

**A NEW SPECIES OF *DOLICHEREMAEUS* (ACARI : ORIBATEI,
OTOCEPHEIDAE) FROM DARJEELING, INDIA**

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INTRODUCTION

A new species of the genus *Dolicheremaeus* Jacot (Acari Oribatei, Otocepheidae), viz., *D. russiae* is described from forest and tea soils in the district of Darjeeling, West Bengal, India.

Jacot (1938) created the genus *Dolicheremaeus* with the type-species *D. rubripedes* from Florida, U.S.A. J. Balogh (1965, 1972) and Aoki (1967) considered the genus *Tetracondyla* Newell, 1956 as a junior synonym of the genus *Dolicheremaeus*. J. Balogh (1972) also considered the genus *Dicondyla* Aoki, 1965 as a synonym of the genus *Dolicheremaeus*. 103 species and 7 subspecies have so far been described under the genus *Dolicheremaeus* from different parts of the globe. All measurements are in micrometers (μm).

***Dolicheremaeus russiae* sp. nov.**

(Figs. 1-15)

Female: Colour yellowish brown; length of the body 540-560; width of the body 294-306.

Prodorsum nearly as long as broad, medially with small irregular foveoles and laterally with irregular sculptures; lateral lamelliform expansion (*spa.l*) moderately developed; tutorium (*tU*) well-developed; lamellae entirely straight, 132-134 long, widely separated from each other, prominently diverging toward anterior direction, distance between the lamellae proximally 52 and distally 64; lamellar apices slightly project beyond the margin of the body and the basal part of lamella strongly protruding laterad; rostral and lamellar setae long, their *RLN* 20.48-25; rostral setae (*ro*) onwardly barbed procumbent, with pointed tips, inserted at the anterior end of *spa.l*, laterally on rostrum, 68-70 long; lamellar setae (*le*) outwardly barbed basal 3/4th, procumbent, with pointed tips, inserted inner to the rostral setae a little above, 80-83 long; interlamellar setae (*in*) bilaterally roughened, inserted below a prominent, semicircular, chitinous ridge, 76-77 long (*RLN* 22.9-23.19) nearly 2 times as long as their mutual distance; bothridium (*bo*) cup-shaped, directed antero-laterad, ventral bothridial plate (*tbv*) prominently triangular and conspicuously protruding antero-laterad;

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sensillus (*ss*) with thin, long stalk, uniformly thick throughout and fusiform head, 97-100 long, directed postero-laterad; exobothridial setae (*ex*) 1 pair, minute, 14-15 long, intimate to the bothridial plate; 4 condyles on the posterior margin well-developed and clearly separated from one another, lateral prodorsal condyles (*co.pl*) larger than median prodorsal condyles (*co.pm*), *co.pl* more or less rounded, overlapping by the anterior rim of lateral notogastral condyles (*co.nl*), *co.pm* more or less rounded with small median blunt projection, the anterior extension of *co.pm* on outside forms a frame-like structure which surrounds the space between the base of interlamellar setae and *co.pm*.

Proportion of notogaster is large compared to small prodorsum; notogaster oval, finely punctate, with irregular crack-like lines and scattered incomplete foveoles posteriorly (notogastral surface deeply foveolated entirely under Scanning Electron Micrographs), 4 notogastral condyles markedly developed; lateral notogastral condyles (*co.nl*) large and triangular; median notogastral condyles (*co.nm*) specially clear-cut and almost rounded square; mutual distance of *co.nm* is twice the distance between *co.nm* and *co.nl*; notogastral setae 10 pairs, bilaterally roughened, with blunt tips and distinct setae base, 36-84 long, ranging from 10.84-25.3 *RLN*, setae *ta* antero-lateral; setae *te*, *ms* dorso-lateral, *ti* mid-dorsal, *r₁*, *r₂* postero-dorsal, *p₁*, *p₂*, *p₃* and *r₃* postero-marginal; distance *ta-te* < distance *te-ti* and nearly half the distance *te-ms*; distance *ti-ti* < *ta-ta* < *te-te* < *ms-ms*; distance *r₁-r₁* < *r₂-r₂*, distance *p₁-p₂* < *p₂-p₃* < *p₃-p₃*, notogastral fissures 5 pairs, *ia* located antero-lateral to the notogaster, a little below the outward to the follicle of *ta*, *im* aligned obliquely between *te* and *ms* laterally, *ih* a far above the insertion of *r₃*, *ips* between *r₃-p₃*, more closer to *r₃*, *ip* between *p₂-p₃*, nearer to *p₃*; *gla* rounded, placed just anterior to *im*.

Surface of ano-genital region finely punctate with scattered irregular foveoles (ventral surface also deeply foveolated under Scanning Electron Micrographs); each anal plate more than twice as long as broad, with 2 glabrous, nearly equal setae, with pointed tips, 28-32 long; *an₁* inserted close to the inner and posterior and *an₂* to median and anterior part of the anal plate; adanal setae 3 pairs, glabrous, nearly equal length with sharply pointed tips, 56-60 long, *ad₁* postero-lateral, *ad₂* medio-lateral and *ad₃* antero-lateral to the anal field, distance *ad₂-ad₂* > *ad₃-ad₃* > *ad₁-ad₁*, *iad* small, close to the antero-lateral border of the anal field, 5-6 long; distance between anal and genital apertures 2 times as long as the latter; each genital plate with striations, more than twice as long as its maximum width, with 4 simple setae, with tips, 20-24 long, 2 of which situated posteriorly and remaining 2 situated anteriorly to the genital plate; aggenital setae (*ag*) 1 pair, simple, with pointed tips, 49-51 long, their mutual distance nearly twice the maximum width of the genital plates.

Epimera I and II distinctly separated, epimera III and IV fused; epimeral setae simple, 16-60 long, setae *4b* longest, epimeral setal formula 3-1-3-3.

Claws monodactylous, curved; all legs with ultimate setae of flagelliform type (L-L-L-L).

Holotype Adult (F), INDIA West Bengal Darjeeling, Darjeeling forest Div., Ghum-Simana forest range, Ghum forest block (from humus with rotten leaves of *Gleichenia* sp.),

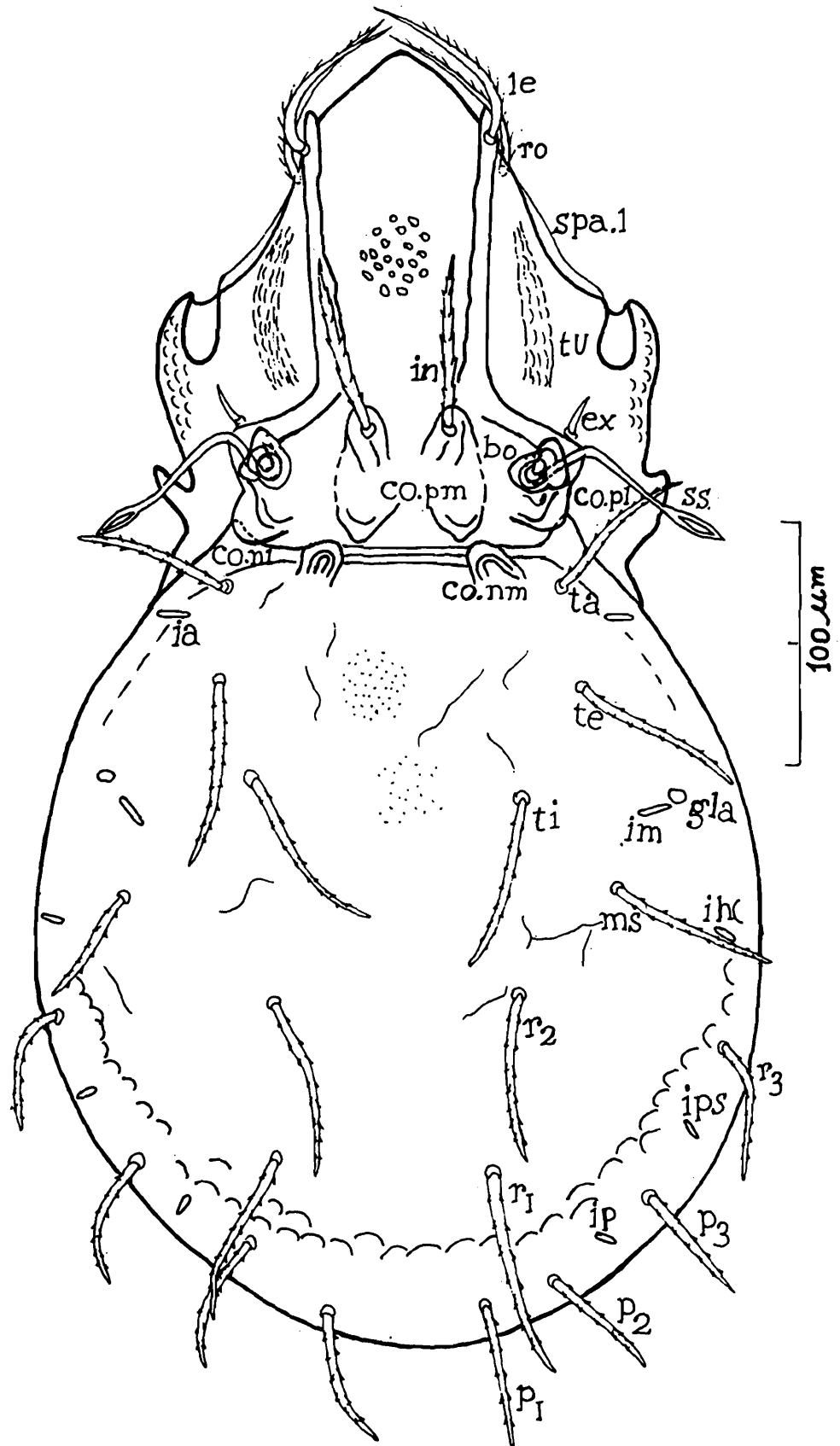


Fig. 1. *Dolicheremaeus russiae* sp. nov. (Dorsal view), ro = rostral seta, le = lamellar seta, in = interlamellar seta, spa.1 = lateral lamelliform expansion, tU = tutorium, bo = bothridium, ss = sensillus, ex = exobothridial seta, co.pm = median prodorsal condyle, co.pl = lateral prodorsal condyle, co.nm = median notogastral 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.

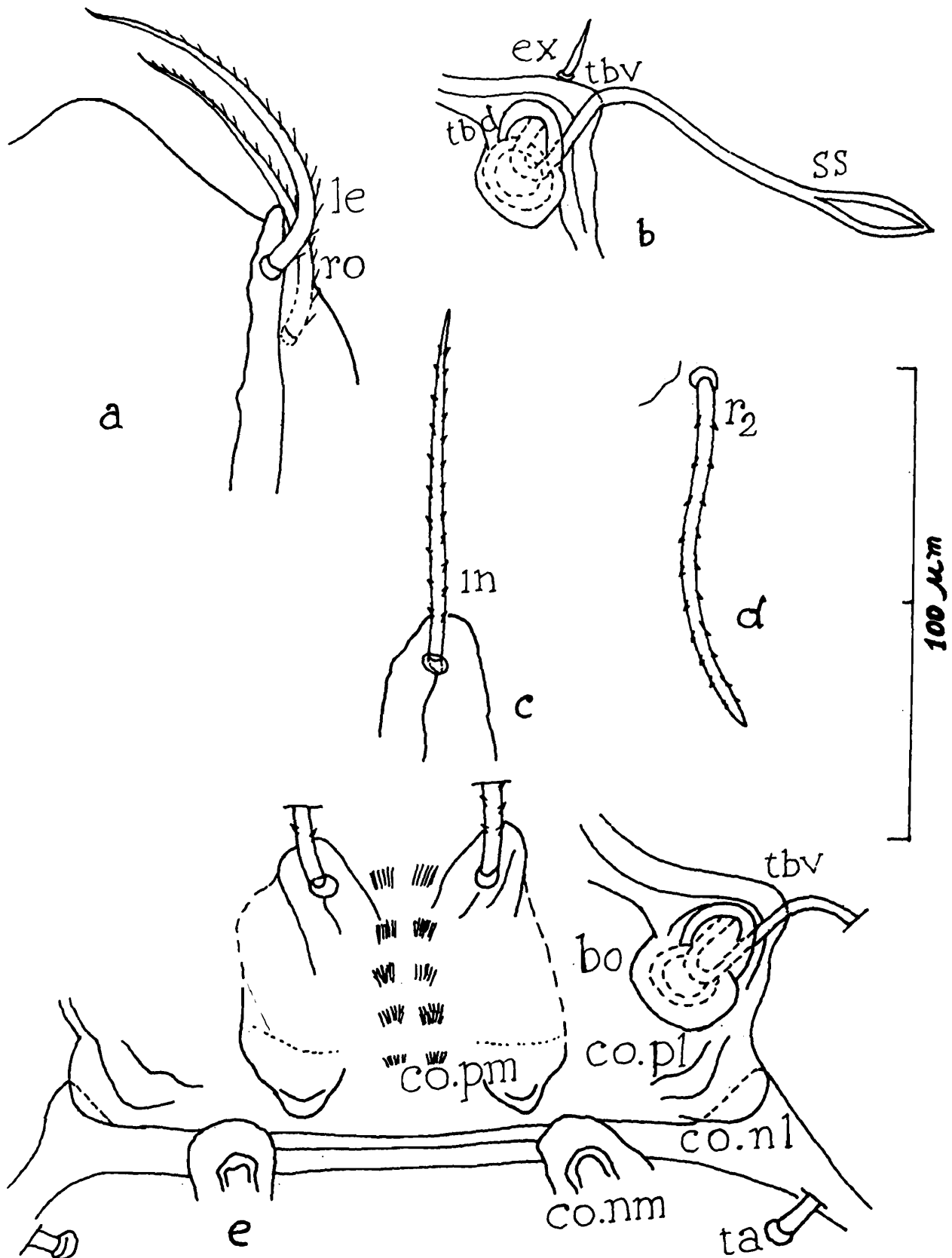


Fig. 2. (a-e) *Dolicheremaeus russiae* sp. nov.-a. The anterior distal portion of prodorsum (right side).-b. Bothridium, exobothridial seta, sensillus and their vicinity (right side). -c. Interlamellar seta on a semicircular ridge.-d. Notogastral seta r_2 . -e. The posterior part of prodorsum and the anterior part of notogaster: *ro* = rostral seta, *le* = lamellar seta, *in* = interlamellar seta, *tbv* = ventral bothridial plate, *tbd* = dorsal bothridial plate, *ex* = exobothridial seta, *ss* = sensillus, *bo* = bothridium, *co.pm* = median prodorsal condyle, *co.pl* = lateral prodorsal condyle, *co.nm* = median notogastral condyle, *co.nl* = lateral notogastral condyle; *ta*, r_2 = notogastral setae.

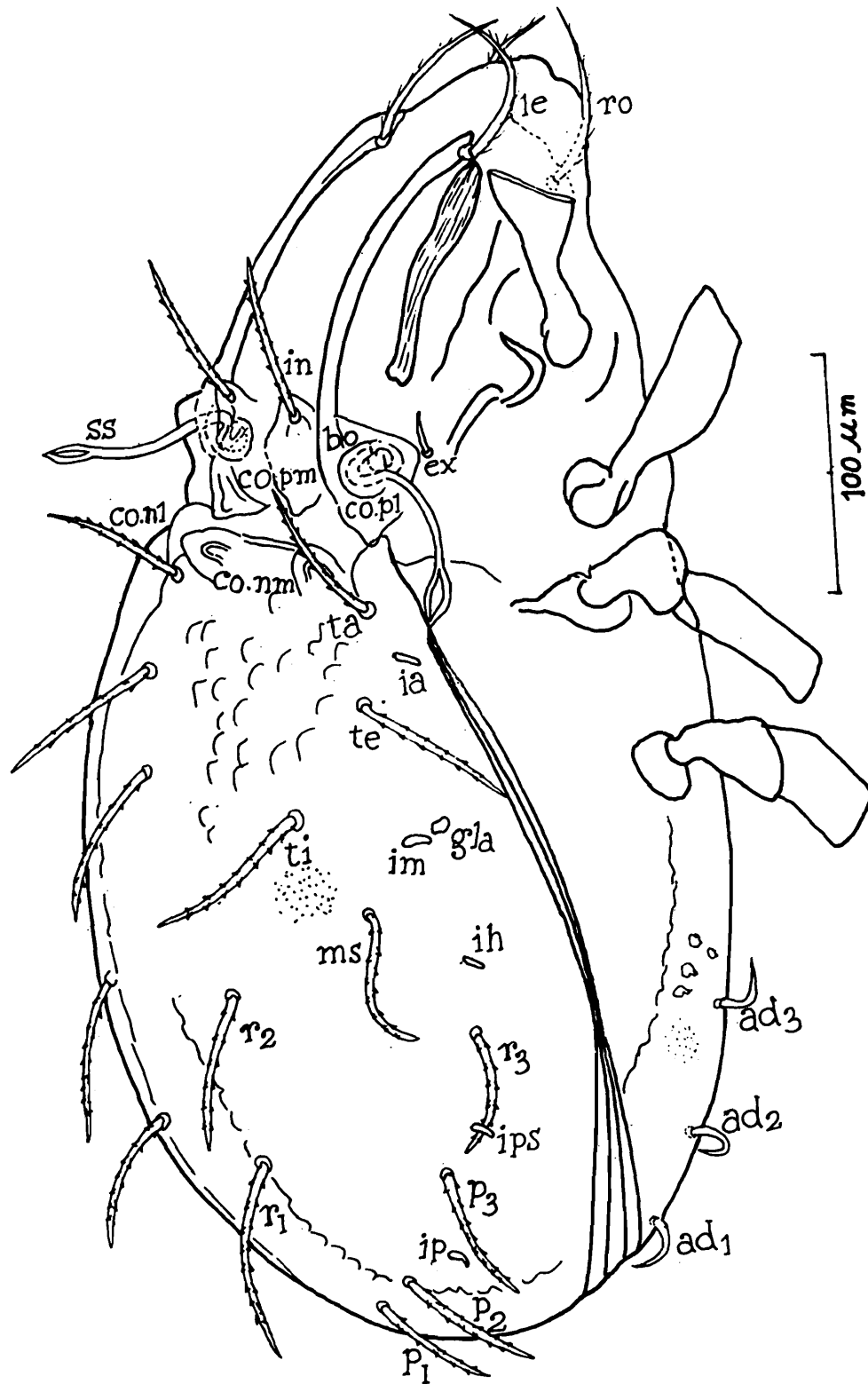
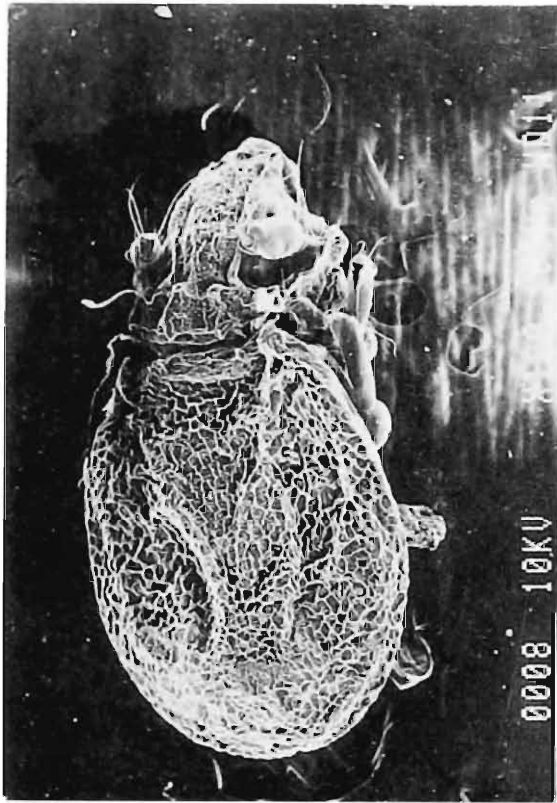
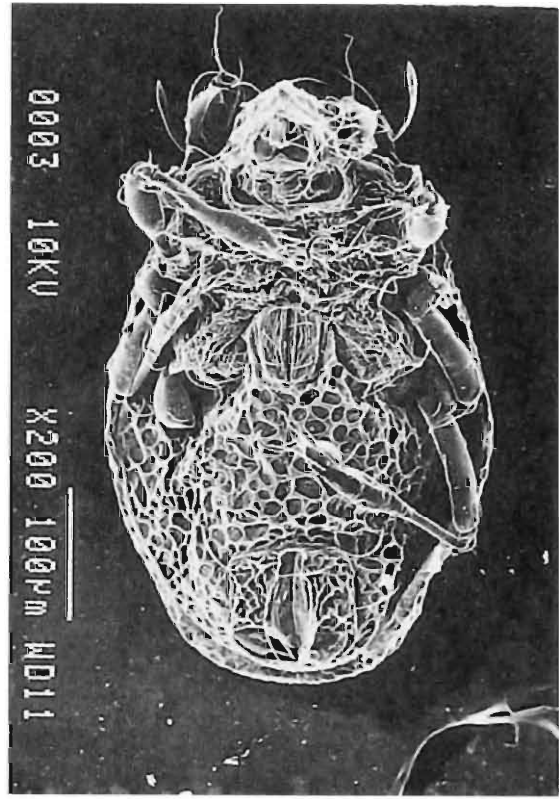


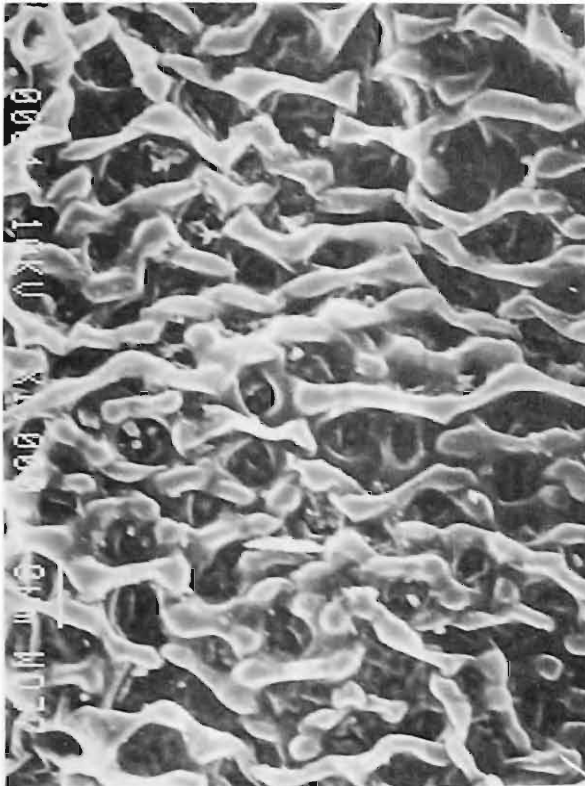
Fig. 3. *Dolicheremaeus russiae* sp. nov. (Lateral view), *ro* = rostral seta, *le* = lamellar seta, *in* = interlamellar seta, *bo* = bothridium, *ex* = exobothridial seta, *ss* = sensillus, *co.pm* = median prodorsal condyle, *co.pl* = lateral prodorsal condyle, *co.nm* = median notogastral condyle, *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; *ad₁*, *ad₂*, *ad₃* = adanal setae.



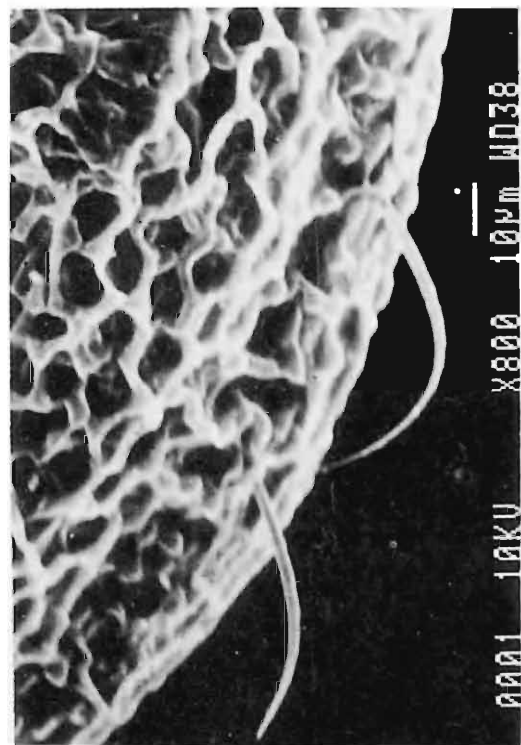
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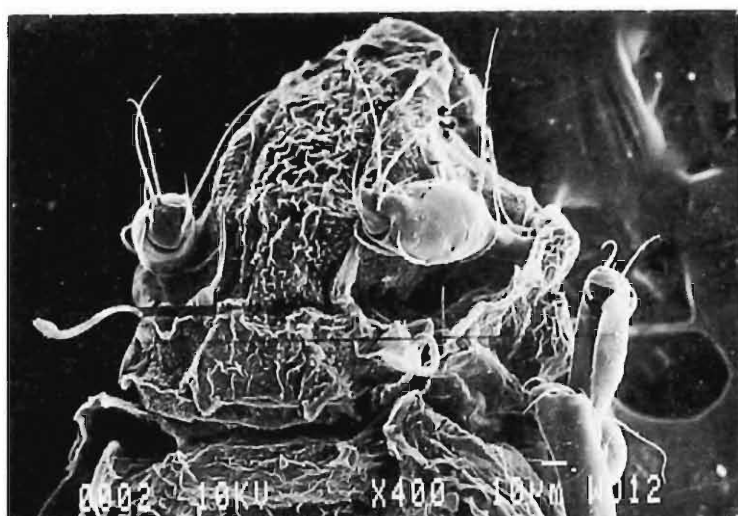


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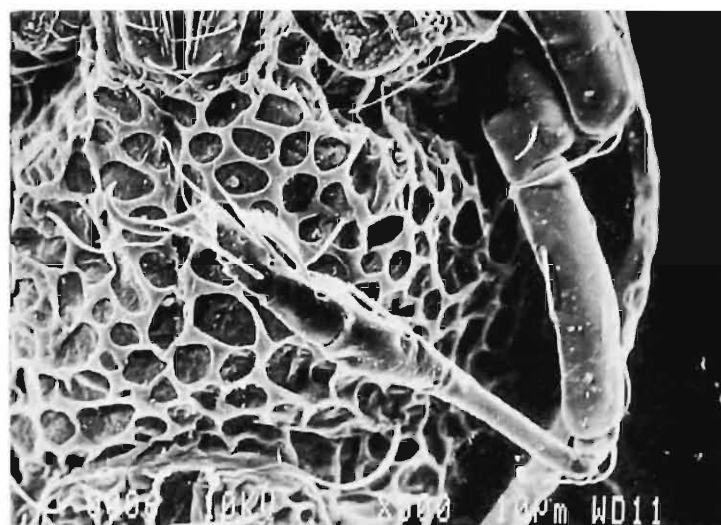


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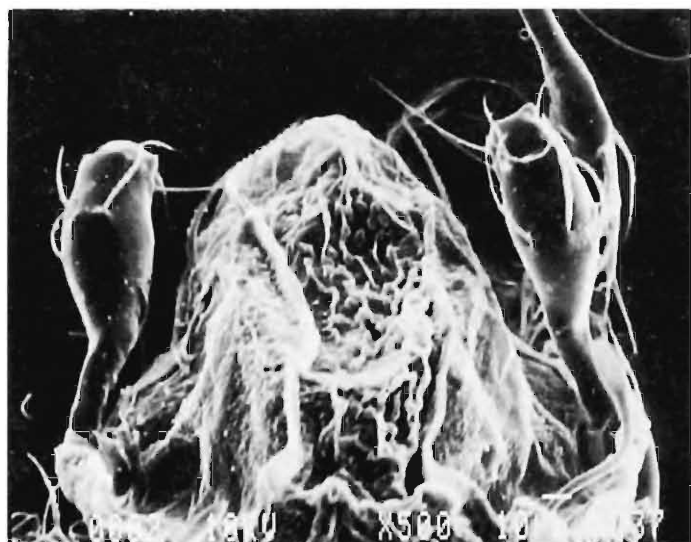
Figs. 5-8. *Dolicheremaeus russiae* sp. nov. (Scanning Electron Micrographs) : 5. Dorsal view, 6. Ventral view, 7. Foveolations on notogaster, 8. Notogastral setae r_1 and p_1 .



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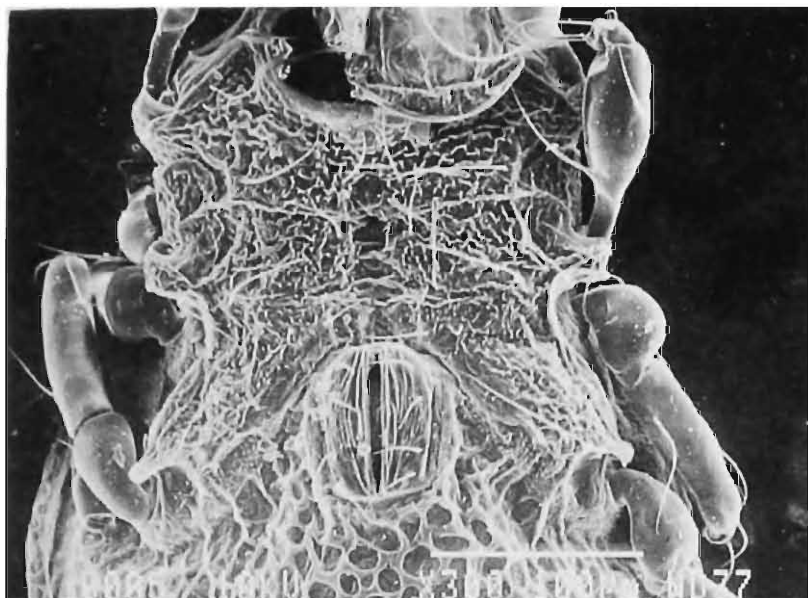


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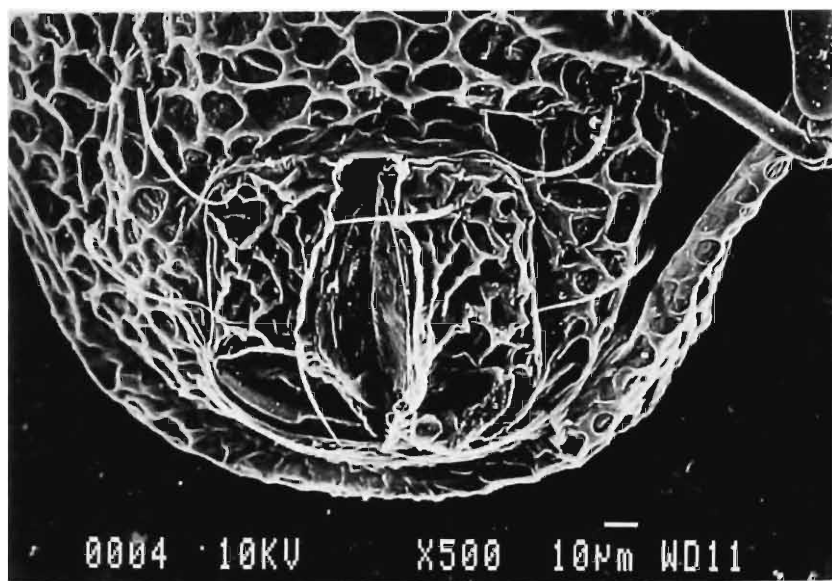
Figs. 9-12. *Dolichëremaeus russiae* sp. nov. (Scanning Electron Micrographs) 9. Details of prodorsum and anterior part of notogaster, 10. Leg-IV 11. Anterior portion of prodorsum, 12. Bothridium and sensillus.



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Figs. 13-15. *Dolicheremaeus russiae* sp. nov. (Scanning Electron Micrographs): 13. Epimeral region and genital plates on ventral side, 14. Genital plates and genital setae, 15. Anal plates, anal setae and adanal setae.

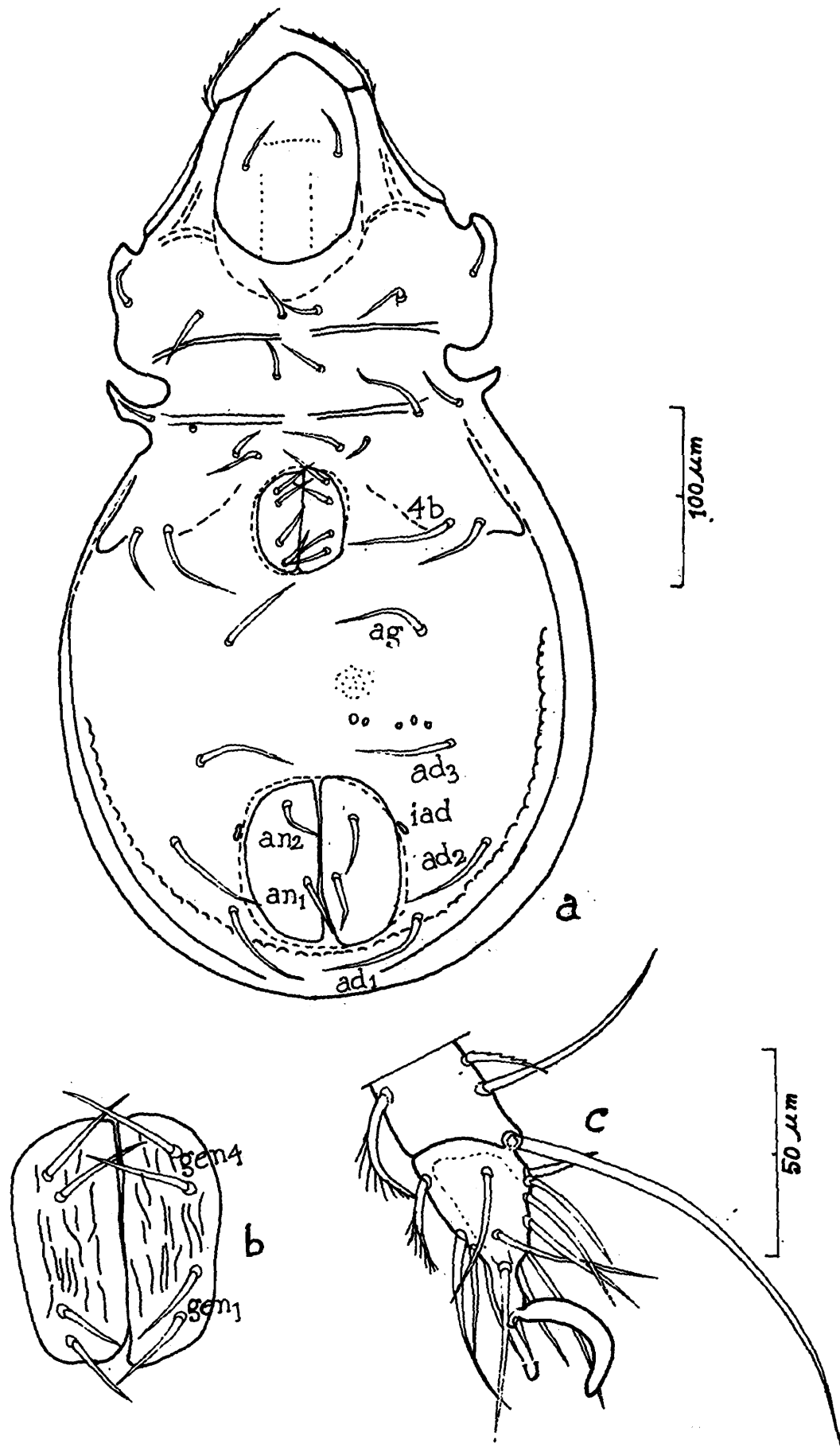


Fig. 4. (a-c). *Dolicheremaeus russiae* sp. nov. -a. *D. russiae* (Ventral view), -b. Genital plates. -c. Tarsus-I: an_1 , an_2 = anal setae, ad_1 , ad_2 , ad_3 = adanal setae, iad = adanal fissure, ag = aggenital seta, gen_1 - gen_4 = genital setae, $4b$ = epimeral seta, U = ultimate seta.

2100 m., 28.vii.1989 (B. K. Mondal coll.); paratypes 2 adult (F), INDIA West Bengal Darjeeling, Darjeeling forest Div., Senchal forest range, Sonada forest block (from soil under a plant, *Machilus edulis*), 2100 m., 30.viii.1989 (B.G. Kundu coll.); paratypes 2 adult (F), INDIA West Bengal Darjeeling, Kurseong forest Div., Sukna forest range, Gulma forest block (from compost heaps under a tree, *Schima wallichii*), 155 m., 10.vii.1988 (B. K. Mondal coll.); paratype 1 adult (F), INDIA West Bengal Darjeeling, Mohurgong Tea Estate (from humus and rotten leaves of *Camellia sinensis*), 117 m., 7.viii.1988 (B.G. Kundu coll.); paratype 1 adult (F), INDIA West Bengal Darjeeling, Gulma Tea Estate (from humus and litter of *Camellia sinensis*), 117 m., 9.vii.1988 (B.K. Mondal coll.); paratype 1 adult (F), INDIA: West Bengal: Darjeeling, Sukna Tea Estate (from loose soil under a tea plant, *Camellia sinensis*), 135 m., 23.vii.1989 (B.K. Mondal coll.); deposited in the laboratory of the Department of Zoology, Ananda Chandra College, Jalpaiguri-735101, West Bengal, India.

Most of the *Dolicheremaeus* species have lamellae more or less bending and converging anteriorly. But the most characteristic feature of the new species is the straight lamellae which are widely separated from each other and prominently diverging anteriorly with lamellar apices slightly projected beyond the margin of the body. In this respect, this new species approaches close to *Dolicheremaeus distinctus* Aoki, 1982 described from South Japan and *D. markusi* Balogh, 1970 from Ceylon. It, however, deviates from the Japanese species in the absence of median prodorsal ridge, exobothridial setae and in having longer and bilaterally roughened notogastral setae, different sensilli, genital plate with striations, besides a few other characters. On the other hand the Ceylonese species differs from *D. russiae* in the lamellae situated more close to each other, the glabrous notogastral setae, the sensilli pointed apically and the larger body size (662 x 343).

SUMMARY

This paper deals with the description of one new species of the genus *Dolicheremaeus* Jacot (Acari Oribatei, Otocepheidae), viz., *D. russiae* from the soils of forest and tea fields in the district of Darjeeling, West Bengal, India.

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REFERENCES

- Aoki, J. 1965. Oribatiden (Acarina) Thailand. I. *Nat. Life Southeast Asia*, **4** 129-193.
- Aoki, J. 1967. A preliminary Revision of the family Otocepheidae (Acari Cryptostigmata) II. Subfamily Tetracondylinae. *Bull. Nat. Sci. Mus. Tokyo*, **10** (3) 297-359.
- Aoki, J. 1982. New species of oribatid mites from the Southern Island of Japan. *Bull. Inst. Environ. Sci. Tech., Yokohama Natn. Univ.*, **8** (1) 173-188.

- Balogh, J. 1965. A synopsis of the world Oribatid (Acari) genera. *Acta zool. hung.*, **11** (1-2) : 5-99.
- Balogh, J. 1970. New oribatids (Acari) from Ceylon. The scientific results of the Hungarian soil zoological expedition. *Opusc. Zool. Budapest*, **10** 33-67.
- Balogh, J. 1972. The Oribatid Genera of the World. *Akadémiai Kiadó, Budapest, Hungary* 1-188, pls. 1-71
- Jacot, A.P. 1938. The Geenton mites of Florida. *Florida Ent.*, **21** (4) 49-57.
- Newell, I. 1956. The genus *Tetracondyla* in the Pacific (Acari Oppiidae). *Proc. Haw. Ent. Soc.*, **16** (1) : 113-121.