DESCRIPTION OF TWO NEW SPECIES OF *HAPLACARUS* (ACARI: ORIBATEI) FROM MALABAR, KERALA, INDIA

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ABSTRACT

Two new species of Haplacarus *viz*., H. xavieri *and* H. davisi *belonging to the family Lohmanniidae are described from Malabar, Kerala*

KEYWORDS

Haplacarus davisi *sp. nov.,* Haplacarus xavieri *sp. nov., Kerala, Malabar, new species, Oribatid mites, soil*

ABBREVIATIONS

ro - rostral seta; le - lamellar seta; exa - anterior exobothridial seta; exp - posterior exobothridial seta; in - interlamellar seta; bo - bothridium; ss - sensillus

An extensive survey on the oribatid fauna of Malabar revealed the occurrence of several new species, of which a few are found potential in terms of biodegradation of higher plant residues. In the present paper two new species of the genus *Haplacarus*, are described.

The genus *Haplacarus* is characterised by genital plates without transverse suture, preanal plate broad, anal and adanal plates fused, one pair of anal and four pairs of adanal setae and notogastral and epimeral region without neotrichy.

The type materials are housed at the Division of Acarology, Department of Zoology, University of Calicut, Kerala, India.

All measurements are given in mm.

Haplacarus xavieri sp. nov.

(Figs. 1-7)

Material Examined

Holotype: Female, 24.viii.2001, soil and leaf litter from Botanical Garden, Calicut University, Kerala, India, coll. Alphonsa Xavier.
Paratype: Two females, one male, same information as holotype.

Etymology

Species is named in honour of P.L. Xavier, the father of the first author.

Diagnostic characters

Colour: Pale yellow to light brown
Measurements: Length: 552 (Range 545-564); Width: 288 (Range 280-294)

Dorsal Region (Fig. 1): Body elongated with conical anterior and posterior ends. Microsulpture of the integument in the form of uniformly distributed papillae and fine punctations.

Prodorsum: Anterior margin of the rostrum smooth and entire without incision. All prodorsal setae foliate and weakly serrated. Seta *ro* inserted well behind the anterior tip of rostrum, directed forward and measures 74. Seta *le* inserted below the level of *ro* outwardly inserted and 72 long. Seta *exa* curved at the base and measures 92. Seta *exp* directed posteriorly and measures 72. Seta *in* inserted very close to *bo* and measures 96. Sensillus pectinate with 14-15 long branches (Fig. 3). A prodorsal band formed of 10-12 papillae extends between the interlamellar setae. The integument of prodorsum exhibits uniformly distributed papillae which become smaller in size towards the tip of rostrum.

Notogaster: Notogaster elongate with straight margins. Nine notogastral bands detected of which s_2, s_3, s_6, s_8 and s_9 incomplete towards the centre. Sixteen pairs of notogastral setae, all foliate and weakly serrate. Microsculpture of notogaster consists of small knob-like papillae distributed uniformly except along the notogastral bands

Ventral Region (Fig. 2): Rutellum (Fig. 2) well developed with 2-3 prominent knobs towards the tip. Chelicerae (Fig. 5) sclerotised moderately, digitus mobilis with two and digitus fixus with three teeth. Setae *cha* and *chb* smooth. Pedipalp (Fig. 6) with a chaetotaxy of 0-0-1-0-9. Infracapitulum with four pairs of setae. Setae *a* and m_1 smooth and simple, while *h* and m_2 barbed. Epimeral setal formula 3-1-3-4. Antero-lateral margin of genital plate bordered by triangular aggenital plate. Genital plate without transverse suture. Ten setae on each genital plate, four antiaxial and six paraxial in position. Paraxial setae thin, small and smooth, antiaxial setae long, slightly barbed. Preanal plate broad with centrally downward projection posteriorly. Anal and adanal plates fused, each carrying one anal and four adanal setae. Anal seta located between ad_3 and ad_4 much smaller than adanal setae and finely barbed. Adanal setae foliate and barbed. Fissure *ia*, *ip* and *ih* clearly visible on lateral sides. A few area porosae distributed on either side of the ventral plate. Ornamentation of ventral region consists of irregularly distributed papillae, smaller than that on the dorsal side.

Legs: All legs monodactylous, chaetotaxy of leg *I* (Fig. 7) 0-5-5-4-17. Seta *v* on femur *I* highly foliate with midirib and serrate. Setae *bv* and *d* smooth. Setae *l'* and *l"* foliate and serrate. Genu *I* carries a solenidion α. Seta *v* like that of femur I. Setae *l', l"* and *d* simple and smooth. Tibia *I* carries a long solenidion ς. Setae *l', l"* long, *l'* barbed, *xt* highly foliate and serrate. Tarsus *I* with two solenidia w_1 and w_2. Setae *pv'* and *pv"* small, well foliate and serrate. Seta *m* long, foliate and serrate. Seta *s* long and

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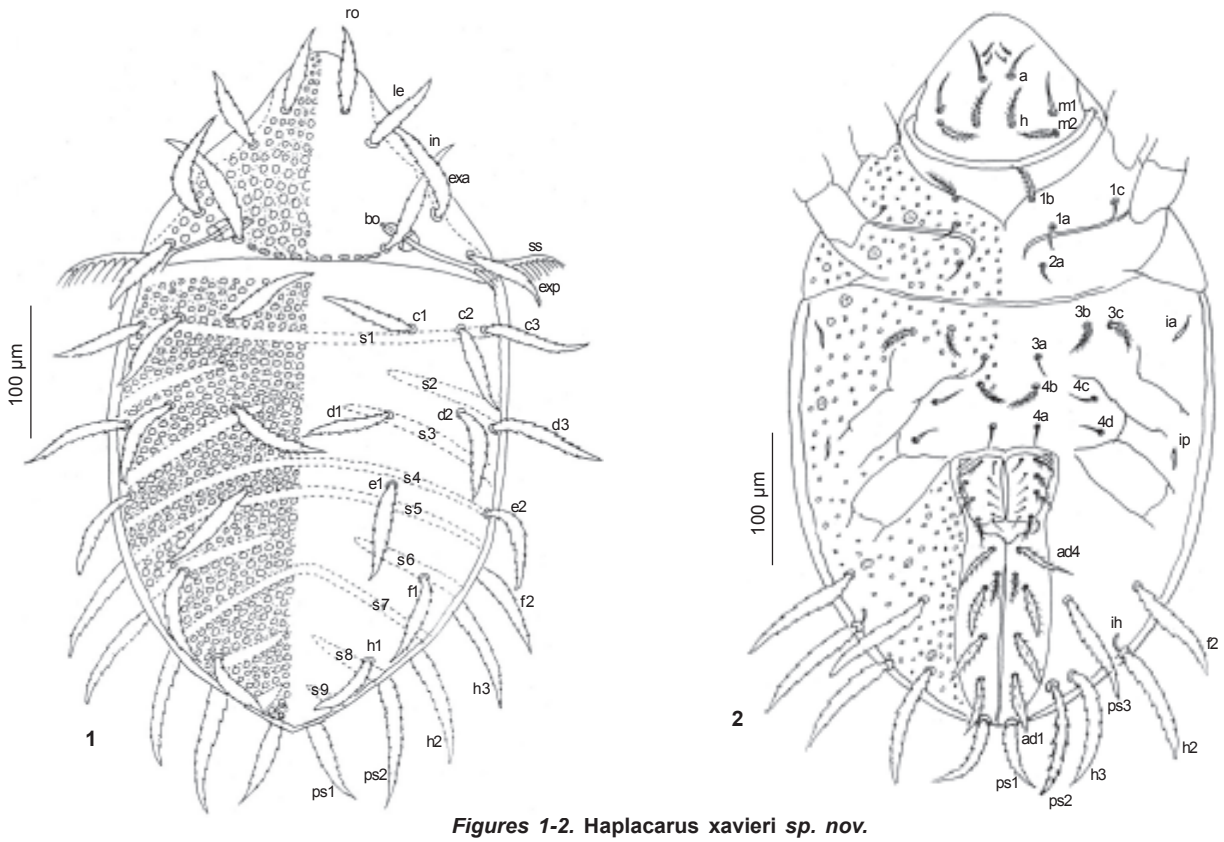


Figures 1-2. **Haplacarus xavieri** ***sp. nov.***
1 - Dorsal view; 2 - Ventral view

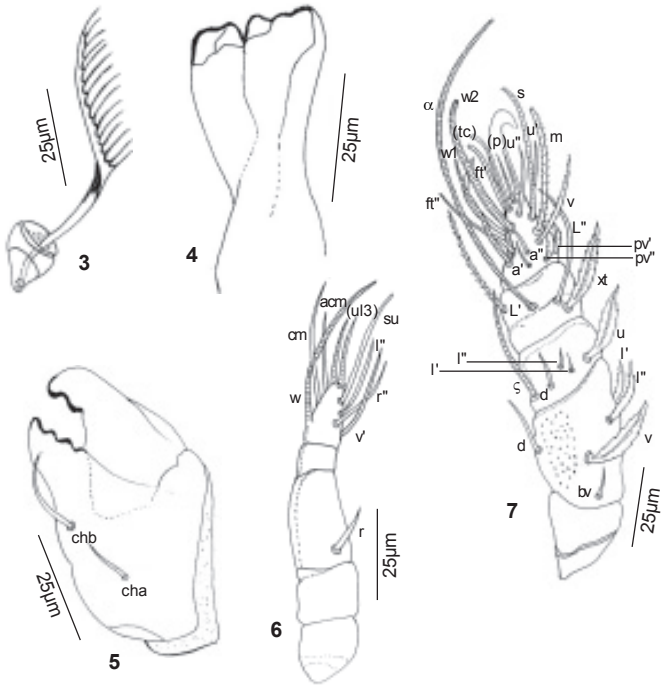


Figure 3-7. **Haplacarus xavieri** ***sp. nov.***
3 - Sensillus; 4 - Rutellum; 5 - Chelicera;
6 - Pedipalp; 7 - Leg I

smooth. Other setae smooth with varying length.

Remarks

The genus *Haplacarus* was erected by Wallwork in 1962 with *H. foliatus* as type species. The genus at present includes 10 species described from different parts of the world. The new species *H. xavieri* on comparison with the previously known species of *Haplacarus* shows similarity to *H. porosus* described by Haq and Clement (1995). The common morphological features detected are the nature of sensillus, number of notogastral and anal setae. However, the present new species differs from *H. porosus* in the incomplete nature of notogastral bands s_2, s_3, s_6, s_8, and s_9 and in the nature of infracapitular and adanal setae, in epimeral setal formula and in the possession of a prodorsal band. The unique features of *H. xavieri* are: (i) Presence of nine notogastral bands of which s_2, s_3, s_6, s_8, and s_9 incomplete; (ii) Sensillus with 14-15 branches; (iii) Infracapitular setae *a* and m_1 smooth, *h* and m_2 barbed; (iv) A prodorsal band formed of 10-12 papillae extends between the interlamellar setae; (v) Epimeral setal formula 3-1-3-4.

***Haplacarus davisi* sp. nov.**
(Figs. 8-14)

Material Examined
Holotype: Female, 28.x.2001, Kakkanchery, leaf litter of *Xylea xylocarpa* Malappuram, Kerala, India, coll. Alphonsa Xavier.
Paratype: Five females, same information as holotype.

Etymology
Species is named in honour of Dr. Davis Paul, the husband of the first author.

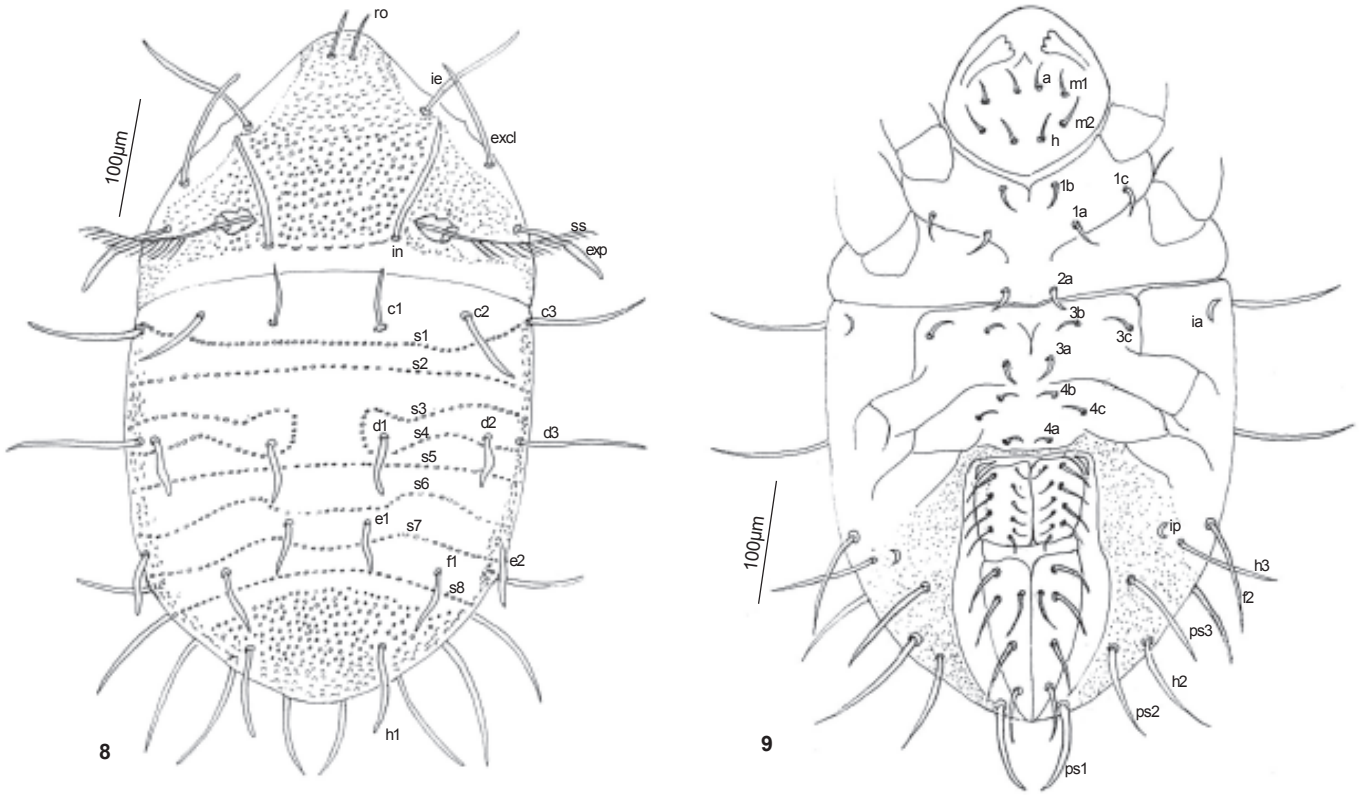
Diagnostic characters
Colour: Golden brown
Measurements: Length: 553 (Range 540-558); Width: 320 (Range 310-322)

Dorsal Region (Fig 8): Body fairly elongated and flat with conical anterior and rounded posterior ends. Integument with scattered rounded foveolae, which are more recognisable at the prodorsum and posterior region of the notogaster.

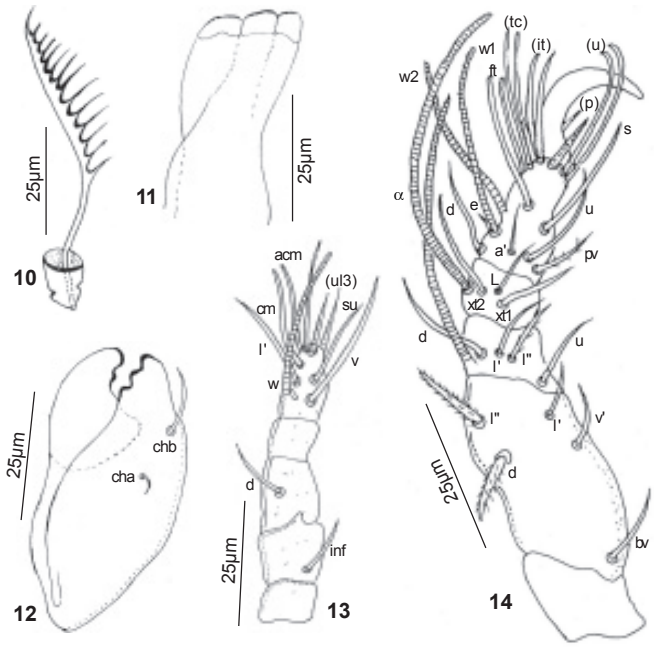
Prodorsum: Prodorsum triangular with broad base and conical anterior region. A small conical projection present in the middle of the lateral prodorsal margin. Five pairs of prodorsal setae, smooth and setiform. Seta *ro* inserted below the tip of rostrum and measures 54. Seta *le* measures 90, inserted well below and outer to the level of *ro*. Seta *in* originates just below and inner to the level of *bo* and of same length as *le*. *exa* measures 85 and *exp* 68. *ss* pectinate with 13-14 branches (Fig. 10). A prodorsal band formed of 6-8 crescentic structures present between the insertional points of setae *in*. Prodorsal integument ornamented with rounded foveolae which become smaller in size towards the rostral apex.

Notogaster: Notogaster elongated, lateral sides straight and rounded posteriorly. Dorsosejugal suture slightly arched and distinct. Eight notogastral bands formed of closely arranged circular area porosae present. s_3 and s_4 fused towards the mid line. Sixteen pairs of notogastral setae, all smooth. Marginal setae longer, range in size 75-82. Central setae smaller and measure 55-66. Notogaster ornamented with rounded foveolae towards lateral and posterior side.

Ventral Region (Fig. 9): Rutellum (Fig. 11) with three prominent blunt teeth. Chelicerae (Fig. 12) stout and well sclerotised. Setae *cha* long and *chb* short, both smooth. Pedipalp (Fig. 13) five segmented with a chaetotaxy of 0-1-1-0-9. Infracapitulum with four pairs of smooth setae. Epimeral setal formula 3-1-3-3. All setae smooth. Anterolateral margin of genital plate bordered by triangular aggenital plate. Genital plates without transverse suture and bear four antiaxial and six paraxial setae. Paraxial setae smaller. All setae smooth. Preanal plate broad with a median downward excrescence. Anal and adanal plates fused. Anoadanal setal formula typical of the genus, i.e., 1+4. All setae smooth. Fissure *ia* located outside sejugal apodeme, *ip* near the postero-lateral margin of the body. Integument of the ventral region with fine punctations.



Figures 8-9.* Haplacarus davisi *sp. nov.
8 - Dorsal view; 9 - Ventral view



Figures 10-14. **Haplacarus davisi *sp. nov.***
10 - Sensillus; 11 - Rutellum; 12 - Chelicera;
13 - Pedipalp; 14 - Leg 1

Legs

All legs monodactylous. Chaetotaxy of leg *I* (Fig. 14) 0-5-5-4-18. Seta *d* on femur *I* foliate and barbed. Seta *l"* stouter and barbed. Setae *bv, v'* and *l'* smooth. Genu *I* bears five setae including solenidion α. Seta *l'* slightly barbed, others smooth. Tibia *I* carries a long solenidion *j*. Tarsus *I* with two solenidia viz., w_1 and w_2. Seta *pv'* slightly barbed, others smooth.

Remarks

A comparison of *Haplacarus davisi* sp. nov. with other described species reveals its similarity with *H. pairathi* Aoki, 1965. Both possess smooth prodorsal, notogastral, infracapitular, anal and adanal setae. But *H. davisi* differs from *H. pairathi* in the number and nature of notogastral bands, lateral prodorsal margin, insertion of seta *le*, epimeral setal formula and in the presence of a prodorsal band. The unique features of *H. davisi* are: (i) Eight notogastral bands, s_3 and s_4 fused; (ii) Insertion of seta *le* above seta *exa*.; (iii) Epimeral setal formula 3-1-3-3; (iv) Presence of a prodorsal band formed of 6-8 crescentic structures between setae *in.;* (v) Sensillus with 13-14 branches.

Described species of the genus *Haplacarus*

1. *H. foliatus* Wall work, 1962 - Ghana
2. *H. pairathi* Aoki, 1965 - Thailand
3. *H. bengalensis* Bhatacharya, 1974 - India
4. *H. javensis* Hammer, 1980
5. *H. pandanus* Sengbusch, 1982 - Micronesia
6. *H. keralensis* Haq *et al*., 1984 - India
7. *H. maharashtraensis* Sanyal, 1984 - India
8. *H. bhadurii* Sanyal, 1984 - India
9. *H. rugosus* Mahunka, 1987 - Malaysia
10. *H. porosus* Haq and Clement, 1987 - India

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