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## Article

### Supplementary description of *Liacarus neominatus* Subías, 2004, with remarks on the genus *Liacarus* (Acari, Oribatida, Liacaridae)

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#### ABSTRACT

The supplementary description of *Liacarus neominatus* Subías, 2004 (Oribatida, Liacaridae) is presented, based on the material collected from soil and sand in a shrub-lichen tundra, Yamal Peninsula, Western Siberia, Russia. The main morphological traits of this species are summarized. The taxonomic status of some liacarid genera related with *Liacarus* is discussed, resulting in the following taxonomic proposals: *Liacarus* Michael, 1898 (= *Dorycranosus* Woolley, 1969 **syn. nov.**, = *Procorynetes* Woolley, 1969 **syn. nov.**, = *Rhaphidosus* Woolley, 1969 **syn. nov.**).

**KEY WORDS:** liacarid mites, morphology, Russia, taxonomy, Western Siberia.

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## INTRODUCTION

The oribatid mite species *Dorycranosus arcticus* (Oribatida, Liacaridae) was originally described by Grishina (1984) from Yamal Peninsula, Western Siberia, Russia. Subías (2004) moved this species to the genus *Liacarus* Michael, 1898, where its species name was preoccupied by Banks (1899), therefore, he proposed the new name, *Liacarus neominatus* Subías, 2004 (within subgenus *Dorycranosus*).

Currently, the distribution area of *L. neominatus* covers from Western Siberia to the Far East of Russia. It inhabits different substrates (e.g. soil-litter, moss, lichen) mainly in typical and mountain

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tundra, and coniferous forests (Grishina 1984, 1985; Ryabinin and Pankov 2002; Ryabinin 2015).

The original description of *L. neonominatus* was correct and species is well discernible, but it was incomplete. In particular, the description lacks length of the body setae and the certain details concerning the gnathosoma, the podosomal region, and the posterior notogastral area; also, the leg setation and solenidia and the detailed leg figures were lacking. The main goals of our paper are: to present the supplementary description of this species, on the basis of the Western Siberian material, to summarize the main morphological traits, which will help with the identification of *L. neonominatus* in the future and to discuss the taxonomic status of the genera *Dorycranosus* Woolley, 1969, *Procorynetes* Woolley, 1969 and *Rhaphidosus* Woolley, 1969, which are morphologically similar to *Li acarus*.

## MATERIALS AND METHODS

### Sampling

Samples of soil and sand were taken from shrub-lichen tundra using a small shovel. Mites were extracted from the samples in Tyumen using modified Berlese funnels by drying the samples for seven days until their completely dry condition without additional heating or lighting. Microarthropods were fixed with 75% alcohol.

### Observation and documentation

For measurement and illustration, specimens were mounted in lactic acid on temporary cavity slides. All measurements are in micrometers ( $\mu\text{m}$ ); body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the notogaster; notogastral width refers to the maximum width in dorsal aspect; setal lengths were measured in lateral aspect. Formulas for leg setation are given in parentheses according to the sequence trochanter-femur-genu-tibia-tarsus (famulus included); formulas for leg solenidia are given in square brackets, according to the sequence genu-tibia-tarsus. Drawings were made with a camera lucida using a Leica DM 2500 transmission light microscope; for SEM images alcohol preserved mites were dusted with gold and scanned with the aid of a TESCAN Mira3 LMU SEM microscope.

### Terminology

Morphological terminology used in this paper mostly follows that of papers on Liacaridae (e.g., Ermilov and Kalúz 2013; Ermilov 2020); also, Norton (1977) for leg setal nomenclature and Norton and Behan-Pelletier (2009) for overview.

### Abbreviations

**Prodorsum:** *mpr* = median part of rostrum; *ltr* = lateral tooth of rostrum; *lam* = lamella; *ltl* = lateral tooth of lamella; *mtl* = medial tooth of lamella; *ro*, *le*, *in*, *bs* = rostral, lamellar, interlamellar, and bothridial setae, respectively; *bo* = bothridium; *tu* = tutorium; *D* = dorsophragma; *P* = pleurophragma. **Notogaster:** *c*, *la*, *lm*, *lp*, *h*, *p* = setae; *ia*, *im*, *ip*, *ih*, *ips* = lyrifissures; *gla* = opisthonotal gland opening. **Gnathosoma:** *a*, *m*, *h* = subcapitular setae; *or* = adoral seta; *d*, *l*, *sup*, *inf*, *cm*, *ul*, *su*, *vt*, *lt* = palp setae;  $\omega$  = palp solenidion; *cha*, *chb* = cheliceral setae; *Tg* = Trägårdh's organ. **Epimeral and lateral podosomal regions:** *1a–1c*, *2a*, *3a–3c*, *4a–4c* = epimeral setae; *PdI* = pedotectum I; *dis* = discidium; *cir* = circumpedal carina. **Anogenital region:** *g*, *ag*, *an*, *ad* = genital, aggenital, anal, and adanal setae, respectively; *iad* = adanal lyrifissure; *po* = preanal organ. **Legs:** *Tr*, *Fe*, *Ge*, *Ti*, *Ta* = leg trochanter, femur, genu, tibia, tarsus, respectively;  $\omega$ ,  $\phi$ ,  $\sigma$  = solenidia;  $\varepsilon$  = famulus; *d*, *l*, *v*, *bv*, *ev*, *ft*, *tc*, *it*, *p*, *u*, *a*, *s*, *pv*, *pl* = setae; *pa* = porose area.

## TAXONOMY

### Family Liacaridae

### *Liacarus* Michael, 1898

### Subgenus *Liacarus* (*Liacarus*) Michael, 1898

**Type species:** *Oribata nitens* Gervais, 1844

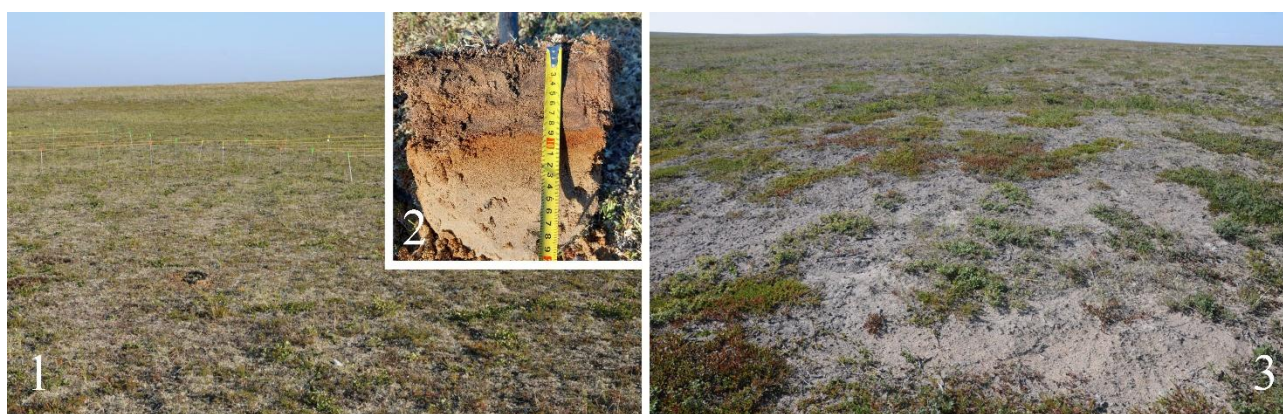
### *Liacarus* (*Liacarus*) *neonominatus* Subías, 2004

(syn.: *Dorycranosus arcticus* Grishina, 1984, preoccupied by Banks (1899))

#### *Material*

Two specimens (two males): Russia, Western Siberia, Yamal Peninsula, near Lake Yaroto-1, shrub-lichen tundra, 67°51'34.61" N, 71°5'27.45" E, practically undisturbed moist soil (locality 2, Figs. 1, 2), 10.viii.2024 (A.V. Soromotin); six specimens (five males and one female): the same, but dry loamy sand (locality 3, Fig. 3).

All specimens (preserved in 70% solution of ethanol with a drop of glycerol) are deposited in the collection of the University of Tyumen, Museum of Zoology, Tyumen, Russia.



**Figures 1–3.** Photos of localities and habitat of *Liacarus neonominatus* Subías, 2004 – 1. Locality 2; 2. Upper part of the soil profile in locality 2; 3. Locality 3.

#### *Supplementary description (Figs. 4–28)*

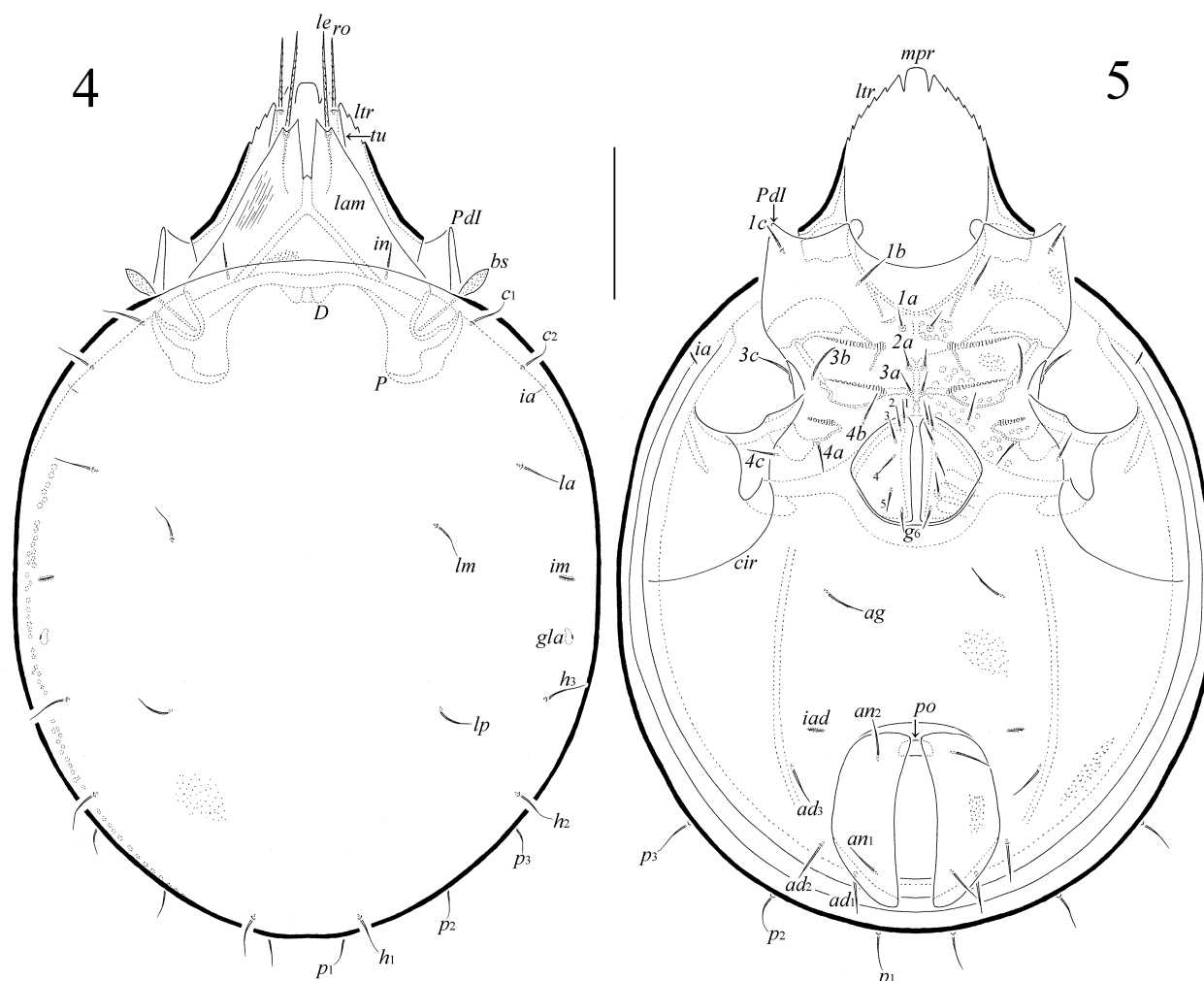
**Measurements** – Body length: 555–585 (seven males), 630 (one female); notogaster width: 390–420 (seven males), 480 (one female).

**Integument (Figs. 4, 5, 20, 23, 24, 26)** – Body brown. Surface densely microsculpturing tuberculate (visible under high magnification in dissected specimens); lamella and dorsal part of tutorium longitudinally striate; lateral side of body partially with microgranulate cerotegument.

**Prodorsum (Figs. 4–6, 8, 9, 17–24)** – Rostrum with median rectangular ledge bordered by two deep incisions and with several (six to eight) lateral teeth (anterior tooth is largest). Lamella (excluding cusp) shorter than half of prodorsum; lamellar cusp slightly shorter than basal part of lamella, distally with strong inner tooth and small lateral outer tooth (sometimes reduced); cusps clearly separated medially, parallel or slightly divergent, connected mediobasally by one small interlamellar tooth. Rostral (52–56) and lamellar (71–75) setae rod-like, barbed; lamellar seta inserted in distal part of lamellar cusp; interlamellar seta (26–28) distinctly thinner than rostral and lamellar setae, setiform, slightly barbed; bothridial seta (34–41) with short exposed stalk and longer, fusiform (narrowed or pointed distally), slightly barbed head; in some specimens, bothridial head has apical spike; exobothridial seta not observable. Tutorium long, ridge-like, directed to rostrum, continue

lateral and near the insertion of rostral seta.

**Notogaster (Figs. 4, 6, 7, 17–21, 25)** – Eleven pairs of notogastral setae (28–34) setiform, smooth; each seta inserted on small tubercle. Opisthonotal gland opening and all lyrifissures well observable.

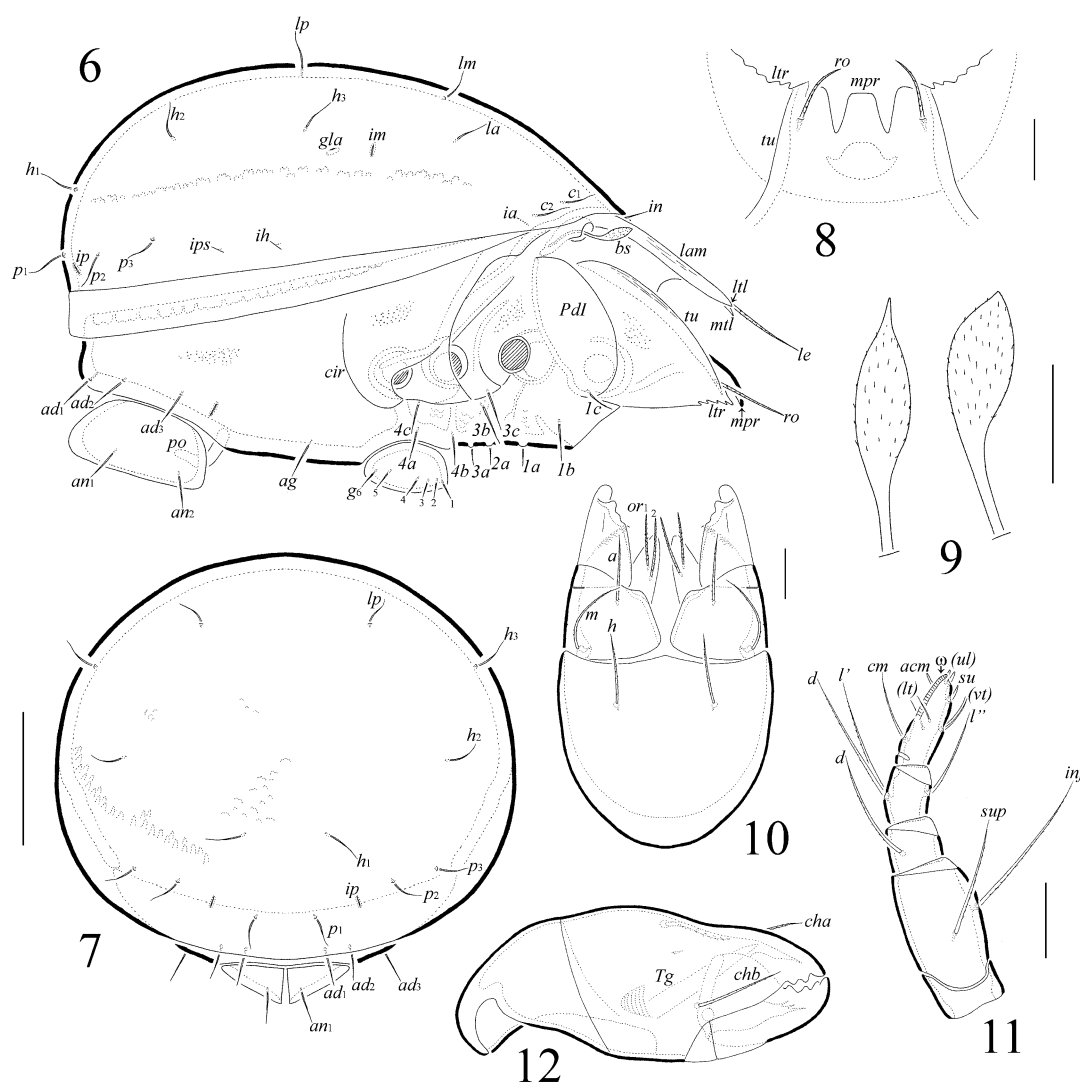


**Figures 4–5.** *Liacarus neominatus* Subías, 2004 (adult, gnathosoma and legs not shown) – 4. Dorsal view; 5. Ventral view.

**Gnathosoma (Figs. 10–12)** – Subcapitulum size: 154–169 × 86–90; subcapitular setae (*a*, *h*: 30–34; *m*: 37–41) setiform, slightly barbed; both adoral setae (26–30) setiform, barbed. Palp length: 90–97; setation: 0-2-1-3-9(+ω); postpalpal seta (7–9) spiniform, smooth. Chelicera length: 154–169; cheliceral setae (*cha*: 52–56; *chb*: 37–41) setiform, barbed.

**Epimeral and lateral podosomal regions (Figs. 5, 6, 19)** – Epimeral setal formula: 3-1-3-3; setae *1a*, *2a*, *3a* (17–19) setiform, smooth, others (*1b*, *3b*, *3c*: 30–34; *1c*, *4a*, *4b*, *4c*: 26–28) setiform, slightly barbed; *1a*, *2a*, *3a*, *3c* inserted on distinct tubercles, others on slight tubercles. Circumpedal carina distinct.

**Anogenital region (Figs 5–7, 19, 26)** – Anogenital setal formula: 6-1-2-3; genital (17–19), anal (30–34) and adanal (30–34) setae setiform, erect, smooth; all adanal setae inserted on slight tubercles; both aggenital setae (30–34) setiform, erect, slightly barbed. Adanal lyrifissure transverse.



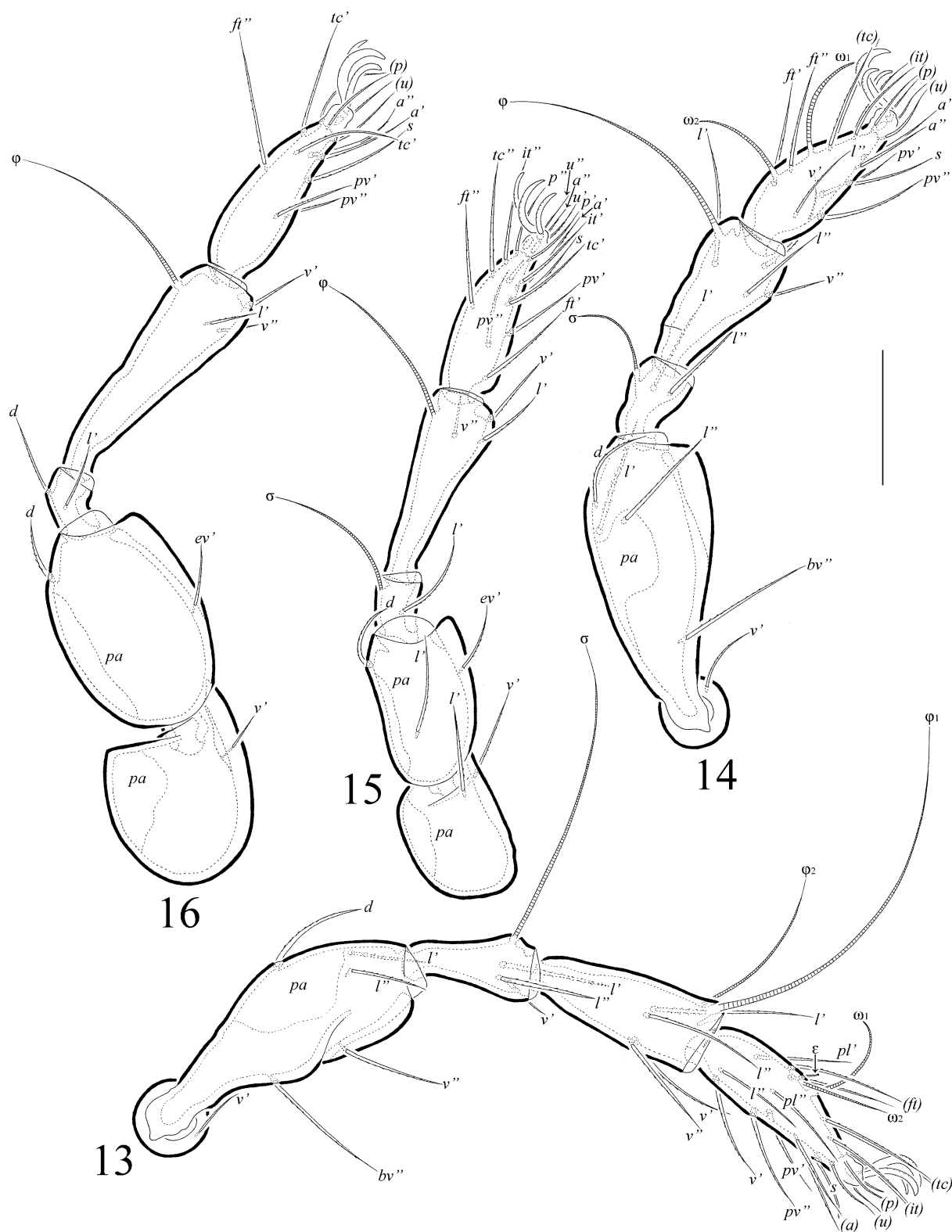
**Figures 6–12.** *Li acarus neominatus* Subías, 2004 (adult) – 6. Right lateral view (gnathosoma and legs not shown); 7. Posterior view; 8. Rostrum, anterior view; 9. Variability of bothridial seta, lateral view; 10. Subcapitulum, ventral view; 11. Palp, right, antiaxial view; 12. Chelicera, right, antiaxial view.

**Legs (Figs. 13–16, 19, 21, 27, 28)** – Median claw thicker than lateral ones, all slightly barbed on dorsal side. Dorsoparaxial porose area on all femora and on trochanters III, IV distinct. Formulas of leg setation and solenidia: I (1-5-3-4-20) [1-2-2], II (1-4-2-4-16) [1-1-2], III (2-3-1-3-15) [1-1-0], IV (1-2-2-3-12) [0-1-0]; homology of setae and solenidia indicated in Table 1; seta *s* on tarsus I eupathidial, located between paired setae *u* and *a*; solenidia  $\omega_1$  and  $\omega_2$  on tarsi I, II and  $\sigma$  on genu III rod-like, rounded apically, other solenidia setiform to subflagellate.

**Table 1.** Leg setation and solenidia of adult *Li acarus neominatus* Subías, 2004.

| Leg | Tr                    | Fe                                                | Ge                                 | Ti                                              | Ta                                                                                                                                                                                            |
|-----|-----------------------|---------------------------------------------------|------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I   | <i>v'</i>             | <i>d</i> , ( <i>l</i> ), <i>bv''</i> , <i>v''</i> | ( <i>l</i> ), <i>v'</i> , $\sigma$ | ( <i>l</i> ), ( <i>v</i> ), $\phi_1$ , $\phi_2$ | ( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> ), <i>v'</i> , ( <i>pl</i> ), <i>l''</i> , $\epsilon$ , $\omega_1$ , $\omega_2$ |
| II  | <i>v'</i>             | <i>d</i> , ( <i>l</i> ), <i>bv''</i>              | ( <i>l</i> ), $\sigma$             | ( <i>l</i> ), ( <i>v</i> ), $\phi$              | ( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> ), <i>l''</i> , $\omega_1$ , $\omega_2$                                         |
| III | <i>l'</i> , <i>v'</i> | <i>d</i> , <i>l'</i> , <i>ev'</i>                 | <i>l'</i> , $\sigma$               | <i>l'</i> , ( <i>v</i> ), $\phi$                | ( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> )                                                                               |
| IV  | <i>v'</i>             | <i>d</i> , <i>ev'</i>                             | <i>d</i> , <i>l'</i>               | <i>l'</i> , ( <i>v</i> ), $\phi$                | <i>ft''</i> , ( <i>tc</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> )                                                                                               |

Note: Roman letters refer to normal setae; Greek letters to solenidia (except  $\epsilon$  = famulus); single quotation mark (') designates setae on the anterior and double quotation mark (') setae on the posterior side of a given leg segment; parentheses refer to a pair of setae.

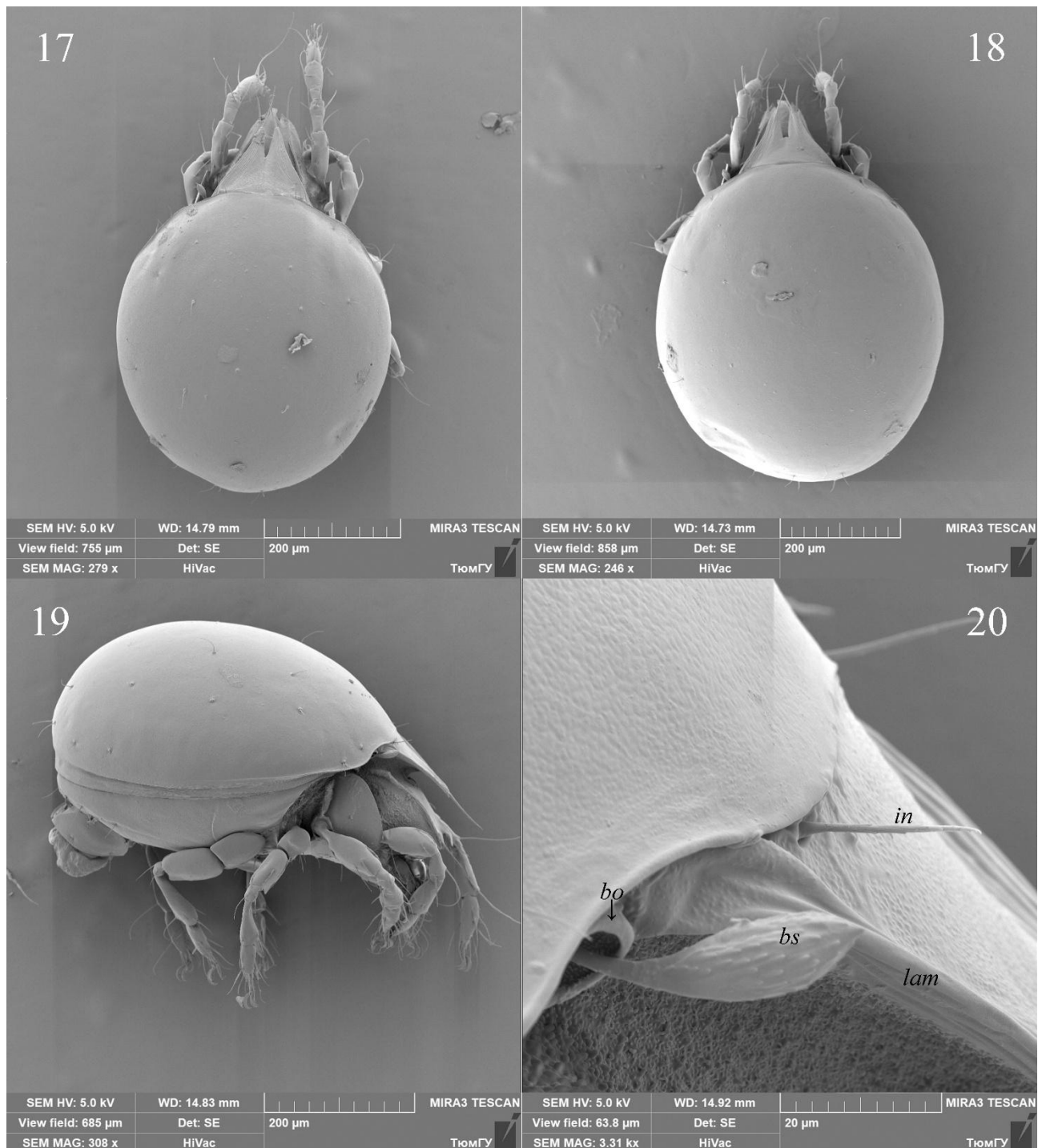


**Figures 13–16.** *Liacarus neonominatus* Subías, 2004 (adult) – 13. Leg I, right, antiaxial view; 14. Leg II, right, antiaxial view; 15. Leg III, left, antiaxial view; 16. Leg IV, left, antiaxial view.

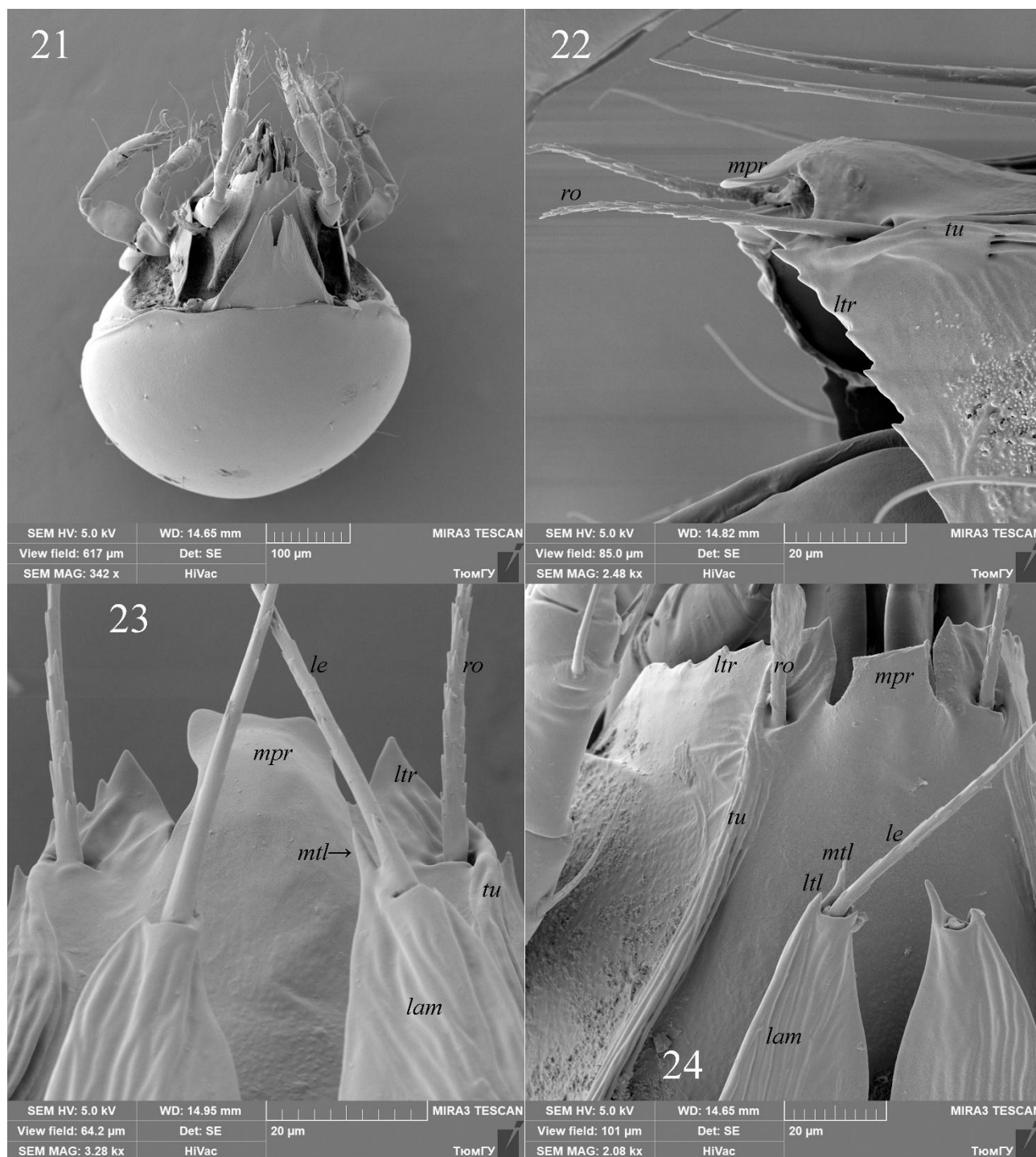
### Diagnosis

Based on our supplementary description and on the original description (Grishina 1984) of adult *L. neonominatus*, we propose the following diagnostic morphological traits for this species:

Body length: 522–665. Surface microsculpturing tuberculate; lamella striate. Rostrum with median rectangular ledge, two incisions and several lateral teeth. Lamellar cusp distally with strong inner tooth and small outer tooth (sometimes reduced); cusps separate medially, connected mediobasally by small tooth. Rostral and lamellar setae medium-sized, rod-like, barbed; interlamellar seta short, setiform, slightly barbed; bothridial seta short, fusiform (sometimes with apical spike), slightly barbed, with head longer than stalk. All notogastral setae short, setiform, smooth, inserted on tubercles. All epimeral and anogenital setae short, setiform. Adanal lyrifissure transverse.



**Figures 17–20.** *Liacarus neominatus* Subías, 2004 (adult, SEM micrographs) – 17, 18. Dorsal view; 19. Right lateral view; 20. Interlamellar and bothridial setae.

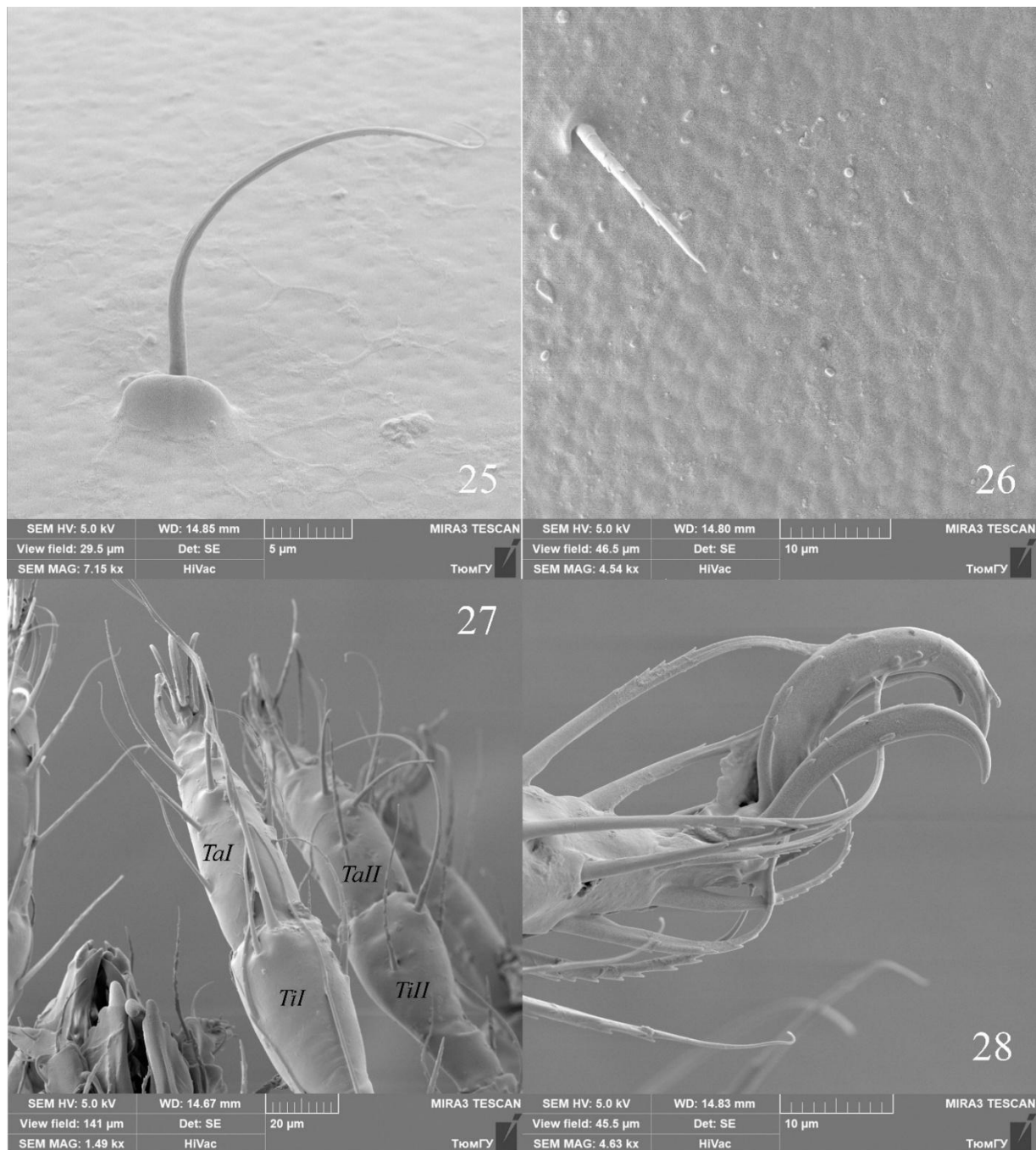


**Figures 21–24.** *Liacarus neonominatus* Subías, 2004 (adult, SEM micrographs) – 21. Anterior view; 22. Rostrum, lateral view; 23, 24. Anterior part of prodorsum, anterior view.

### GENERAL REMARKS

1. Family Xenillidae. It was established by Woolley and Higgins (1966). Many authors (e.g., Balogh 1985; Weigmann 2006; Norton and Behan-Pelletier 2009) rejected the family status for Xenillidae, consider Xenillidae to be a junior synonym of Liacaridae, since the main difference

between these families (surface sculpturing) is not diagnostic at the family level, and we agree with these authors. However, some authors (e.g., Grobler *et al.* 2003; Subías 2004, 2022; Liu and Chen 2024) supported Xenillidae as a valid taxon.



**Figures 25–28.** *Liacarus neominatus* Subías, 2004 (adult, SEM micrographs) – 25. Notogastral seta *lp*, lateral view; 26. Aggenital seta, lateral view, and aggenital sculpturing; 27. Anterior part of legs I, II, dorsal view; 28. Anterior part of leg tarsus III, lateral view.

2. Genera *Liacarus*, *Dorycranosus*, *Procorynetes*, *Rhaphidosus*. The genus *Liacarus* Michael, 1898 was described by Michael (1898), with *Oribata nitens* Gervais, 1844 as type species. Woolley (1969) established three new genera within Liacaridae, namely: *Dorycranosus* Woolley, 1969, with *Liacarus abdominalis* Banks, 1906 as type species; *Procorynetes* Woolley, 1969, with *Liacarus*

*nigerrimus* Berlese, 1916 as type species; and *Rhaphidosus* Woolley, 1969, with *Liacarus carolinensis* Banks, 1906 as type species. These genera are similar to each other, differing mainly by the morphology of their bothridial setae: spindle-shaped, with setiform or bacillar apex in *Liacarus*; clavate/fusiform in *Dorycranosus*; capitate in *Procorynetes*; and setiform/bacilliform in *Rhaphidosus*. Fujikawa and Aoki (1970) described species with spindle-shaped, fusiform or clavate bothridial setae within the genus *Liacarus*, and moreover Aoki (1980) combined all the Japanese species with various types of bothridial setae in this genus, which formerly assigned either to *Dorycranosus* or *Procorynetes*. At present, some authors supported their generic status (e.g., Pfingstl & Schatz 2021; Schatz 2022; Behan-Pelletier & Lindo 2023), but the others downgraded *Dorycranosus*, *Procorynetes*, and *Rhaphidosus* to the subgeneric level under *Liacarus* (Salazar-Fillippo and Miko 2022; Subías 2022; Liu and Chen 2024).

The importance of the morphology of the bothridial setae in the taxonomic differentiation at the supraspecies level varies in Oribatida: in some superfamilies it can be widely used (e.g. Oppioidea), while in others it is practically not taken into account (e.g. Galumnoidea). In case of Liacaridae, the use of bothridial setal morphology as a taxonomic feature to distinguish different genera is controversial. On the one side, as noted above, some genera/subgenera related with *Liacarus* (*Dorycranosus*, *Procorynetes*, *Rhaphidosus*) are supported based on the morphology of their bothridial setae. On the other side, another related (with *Liacarus*) genus *Xenillus* Robineau-Desvoidy, 1839 comprises species with all morphological types of the bothridial setae (clavate/fusiform; spindle-shaped, with setiform or bacillar apex; capitate; setiform/bacilliform). Hence, it is obviously illogical to distinguish some genera/subgenera of Liacaridae based on bothridial setal morphology while others not.

It is worth to note that *Liacarus* and *Xenillus* are clearly separate genera, differing from each other by the body surface (without heavy sculpturing in *Liacarus* versus with heavy sculpturing in *Xenillus*), therefore, the inclusion of species with different types of bothridial setae in both genera is may be correct, which indicates the morphology of the bothridial seta as a species (not generic/subgeneric) character. Therefore, the allocation for *Dorycranosus*, *Procorynetes*, *Rhaphidosus* from *Liacarus* is unnecessary.

Based on above listed explanations, we propose the following taxonomic actions: *Liacarus* Michael, 1898 (= *Dorycranosus* Woolley, 1969 **syn. nov.**, = *Procorynetes* Woolley, 1969 **syn. nov.**, = *Rhaphidosus* Woolley, 1969 **syn. nov.**). All representatives of *Dorycranosus*, *Procorynetes*, *Rhaphidosus* should be combined with *Liacarus*.

3. *Leuroxenillus*, *Stenoxenillus*. Woolley and Higgins (1966) established two other genera related with *Liacarus*, namely: *Leuroxenillus* Woolley & Higgins, 1966, with *Leuroxenillus trichionus* Woolley & Higgins, 1966 as type species, and *Stenoxenillus* Woolley & Higgins, 1966, with *Stenoxenillus atraktus* Woolley & Higgins, 1966 as type species (their third proposed new genus, *Stonyxenillus* Woolley & Higgins, 1966, is similar to *Xenillus*). These genera characterized mainly by the morphology of the lamellae: fused mediodistally by strong toothlike process, broad, dentate distally in *Leuroxenillus*; well separate, very narrow, with lateral tooth in *Stenoxenillus*. Later, Woolley (1970) questioned the validity of *Stenoxenillus* and considered the type species to be a representative of *Stonyxenillus*. Balogh and Balogh (1992) synonymized *Leuroxenillus* with *Liacarus*, but saved *Stenoxenillus*. Grobler *et al.* (2003) revised *Stenoxenillus* and supported its generic status. Subías (2004, 2022) considered both as junior synonyms of *Liacarus*. We preliminary agree with the latter synonymies, because the morphology of the lamellae (e.g., in *Liacarus* and *Xenillus*) is highly variable, however, we admit that the study of this morphological aspect within Liacaridae may be promising.

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## REFERENCES

- Aoki, J. (1980) Cryptostigmata. In: Ehara, S. (Ed.), *Illustrations of the Mites and Ticks of Japan*. Zenkoku Noson Kyoiku Kyokai Co. Ltd., Tokyo, pp. 398–489. (In Japanese)
- Balogh, P. (1985) The species of the genus *Xenillus* Robineau-Desvoidy, 1839 in the Neogaea (Acari: Oribatei). *Opuscula Zoologica Budapest*, 21: 41–62.
- Balogh, J. & Balogh, P. (1992) *The oribatid mite genera of the World. Vol. 1*. Hungarian National Museum Press, Budapest, 263 pp.
- Banks, N. (1899) Arachnida. In: Ashmead, W.H. (Ed.), *Reports upon the insects, mites and myriapods collected by Dr. L. Stejneger and Mr. G.E.H. Barrett-Hamilton on the Commander Islands. Report of Fur-Seal Investigations, 1896–97*, pp. 347–351.
- Banks, N. (1906) New Oribatidae from the United States. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 58: 490–500.
- Behan-Pelletier, V.M. & Lindo, Z. (2023) *Oribatid Mites – Biodiversity, Taxonomy and Ecology*. CRC Press, Boca Raton, London, New York, 494 pp. DOI: [10.1201/9781003214649](https://doi.org/10.1201/9781003214649)
- Berlese A. (1916) Centuria prima di Acari nuovi. *Redia*, 12: 19–67.
- Ermilov, S.G. (2020) Two new species of oribatid mites (Acari, Oribatida) of the genus *Xenillus* Robineau-Desvoidy (Acari, Oribatida, Liacaridae) from Ecuador. *Zoologicheskyy Zhurnal*, 99: 157–164. DOI: [10.31857/S0044513420020105](https://doi.org/10.31857/S0044513420020105)
- Ermilov, S.G. & Kalúz, S. (2013) Additions to the Moroccan oribatid mite fauna, with a supplementary description of *Xenillus clavatopilus* (Acari: Oribatida: Liacaridae). *Acarina*, 21: 76–80.
- Fujikawa, T. & Aoki, J. (1970) Five species of the genus *Liacarus* Michael (Acari: Liacaridae). Taxonomic notes on oribatid mites of Hokkaido. III. *Annotationes Zoologicae Japonensis*, 43: 158–165.
- Gervais, P. (1844) Acari. In: Walckenaer, M. Le Baron (Ed.), *Histoire Naturelle des Insectes Aptères*, Vol. 3. Paris, pp. 1–476.
- Grishina, L.G. (1984) A new species of the oribatid mite genus *Dorycranosus* Woolley, 1969 from the North Siberia and the Urals. In: Cherepanov, A.I. (Ed.), *Arthropods and Helminths*. Nauka, Novosibirsk, pp. 3–6.
- Grishina, L.G. (1985) Oribatid mites of Northern Siberia. In: Zolotarev, G.S. (Ed.), *Arthropods of Siberia and the Far East*. Nauka, Siberian Branch, pp. 14–23.
- Grobler, L., Ozman, S.K. & Cobanoglu, S. (2003) The genera *Liacarus*, *Stenoxenillus* and *Xenillus* (Oribatida: Gustavioidea) from Turkey. *Acarologia*, 43: 133–149.
- Liu, D. & Chen, J. (2024) Checklist of oribatid mites (Acari: Oribatida) from China. *Zootaxa*, 29: 891–1026. DOI: [10.11158/saa.29.7.8](https://doi.org/10.11158/saa.29.7.8)
- Michael, A.D. (1898) Oribatidae. In: Schulze, F.E. (Ed.), *Das Tierreich, Lief. 3 (Acarina)*, Vol. 8. Verlag von R. Friedländer und Sohn, Berlin, pp. 1–93. DOI: [10.5962/bhl.title.69306](https://doi.org/10.5962/bhl.title.69306)
- Norton, R.A. (1977) A review of F. Grandjean's system of leg chaetotaxy in the Oribatei (Acari) and its application to the family Damaeidae. In: Dindal, D.L. (Ed.), *Biology of oribatid mites*. SUNY College of Environmental Science and Forestry, Syracuse, pp. 33–61.

- Norton, R.A. & Behan-Pelletier, V.M. (2009) Suborder Oribatida. *n*: Krantz, G.W. & Walter, D.E. (Eds.), *A manual of acarology*. Texas Tech University Press, Lubbock, pp. 430–564.
- Pfingstl, T. & Schatz, H. (2021) A survey of lifespans in Oribatida excluding Astigmata (Acari). *Zoosymposia*, 20: 7–27. DOI: [10.11646/zoosymposia.20.1.4](https://doi.org/10.11646/zoosymposia.20.1.4)
- Robineau-Desvoidy, D.M. (1839) Mémoire sur le *Xenillus clypeator* (Coléoptère nouveau). *Annales de la Société Entomologique de France*, 8: 455–462.
- Ryabinin, N.A. (2015) Oribatid mites (Acari, Oribatida) in soils of the Russian Far East. *Zootaxa*, 3914: 201–244. DOI: [10.11646/zootaxa.3914.3.1](https://doi.org/10.11646/zootaxa.3914.3.1)
- Ryabinin, N.A. & Pankov, A.N. (2002) *Catalogue of oribatid mites of the Russian Far East. Part II. Continental part of the Far East*. FEB RAS, Vladivostok–Khabarovsk, 92 pp.
- Salazar-Fillippo, A.A. & Miko, L. (2022) Checklist of the oribatid mites (Acari: Oribatida) of the Republic of Colombia. *Zootaxa*, 5087: 35–58. DOI: [10.11646/zootaxa.5087.1.2](https://doi.org/10.11646/zootaxa.5087.1.2)
- Schatz, H. (2022) Oribatid mites (Acari, Oribatida) from the Petzen massif (Karawanks, Carinthia, Austria). *Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark*, 152: 5–25.
- Subías, L.S. (2004) Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes, Oribatida) del mundo (1758–2002). *Graellsia*, 60: 3–305.
- Subías, L.S. (2022) Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes, Oribatida) del mundo (excepto fósiles). *Monografías Electrónicas Sociedad Entomológica Aragonesa*, 12: 1–539.
- Weigmann, G. (2006) *Hornmilben (Oribatida)*. *Die Tierwelt Deutschlands*. Teil 76. Goecke and Evers, Keltern, 520 pp.
- Woolley, T.A. (1969) North American Liacaridae, III – New genera and species (Acari: Cryptostigmata). *Journal of the Kansas Entomological Society*, 42: 183–194.
- Woolley, T.A. (1970) Two new Xenillidae from Lebanon (Acari: Cryptostigmata, Liacaroidae). *Zoologischer Anzeiger*, 184: 225–230.
- Woolley, T.A. & Higgins, H.G. (1966) Xenillidae, a new family of oribatid mites (Acari: Cryptostigmata). *Journal of the New York Entomological Society*, 74: 201–221.

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## توصیف تکمیلی در مورد *Liacarus neominatus* Subías, 2004 همراه با بحثی درباره جنس *Liacarus* (Acari, Oribatida, Liacaridae)

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### چکیده

توصیف تکمیلی *Liacarus neominatus* Subías, 2004 (Oribatida, Liacaridae) بر اساس نمونه‌های جمع‌آوری شده از خاک و ماسه در توندرای بوته‌ای-گلشنگی در شبه‌جزیره یامال، سیبری غربی، روسیه ارائه شده است. ویژگی‌های اصلی ریخت‌شناسی این گونه خلاصه شده‌اند. وضعیت رده‌بندی برخی از جنس‌های این خانواده همراه با *Liacarus* مورد بحث قرار گرفته است که منجر به پیشنهاد‌های آرایه‌شناختی زیر شده است: *Liacarus* Michael, 1898 (= *Dorycranosus* Woolley, 1969 **syn. nov.**, = *Procorynetes* Woolley, 1969 **syn. nov.**, = *Rhaphidosus* Woolley, 1969 **syn. nov.**)

واژگان کلیدی: هرناهای لیاکارید، ریخت‌شناسی، روسیه، آرایه‌شناسی، سیبری غربی.

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