ON A COLLECTION OF ORIBATEI (ACARI: CRYPTOSTIGMATA) FROM SILENT VALLEY, KERALA (INDIA) WITH DESCRIPTIONS OF SIX NEW SPECIES

A. K. SANYAL
Zoological Survey of India, Calcutta

INTRODUCTION

During the course of investigation of faunal wealth of Silent valley, Kerala, India, by a survey party of Zoological Survey of India, soil dwelling oribatid mites were collected on which the present paper is based. Altogether 19 species belonging to 15 genera under 14 families are treated of which 6 species are new to science and 4 genera (Camisia, Gibbicepheus, Oppiella, Lauritzenia) and 7 species are recorded for the first time from India. All measurements are in microns. The types are deposited in the National Collection of the Zoological Survey of India, Calcutta.

Family MESOPLOPHORIDAE

1. Mesoplophora sp.


Distribution: India: Kerala (new record), West Bengal.

Remarks: The specific identification was not possible as the specimen is damaged. So far, this genus was recorded from West Bengal and now it is being reported for the first time from Kerala.

Family PHTHIRACARIDAE

2. Hoplophthiracarus indicus n. sp.

(Figs. 1-3)

Colour of the body light yellowish; length of the notogaster 404, height 309; length of aspis 247.

Aspis flat and narrow; distinct lateral carina arising from above bothridium and running almost parallel with lateral margin of aspis on the distal half, lateral carina touches the tip of aspis; rostral setae (29.2) slightly longer than lamellar setae, situated a little distance away from the tip of the aspis, directed outward and curved downward, smooth, thin, pointed; lamellar setae (20.9) 1/3 as long as interlamellar setae, fine, smooth, pointed; interlamellar setae long (66.8), thick, minutely barbed on its distal half, directed dorsoanteriad; sensillus (62.7) slender, weakly winding near base, head elongate and hyaline shaped; exobothridial setae very minute; fine foveolation on the dorsal surface of aspis, rest portion of aspis punctated.
Notogaster weakly convex, fifteen pairs of notogastral setae, moderately long (62.7-66.8), thick, barbed on their distal half, slightly bending towards anterior direction, c3 slightly longer than c2, c1 and c3 with nearly equal distance from the anterior margin of notogaster, hI the longest setae, mutual distance between h3 – ps4 longer than the distance between ps3 – ps4, notogastral surface densely punctated.

Genital as well as anal plate lightly punctated, nine pairs of genital setae, four pairs placed somewhat distant from the inner margin of genital plate, two pairs close to the margin, munute, three pairs on the anterior appendage of genital plates; five pairs of setae on ano-adanal plates, all setae weakly barbed; an1 and an2 subequal in length and in thickness to ad3, ad1 and ad2 very long, thick, ad2 longer than the longest notogastral setae h1, finely barbed.

All tarsi with one strong claw.

*Holotype*: ♀, India: Kerala, Silent valley, 13 kms away from Valliyaparathodu, 28.i.1980, ex soil and litter, coll. S.K. Bhattacharyya *Paratype*: 1 ♀, data same as for holotype.

*Remarks*: The new species bears close similarity with *Hoplophthiracarus kugohi* Aoki, 1959, in the general configuration of the body and in a number of characters. It can, however, be distinguished from Aoki’s species by the absence of longitudinal striations between in and la and dense punctation of the body.

Family  **EUPHTHRACARIDAE**

3. *Rhysotritia ardua* (Koch)


*Distribution*: India : Kerala (new record), Orissa, Uttar Pradesh.

4. *Rhysotritia ardua* (Koch) var. *otaheitensis* Hammer


Material examined: 1 ♀, India: Kerala, Silent valley, 10 kms. away from Valliyaparathodu on Palghat Road, 25.i.1980, ex soil and litter, coll. S.K. Bhattacharyya; 1 ♀, India: Kerala, Silent valley, 13 kms away from Valliyaparathodu, 28.i.1980, ex soil and litter, coll. S.K. Bhattacharyya.

Distribution: India: Kerala (new record), West Bengal.

Family CAMISIIDAE

5. Camisia sp.

Material examined: 1 Protonymph, India: Kerala, Silent valley, 10 kms north west of camp 2 at Valliyaparathodu, 24.i.1980, ex soil and litter, coll. S.K. Bhattacharyya.

Distribution: India: Kerala (new record).

Family HERMANNIIDAE

Genus Phyllhermannia

Key to the Indian Species of the genus Phyllhermannia

1. Body foveolated with punctation; chitinized ridge above the interlamellar setae .......................................................... foveolatus n. sp.

Body punctated; chitinized ridge below or in between the interlamellar setae .............................................................................................................................................. 2

2. Chitinized ridge below the interlamellar setae, notogastral setae 16 pairs; genital setae 9 pairs .............................. punctatus n.sp.

Chitinized ridge in between the interlamellar setae; notogastral setae 15 pairs; genital setae 18 pairs .................................. berlesei Mondal

6. Phyllhermannia foveolatus n.sp.  
(Figs. 4-5)

Colour blackish brown; length of the body 840, width of the body 470.

The whole surface of prodorsum punctated, specially posterior part more densely punctated, prodorsum broader than long, one round shaped hump above the first leg; rostrum conical, rostral setae smooth, thin, pointed, slightly shorter than their mutual distance (29); lamellar setae (20.5) situated on the lateral side of the prodorsum, very thin, smooth, pointed; interlamellar setae situated below the chitinized arch between the pseudostigmata, sword like, pointed, margins rough, long(71), half as long as to their mutual distance; a strong ridge on either sides lateral to the pseudostigmata; pseudostigmatic organ (120) rod shaped, stem compressed, tip with fine bristles, less than half as long as to their mutual distance.
Figs. 4. *Phyllhermannia foveolatus* n. sp.: Dorsal view; 5. *Phyllhermannia foveolatus* n. sp.: Ventral view.
Notogaster oval, foveolated and punctated; notogastral setae sixteen pairs, long (45.8 - 91.7), narrowly leaf shaped, curved, tips pointed, margins rough, \(d_2, e_2\) and \(f_2\) curved inward, \(p_s_1\) and \(p_s_2\) curved inward like hook, \(h_1, h_2\) and \(p_s_2\) curved outward, setal pores luminous.

The whole ventral surface densely punctated; hypostome rounded; hypostomal setae situated in the middle of the infracapitulum, minute, smooth; apodemata distinct, chitinized, median ridge prominent; epimeral setal formula 3-1-4-7, setae \(3a, 3b, 3c, 4a, 4b,\) and \(4c\) very long (max. 95), fine, smooth, other setae minute, smooth; genital plate smaller than anal plate, nine pairs of genital setae, six on the inner margin and other three on the middle of the genital plate, minute, smooth; agential setae two pairs, one near anterior part and the other near posterior part of genital field, minute, stiff, smooth; adanal fissures distinct, situated obliquely in front of anal field; adanal setae three pairs, short, thick, smooth; anal setae two pairs, minute, smooth, placed on the inner margin of anal plate.

Legs monodactylous, foveolated and punctated; few setae long, leaf like, others string like.


**Remarks**: The new species is well in accord with the description and diagrams of *Phyllhermannia gladiata* Aoki, 1965 by the general body shape, presence of hump on the prodorsum, number and shape of notogastral setae. But it differs from *P. gladiata* by the absence of a ridge on the base of the prodorsum and the ridge on the anterior part of notogaster and by the presence of thin arch on the middle of prodorsum, apically compressed barbed pseudostigmatic organs, inwardly curved posterior notogastral setae and notogastral foveolation. The species also shows some resemblance to the Indian species *P. berlesei* Mondal, 1984 in general body shape and shape of the notogastral setae. But it can easily be separated from Mondal's species in the absence of ridges on the prodorsum and notogaster, in the presence of barbed sensilla, 16 pairs of notogastral setae and 9 pairs of genital setae.

7. *Phyllhermannia punctatus* n.sp.  
(Figs. 6-7)

Colour of the body blackish brown; length of the body 840, width of the body 483.

Prodorsum punctated, area between interlamellar setae and anterior border of hysterosoma more densely punctated; the margin of prodorsum above the first leg round shaped like a hump; rostral setae smooth, thin, pointed, slightly shorter than their mutual distance (33.4); lamellar setae (10.4) situated just above the hump, smooth, thin, pointed, about four times smaller as to their mutual distance (87.7); interlamellar
SANYAL : *On a Collection of Oribatei* 473

setae sword like, apex pointed, margins rough, about half the length of their mutual distance (133.7); a thin arch between the interlamellar setae; pseudostigmatic organ long (127.0), rod like, stem compressed at the tip with fine bristles, less than half of their mutual distance; one semilunar shaped chitinized ridge on the posterior part of prodorsum.

Notogaster oval shaped, punctated, a pair of chitinized ridge on the anterior part of notogaster, notogastral setae sixteen pairs, long (41-90), sword like, pointed tips, $d_2, e_2$ and $f_2$ curved, tips of $p_s_1$ and $p_s_2$ curved inward like hook, $h_1, h_2$ and $p_s_3$ outwardly curved; setal pores prominent.

The whole ventral surface densely punctated, hypostome rounded; a chitinized ridge on the infracapitulum; hypostomal setae minute, smooth, situated on the middle of the infracapitulum; apodemata distinct, chitinized; median ridge prominent; epimeral setal formula 3-1-4-7, setae $3a, 3b, 3c, 4a, 4b$ and $4c$ long (Max. 91), fine, smooth; other setae minute, smooth; genital plate smaller than anal plate (188); genital setae nine pairs, six minute setae on the inner line, three others on the middle, comparatively long, smooth, pointed; aggenital setae two pairs, one near the distal part of the genital field, other near middle of the posterior part of epimeral plate IV, minute, smooth, pointed; adanal fissures distinct, situated obliquely in front of anal field; adanal setae three pairs, short, thick, smooth, pointed; two pairs anal setae, minute, smooth, situated on the inner line and middle of anal plate.

Legs monodactylous, densely punctated; long and minute setae of notogastral type.


**Remarks** : The species shows resemblance to *Phyllhermannia gladiata* Aoki, 1965 by general body shape, presence of hump on the prodorsum, ridge on the base of the prodorsum, number and shape of notogastral setae and small semilunar shaped ridge on the anterior part of notogaster. But it differs from *P. gladiata* by the presence of thin arch on the middle of prodorsum, apically compressed barbed pseudostigmatic organ, inwardly curved posterior notogastral setae and notogastral punctuation. The species also resembles *P. foveolatus* n.sp. in a number of characters but clearly differs from that in the presence of interlamellar setae above the chitinized arch, absence of semilunar shaped ridge on prodorsum and absence of foveolation on the body. Further, the new species are similar to the Indian species *P. berlesei* Mondal, 1984 in general body shape, body punctuation and shape of notogastral setae. It can, however, be separated from *berlesei* by the characters like shape of the ridges on prodorsum and notogaster, barbed sensillus, 16 pairs of notogastral setae and 9 pairs of genital setae.
Family CARABODIDAE

8. Gibbicephus sisiri n.sp.  
(Figs. 8-9)

Colour light brown; length of the body 564, width of the body 326.

The whole body surface finely punctated; prodorsum broad, flat; lamellae broad, width greater than rostral setae, distal part with two elongated light portions; rostral setae small (12.5); lamellar setae a little smaller than rostral setae, situated on the antero-lateral portion of lamella, fine, smooth, directed anteriorly; interlamellar setae long (62.7), directed outwardly, fine, smooth; bothridium cone shaped; sensillus erect to inclinate, filiform, aciculate.

Notogaster almost flat, broad; two fine longitudinal crest on the middle of hysterosoma; two more thick ridges situated latero-medially on the hysterosoma; one marginal ridge encircling the whole hysterosoma; fourteen pairs of notogastral setae, small (max. 34), fine, smooth, four pairs on the median crest, one pair near dorsosejugal suture, three pairs on latero-medial ridge, two pairs on marginal ridge, four pairs in postero-marginal position.

Hypostome round; one pair of setae in the middle of infracapitulum, fine, smooth; epimeral plates distinct, dark coloured; epimeres touching the lateral margin of the body; epimeral setal formula 3-1-3-3, setae fine, smooth; four pairs of genital setae, minute, fine, smooth; anal setae two pairs, minute, pointed; three pairs of adanal setae, fine, smooth, posterior two pairs of adanal setae in postanal position; adanal fissures distinct, situated obliquely away from the base of ad3.

All legs monodactylous.

Holotype : ♀, India : Kerala, Silent valley, 10 kms north west of camp 2 at Valliyaparathodu, 24.i.1980, ex soil and litter, coll. S.K. Bhattacharyya.

Remarks : The new species can easily be differentiated from all other species under the genus by the combination of minute, fine, smooth setae, fine longitudinal crest on the middle of notogaster, thick median ridge on the hysterosoma and dense punctation of the body.

Family TECTOCEPHEIDAE

9. Tectocepheus velatus (Michael)


Distribution: India: Kerala (new record), Orissa, Sikkim, West Bengal.

Family OTOCEPHIDAE

10. Dolicheremaeus renukae n.sp.
(Figs. 10-12)

Colour dark brown; length of the body 809, width of the body 457.

Prodorsum longer than broad, densely punctated, lateral margins of prodorsum without angular tooth; lamellae mostly parallel, roughly sculptured, a weakly chitinised ridge on the outer side of lamellae; rostral setae (76.1) arise from postero-lateral margin of rostrum, curved, conspicuously barbed on the outer side, tips fine extending slightly beyond the anterior margin of rostrum; lamellar setae (81) similar to that of rostral setae; interlamellar setae long (124), situated close to bothridium, stiff, erect, minutely barbed, slightly longer than twice their mutual distance; dorsal pseudostigmatic plates well developed covering the pseudostigmata, ventral pseudostigmatic plates round; sensillus (171) with fusiform head and long pointed bifurcate apex, smooth, stem strongly elbowed near the base; exopseudostigmatic setae placed antero-lateral to ventral pseudostigmatic plate on each side, long (90.4), stiff, erect, minutely barbed, extend beyond the postero-lateral margin of prodorsum; median prodorsal and lateral condyles large, well chitinized, inner postero-median part of prodorsum with two longitudinal rows of scale like sculptures.

Notogaster longer than broad, dorsally punctate, irregular foveolation on the posterior part; indistinct double lined interrupted longitudinal ridges on the median portion of notogaster, lateral notogastral condyles (Co.nl) triangular, projected anteriad, median notogastral condyles (Co.nm) well developed, almost rectangular; ten pairs of notogastral setae, long, stiff, erect, minutely barbed; setae ta, te, ti, ms, r1 and r2 longer (123.7) than other notogastral setae (100.2); distance te-ti > ta-te and te-ms < ms-r1; mutual distance ta-ta < te-te and ti-ti < ms-ms; five pairs of notogastral fissures, ia located in between ta and te, im in between te and ti and posterior to gla being separated from this for a good distance, ih, ips and ip situated anterior to r3, p3 and p1 respectively.

Hypostome anteriorly rounded, hypostomal setae situated somewhat in the middle of the infracapitulum, relatively long and minutely barbed; the whole ventral surface punctated and foveolated; epimeral setae finely barbed, arranged in the formula 3-1-3-3, antiaxial row of setae longer than para axial row; genital plate smaller than anal plate, four pairs of genital setae, equal in length, five times smaller than the anal setae, smooth; aggenital setae barbed; anal setae two pairs, anterior pairs longer than posterior pairs (158), minutely barbed; adanal fissures distinct, situated parallaly on either side of the anal plate; adanal setae three pairs, minutely barbed.
Legs monodactylous.

Holotype: ♀, India: Kerala, Silent valley, 13 kms away from Valliyaparathodu, 28.i.1980, ex soil and litter, coll. S.K. Bhattacharyya, Paratype: 1 ♀, data same as for holotype.

Remarks: The new species shows some resemblance to D. coronarius Chakraborti et al., 1981 in the presence of longitudinal ridges on the notogaster but all other major characters are dissimilar in two species. Further renukae is well in accord with D. cuspidata Wallwork, 1962 in the form of lamellae and rostral, lamellar, notogastral and ventral setae. But the shape of sensilla, long exopseudostigmatic setae and longitudinal ridges on the notogaster distinctly recognise D. renukae as a new species.

11. Dolicheremaus keralaensis n.sp.
     (Figs. 13-15)

Colour dark brown; length of the body 945, width of the body 438.

Prodorsum longer than broad, punctated, lateral margins of prodorsum without angular tooth; lamellae parallal, thin, touching the rostrum; rostral setae (92) originated from postero-lateral margin of rostrum, directed outward and strongly curved inward, unilaterally feathered on the outer side, tips very fine; lamellae almost parallel, a weakly chitinized ridge on the outer side of lamellae; lamellar setae (125.4) similar to that of rostral setae, tips meeting each other; interlamellar setae twice the length of their mutual distance (66.8), straight, smooth, tips fine, situated close to bothridium; dorsal pseudostigmatic plates cover most of pseudostigmata, well developed, almost rounded ventral pseudostigmatic plates; sensillus (142) spindle shaped, smooth, mid-portion slightly expanded, stem strongly elbowed near the base; exopseudostigmatic setae clearly visible, minute (21), situated antero-lateral to ventral pseudostigmatic plate on each side; prodorsal condyles broadly rounded, chitinized, two longitudinal rows of scaly structures on the inner postero-median part of prodorsum.

Notogastral surface covered with dense punctation, distinct foveolation and indistinct broken ridges; lateral notogastral condyles (Co.nl.) well developed and somewhat rounded, median notogastral condyles (Co. nm) relatively small and rounded; notogastral setae ten pairs, ta, te, ti, ms and p3 weakly barbed, p1, p2, r1 and r2 long (146), flagelliform, sometimes tips curved, others setiform (83.6); distance te-ti > ta-te and te-ms < ms-r1; mutual distance ta-ta < te-te and ti-ti < ms-ms; notogastral fissures ia and im aligned obliquely, the latter placed immediately above gla, ih and ips located anterior to r3, ip between p2 and p3.

Hypostome anteriorly rounded, hypostomal setae situated in the middle of the infracapitulum, smooth; the whole ventral surface finely punctated and foveolated; epimeral setae smooth, tips fine, arranged in the formula 3-1-3-3, antiaxial row of setae smaller than paraaxial row; genital plate smaller than anal plate, four pairs of genital
setae, equal in length, smooth; aggenital setae smooth; anal setae two pairs, smooth; adanal fissures distinct, situated obliquely on either side of the anal plate, adanal setae three pairs, smooth, tips fine.

Legs monodactylous.


_Remarks_ : _D. keralaensis_ is closely related to _D. capreolata_ Wallwork, 1962 in general body shape and size, finely barbed rostral and lamellar setae, flagelliform tips of _r_1 and _p_2 and shape of the epimeral setae. But it differs from _D. capreolata_ by the presence of smooth and long interlamellar setae, barbed _ta, te, ti, ms, r_3 and _p_3, broken ridge on the notogaster, smooth adanal setae and in the shape of the sensillus.

12. _Dolicheremaeus aurila_ Aoki


_Distribution_ : India : Kerala (new record).

Family **OPPIDAE**

13. _Oppia arcualis_ (Berlese)

1913. _Dameosoma arcuaile_ Berlese, _Redia, 9_ : 89.


_Distribution_ : India : Kerala (new record).

14. _Oppiella nova_ (Oudemans)

1902. _Eremaeus novus_ Oudemans, _Ent. Ber., 1_ : 36.

_Material examined_ : 2 ♀ ♂, India : Kerala, Silent valley, 10 kms away from Valliyaparathodu on Palghat Road, 25.i.1980, ex leaf litter, coll. S.K. Bhattacharyya.

_Distribution_ : India : Kerala (new record).
Family **CHAUNOPROCTIDAE**

15. *Caloppia minor* Balogh


*Material examined:* 1 ♀, India: Kerala, Silent valley, around Valliyaparathodu camp, 29.i.1980, ex leaf litter and soil, coll. S.K. Bhattacharyya.

*Distribution:* India : Kerala (new record).

Family **ORIBATULIDAE**

16. *Scheloribates elegans* Hammer


*Distribution:* India : Kerala (new record).

Family **HAPLOZETIDAE**

17. *Lauritzenia longipluma* Hammer


*Distribution:* India : Kerala (new record).

Family **MOCHLOZETIDAE**

18. *Unguizetes clavatus* Aoki


*Distribution:* India : Kerala (new record), West Bengal.

Family **GALUMNIDAE**

19. *Galumna flabellifera orientalis* Aoki


Distribution: India Kerala, West Bengal.

SUMMARY

Nineteen oribatid species belonging to fifteen genera from Silent valley, Kerala, India are treated in this paper. It includes the adequate descriptions of six new species viz., Hoplophthiracarus indicus, Phyllhermannia foveolatus, P punctatus, Gibbiecephus sisiri, Dolicheremaeus renukae and D. Keralaensis. Camisia sp., D. aurita, Oppia arcualis, Oppiella nova, Caloppia minor, Scheleribates elegans and Lauritzenia longipluma are recorded for the first time from India.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, for laboratory facilities and highly indebted to Dr. A.K. Bhaduri, Vidyasagar College, Calcutta for helping with valuable papers and suggestions.

REFERENCES

