

モンゴル産ジュズダニモドキ科の新種および特産種(ダニ目: ササラダニ亜目)

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A New and a Little Known Species of Gymnodamaeid Mites (Acari: Oribatida: Gymnodamaeidae) from Mongolia

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Abstract A new species of oribatid mite belonging to the genus *Pleodamaeus* PASCHOAL is described from litter of birch forest in Central Mongolia. *Pleodamaeus rotundigranulatus* sp. nov. can be distinguished from single known species of this genus by the different number of genital setae, the evenly rounded posterior margin of notogaster, the different placement of notogastral and adanal setae, and the distally attenuate prodorsal, notogastral and adanal setae. In addition, the supplementary description of a known species, *Nortonella mongolica* BAYARTOGTOKH and AOKI is given.

Key words: Oribatida, Gymnodamaeidae, *Pleodamaeus*, *Nortonella*, new species, Mongolia

Introduction

The oribatid mite family Gymnodamaeidae was proposed by GRANDJEAN (1954) to encompass four genera, namely *Aleurodamaeus* GRANDJEAN, *Arthrodamaeus* GRANDJEAN, *Gymnodamaeus* KULCZYNSKI and *Plesiodamaeus* GRANDJEAN, and three of them were described by him as new genera.

Later, several genera such as *Allodamaeus* BANKS, *Licnoliodes* GRANDJEAN and *Heterodamaeus* EWING have been included in this family (BALOGH, 1963, 1965, 1972). More recently, PASCHOAL (1987a, 1989d) reexamined the supraspecific classification of Gymnodamaeoida and elevated Plateremaeoida as an independent superfamily for three families such as Plateremaeidae TRÄGÅRDH, Licnodamaeidae GRANDJEAN and Licnobelbidae GRANDJEAN. Moreover, PASCHOAL (1987b, c 1989a, b, c) erected five new families: Hammeriellidae, Lyrifissellidae, Nooliodidae Pheroliodidae and Pedrocortesellidae within Plateremaeoida.

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Concerning the superfamily Gymnodamaeidea, PASCHOAL and JOHNSTON (1982b) and PASCHOAL (1987d, 1989d) included three families, namely Gymnodamaeidae GRANDJEAN, Aleurodamaeidae PASCHOAL & JOHNSTON and Idiodamaeidae PASCHOAL.

In the meantime, MARSHALL *et al.* (1987) adopted the name Plateremaeoidea TRÄGÅRDH, which has a priority over the Gymnodamaeidea GRANDJEAN. In a latest review of the oribatid mite genera, BALOGH and BALOGH (1992) followed the classification by PASCHOAL (1989d). At the same time, however, WOAS (1992) did not accept the PASCHOAL's classification and moreover, he did not recognize the taxonomic status of some families and genera of Gymnodamaeidea and Plateremaeoidea.

In my opinion, the current supraspecific classification and diagnosis of Gymnodamaeidea and Plateremaeoidea are too restrictive and some families or genera belonging to these taxa differ from one another by very slight features, which might be considered as species level characters. Not only the classification of families and genera, but also the taxonomy of most species is very poorly known. Only a few species have rather sufficient descriptions. Original descriptions or redescriptions of most species have been based only on the character of dorsal aspect or at most ventral aspect, and even many species have been described without figure. Therefore, further detailed studies on type materials are necessary for the better understanding of taxonomy and systematics of this group.

Since there is no fully acceptable classification for this group, in the present work I am tentatively following the most recent classification by BALOGH and BALOGH (1992), who followed the system proposed by PASCHOAL (1982, 1987d, 1989d), PASCHOAL and JOHNSTON (1982a, b). According to them, both the genera studied here, *Pleodamaeus* PASCHOAL and *Nortonella* PASCHOAL, belong to the family Gymnodamaeidae. WOAS (1992) considered *Nortonella* as a junior synonym of *Gymnodamaeus*. However, the genital and anal aperture not separated, but contiguous and femur IV with three setae in *Gymnodamaeus* as opposed to the well separated genital and anal apertures and presence of only two setae on femur IV in *Nortonella*. Therefore, I consider *Nortonella* as a valid genus.

The family Gymnodamaeidae is known to be rather diverse mostly in the Northern Hemisphere and most species are inhabitants of litter of forests, mosses, decaying woods and organic and mineral soil layers. Mongolian gymnodamaeid fauna, however, remains almost completely unknown. The present work is a part of the series of studies on systematics of Mongolian oribatid mites. The description of a new species belonging to the genus *Pleodamaeus* and the supplementary description of a known species of the genus *Nortonella* are presented here. Both the species were collected in 1996, from the litter of birch and larch forests in Central Mongolia. The type locality and habitat characteristics for each species are given in the respective "material examined" sections. Immature stages are unknown for both of these species.

Pleodamaeus rotundigranulatus sp. nov.

(Figs. 1 & 2)

Diagnosis. Relatively large species. Body and legs covered with round granules; lamellar seta inserted a little posterior or almost at the same level to rostral seta; sensillus with a long stalk and a club shaped head; prodorsum with three transversal and a pair of longitudinal faint ridges; three pairs of notogastral, seven pairs of genital and three pairs of adanal setae; *ad*, much longer and thicker than others, covered with cerotegument.

Measurements. Body length 608–646 (623) μm ; length of prodorsum 208–236 (223) μm ; width of prodorsum 241–260 (250) μm ; length of notogaster 408–440 (424) μm ; width of notogaster 336–372 (354) μm .

Integument. Body color yellowish-brown. Surface of body and leg segments yielding relatively thick cerotegument with round granules. Exuvial scalps absent.

Prodorsum. Rostrum rounded in dorsal view, but relatively robust in lateral view. Rostral seta (*ro*) moderately long (78–86 (82) μm), covered with cerotegument. Lamellar seta (*le*) nearly as long as *ro* (81–85 (83) μm), inserted a little posterior or almost at the same level to *ro*. Interlamellar seta (*in*) very short, inserted on a distinct apophysis. Exobothridial seta (*ex*) relatively long (24–28 (26) μm), covered with cerotegument. Sensillus (*ss*) with a long stalk and a club shaped head with long and dense barbs. Bothridium (*bo*) irregular funnel-shaped, directed posterolaterad. A faint transverse rostromellar ridge situated just behind the insertion of lamellar seta. A pair of short and thin exobothridial ridges appeared anterior to each bothridium and situated laterad of insertions of interlamellar setae. Interlamellar ridge completely developed, transversely situated anterior to interlamellar seta and curved posterolaterad connecting two bothridia. A central semicircular ridge present anterior to interlamellar ridge (Fig. 1A).

Notogaster. Oval, about 1.2 times as long as wide. Very flat in lateral view and conspicuously flattened anteriorly. Three pairs of notogastral setae; seta *ps*₂ more clearly visible in lateral view; all setae covered with cerotegument. Lyrifissures *ia*, *im*, *ih*, *ip*, *ips* and latero-opisthosomal gland opening (*gla*) well developed (Figs. 1A & 2A).

Gnathosoma. Infracapitular mentum slightly wider than long, without noticeable microtubercles. Hypostomal setae *a*, *h* and *m* moderately long, smooth (Fig. 1B). Chelicera and palp normal, typical of the family, generally similar to those of the next species. Fixed and movable digits of chelicera with a few blunt teeth. Trägårdh's organ narrow; setae *cha* and *chb* conspicuously barbed. Palp slender, palpal setation: 0–2–1–3–9 including solenidion ω on tarsus.

Epimeral region. Apodema *apo.2* well developed, other apodemata not evident. Discidium not evident. Epimeral setae short, smooth; setal formula: 3–1–3–3 (Figs. 1B, & 2A).

Ano-genital region. Genital and aggenital apertures distinctly separated from each other. Ano-genital setae moderately long, smooth; adanal setae *ad*, much thicker and longer than others and covered by cerotegument; setal formula: 7–1–2–3. Adanal lyrifissure not evident. Genital plates with a few microtubercles; median and posterior margins of anal plates slightly sclerotized and darkly pigmented (Fig. 1B).

Legs. Length measurements of leg segments are shown in Table 1. Articulation of leg segments not in sockets. Ventrodiscal tectum poorly developed on trochantera III and IV. Solenidia σ of genua I and II inserted very close to setae *d* and slightly longer or shorter than the respective setae *d*. In leg III, seta *d* and solenidion σ of genua situated far from each other. Solenidion ϕ_1 of tibia I very long, ϕ_2 short. Solenidia ϕ of tibiae II and IV subequal in length; ϕ on tibia III almost twice as long as ϕ of tibiae II and IV. Solenidia ω_1 and ω_2 of tarsi I and II moderately long, approximately same in length to one another. Setae *d* on genu II, *l*' on genu I, tibiae I, II and IV, *v*' on tibiae II–IV, tarsi II and III, *ft*' and *ft*'' on tarsi II–IV covered with dense cerotegument. Formula of leg setation (including famulus): I (1–5–3–5–18); II (1–3–3–5–17) III (1–2–2–3–16); IV (1–2–2–3–12); formula of solenidia: I (1–2–2); II (1–1–2); III (1–1–0); IV (0–1–0). Structure and setation of legs I–IV as shown in Figs. 2B–E.

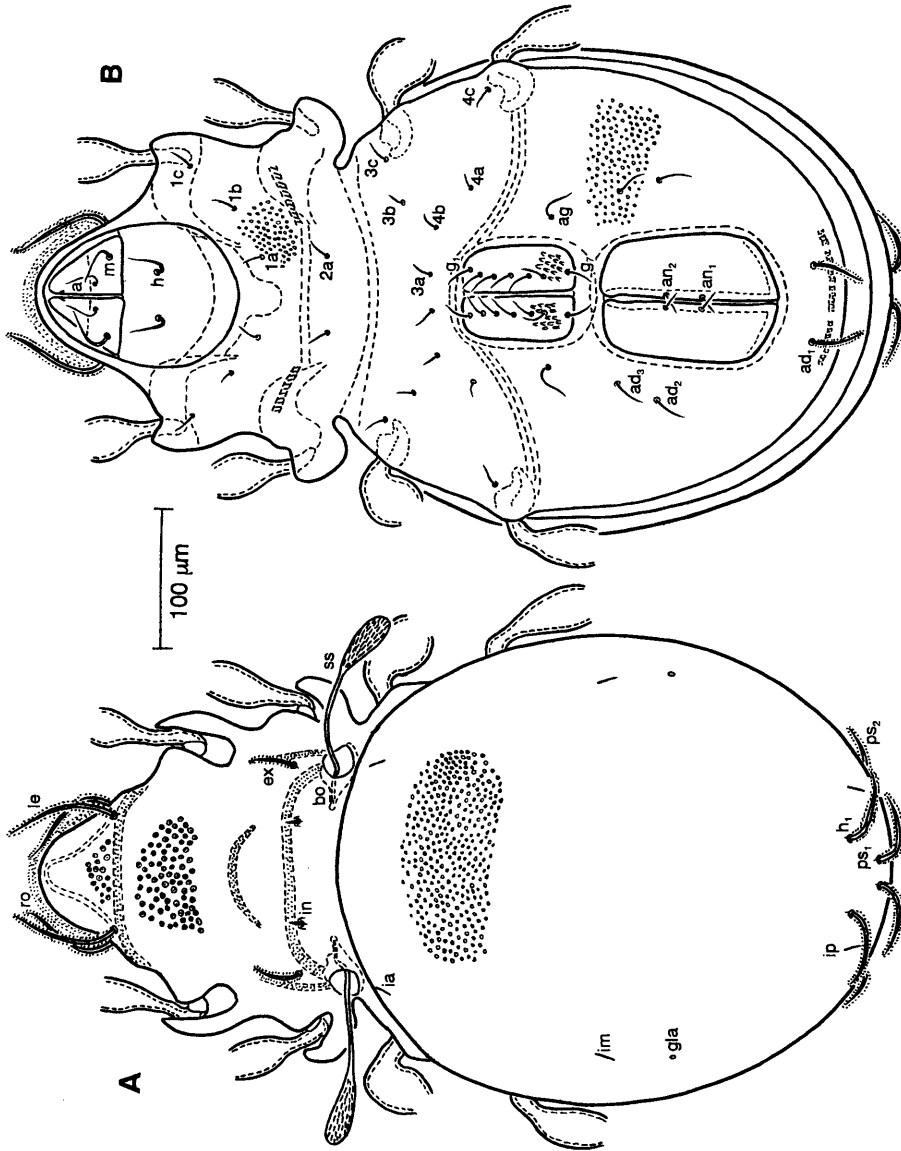


Fig. 1. *Pleodamaeus rotundigranulatus* sp. nov. A: Dorsal aspect; B: Ventral aspect.

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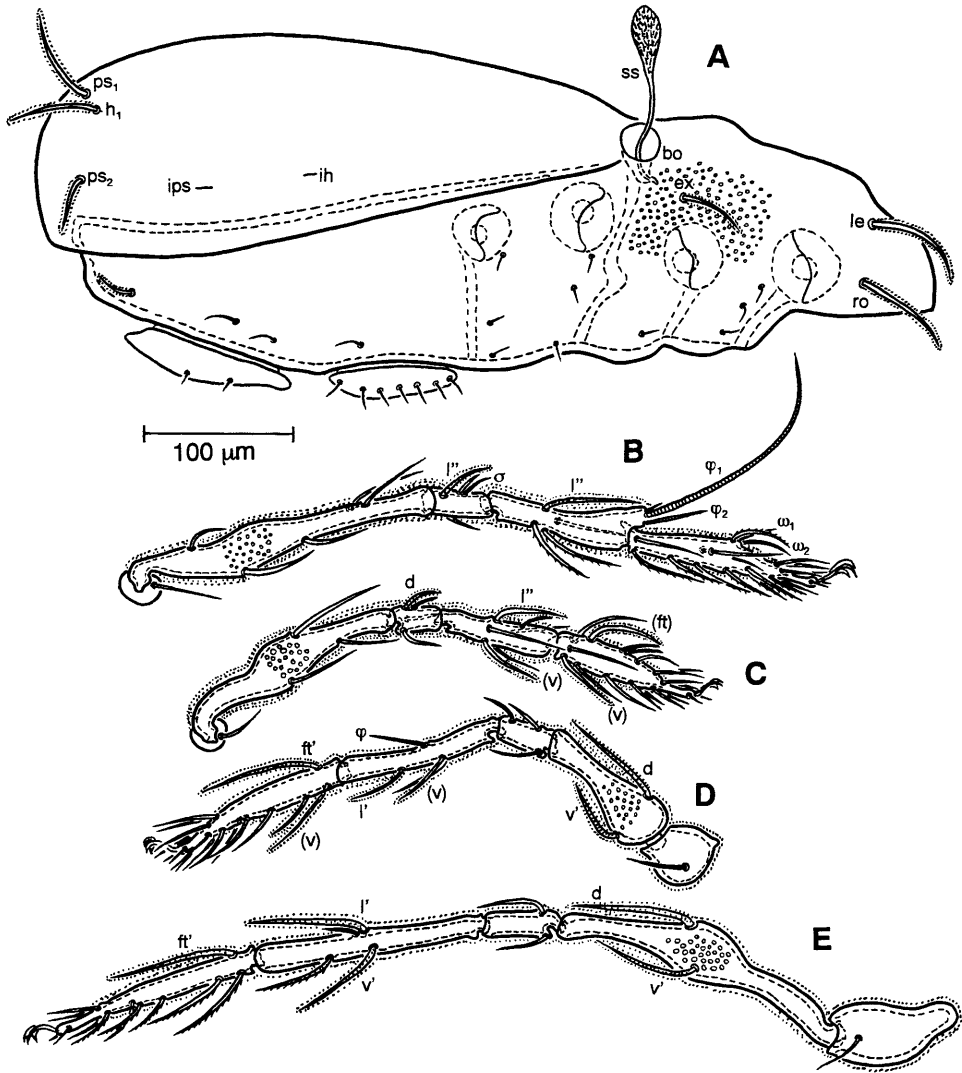


Fig. 2. *Pleodamaeus rotundigranulatus* sp. nov. A: Lateral aspect. B: Leg I (right, antiaxial aspect); C: Leg II (right, antiaxial aspect); D: Leg III (right, antiaxial aspect); E: Leg IV (right; antiaxial aspect).

Table 1. Length of leg segments of *Pleodamaeus rotundigranulatus* sp. nov. (μm)

Legs	Trochanter	Femur	Genu	Tibia	Tarsus
I	—	202	52	108	118
II	—	146	40	78	94
III	60	130	46	94	94
IV	92	196	50	136	128

Material examined. Holotype (male) and two paratypes (male and female): Mt. Khustai, District Altanbulag, Central Province, litter of birch forest (*Betula platyphylla* SUKATCHEW, 1911), 47°42' N., 106°25' E., 1680m above sea level, 11-IV-1996, Leg. B. BAYARTOGTOKH. The holotype and a paratype (in alcohol) are deposited in the collection of the Department of Zoology, National University of Mongolia, Ulaanbaatar, Mongolia (NUM DZ Ac 0045, 0046) and a paratype is deposited (in alcohol) in the collection of the National Science Museum, Tokyo, Japan (NSMT Ac 11181).

Remarks. The genus *Pleodamaeus* PASCHOAL, 1982 is monotypic, and the type species is known from Colorado, USA. *Pleodamaeus rotundigranulatus* sp. nov. is distinguishable from *P. plokosus* described by WOOLLEY and HIGGINS (1973) by the 1) presence of seven pairs of genital setae as opposed to the six pairs in *P. plokosus*; 2) evenly rounded posterior margin of notogaster as opposed to the crenulated posterior margin of notogaster with prominent folds or nubbins; 3) different (anterocentral) situation of notogastral setae h_1 and ps_1 ; 4) more posterior and anterior placement of adanal setae ad_1 and ad_2, ad_3 , respectively, and 5) distally attenuate prodorsal, notogastral and adanal setae.

The generic placement of the new species, *P. rotundigranulatus* sp. nov. can be questioned, considering the current diagnosis of the genus *Pleodamaeus*. PASCHOAL and JOHNSTON (1982b), PASCHOAL (1989d), BALOGH and BALOGH (1992) considered that the posterior margin of notogaster of *Pleodamaeus* with prominent folds, on which notogastral setae inserted. The new species is showed posteriorly evenly rounded notogaster and seven pairs of genital setae. However, in this work, these differences are not considered to be features at the generic level.

Etymology. The specific name “*rotundigranulatus*” refers to the presence of round granules covering the body and legs of this species.

Nortonella mongolica BAYARTOGTOKH & AOKI, 1997
(Figs. 3-5)

Nortonella mongolica BAYARTOGTOKH & AOKI, 1997: 129, figs. 19-21.

Diagnosis. Medium in size. Body and legs covered with round granules; lamellar seta inserted a little anterior to rostral seta; sensillus with a moderately long stalk and a leaf-shaped head; prodorsum with two ridges; five pairs of notogastral setae; two pairs of adanal setae, ad_1 absent.

Measurements. Body length 448-504 (480) μm ; length of prodorsum 142-156 (150) μm ; width of prodorsum 144-170 (157) μm ; length of notogaster 289-352 (324) μm ; width of notogaster 248-264 (257) μm .

Supplementary description. Body color light yellowish-brown. Surface of body and leg segments yielding thick cerotegument with round granules. Exuvial scalps absent. Rostrum distinctly projected in lateral view. Seta ro 51-59 (54) μm in length; seta le 49-60 (52) μm ; seta in very short, hardly visible; seta ex 38-43 (40) μm , covered with cerotegument. Rostrolamellar ridge situated just behind the insertion of lamellar seta. Interlamellar ridge weakly developed, its anterior ridge transversely situated between exobothridial setae and curved posterolaterad connecting two bothridia (Fig. 3A). Notogaster very flat in lateral view and conspicuously flattened anteriorly; lateroposterior margin of notogaster conspicuously undulated as seen in dorsal view (Fig. 3A). Notogastral setae covered with cerotegument and well visible in dorsal and lateral views. Lyrifissures ia, im, ip and latero-opisthosomal gland

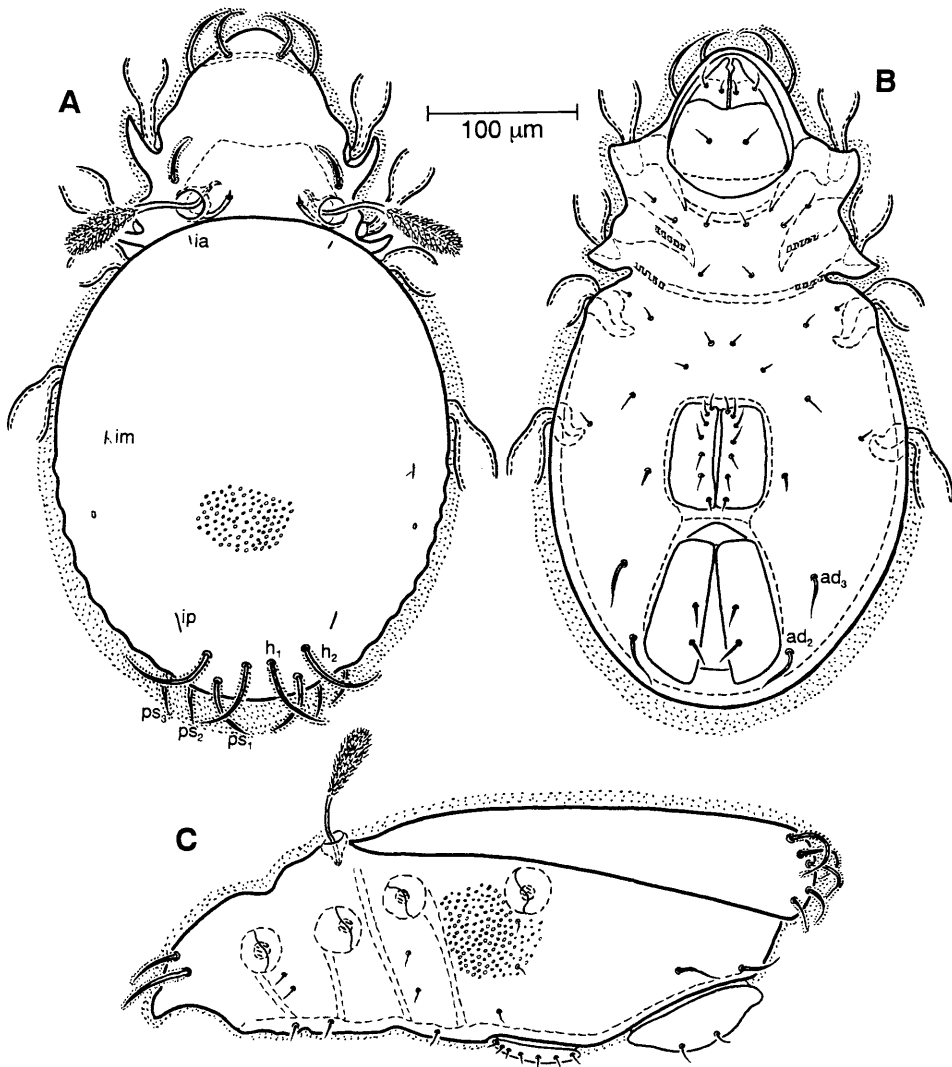


Fig. 3. *Nortonella mongolica* BAYARTOGTOKH & AOKI, 1997. A: Dorsal aspect; B: Ventral aspect; C: Lateral aspect.

opening well developed, *ih* and *ips* not evident (Figs. 3A & 3C). Infracapitular mentum slightly wider than long, without noticeable microtubercles. Hypostomal setae *a*, *h* and *m* short, smooth (Fig. 3B). Chelicera and palp normal, typical of the family. Fixed and movable digits of chelicera with a few blunt teeth. Trägårdh's organ well visible; setae *cha* and *chb* conspicuously barbed (Fig. 4A). Palp slender, palpal setation: 0-2-1-3-9 including solenidion ω on tarsus (Fig. 4B). Apodemata *apo.2* and *apo.sj* well developed, other apodemata not evident. Discidium absent. Adanal setae much longer and thicker than other ano-genital setae;

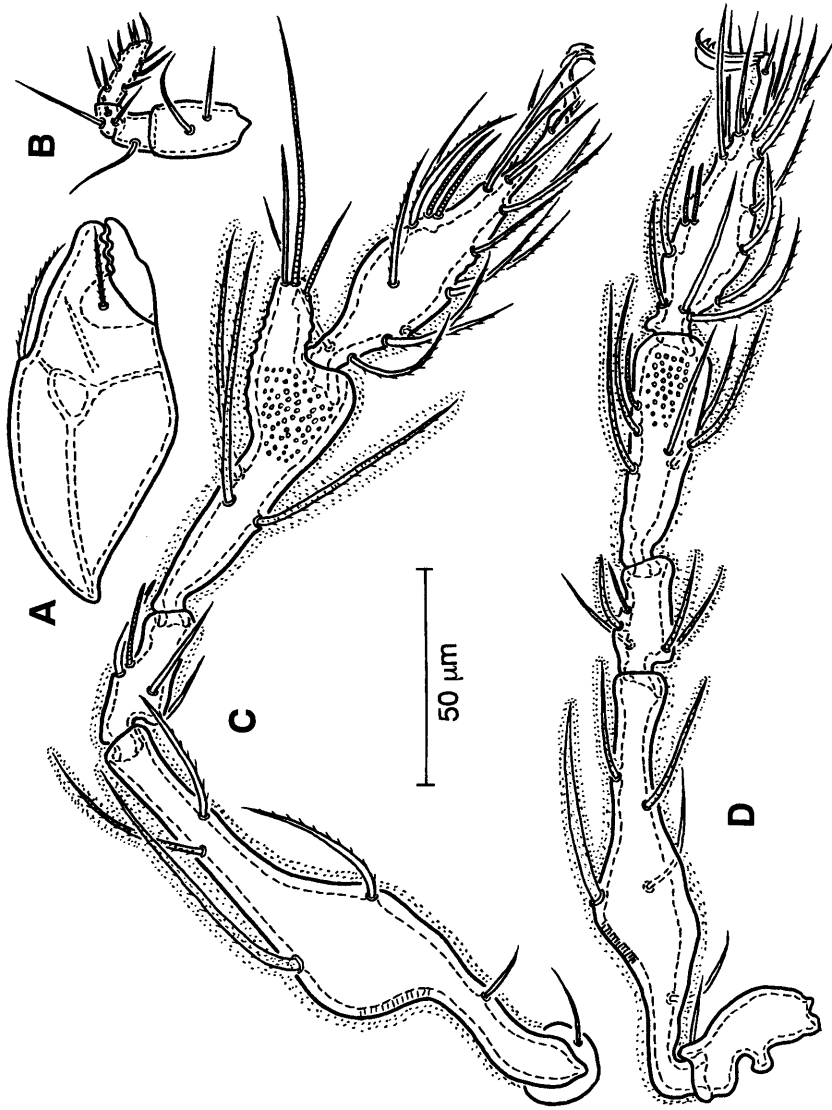


Fig. 4. *Nortonella mongolica* BAYARTOGTOKH & AOKI, 1997. A: Chelicera (right, antiaxial aspect); B: Palp (right, antiaxial aspect); C: Leg I (right, antiaxial aspect); D: Leg II (left, paraxial aspect).

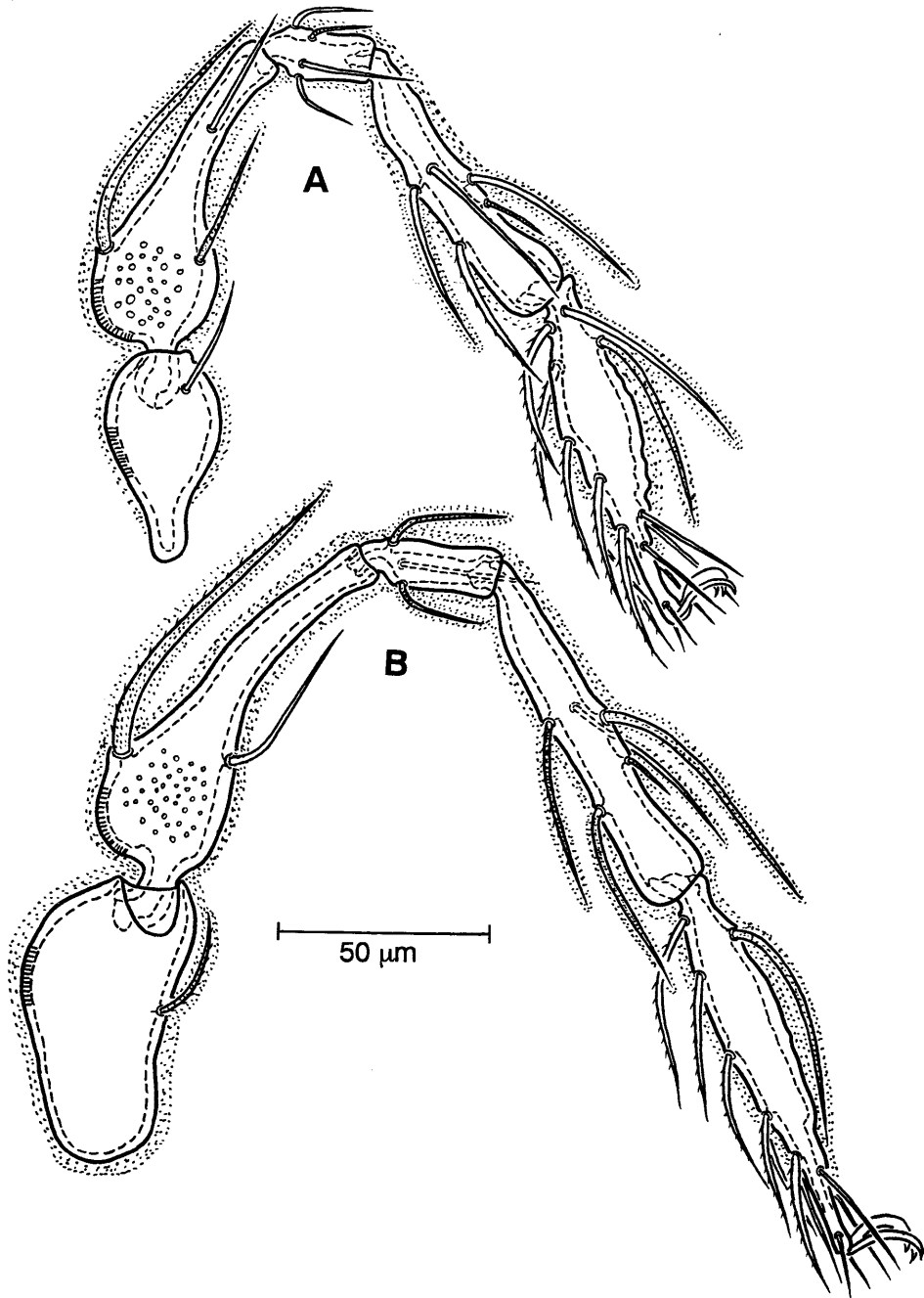


Fig. 5. *Nortonella mongolica* BAYARTOGTOKH & AOKI, 1997. A: Leg III (left, anti-axial aspect); B: Leg IV (right, para-axial aspect).

Table 2. Length of leg segments of *Nortonella mongolica* BAYARTOGTOKH & AOKI (μm)

Legs	Trochanter	Femur	Genu	Tibia	Tarsus
I	—	140	38	90	90
II	—	112	30	54	70
III	52	90	32	76	82
IV	70	106	36	94	102

*ad*₁ absent; lyrifissure *iad* not evident. (Fig. 3B). Length measurements of leg segments are shown in Table 2. Articulation of leg segments not in sockets. Ventrodistal tectum very poorly developed on trochantera III and IV. Solenidia σ of genua I-III inserted close to setae *d*, but not coupled and nearly as long as respective setae *d*. Setae *d* of femur I-IV, genua II and IV, *l'* and *l''* of tibiae I-IV, femur II, *v'* and *v''* of tibiae I-IV, genua II and IV, femora II and III, *ft'* and *ft''* of tarsi II and III, *ft''* of tarsus IV covered with dense cerotegument (Figs. 4C, D & 5). Formula of leg setation (including famulus): I (1-5-3-4-18); II (1-5-4-5-17) III (1-3-3-4-15); IV (1-2-3-4-12); formula of solenidia: I (1-2-2); II (1-1-2); III (1-1-0); IV (0-1-0).

Material examined. Fourteen specimens: Mt. Bogd Khan, Central Province, 6 km south of Ulaanbaatar, litter of larch forest (*Larix sibiricus* LEDEBOUR, 1833), 47° 55' N., 106° 30' E., 1780m above sea level, 06-X-1996, Leg. B. BAYARTOGTOKH.

Remarks. The granules on the body and leg segments of the specimens studied here are larger, covering all parts of the body. Interbothridial ridge in the present material is developed very weakly than that in the type specimens, and there is no ridge between insertions of posterior notogastral setae in the examined specimens here. Except for these points, the features of the specimens studied here well accord with the characters of the type specimens, which were given in the original description and figures. Illustration and description of the structure and setation of legs, palp, chelicera and lateral view have not been included in the original description, and those characters are given in this supplementary description. Adanal setae *ad*₂, *ad*₃ and lyrifissure *ip* were incorrectly labeled in the figure of original description, which correctly considered here.

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摘要

バダムドルジ・バヤルトグトホ (横浜国立大学 環境科学研究センター 土壌環境生物学研究室 〒240-8501 横浜市保土ヶ谷区常盤台79-7): モンゴル産ジュズダニモドキ科の新種および特産種 (ダニ目: ササラダニ亜目).

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中央モンゴルのカンバ林のリターからジュズダニモドキ科の未知種が採集され, *Pleodamaeus rotundigranulatus* sp. nov. と命名して記載した。本種は次の点により, 唯一の同属既知種と区別され

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る：生殖門毛の数，後体部後縁が平滑である事，背毛および肛側毛の配置，前体部背面の毛，背毛および肛側毛の先端が細くとがっていること。また，モンゴル特産の *Nortonella mongolica* BAYARTOGTOKH & AOKI, 1997 の再記載を行った。

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