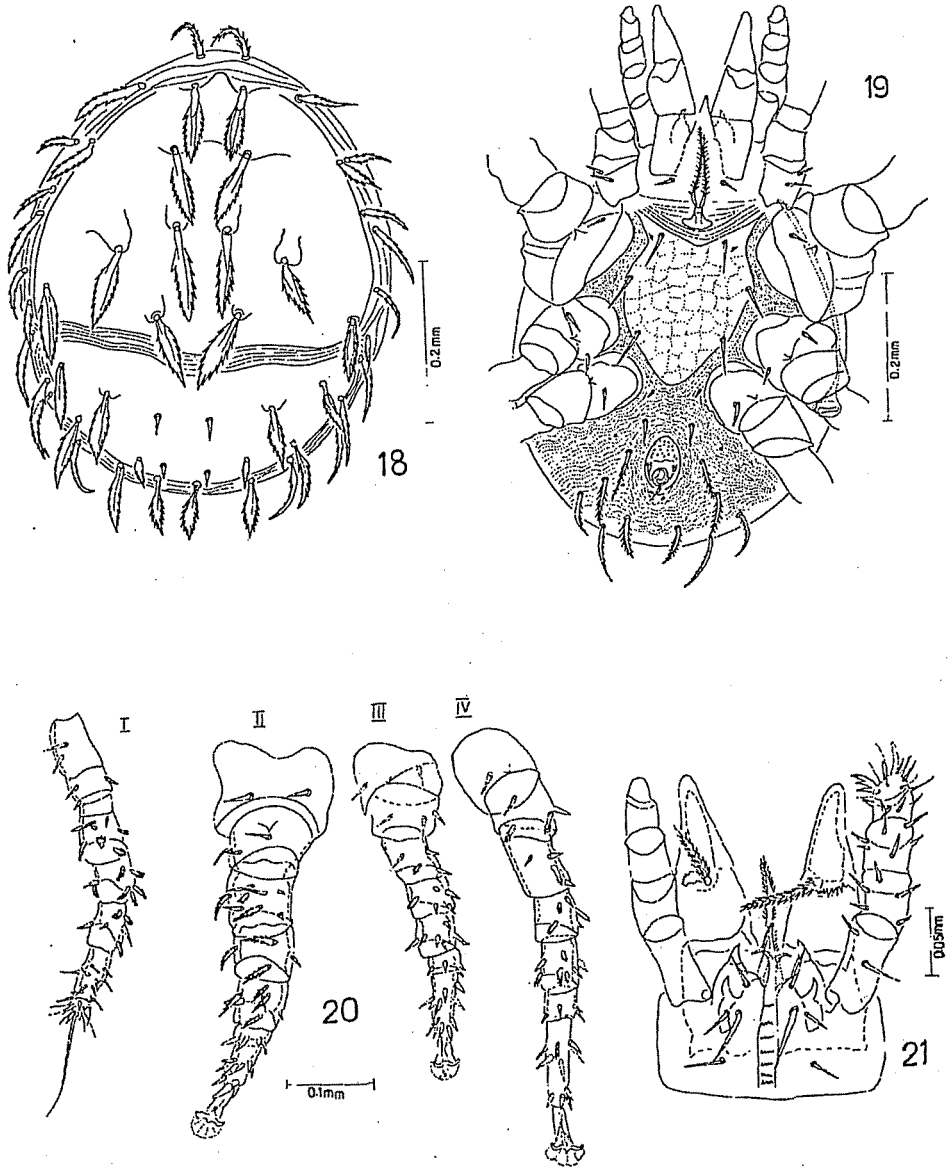
Female dorsum: The dorsal shield entire with punctate surface pattern throughout. Idiosoma 567 long and 420 wide with 26 pairs of long spatulate setae (116). Most of the setae located on the lateral margins of the shield and only 5 pairs of setae arranged medially and mediolaterally on the dorsal surface.

Venter: Venter with a well developed sternal shield longer 189 than wide 162 with 3 pairs of setae and a pair of pores. Sternal shield distinctly reticulated. Anal shield large (108), oval shaped with a pair of paranal and a postanal setae. Two pairs of small simple setae found between sternal shield and anal shield and five pairs of serrate setae present on the integument surrounding the anal shield.

Gnathosoma: Gnathosoma 270 long; chelicerae strong with an arthrodial process; corniculi strong and horn like; ventral hypostomal setae simple, setae C_2 longer than C_1 , C_3 and capitular setae C_4 . Palpal apotele 3 tined.

Legs: All legs bear small setae and spurs. Legs I-IV measures 472, 420, 420 and 525 long. Leg chaetotaxy: Leg I, 2-3-7-7-6-24; Leg II, 2-3-9-4-7-14; Leg III, 2-3-4-5-6-15 and Leg IV, 1-4-4-5-7-14.

Types: The holotype adult female marked on slide, India: Tamil Nadu: Madurai, 28.X.1992. ex. *Catharsius capucinus* (Coprinae: Coleoptera), coll. K. Ramaraju (No. 22/2), two paratype slides with collection data same as that of holotype.



Figures 18-21. *Eviphis spatulaesetae* sp. nov. 18. Dorsal view of adult female, 19. Ventral view of adult female, 20. Legs I-IV, 21. Gnathosoma.

The mite species is named after the dorsal body (spatulate) setal character.

Relationship to the host: Large pale brown coloured mites were extracted from the host beetle collected from the light trap during routine survey. The mites were found alive and firmly attached to the host appendages on the venter by their chelicerae and leg claws and hence the nature of the association may be a simple phoresy.

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Özet

Tamil Nadu (Hindistan)'dan yeni *Alliphis* ve *Eviphis* (Acari, Eviphididae) türleri

Bu çalışmada Tamil Nadu (Hindistan)'da Coprinidae (Coleoptera) familyası türleri üzerinde phoretic olarak bulunan yeni türler *Alliphis trichiensis* sp. nov., *A. serrochaetae* sp. nov., *Eviphis ramosae* sp. nov. ve *E. spatulaesetae* sp. nov. (Acari, Eviphididae)'nin orijinal tanımları yapılmıştır.

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