

A NEW SPECIES OF THE GENUS *EUROSTOCEPHEUS* (ACARI : ORIBATEI, OTOCEPHEIDAE) FROM DARJEELING, INDIA

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INTRODUCTION

A survey was undertaken to investigate on the soil oribatid mites from the forest and tea fields of Darjeeling, the northernmost district of the state of West Bengal, India since 1988. Taxonomic studies of a part of the collected material reveal the occurrence of one new species, *Eurostocepheus (Eurostocepheus) mahunkai* of Otocepheidae (Acari Oribatei).

The genus *Eurostocepheus* was established by Aoki (1965) with *Eurostocepheus aquilinus* as the type-species from North Thailand. J. Balogh (1970) contributed another new species *Eurostocepheus trisetosus* from Ceylon. Mahunka (1973) while reporting the same species *E. trisetosus* Balogh, 1970 from Ceylon erected a new subgenus *Cerostocepheus* under the genus *Eurostocepheus* with the type-species *Eurostocepheus (Cerostocepheus) trisetosus* Balogh, 1970. He (*op. cit.*) created this new subgenus principally by the presence of 3 pairs of genital setae and also the extraordinarily widened lamellae. Corpuz-Raros (1979) added another new species, viz., *Eurostocepheus (Eurostocepheus) sajisei* from Philippines to the list of the genus. Thus 2 subgenera and 3 species, viz., *E. (E.) aquilinus*, *E. (E.) sajisei* and *E. (C.) trisetosus* are known to occur under the genus *Eurostocepheus*.

The genus *Eurostocepheus* is being reported here for the first time from India. All measurements are in micrometers (μm).

Eurostocepheus Aoki, 1965

Generic diagnosis : Lateral lamelliform expansion (*spa.l*) distinct; tutorium (*tU*) may be present or absent; lamellae stout and weakly sigmoid or sometimes extraordinarily widened; dorsal bothridial plate (*tbd*) entirely covers bothridium; ventral bothridial plate (*tbv*) poorly or prominently developed; sensillus (*ss*) with fusiform head; interlamellar setae (*in*) short and fine or long and roughened; *co.pl* present; *co.pm* present or absent, pedotecta well-developed, especially the posterior part of *pd*. 2-3 strikingly conspicuous, projecting latero-posteriad like a wing; *co.nl* widely separated from each other; *co.nm* absent; 10 pairs of notogastral setae; marginal ridge (*vm*) present or absent; *gla* situated in the level of *ti*; 5 pairs of notogastral fissures; adanal fissure (*iad*) situated close to anal aperture; genital plates strongly wrinkled or smooth; *apo* 1, 2 and *sj* distinctly developed; sternal ridge present or

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absent; anal setae 2 pairs; adanal setae 3 pairs; genital setae 3 or 4 pairs; aggenital setae (*ag*) 1 pair; legs monodactylous; palps 5 segmented.

Key to the subgenera

- 1(2) Lamellae not extraordinarily widening, in superior view not covering like an awning also lateral margin of prodorsum anteriorly to pedotecta I; surface of genital plates strongly wrinkled, emitting 4 pairs of setae.....*Eurostocephus* s.str.
- 2 (1) Lamellae extraordinarily widening, in superior view covering like an awning also lateral margin of prodorsum anterior to pedotecta I; surface of genital plates smooth, emitting 3 pairs of setae.....*Cerostocephus* Mahunka, 1973

Eurostocephus (Eurostocephus) mahunkai sp. nov.

(Figs. 1-16)

Female Colour yellowish brown; length of the body 1138-1162; width of the body : 546-558.

Prodorsum more or less as long as broad with densely punctate and laterally with irregular sculptures; lateral lamelliform expansion (*spa.l*) distinct, well-developed, extended anteriorly a little below the base of the insertion of rostral setae (*ro*), tutorium (*tU*) moderately developed; lamellae well-developed, more or less parallel but terminating by small arcuating end, 280-283 long, widely separated from each other; rostral and lamellar setae long, their *RLN*· 23.21-23.37; rostral setae (*ro*) densely barbed outwardly, incurved, inserted laterally on rostrum, 163-165 long; lamellar setae (*le*) distinctly barbed, procumbent, with pointed tips, originating from a little below the anterior inside end of lamellae, 163-165 long; interlamellar setae (*in*) roughened, straight, located inner and anterior to the bothridium, 172-175 long (*RLN*· 24.5-24.9), nearly twice as long as their mutual distance; bothridium (*bo*) cup-shaped, directed antero-laterad, ventral bothridial plate (*tbv*) more or less triangular, dorsal bothridial plate (*tbd*) completely covers bothridia; sensillus (*ss*) with thin, long stalk, with a slightly roughened fusiform head, 156-160 long, directed postero-laterad; interlamellar wrinkles (*rin*) weakly developed; 4 condyles on the posterior margin well-developed, lateral prodorsal condyles (*co.pl*) larger than median prodorsal condyles (*co.pm*), *co.pl* subrounded projecting over the anterior rim of lateral notogastral condyles (*co.nl*), *co.pm* distinct subrounded, fuse with each other.

Pedotecta I-IV (*pd. 1*~4) distinctly developed; pedotecta I (*pd. 1*) with distinct sculptures; subpedotectum (*spd*) distinct; pedotecta complex II-III (*pd. 2-3*) prominently developed specially in the posterior end, well projecting postero-laterad and forming a wing-like expansion, the posterior tip of which reaches almost the level of the anterior border of genital aperture; pedotecta IV (*pd. 4*) with rounded tip.

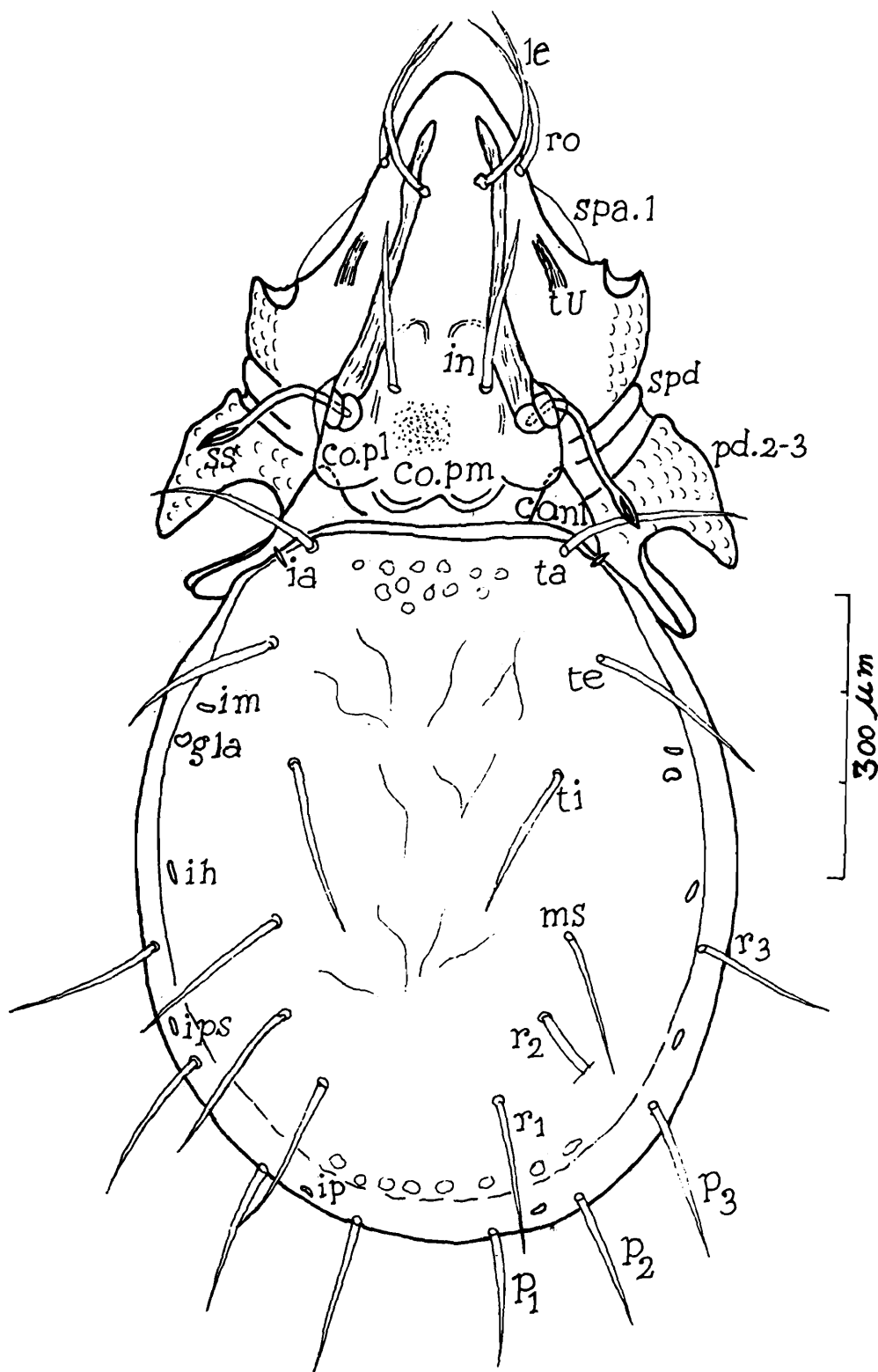


Fig. 1. *Eurostocepeus (Eurostocepeus) mahunkai* sp. nov. (Dorsal view), ro = rostral seta, le = lamellar seta, in = interlamellar seta, spa.1 = lateral lamelliform expansion, tU = tutorium, spd = subpedotectum, pd.2-3 = pedotecta complex II-III, ss = sensillus, co.pm = median prodorsal condyle, co.pl = lateral prodorsal condyle, co.nl = lateral notogastral condyle; ta, te, ti, ms, r₁, r₂, r₃, p₁, p₂, p₃ = notogastral setae; ia, im, ih, ips, ip = dorsal lyrifissures; gla = orifice of latero-abdominal gland.

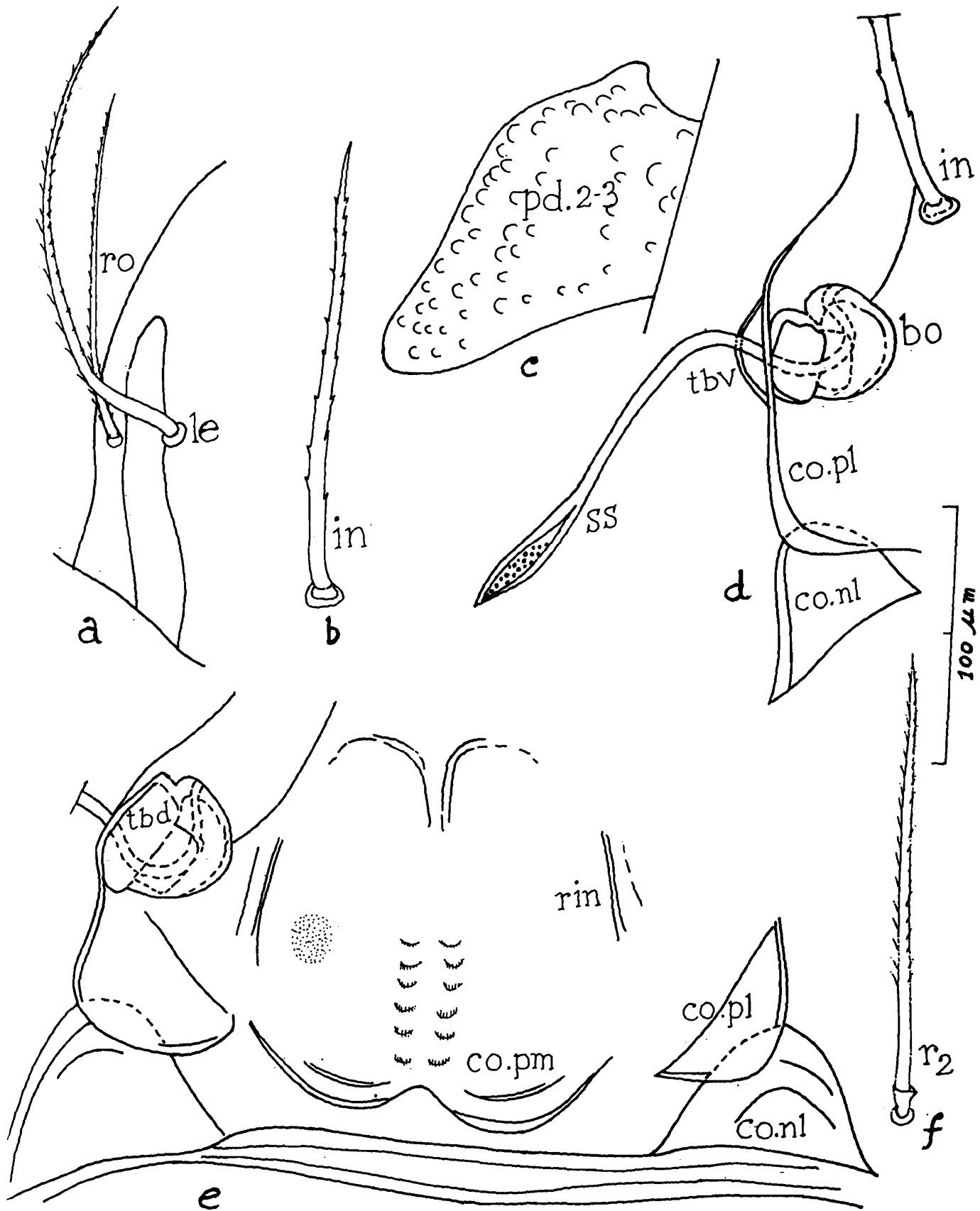


Fig. 2. (a-f). *Eurostocephalus (Eurostocephalus) mahunkai* sp. nov.-a. The anterior distal portion of prodorsum (left side).-b. Interlamellar seta.-c. Pedotecta complex II-III.-d. The posterior part of prodorsum and lateral notogastral condyle (left side). -e. The posterior part of prodorsum and the anterior part of notogaster. -f. Notogastral seta r_2 ; ro = rostral seta, le = lamellar seta, in = interlamellar seta, pd.2-3 = pedotecta complex II-III, bo = bothridium, tbv = dorsal bothridial plate, rin = interlamellar wrinkles, co.pm = median prodorsal condyle, r_2 = notogastral seta.

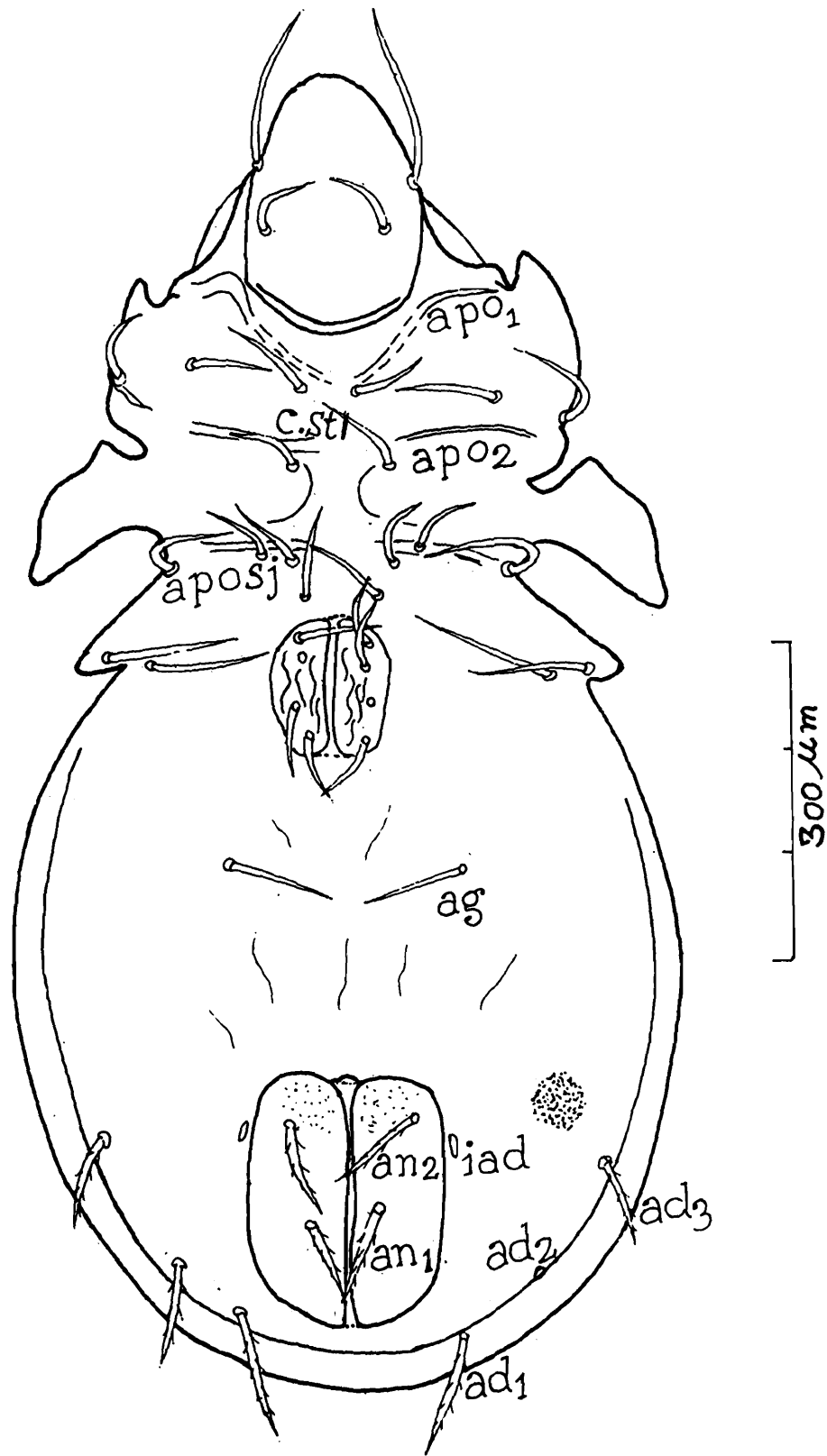
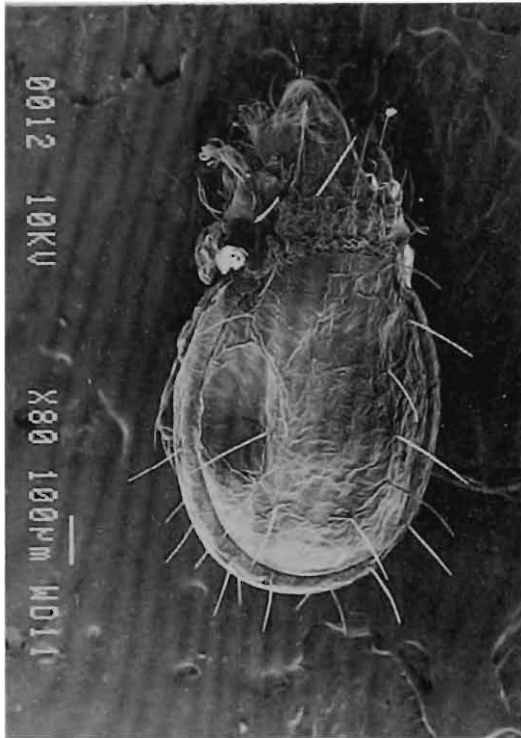
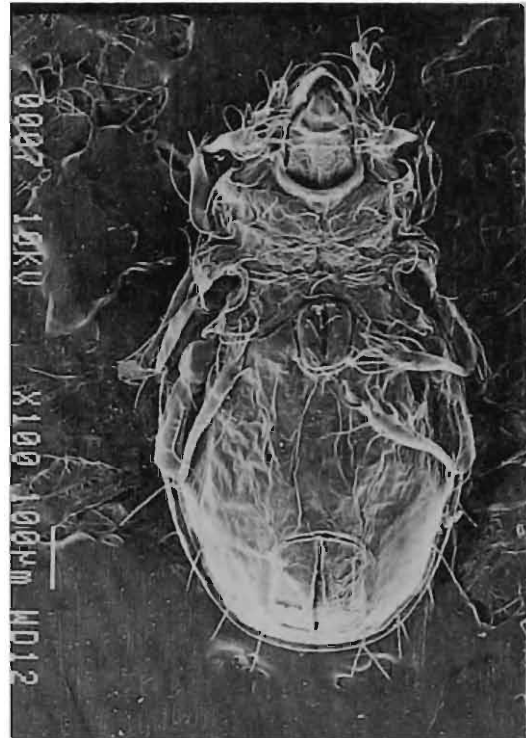


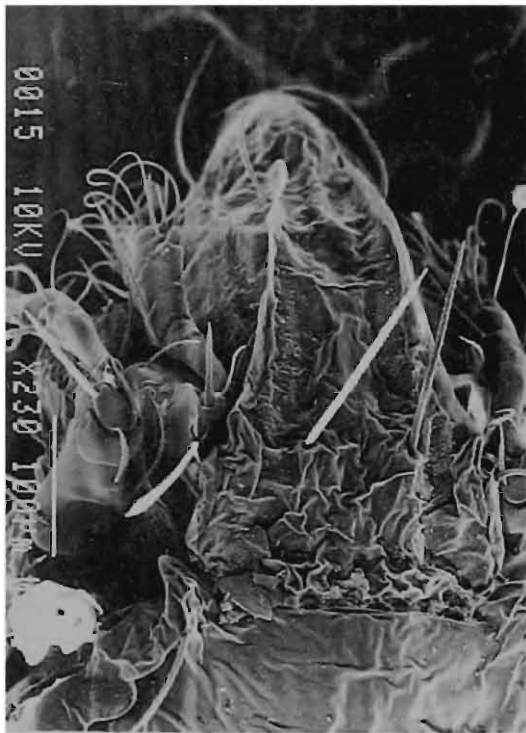
Fig. 3. *Eurostocephus (Eurostocephus) mahunkai* sp. nov. (Ventral view), an₁, an₂ = anal setae, ad₁, ad₂, ad₃ = adanal setae, iad = adanal fissure, ag = aggenital seta, c.st = sternal ridge, apo₁, = apodemata 1, apo₂ = apodemata 2, apo_{sj} = apodemata sj.



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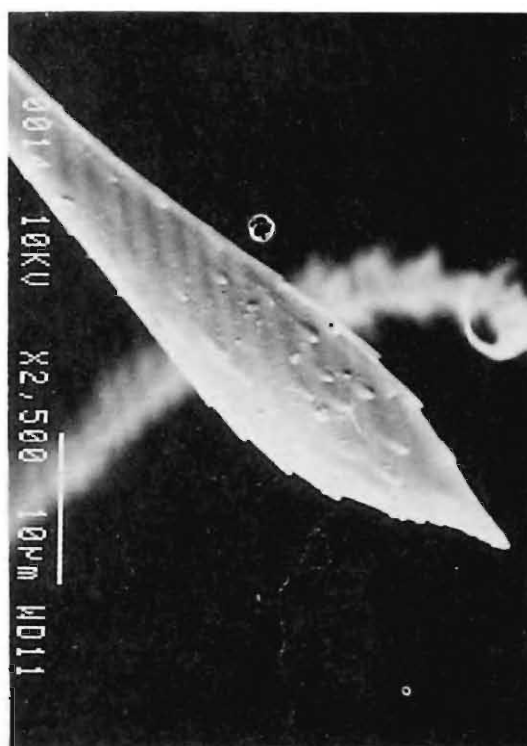


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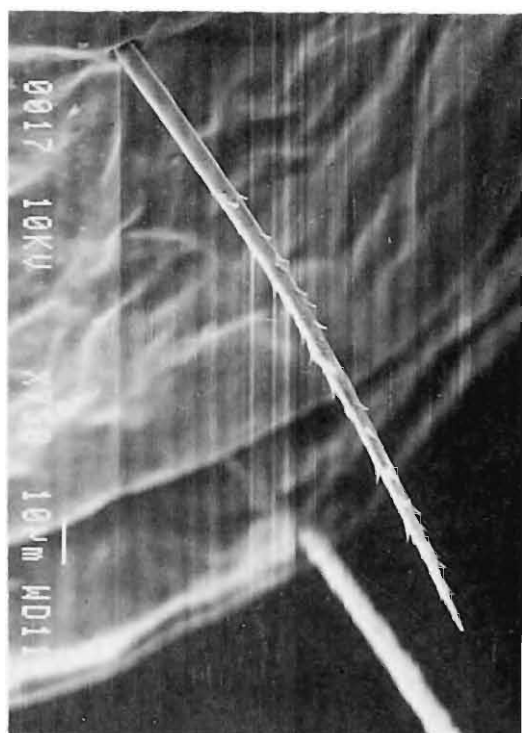
Figs. 5-8. *Eurostocephus (Eurostocephus) mahunkai* sp. nov. (Scanning Electron Micrographs) : 5. Dorsal view, 6. Ventral view, 7. Details of prodorsum and anterior part of notogaster, 8. Anterior distal portion of prodorsum.



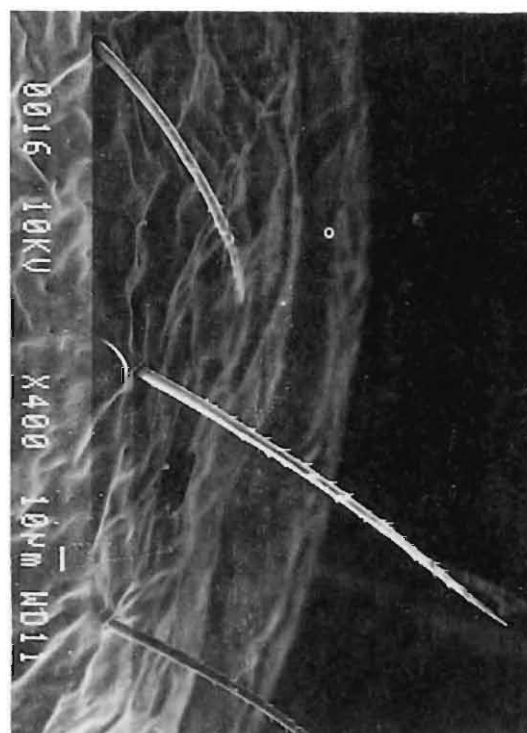
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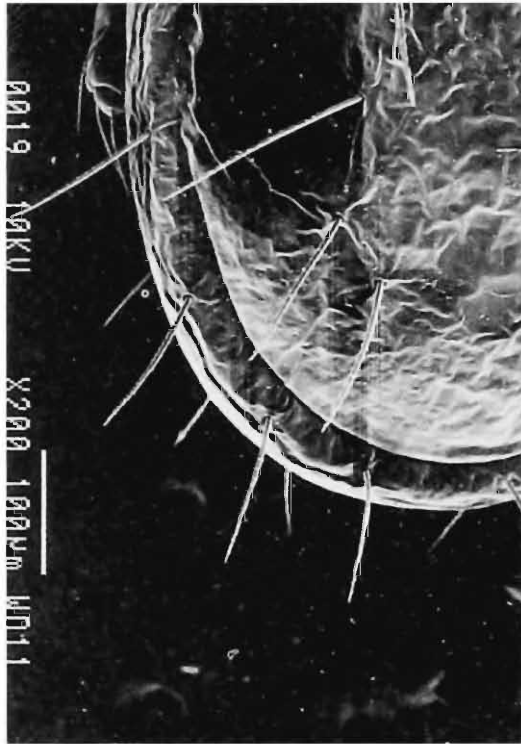


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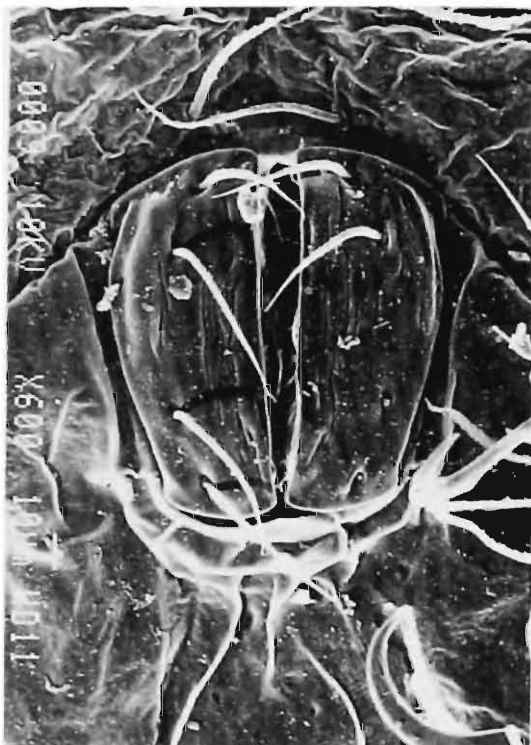
Figs. 9-12. *Eurostocephalus (Eurostocephalus) mahunkai* sp. nov. (Scanning Electron Micrographs) : 9. Sensillus and bothridium, 10. Head of sensillus, 11. Notogastral setae ms and r_1 , 12. Notogastral setae ti , ms and r_2 .



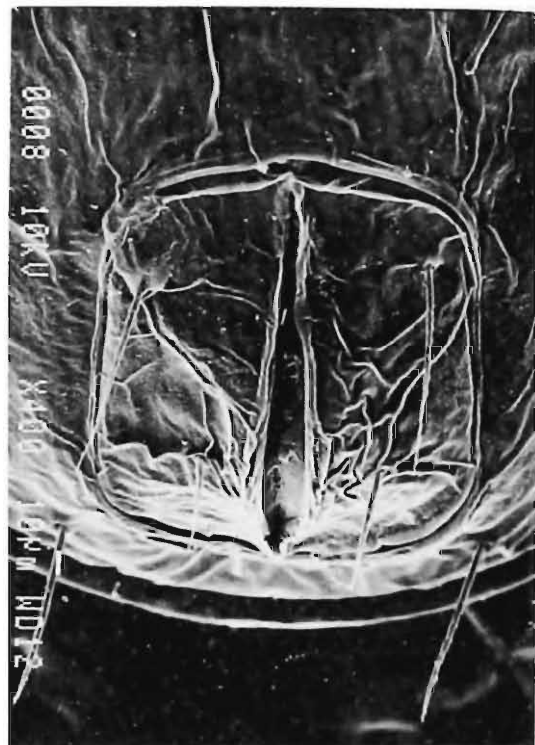
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Figs. 13-16. *Eurostocepheus (Eurostocepheus) mahunkai* sp. nov. (Scanning Electron Micrographs) : 13. Posterior portion of notogaster (left side), 14. Leg-I, 15. Genital plates and genital setae, 16. Anal plates, anal setae and setae ad_1 .

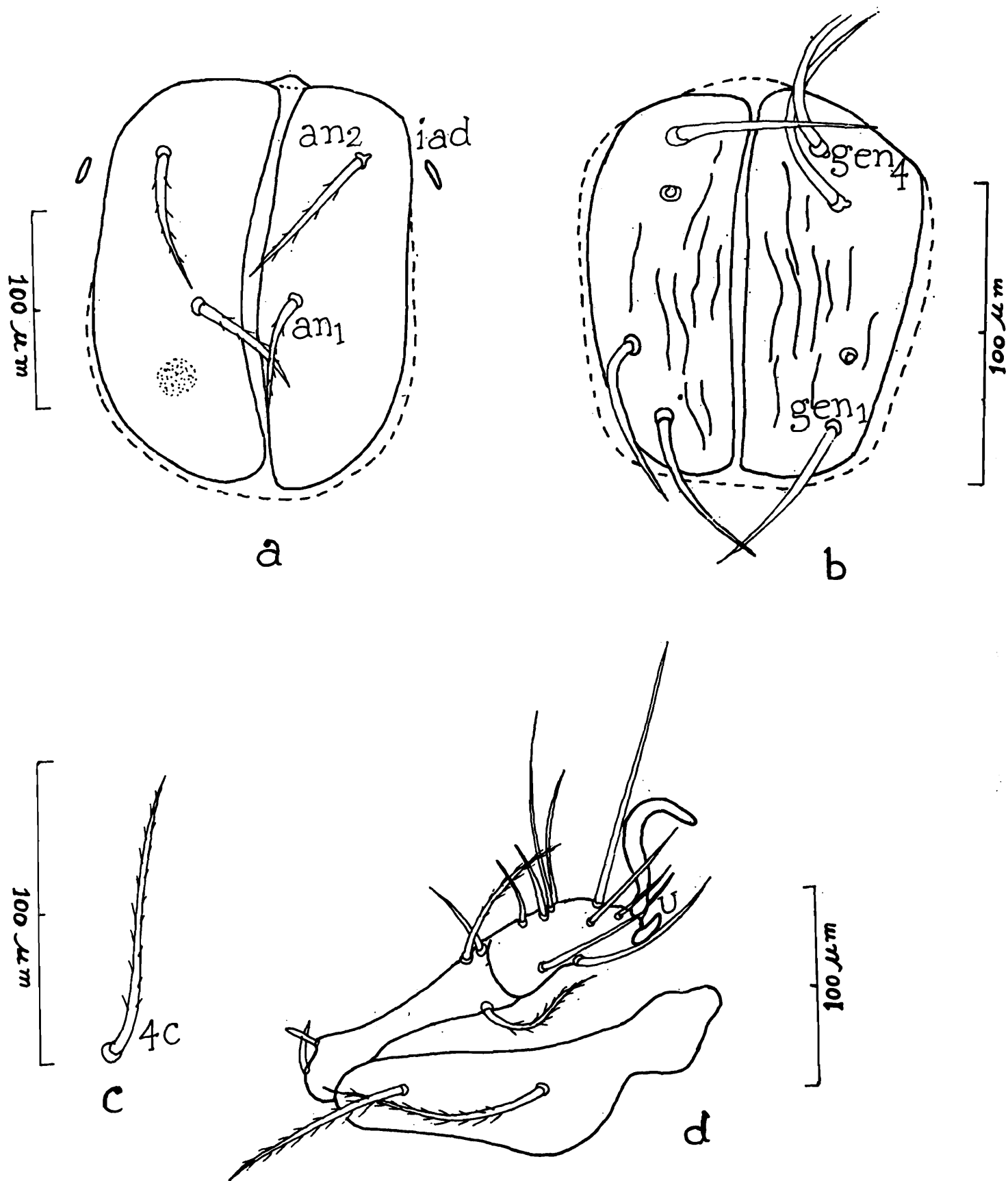


Fig. 4. (a-d). *Eurostocepheus (Eurostocepheus) mahunkai* sp. nov.-a. Anal plates and adanal fissures.-b. Genital plates. -c. Epimeral seta 4c. -d. Leg II : *an1*, *an2* = anal setae, *iad* = adanal fissure, *gen1*-*gen4* = genital setae, 4c = epimeral seta, U = ultimate seta.

Notogaster oval, anterior border nearly straight, densely punctate, with irregular crack-lines and with a few foveoles anteriorly and posteriorly; lateral notogastral condyles (*co.nl*) highly developed, broad and triangular, not sharply pointed at tips, the distance between them 24.5 *RLN*; median notogastral condyles (*co.nm*) absent; marginal ridge (*vm*) not discernible; notogastral setae 10 pairs, long, distinctly barbed except basal 1/3rd or 1/4th, with pointed tip, 125-187 long, ranging from 17.8-26.6 *RLN*; setae *ta*, *te* antero-laterad; setae *ti*, *ms* medio-laterad; setae *r₁* postero-dorsal; setae *r₂* postero-lateral; setae *r₃* postero-marginal; setae *p₁*, *p₂*, *p₃* extreme postero-marginal; distance *ta-te* < distance *te-ti* < distance *ti-ms*; distance *ta-ta* < distance *ti-ti* < distance *ms-ms* < distance *te-te*; distance *r₁-r₁* < distance *r₂-r₂*; distance *p₁-p₂* < distance *p₂-p₃* < distance *p₃-r₃*, notogastral fissures 5 pairs, *ia* situated at the level of insertions of *ta* laterally, *im* above *gla*, *ih* far above the insertion of *r₃*, *ips* in between *p₃* and *r₃* and *ip* in between *p₁* and *p₂*, all laterally.

Each anal plate minutely punctate, nearly thrice as long as wide, with parallel lateral margin to each other, anal setae 2 pairs, weakly barbed, nearly equal, 70-78 long, *an₁* inserted close to the inner and posterior and *an₂* lateral and anterior part of the anal plate; adanal setae 3 pairs, slightly roughened, 47-109 long, *ad₁* > *ad₂* > *ad₃*, *ad₁* postero-lateral, *ad₂* lateral to the posterior margin of anal plate, *ad₃* widely lateral to the anterior border of anal plate; *iad* distinct, oblique and placed apart antero-lateral to the anal field; ventral plate also densely punctate with a few crack-lines; distance between anal and genital apertures 2½ times as long as the latter; genital plates with strong furrows, more darker than anal and ventral plates; each genital plate more than 2½ times as long as its maximum width; genital setae 4 pairs, glabrous (in microscopic observation, but minutely sparsely roughened in basal half under Scanning Electron Micrograph), with pointed tips, 47-54 long, 2 of which situated posteriorly and remaining 2 situated anterior to the genital plate; aggenital setae 1 pair, glabrous, 109-113 long, their mutual distance nearly twice the maximum width of the genital plates.

Epimera I and II separate, III and IV fuse; apodemata 1, 2 and *sj* (*apo₁*, *apo₂* and *apo_{sj}*) distinctly developed; *apo₁* markedly elevated medially but not touching each other medially; sternal ridge (*c.st*) developed in epimera I only; epimeral setae sparsely barbed, long 54-140 in length, setae 4b longest; epimeral setal formula 3-1-3-3.

All tarsi monodactylous, claws curved, sharply bent at distal 2/5th, all legs with ultimate setae of short blunt type (S-S-S-S).

Holotype Adult (F), INDIA W Bengal Darjeeling, Darjeeling forest Div., Tonglu forest range, Palmajua forest bungalow area (from rotten leaves of *Cryptomeria japonica*), 2300 m., 1.ix.1989 (*B.K. Mondal* coll.); paratype 1 adult (F), INDIA W Bengal Darjeeling, Darjeeling forest Div., Ghum-Simana forest range, Sukiapokhri forest block (from decomposed leaves of *Cryptomeria japonica*), 2100 m., 3.ix.1989 (*B.K. Mondal* coll.); paratype 1 adult (F), INDIA W Bengal Darjeeling, Teesta Valley Tea Estate (from humus under a tea plant, *Camellia sinensis*), 900 m., 28.viii.1989 (*B. K. Mondal* coll.); paratype 1 adult (F), INDIA W Bengal Darjeeling, Darjeeling forest Div., Teesta Valley forest

range, Pashok forest block (from soil under a plant, *Acacia catechu*), 700 m., 30.viii.1989 (*B. G. Kundu* coll.); paratype: 1 adult (F), INDIA W Bengal Darjeeling, Darjeeling forest Div., Senchal forest range, Sonada forest block (from soil under a plant, *Machilus edulis*), 2100 m., 30.vii.1989 (*B.K. Mondal* coll.); deposited in the laboratory of the Department of Zoology, Ananda Chandra College, Jalpaiguri-735 101, India.

This new species approaches close to the type-species of the genus *Eurostocephus* (*Eurostocephus*) *aquilinus* Aoki, 1965 described from North Thailand in a number of characters, but can be easily separated from Aoki's species in the nature and length of interlamellar setae, location of anterior end of *spa.I*, presence of *co.pm* and tutorium (*tU*), distinctly developed *tbv*, nature of sensillus being roughened fusiform head, absence of *vm*, nature of notogastral setae being distinctly barbed except basal 1/3rd or 1/4th, location of *ip*, absence of aggenital fissure, epimeral setal formula and untouched condition in the middle of apodemata I (*apo*₁). Hence it is considered to be a new species.

SUMMARY

The paper deals with the description of a new species of oribatid fauna (Acari), viz., *Eurostocephus* (*Eurostocephus*) *mahunkai* from forest and tea soils in the district of Darjeeling, West Bengal, India. The genus *Eurostocephus* is recorded here for the first time from India.

ACKNOWLEDGEMENT

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