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A Review of Oribatid Mites of the Family Oribatellidae (Acariformes, Oribatida) from the Caucasus

U. Ya. Shtanchaeva[a] and L. S. Subías[b]

[a]*Caspian Institute of Biological Resources, Daghestan Scientific Center, Russian Academy of Sciences, Makhachkala, 376000 Russia*
e-mail: *umukusum@mail.ru*
[b]*Universidad Complutense de Madrid, Facultad de Biologia, Madrid, E–28040 Spain*
e-mail: *subias@bio.ucm.es*

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Abstract—The paper summarizes the data on oribatid mites of the family Oribatellidae Jacot, 1925 from the Caucasus. The redescriptions of the genus *Ferolocella* Grabovsky, 1971 = *Gendzella* Kuliev, 1977 (Subías, 2004), the subgenus *Multoribatella*, the endemic species *Ferolocella cribraria* (Kuliev, 1977), and the new species *Oribatella abdurachmanovi* from mountain Daghestan are given. Two species are synonymized (*Ferolocella cribraria* Kuliev, 1977 = *Oribatella sitnikovae* Dzaparidze, 1989, syn. n. and *Oribatella foliata* Krivolutsky, 1974 = *Oribatella brevipila* Bernini, 1977, syn. n.). The species *Oribatella bulanovae* Kuliev, 1962; *O. reticulata* Berlese, 1916; *O. asiatica* Krivolutsky, 1974; *O. foliata*, *O.* (*M.*) *colchica* Krivolutsky, 1974; and *O.* (*M.*) *nigra* Kuliev, 1967 are redescribed. Original illustrations of *O. heterodentata* Karppinen et Shtanchaeva, 1987; *O. krivolutskyi* Karppinen et Shtanchaeva, 1987; *O. sexdentata* Berlese, 1916; *O. exilicornis* Berlese, 1910; *O.* cf. *calcarata* (C.L. Koch, 1836) and *O.* cf. *foliata*, demonstrating some differences from the nominotypical species, are given. The diagnoses, differential diagnoses, and keys to the Caucasian species of *Joelia* Oudemans, 1906 and *Oribatella* Banks, 1895 are presented. The distribution of Oribatellidae species in the territory of the Caucasus is shown.

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Until recently, the literary data on oribatid mites of the family Oribatellidae Jacot, 1925 from the Caucasus included a list of 26 species of 4 genera (Shtanchaeva, 2001). Ten species and a single genus of this family were described from the Caucasus. This list needed clarification; therefore, we reviewed the fauna of Oribatellidae and performed the taxonomic analysis of some species. A key for genera and also for species of the genera *Joelia* Oudemans, 1906 and *Oribatella* Banks, 1895 was composed. All the dimensions are given in micrometers; the material on data sources on the distribution of oribatid mites can be found in the catalogue of Caucasian oribatid mites (Shtanchaeva, 2001).

Genus ***FEROLOCELLA*** Grabovsky, 1971

= *Gendzella* Kuliev, 1977 (synonymy according to Subías, 2004).

Type species (*Oribatella carolina* Banks, 1947) = *Oribatella tessellata* Berlese, 1908.

The Holarctic genus *Ferolocella* includes two species: *Ferolocella tessellata* (Berlese, 1908) = *F. carolina* Banks, 1947 (Norton and Kethley, 1989), distributed in southern Europe and USA; and the Caucasian species *F. cribraria* (Kuliev, 1977), comb. n.

The Caucasian genus *Gendzella* Kuliev, 1977, formerly treated as a Caucasian endemic, was synonymized to *Ferolocella* Grabovsky, 1971 in the catalogue of the world oribatids (Subías, 2004). Morphological analysis of these taxa, however, was not performed; the authors of both descriptions mentioned different characters in their diagnoses (Grabovsky, 1971; Kuliev, 1977). Therefore, we redescribed the genus *Ferolocella* and the species *F. cribraria* and synonymized *Oribatella sitnikovae* Dzaparidze, 1989 (syn. n.) to it, which absolutely corresponds to the description of *F. cribraria*.

Description. Small mites, body size varying from 224 to 360. Integument dark brown. Large lamellae reaching rostrum; cuspids of lamellae with more or less wide external tooth. Inner tooth very small, short, and pointed, as in *F. cribraria*, or narrow and spine-shaped, as in *F. tessellata*. Translamella wide; in *F. tessellata* shaped like loop resembling frame under

anterior margin of notogaster.[1] Tutoria serrate. Setae of proterosoma covered with short spines, long, projecting beyond apex of rostrum; lamellar setae can be strongly thickened (*F. cribraria*) or fine (*F. tessellata*). Trichobothria large, spindle-shaped or lanceolate, pubescent or covered with short spines, reaching inner teeth of cuspids or projecting beyond it; apex of trichobothrium pointed (*F. cribraria*) or blunt (*F. tessellata*).

Notogaster more or less wide, with finely punctate (*F. tessellata*) or polygonal-sculptured (*F. cribraria*) surface.[2] Notogaster with 4 pairs of pores and 10 pairs[3] of rather large notogastral setae.

Structure of ventral side in representatives of *Ferolocella* virtually similar to those in species of the genus *Oribatella* Banks, 1895.

Legs with three claws; middle claw bigger than others.

Diagnosis. The genus *Ferolocella* is characterized by the following combination of characters: the body is small (224–360); large lamellae possess cuspids reaching the rostrum; the inner lamellar tooth is very small; translamella is wide and well-developed; long lamellar and interlamellar setae project above the apex of the rostrum; the notogaster possesses 4 pairs of small pores and 10 pairs of setae; each leg possesses 3 claws.

Differential diagnosis. The main difference from the morphologically closely related genus *Oribatella* includes the presence of pores instead of porosae fields.

Ferolocella cribraria (Kuliev, 1977)

= *Oribatella sitnikovae* Dzaparidze, 1989 syn. n.
(Fig. 1)

Material. 5 specimens. Inner mountain Daghestan, Untsukulskii District, near Maidanskoe Vill., Gimrinskii Mt. Range, Mt. Zuberkha, 1300 m a.s.l., moss from mixed pine-birch forest, U.Ya. Shtanchaeva, 25.V.2004. Previous descriptions of this species were made according to the material from Azerbaijan and Georgia (Kuliev, 1977; Dzhaparidze, 1989): Caucasus Minor, environs of Chiragedzor, hornbeam forest, moss, 2 specimens, collected by K.A. Kulieva (date of collection not mentioned); Svaneti, Banguriani, soil in alpine meadow, VII.1989 and Svaneti, Becho, soil in subalpine soil, N.I. Dzaparidze, VII.1989.

Description. Small mites, length 320–360, width 220–250. Integument dark brown.

Dorsal side (Fig. 1, *1*). Length of prodorsum 95–125; length of histerosoma 217–260. Rostrum rounded, with sclerotized margin. Rostral setae large (32–45), very strong pubescent. Tutoria serrate. Large, half-fused lamellae possess cuspids with external teeth (37–45) reaching apices of rostrum; internal teeth very short (3–5), pointed. Length of slit between lamellae 25–30; of fused part of lamellae 20–33. Surface of lamellae covered with fine sclerotized carinae with pale pores along them. Lamellar setae very large (60–75), strongly thickened (Fig. 1, *3*), covered with long spines. Interlamellar setae long (110–125), fine, with indistinct serrations, projecting beyond margin of rostrum. Trichobothria long (90–100), narrow, lanceolate, covered with small spines; bothria very wide, with narrow long median tooth.

Notogaster more or less wide, its surface with polygonal structure, finely punctate (Fig. 1, *3*), with 4 pairs of pores and 10 pairs of rather large smooth notosetae; length of humeral setae 37−50, length of marginal posterior setae 20–25.

Ventral side (Fig. 1, *2*). Structure of ventral side similar to that in species of the genus *Oribatella*. Epimeral formula 2 : 1 : 2 : 2. In *F. cribraria*, surface of ventral side with polygonal pattern. Epimeral setae *1a*, *1b*, *2a*, *3a* fine, short (7–8); setae *3b*, *4a*, *4b* larger (20–30), slightly pubescent. Genital aperture 38–45 × 50–55; anal aperture 57 × 70. Anterior part of anal aperture significantly narrower than posterior part. Genital, anal, aggenital, and adanal setae constituting 6, 2, 1, and 3 pairs, respectively.

Legs with 3 claws; central claw larger than marginal claws. Tibia and tarsi of legs I and II with one seta larger than others (23–30), strongly thickened, and covered with small spines.

Distribution. The Caucasus (Daghestan, Azerbaijan, Georgia).

[1] In the description by Grabovsky, this character was mentioned as the differential one for the genus.

[2] In the description of Kuliev, this character is mentioned as the differential character of the genus.

[3] In the original description (Grabovsky, 1971), the exact number of notogastral setae is not mentioned; however, it is known that *O. carolina*, the junior synonym of *F. tessellata*, possesses 10 pairs of notogaster setae (Norton and Kethley, 1989); Kuliev (1977) erroneously mentioned 11 pairs of setae on the notogaster.

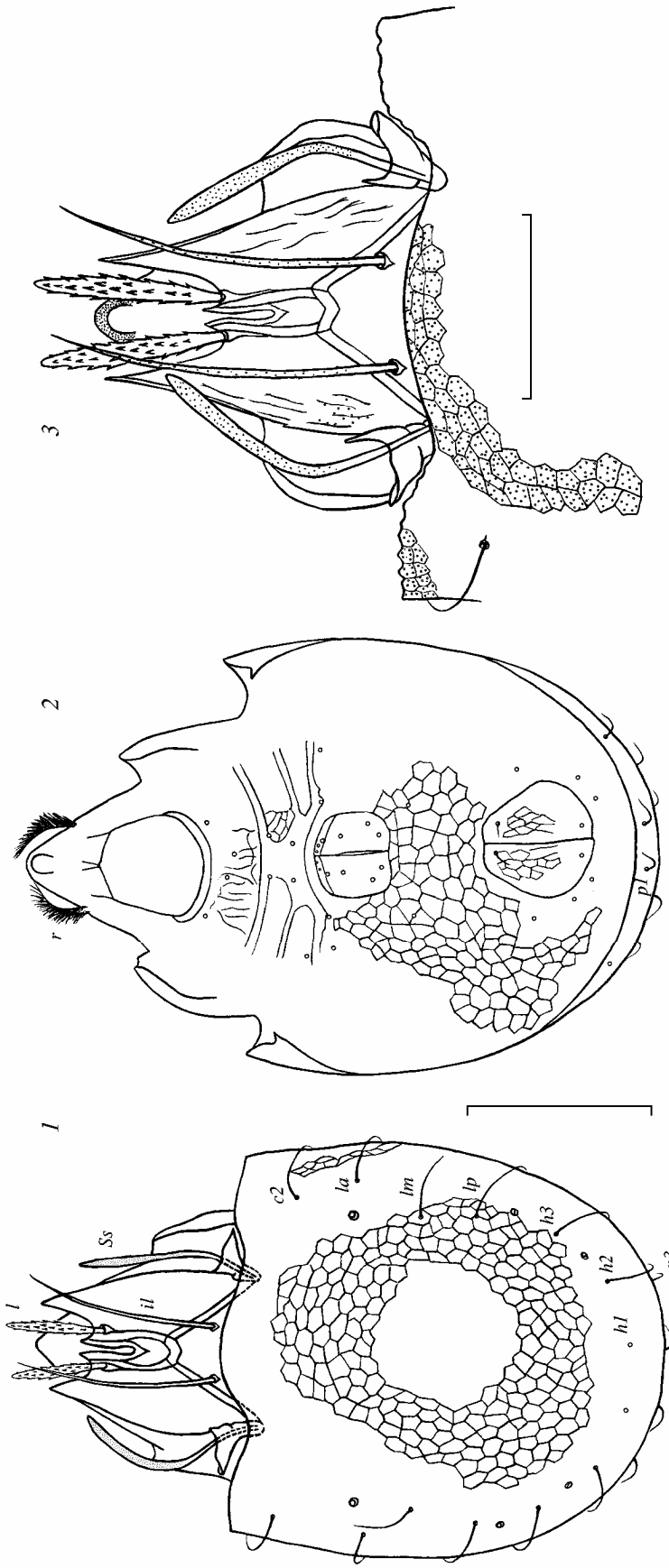

Fig. 1. *Ferolocella cribraria*: (*1*) dorsal side [setae: *l*, lamellar; *il*, interlamellar; c_2, *la*, *lm*, *lp*, h_1–h_3, p_1–p_3, notogastral setae; *Ss*, trichobothria; (*2*) ventral side [*r*, rostral setae]; (*3*) prodorsum and anterior part of notogaster. Scale (μm): (*1*, *2*) 100; (*3*) 60.

Diagnosis. *F. cribraria* is characterized by the following combination of characters: body size 320–360; lamellar setae very large and wide; surface of notogaster covered with polygonal sculpture.

Differential diagnosis. The main differences from *F. tessellata* include another shape of translamella and the polygonal sculpture of the notogaster. Besides, *F. cribraria* differs in the shape of cuspids, wider lamellar setae, the presence of thickened setae on tibiae and tarsi, and other less significant characters.

Genus ***JOELIA*** Oudemans, 1906

This Holarctic genus comprises 4 species (Subías, 2004), including the Caucasian species *Joelia dubia* (Kuliev, 1967) described from Talysh and *J. spina* Kuliev, 1979 recorded from Azerbaijan (Sheki, Zakataly), Krasnodar Territory (Sochi) and Abkhazia (Lake Ritsa).

A Key to Caucasian Species of the Genus Joelia

Inner teeth of cuspids longer than outer teeth. Lamellae fused along half of their length. Pteromorphs with pointed spine. Size 422 × 263 ..... *J. spina.*

—Inner teeth of cuspids shorter than outer teeth. Lamellae fused along two-thirds of their length. Pteromorphs without pointed spine. Size 395 × 253 ..... *J. dubia.*

Genus ***OPHIDIOTRICHUS*** Grandjean, 1953

This Holarctic genus comprises six species (Subías, 2004). *Ophidiotrichus connexus* (Berlese, 1904), a junior synonym of the eastern Palaearctic *Ophidiotrichus tectus* (Michael, 1884) was reported from the Caucasus (environs of Sochi and from Teberda).

Genus ***ORIBATELLA*** Banks, 1895

A cosmopolite genus with two subgenera: *Oribatella* with 99 species and 2 subspecies and *Multoribatella* Subías, 2004, comprising at present 7 species.

Different authors recorded 22 species of the genus *Oribatella* in the Caucasus (Shtanchaeva, 2001): Holarctic *O. calcarata* (C.L. Koch, 1836), *O. quadricornuta* (Michael, 1880), *O. sexdentata* Berlese, 1916; southern Holarctic *O. reticulata* Berlese, 1916; southern Palaearctic *O. asiatica* Krivolutsky, 1974 (Caucasus and Central Asia) and *O. superbula* Berlese, 1904 = *O. meridionalis* Berlese, 1908; western Palaearctic *O. berlesei* Michael, 1898 and *O. ornata* (Coggi, 1900) = *O. producta* Berlese, 1908; eastern Palaearctic *O. shaldybinae* Rjabinin, 1974; southern European *O. colchica* Krivolutsky, 1974, *O. exilicornis* Berlese, 1910, *O. inflexa* Mihelcic, 1957, *O. kurchevi* Krivolutsky, 1974, and *O. eutricha* Berlese, 1908; reported from southeastern Europe *O. angulosa* Csiszar, 1962 and *O. tenuis* Csiszar, 1962; Caucasian species *O. bulanovae* Kuliev, 1962, *O. foliata* Krivolutsky, 1974, *O. heterodentata* Karppinen et Shtanchaeva, 1987, *O. krivolutskyi* Karppinen et Shtanchaeva, 1987, *O. nigra* Kuliev, 1967, and *O. sitnicovae* Dzaparidze, 1989.

This list needs clarification. For example, the species *O. meridionalis*, mentioned in Caucasian lists of species, is a junior synonym of *O. superbula*; *O. sitnicovae* Dzaparidze, 1989 is synonymized to *Ferolocella cribraria*; the species *O. nigra* and *O. kurchevi* were recently placed into a newly established subgenus *Multoribatella* (Subías, 2004), etc. Besides, a species new to science was found in Daghestan; the description of this species is given below.

Oribatella (s. str.) ***abdurachmanovi*** Shtanchaeva, sp. n. (Fig. 2)

Material. Holotype, ♀:[4] Inner mountain Daghestan, Untsukulskii District, environs of Maidanskoe, Gimrinskii Mt. Range, Mt. Zuberkha, 1300 m a.s.l., soil of mixed pine-birch forest, A.A. Grikurova, 18.V.2001. Holotype deposited at the Caspian Institute of Biological Resources, Daghestan Scientific Center, Russian Academy of Sciences, Makhachkala.

Description. Body length 290, width 180. Integument pale brown, smooth.

Dorsal side (Fig. 2, *1*). Length of proterosoma 110. Rostrum triangular, with pointed apex. Tutoria smooth, without teeth, visible only from lateral side (Fig. 2, *4*). Lamellae large, concealing proterosoma; their teeth projecting beyond apex of rostrum. Long strong bridge found between lamellae; this bridge running in parallel to anterior part of notogaster; interlamellar space posteriorly to this bridge of right trape-

[4] The species possesses such an original combination of characters that it was described as a single specimen. All the following attempts to find another specimen of the species in the same locality failed.

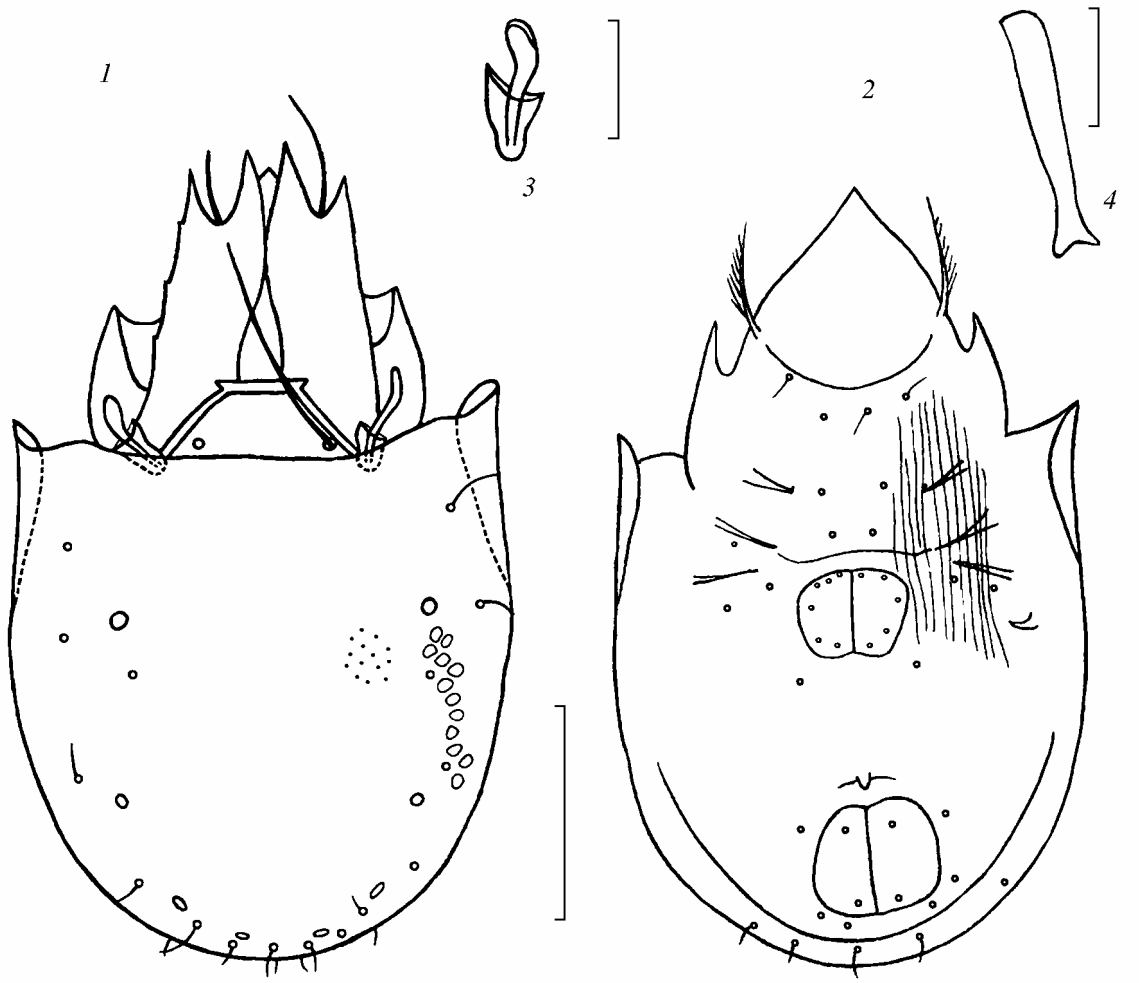

Fig. 2. *Oribatella abdurachmanovi*, sp. n.: (*1*) dorsal side; (*2*) ventral side; (*3*) trichobothrium; (*4*) tutorium. Scale (μm): (*1*, *2*) 60; (*3*, *4*) 20.

ziform shape; anteriorly to bridge, this space caliciform. External margin of lamellae with several hardly visible small teeth. Cuspids of lamellae with two large teeth; inner teeth (28–30) slightly larger than outer ones (18–20). All setae of proterosoma smooth, excluding rostral setae. Interlamellar setae large (75), slightly bent, nearly reaching apex of rostrum; bases of setae situated closely to lamellae. Bothridia caliciform. Trichobothria short (20–25), smooth, with head nearly as long as stalk; transition between stalk and club very smooth (Fig. 2, *3*). Trichobothria of original shape untypical of representatives of the genus, looking like club-shaped structures uniformly thickening distally; closer view shows flattening of trichobothrium and its strongly bent rounded apex.

Length of histerosoma 188. Notogaster with humeral projections slightly bent ventrally; surface covered with very small pale dots and 10 pairs of fine smooth setae; humeral setae c_2 longest (17); posterior marginal setae very short (5–10). Porosae areas rounded, small (2–5).

Ventral side (Fig. 2, *2*). Structure of ventral side typical of representatives of the genus; epimeral area covered with longitudinal parallel lines. Epimeral formula 2–4–2–2, epimeral setae very fine and small (5.0–7.0). Size of genital aperture 35 × 38, size of anal aperture 45 × 45. Number of genital setae constituting 5 or 6 pairs (their number differs on two folds); number of aggenital, anal, and adanal setae constituting 1, 2, and 3 pairs, respectively (setae lost).

Legs. It was impossible to determine the number of claws because tarsi were lacking.

Distribution. The species is known only from the type locality.

Diagnosis. The new species is characterized by the following combination of characters: body small (290 × 180); lamellae long, with ends projecting be-

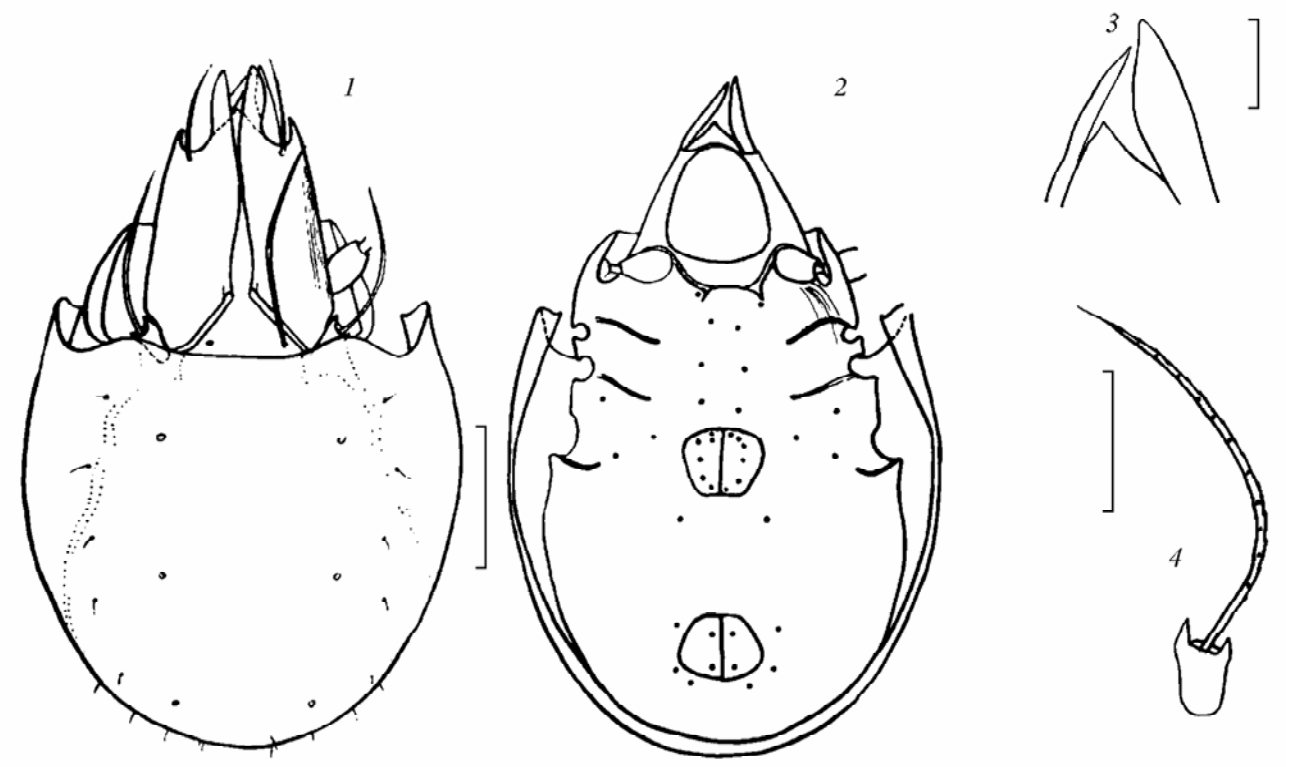

Fig. 3. *Oribatella heterodentata*: (*1*) dorsal side; (*2*) ventral side; (*3*) tutoria; (*4*) trichobothrium. Scale (μm): (*1*, *2*) 70; (*3*, *4*) 35.

yond apex of rostrum; inner teeth of cuspids slightly longer than outer teeth; translamella straight and long; tutorium smooth, without teeth; proterosomal setae smooth; trichobothria very short (20–25), reaching only level of translamella, their projecting part as long as bothridium.

Differential diagnosis. The new species differs from other species of the genus in a very small size, because in the majority of species the body is 400–750; in some cases, 300–330 (Hammer, 1958, 1962, 1977; Krivolutsky, 1974; A Key to Soil Sarcoptiformes Mites, 1975; Mahunka, 1979; Bernini and Avanzati, 1983; Perez-Inigo, 1993) and very short trichobothria. *Oribatella palustris* Hammer, 1962, described from the Chilean Andes, is the most closely related species with short trichobothria and long lamellae projecting beyond the apex of the rostrum. More or less short trichobothria are characteristic of *O. punctata* Hammer, 1958 and *O. unispinata* Hammer, 1958, described from Andes in Argentina and Bolivia (Hammer, 1958) and *O. strinatii* Mahunka, 1979 from Guatemala (Mahunka, 1979); these species, however, have another combination of characters. The main differences of the new species from the abovementioned species include the shape and size of trichobothria and the shape of translamella.

Etymology. The species is named after entomologist G.M. Abdurakhmanov, a member of the Russian Ecological Academy; under his supervision, students of the Daghestan State University collected the material for investigation.

It should be noted that *O. ornata*, *O. bulanovae*, *O. tenuis*, *O. eutricha*, *O. colchica*, and *O. heterodentata* are very similar morphologically. Such characters as the size of the body, the structure of lamellae, the chaetom of the proterosoma, the shape and length of trichobothria, small notosetae, and monodactyle tarsi are common for the abovementioned species. Morphological similarity of the three first species was noted by Bernini (1974).[5] The author was doubtful of the species independence of *O. bulanovae* (Kuliev, 1962) and *O. tenuis* (Csiszar and Jeleva, 1962), leaving, however, the question of their synonymy debatable because of the impossibility of comparison of type specimens and the brief character of redescriptions, where some morphological characters were not mentioned. *O. colchica* is transferred into the subgenus *Multoribatella* (see below).

[5] In this work, *O. bulanovae* Kuliev, 1962 is erroneously named *O. bregetovae* Kuliev, 1962 and *O. colchica* is not mentioned.

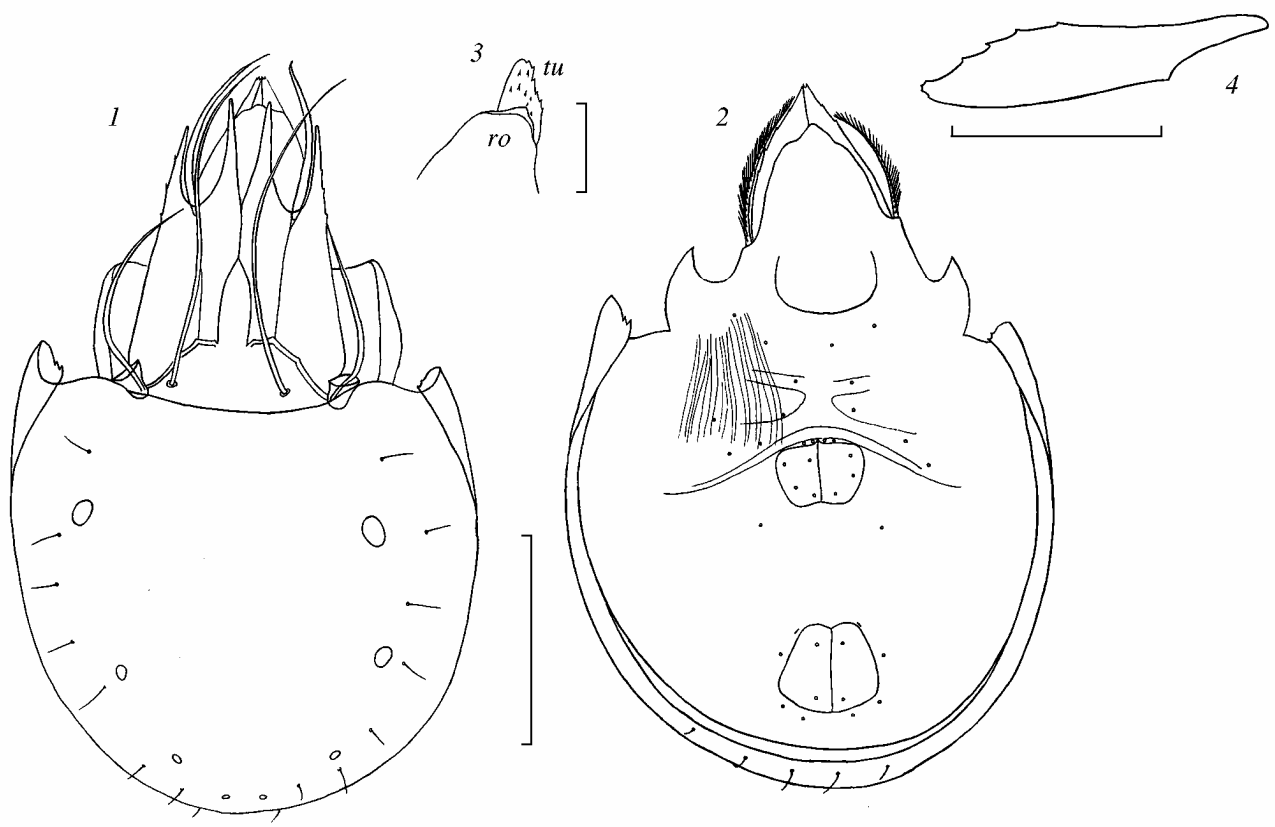

Fig. 4. *Oribatella bulanovae*: (*1*) dorsal side; (*2*) ventral side; (*3*) rostrum (*ro*) and part of tutorium (*tu*), lateral view (*4*) tutorium; Scale (μm): (*1*, *2*, *4*) 100; (*3*) 50.

The question on the probable synonymy of *O. ornata* and *O. tenuis* also remains open, needing additional investigations. *O. ornata*, redescribed in detail by Bernini (1974), was recorded in Rostov Province, Krasnodar Territory (Sochi, Novorossiisk), and Abkhazia (Myusera, Novyi Afon, Khodzhala). The data on finding of *O. tenuis* in Transcaucasia are given in a Key to Soil Sarcoptiformes Mites (1975). Mention of finding of this species in Azerbaijan (Lenkoran) in the catalogue of Caucasian Oribatida (Shtanchaeva, 2001) is erroneous.

The species *O. eutricha*, described by Berlese as a variation of *O. ornata*, was treated as an independent species by Bernini (1977); this species is characterized by monodactyle tarsi, free lamellae, inner teeth of cuspids longer than outer ones, long and pointed trichobothria, tutoria with serrate anterior and upper margins, absence of single seta on femur III, and by thickened epimeral seta *4c*. In the Caucasus, the species was recorded only from Rostov Province.

O. heterodentata (Fig. 3) differs from all other species morphologically similar to *O. ornata* in the original shape of cuspids, very small porosae areas, and significantly shorter notosetae (Karppinen and Shtanchaeva, 1987). By now, the species was recorded only from the type locality (Kumukh, Daghestan).

The original description of *O. bulanovae* was very brief, hampering diagnostics. The study of specimens deposited at the A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences (Moscow) [IPEE] and also of specimens collected by we in Talysh, allowed redescribing this species.

Oribatella (s. str.) ***bulanovae*** Kuliev, 1962 (Fig. 4)

Material. 3 specimens, Azerbaijan, Lenkoran, D.A. Krivolutsky, 1964; 2 specimens, Girkanskii Nature Reserve, floodland liana forest, litter and soil, 2.VII.2004, U.Ya. Shtanchaeva. The material is deposited at IPEE (Moscow) and at the Caspian Institute of Biological Resources, Daghestan Scientific Center, Russian Academy of Sciences (Makhachkala).

Description. Body length 340–350, width 240. Integument pale brown, smooth.

Dorsal side (Fig. 2, *1*). Length of prodorsum 125–150. Rostrum with rounded apex, in specimens

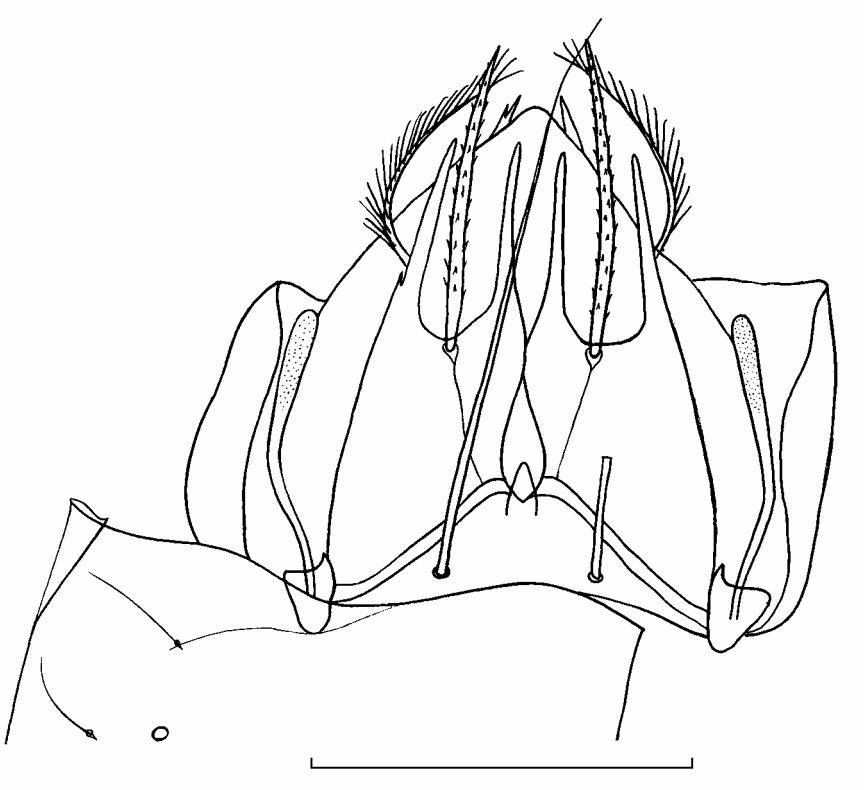

Fig. 5. *Oribatella exilicornis*, prodorsum and part of notogaster. Scale 50 μm.

examined its sides covered with tutoria and hardly visible. Tutoria long, projecting beyond end of rostrum. Lower margins of tutoria smooth, upper margins, with teeth; outer surface covered with sparse small teeth (Fig. 4, *3*, *4*).

Lamellae large, projecting beyond apex of rostrum, concealing proterosoma. Bridge between lamellae absent. External margin of lamellae with several hardly visible small teeth. Inner teeth of lamellar cuspids (55–63) slightly larger than outer ones (38–43). Rostral setae long (65–68), strongly pubescent. Lamellar setae large (95–100), thick, covered with small spines. Interlamellar setae large (175–178), slightly bent, projecting beyond apex of rostrum, slightly scabrous. Bothridia caliciform. Trichobothria (100–115) setae-like, nearly smooth.

Length of histerosoma about 225. Notogaster with humeral projections slightly bent ventrally; ends of pteromorphs with several small teeth. Surface of notogaster punctate, with 10 pairs of fine, short, smooth setae; humeral setae c_2 (10–15), *lp* (13), and posterior marginal setae h_1–p_3 (5–10) nearly of same length. Porosae areas rounded, first two pairs very large, especially *Aa* (12–43); other pairs significantly smaller (4–5).

Ventral side (Fig. 4, *2*). Structure of ventral side typical of representatives of the genus; epimeral area covered with longitudinal parallel lines. Epimeral formula 2–4–2–2; in specimens examined, however, epimeral setae lost. Size of genital aperture 30–35 × 50, size of anal aperture 50 × 60. Number of genital, aggenital, anal, and adanal setae constituting 6, 1, 2, and 3 pairs, respectively.

Legs with single claw. Tibial apophyses I large (up to 8).

Distribution. Caucasus: Krasnodar Territory (Sochi, Novorossiisk), Azerbaijan (Sheki, Chiragedzor, Kelbadzhr, Talysh)

Diagnosis. The species is characterized by the following combination of characters: body small (340–350 × 240); large lamellae with ends projecting beyond apex of rostrum; inner teeth of cuspids slightly longer than outer teeth; translamella absent; margin of tutorium covered with small sparse short spines; interlamellar setae and seta-like trichobothria (100–115) slightly scabrous, without pubescence.

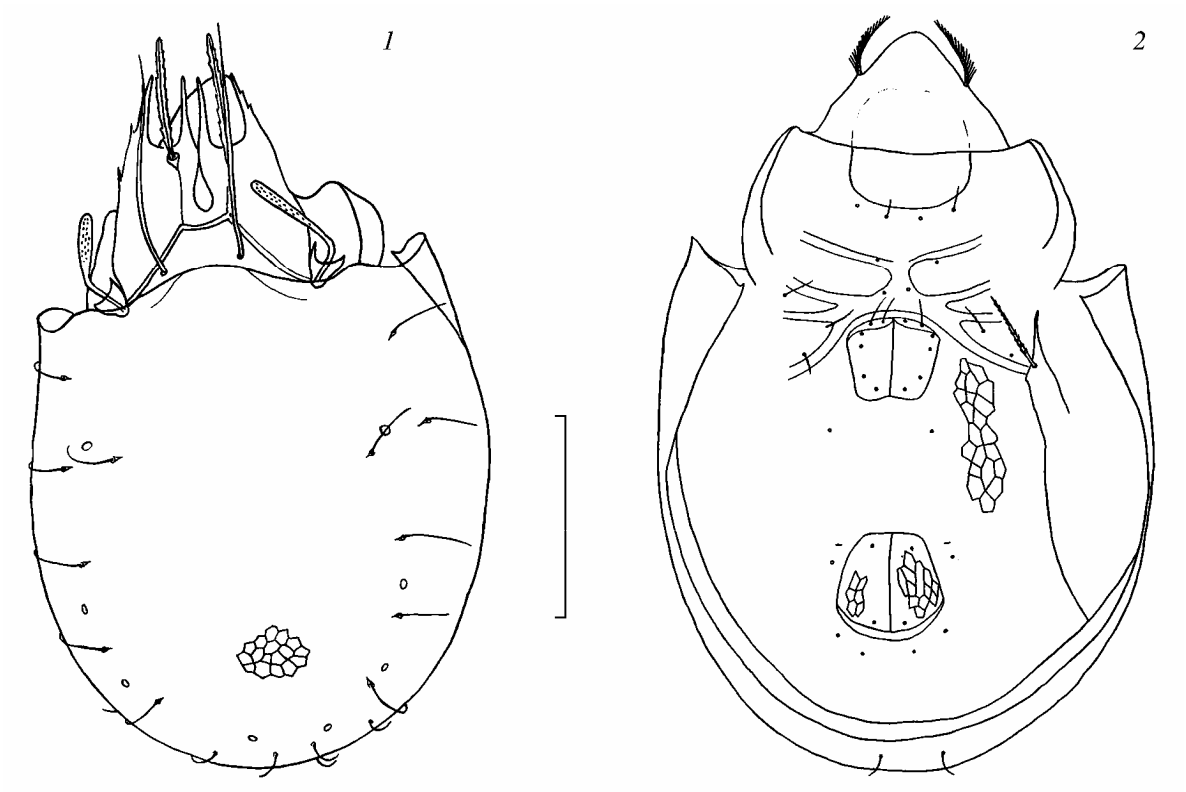

Fig. 6. *Oribatella reticulata*: (*1*) dorsal side; (*2*) ventral side; Scale 100 μm.

Differential diagnosis. The most closely related species is *O. ornata*.[6] *O. bulanovae*, however, distinctly differs from this species in the shape of the rostrum (in *O. ornata*, the latter is pointed), very large porosae areas *Aa* and A_1, and smaller and smoother notosetae. Additionally, the translamella is outlined in *O. ornata*, whereas it is entirely absent in *O. bulanovae*.

O. exilicornis possesses a peculiar complex of characters: trichobothria club-shaped; inner and outer teeth of cuspids very narrow and of same length (Fig. 5); epimeral setae *4c* short and fine; their structure similar to that typical of other epimeral setae (Bernini, 1978). In the collection of IPEE, we found a specimen of *O. exilicornis* from Georgia (Central Caucasus, N.I. Dzhaparidze, 31.I.1969). Some data are also available (but not confirmed by us) on finding of this species in Daghestan (Oribatid Mites, 1955).

The species *O. reticulata* distinctly differs from other representatives of the genus by the polygonal sculpture of the notogaster surface. No reliable description of this species is available. As far as this species was mentioned for the Caucasus but was not found by us, we give a redescription of this species on the basis of specimens from Astrakhan (collection of IPEE).

Oribatella (s. str.) ***reticulata*** Berlese, 1916 (Fig. 6)

Material. 11 specimens, Astrakhan, D.A. Krivolutsky (collecting date unknown). Slides are deposited at IPEE (Moscow).

Description. Body length 370–380, width 260–280. Integument pale brown.

Dorsal side (Fig. 6, *1*). Length of proterosoma 88–115. Rostrum rounded, in specimens examined, its sides covered with tutoria and hardly visible. Tutoria reaching end of rostrum, with several teeth on distal margin. Lamellae large, connected by wide (10–45) translamella, concealing proterosoma. Outer margins of lamellae smooth or with several slightly visible teeth. Cuspids of lamellae with fine narrow teeth of same length (43). Rostral setae long (65–68), strongly pubescent. Lamellar setae (63–75) thick, covered with small spines. Interlamellar setae large (100–125), slightly bent, scabrous, projecting beyond apex of

[6] We examined specimens of *O. ornata* from the collection of Complutense University in Madrid.

rostrum. Bothridia caliciform, their medial margin with long pointed tooth. Trichobothria (73–80) club-shaped, nearly smooth.

Length of notogaster 250–275. Pteromorphs with small apical tooth. Surface of notogaster with polygonal pattern and finely punctate; 10 pairs of notosetae fine and smooth; humeral setae c_2 rather long (38–45), length of setae *la*, *lm*, *lp*, h_1–h_3 and p_1–p_3 constituting 25–40, 30–33, 28–35, 23–28, and 18–23, respectively. Porosae areas rounded, small, *Aa* (8) slightly larger than others (2.5–5).

Ventral side (Fig. 6, *2*). Structure of ventral side typical of representatives of the genus; epimeral area covered with longitudinal parallel lines. Epimeral formula 2–4–2–2 (in specimens examined, many setae lost, only sockets visible). Size of genital aperture 38 × 55–63, size of anal aperture 55 × 50–58. Number of genital, aggenital, anal, and adanal setae constituting 6, 1, 2, and 3 pairs, respectively. Genital (18) and anal (8–10) setae fine, long; adanal setae (13) weakly pubescent. Anal-genital area with reticulate ornament.

Legs with 3 claws.

Distribution. Southern Holarctic species, recorded from the Caucasus without mentioning of certain collecting sites (A Key to Soil Sarcoptiformes Mites, 1975).

Diagnosis. The species is characterized by the following combination of characters: body small (370–380); rostrum rounded; lamellae fused at base, bearing fine, equally long teeth of cuspids; thin translamella possesses no interlamellar teeth; tutorium bears several teeth at distal end; trichobothria (73–80) club-shaped; surface of notogaster covered with polygonal pattern.

Differential diagnosis. The species differs from all other species of the genus by the polygonal sculpture of the notogaster.

The species *O. superbula* Berlese, 1904 (= *O. meridionalis* Berlese, 1908, synonymy according to Mahunka and Mahunka-Papp, 1995) is recorded from Rostov Province, Krasnodar Territory (Novorossiisk), Daghestan (Kurush), and Georgia (Saguramo, Manglisi).

Dzhaparidze (1989) describes *O. meridionalis* from Tbilisi, Margkopi, and Kodzhori; the specimens described, however, possess 3 claws on each leg, whereas *O. superbula* (= *O. meridionalis*) possesses two-clawed legs. By the complex of the characters mentioned (body length constituting 500; presence of pointed rostrum; shape of lamellae with bent inner teeth of cuspids; blunt trichobothria), they can be attributed to the species *O. inflexa*, recorded in the Caucasus only from Azerbaijan (Sheki).

The species *O. quadricornuta*, very similar to *O. inflexa*, but differing from the latter in the presence of straight inner teeth of lamellar cuspids and a rounded rostrum, was recorded in the northern Caucasus from Teberda and Caspian and Tersko-Kumskaya Lowlands of Daghestan.

Bernini (1977) analyzed the morphology of some species of the genus *Oribatella*, morphologically similar to *O. quadricornuta*. He redescribed the species *O. berlesei*, *O. calcarata*, and *O. sexdentata* on the basis of their types or topotypes.

O. berlesei differs from *O. quadricornuta* in the shape of the rostrum (pointed) and bothridia and the shorter custodium. In the Caucasus, this species was recorded from North Ossetia and Georgia (Krestovyi Pass, Borzhomi, Bakuriani, Manglisi, Martkobi, Tsagveri, Banguriani, Ritsa, Myusera, Novyi Afon)

O. calcarata differs from *O. quadricornuta* by the following characters: larger body size (more than 600); black coloration and shape of body; irregular microsculpture of notogaster; inner teeth of lamellae slightly longer than outer teeth; pointed and thin trichobothria and notosetae; structure of apophyses on the tibia. As mentioned by Bernini (1977), these characters must be treated as a whole complex, because no single character is typical exclusively of *O. calcarata*. The author also points to the synonymy of *O. decumana* Berlese, 1910 and *O. calcarata* (C.L. Koch, 1836). In the Caucasus, this species was recorded from Daghestan (Kumukh, Tlyarata, Tsumilukh), Azerbaijan (Maslay, Kipchal, Kaladuz, Khachmas, Apsheron), Georgia (Batumi, Trialetskii Mt. Range, Tbilisi, Verkhnyaya Kartli, Saguramo), and Armenia (Lora-Pambak, Lake Sevan, Ararat Valley). Four specimens were recorded from the highland Daghestan (Tlyaratinskii District, Nukatl Mt. Range); these specimens differ from the others in some structural details, and their description is given below.

O. sexdentata (Fig. 7) is characterized by a small size, a peculiar shape of lamellae (the outer cuspid tooth is larger than the inner one; the lamellae are

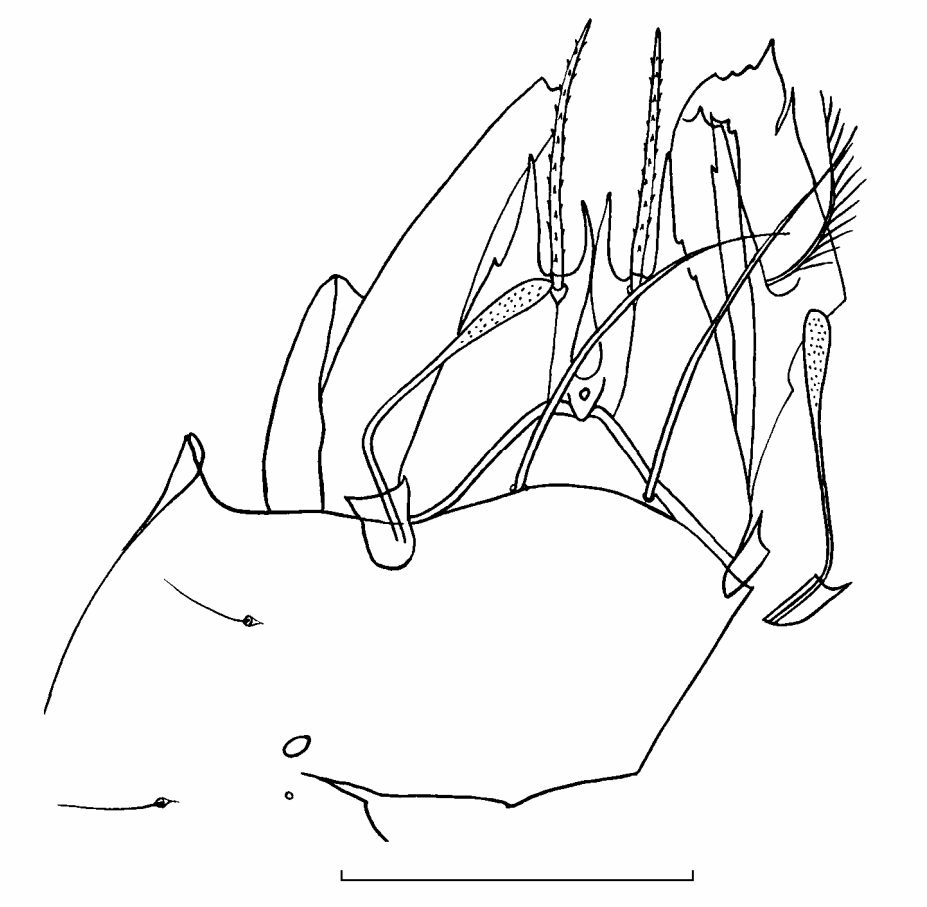

Fig. 7. *Oribatella sexdentata*, prodorsum and part of notogaster. Scale 40 μm.

fused medially at bases), rostrum with hatches,[7] club-shaped trichobothria, and single-claw legs. The species was recorded from North Ossetia, Karachay-Cherkessia (Teberda), and Georgia (Central Caucasus).

It should be also noted that a high degree of morphological similarity occurs between *O. quadricornuta* and *O. willmanni* Subías et Gil-Martin, 1995 (= *O. similisuperbula* Weigmann, 2001) and *O. tridactyla* Ruiz, Subías et Kahwash, 1991, taking into account a strong intraspecific variability of characters of *O. quadricornuta* in relation to the structure of trichobothria and the interlamellar tooth (Bernini, 1975). Nevertheless, some differences are also evident. In particular, all the known representatives of *O. tridactyla* (58 specimens) possess very large pointed interlamellar tooth and trichobothria with a blunt end; setae *4c* are thick, pubescent, but short. In specimens of *O. willmanni*, the lamellar tooth is absent or slightly distinct; trichobothria also possess a blunt apex, but setae *4c* are long, thick, and roughly pubescent. The species *O. similisuperbula* is synonymized to *O. willmanni* (Subías, 2004), because it is characterized by the abovementioned characters; only its interlamellar tooth is small. In his original description, the author (Weigmann, 2001) noted that this species can be a junior synonym of *O. willmanni*. *O. willmanni* and *O. tridactyla* also differ from *O. quadricornuta* in the body size: *O. quadricornuta* is significantly larger (490–520), whereas in the original descriptions of *O. tridactyla*, *O. willmanni*, and *O. similisuperbula*, their size was mentioned as constituting 362–375, 300–350, and 320–380, respectively.

The list of Caucasian Oribatida (Shtanchaeva, 2001) also includes species morphologically similar to *O. quadricornuta*: *O. angulosa*, *O. asiatica*, *O. shaldybinae*, *O. foliata*, and *O. krivolutskyi*.

By contrast to other species, *Oribatella krivolutskyi*, described from the Caucasus, possesses large, saber-shaped notogastral setae covered with large denticles

[7] In the specimen examined, the rostrum is not visible.

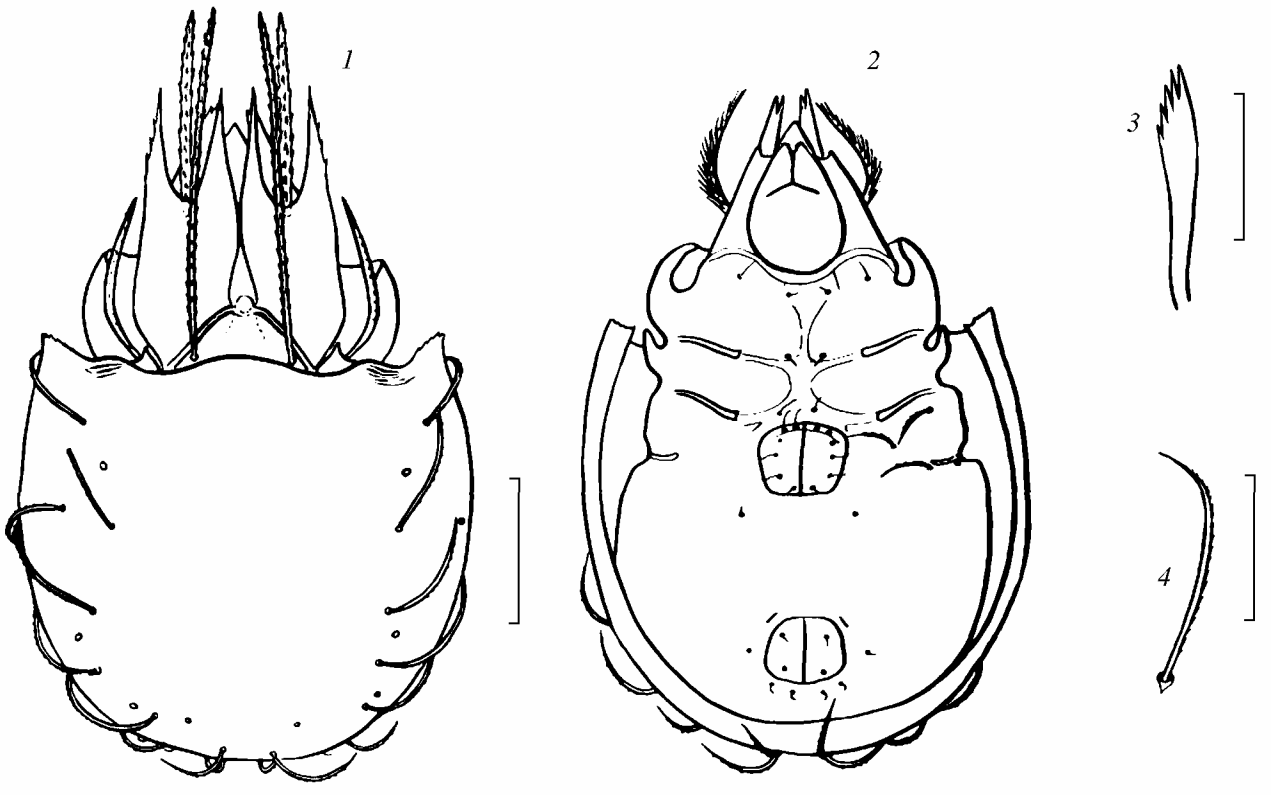

Fig. 8. *Oribatella krivolutskyi*: (*1*) dorsal side; (*2*) ventral side; (*3*) tutorium; (*4*) notoseta. Scale (μm): (*1*, *2*) 100; (*3*, *4*) 50.

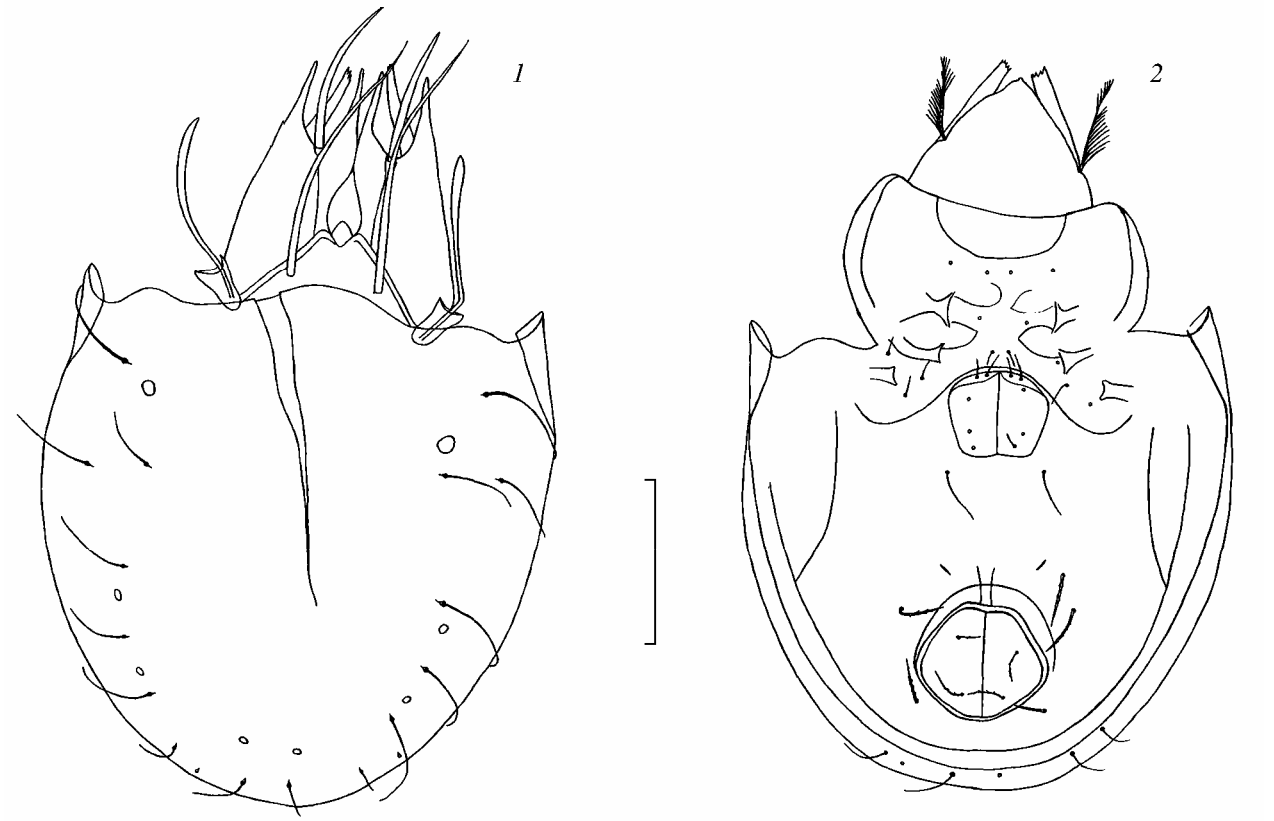

Fig. 9. *Oribatella asiatica*: (*1*) dorsal side; (*2*) ventral side. Scale 100 μm.

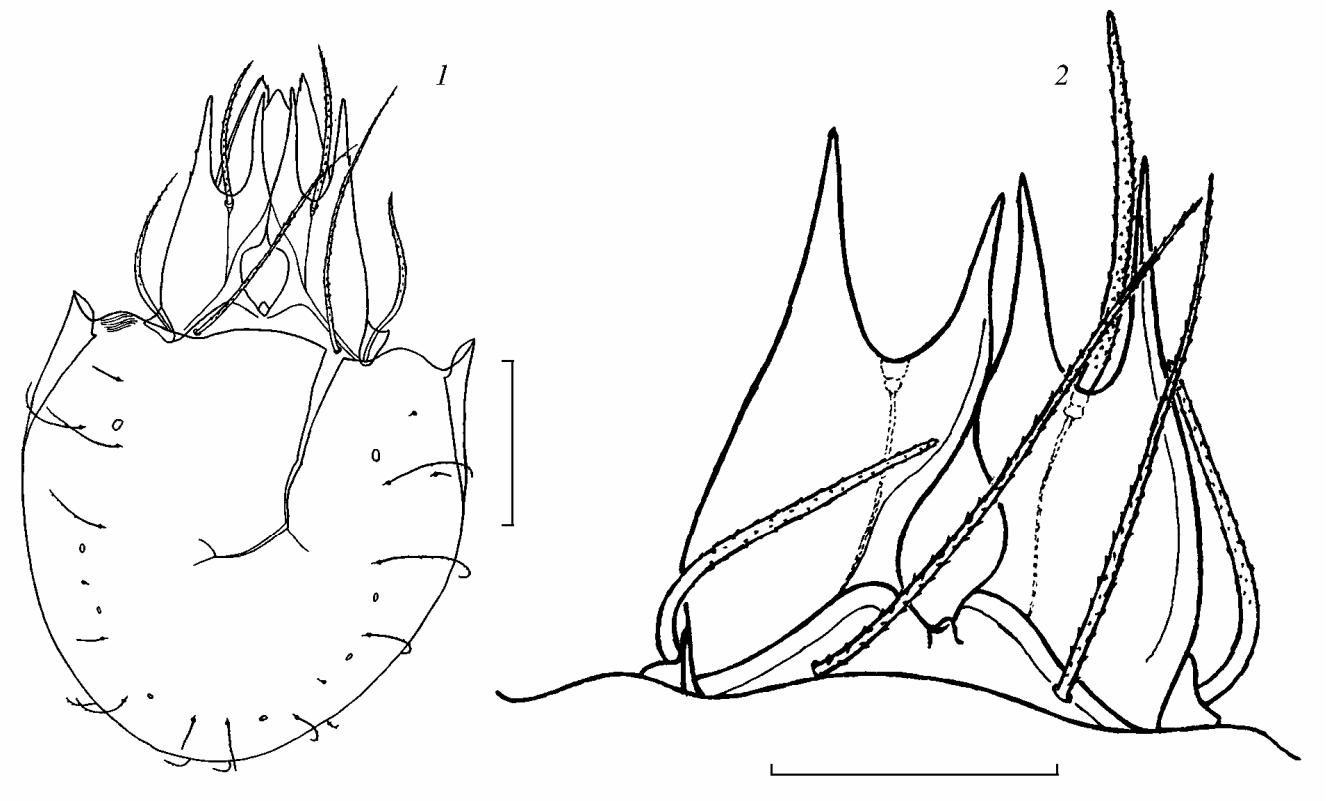

Fig. 10. *Oribatella foliata*: (*1*) dorsal side (Batumi); (*2*) Prodorsum (Spain). Scale (μm): (*1*) 110; (*2*) 100.

and bent under the notogaster, and small porosae areas (Karppinen and Shtanchaeva, 1987) (Fig. 8). At present, this species was recorded only from Daghestan (Buinaksk, Samur, Derbent).

The main difference of *O. shaldybinae* from closely related species includes the original shape of the anchor-looking rostrum with three teeth (Krivolutsky and Ryabinin, 1974; Bayartogtokh and Aoki, 1998). According to the literary data, this species was recorded from Daghestan (Caspian Lowland).

The species *O. angulosa*, described from Bulgaria, according to other authors differs from the other known species of *Oribatella* in the shape of the histerosoma and the sculpture of the ventral side (Cziszar and Jeleva, 1962); this species, however, needs redescription. According to the literary data, this species was recorded in the Caucasus from Rostov, Sochi, and Batumi. The study of the specimen with a label "*O. angulosa*" from Batumi (collection of IPEE) demonstrated that in reality it belonged to *O. calcarata*; therefore, mention on its finding in Batumi is erroneous.

The length of anal and adanal setae equal to that of anal folds was mentioned as a differential character of *O. asiatica* (Krivolutsky, 1974). The holotype was examined by us (Fig. 9). It really possesses significantly longer and pubescent anal (13–15), adanal (28–30), and aggenital[8] setae in comparison with representatives of other species similar to *O. quadricornuta*; these setae, however, are significantly shorter than the width of anal folds (38); a small tooth is present at the end of the rounded rostrum. Such long and pubescent anal and adanal setae are found in representatives of *O. kunsti* Bernini, 1972, described from the Italian Alps (Bernini, 1972). In the original description of *O. kunsti*, however, it is mentioned that notosetae are coarse and strongly pubescent and setae *la* and *1p* are shifted towards the center of the notogaster. At the same time, in *O. asiatica*, notogastral setae are slightly pubescent and are situated in the position typical of the subgenus. Additionally, the rostrum of *O. kunsti* possesses neither tooth nor seta; setae *3b*, *4b*, and *4c* are fine. In the Caucasus, *O. asiatica* was recorded from North Ossetia, Teberda, and, according to unconfirmed literary data, from the Caspian Lowland of Daghestan.

[8] Aggenital and some other ventral setae were pictured but then lost after the second preparation of the slide.

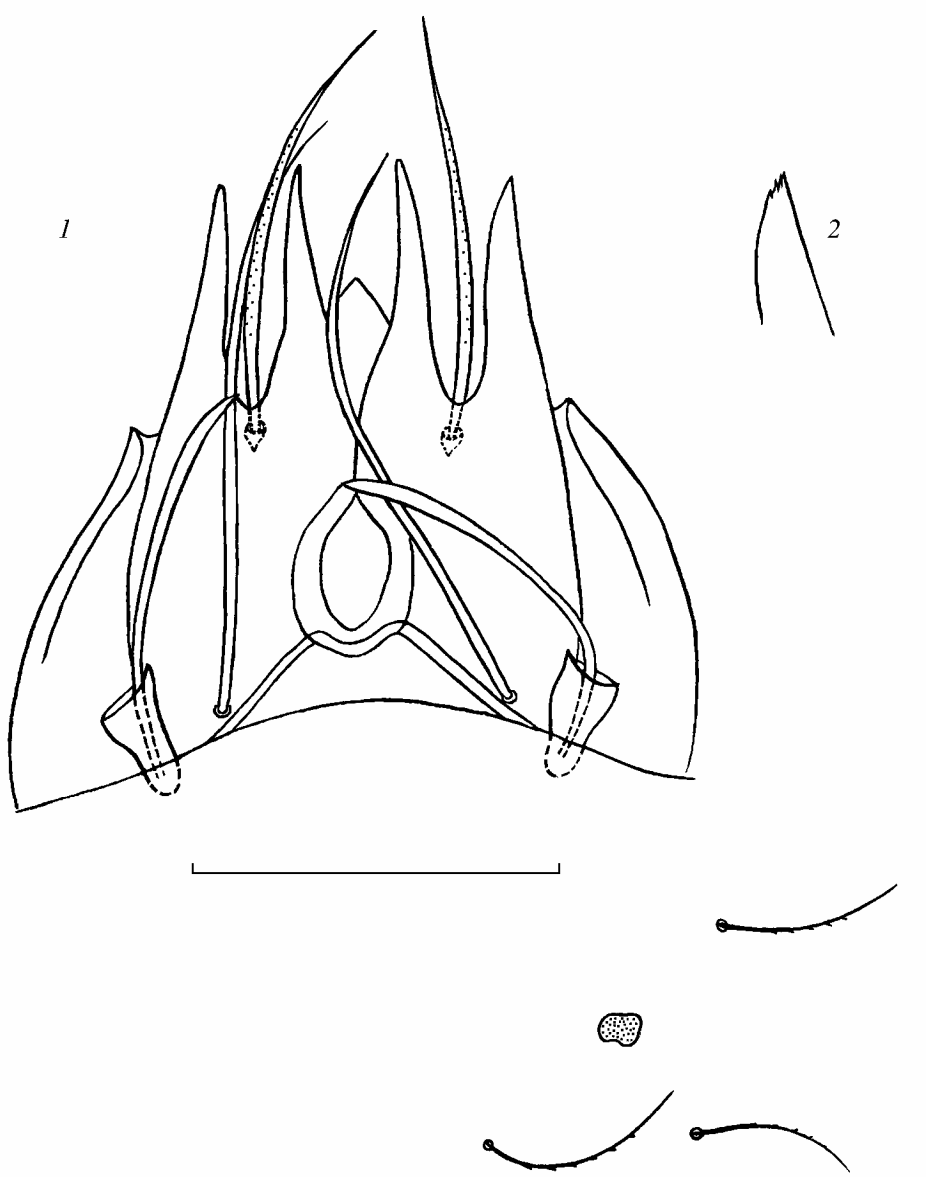

Fig. 11. *Oribatella* cf. *foliata*: (*1*) prodorsum and anterior part of notogaster; (*2*) tutorium. Scale 60 μm.

The original description of *O. foliata* based on the material from the Caucasus was very brief. By contrast to other species similar to *O. quadricornuta*, the presence of 11 pairs of notogastral setae was mentioned as a differential character (Krivolutsky, 1974). The study of a single specimen of *O. foliata* from the collection of Krivolutsky (Fig. 10, *1*) demonstrated, however, that it possessed 10 pairs of notosetae and all the other characters corresponding to the description of *O. brevipila* Bernini, 1977 (Bernini, 1977). Therefore, we treat *O. brevipila* as a junior synonym of *O. foliata*. Since the description made by Bernini is very detailed, we give no redescription, but only a figure of the *O. foliata* specimen from Batumi (Fig. 10, *1*). In the description of *O. brevipila* (this species, as it was stated by Bernini, previously was erroneously named *O. berlesei*), its typical characters are listed as follows: presence of slightly thickened epimeral seta *4c*; narrow custodial tooth; interlamellar tooth longer than that in *O. quadricornuta*; trichobothria long and pointed. A specimen belonging to this species is deposited at the University of Complutense in Mardid (Fig. 10, *2*). It should be noted that in *O. foliata* such characters as the ratio between the length of cuspid's teeth (the outer tooth can be slightly longer or also shorter than the inner tooth) and the degree of pubescence of proterosomal and notogastral setae strongly varies. The species *O. foliata* was recorded from North

Fig. 12. *Oribatella* cf. *calcarata*: (*1*) prodorsum and anterior part of notogaster; (*2*) lamellar seta; (*3*) tutorium. Scale 70 μm.

Ossetia, Krasnodar Territory (Sochi), Karachay-Cherkessia (Teberda), Daghestan (Kumukh, Tlyarata), Azerbaijan (Lenkoran), and Georgia (Krestovskii Pass, Ritsa, Bsyb Canyon).

Five specimens of *Oribatella* were found in highland Daghestan (Tlyaratinskii District, Nukatl Mt. Range, 2100 m a.s.l., rhododendron birch forest, moss, U.Ya. Shtanchaeva, 20.VIII.1984); four of these specimens were identified as *O.* cf. *calcarata* and one specimen, as *O.* cf. *foliata*, because they differ from the species compared in some structural details. Pictures of these species and some notes on their morphology are given below.

A single specimen of *Oribatella* cf. *foliata* (Fig. 11) differs from the nominotypical form[9] in the shape of trichobothria, slightly widened distally (according to the description of its junior synonym *O. brevipila*, such shape of lamellae stays within the limits of intraspecific variability), the absence of teeth on the outer size of lamellae, rectangular shape of porosae areas *Aa*, smaller notosetae, and the absence of the interlamellar tooth.

Oribatella cf. *calcarata* (Fig. 12, *1*) from highland Daghestan are characterized by the body 540–590 long; a pointed rostrum; tutorial with small pointed teeth (Fig. 12, *5*); and large lamellae with inner teeth of cuspids slightly (by 8–10) longer than outer ones. A single pointed tooth is present on the outer side of lamellae; in some specimens, this tooth is absent. Lamellar setae bear large spines (Fig. 12, *2*); interlamellar setae are serrate. Trichobothria are seta-like, finer than lamellar setae, coarse, with small terminal teeth. Apices of trichobothria reach the level of cuspids. This species differs from the nominotypical species in the smaller body size and shorter and smooth notosetae.

Oribatella nigra Kuliev, 1967, known only from the Caucasus and characterized by a large size (750 × 520), rectangular rostrum, and the presence of 13 pairs of notosetae, is transferred into the subgenus *Multoribatella* (Subías, 2004).

[9] A specimen from the collection of SIEE, identified by D.A. Krivolutsky, was examined.

Fig. 13. *Oribatella* (*Multoribatella*) *nigra*: (*1*) dorsal side; (*2*) ventral side. Scale 200 μm.

As far as the subgenus *Multoribatella* Subías, 2004, is described in the "Catalogue of Oribatid Mites of the World" (Subías, 2004) very briefly, a detailed redescription of this subgenus with some corrections and supplements is given below.

Oribatella (***Multoribatella***) Subías, 2004

Type species *Oribatella bromeliarum* Behan-Pelletier et Paoletti, 1993.

The subgenus *Multoribatella* comprises the following species: *Oribatella* (*Multoribatella*) *alami* Kardar, 1975, comb. n.;[10] *O.* (*M.*) *bromeliarum* Behan-Pelletier et Paoletti, 1993; *O.* (*M.*) *colchica* Krivolutsky, 1974, comb. n.; *O.* (*M.*) *dudichi* Willmann, 1938, comb. n.; *O.* (*M.*) *nigra* Kuliev, 1967; *O.* (*M.*) *kurchevi* Krivolutsky, 1974; *O.* (*M.*) *serrata* Balogh et Mahunka, 1969, comb. n.; *O.* (*M.*) *szaboi* Balogh et Mahunka, 1979, comb. n.

Description. Size of mites varying from 310 (*O. colchica*) to 750 (*O. nigra*), coloration varying from pale brown to dark brown. Rostrum usually rounded, only in *O. alami* quadrangular. Tutoria with teeth or smooth (*O. colchica*). Lamellae projecting beyond rostrum or not reaching its apex (*O. kurchevi*, *O. alami*); lamellae sometimes free, without bridge (*O. kurchevi*, *O. colchica*), sometimes with translamella, or fused at base (*O. nigra*). Lamellar cuspids short (*O. kurchevi*, *O. dudichi*) or long (*O. alami*, *O. nigra*), their teeth of more (*O. nigra*) or less (*O. colchica*, *O. dudichi*) equal length. Proterosomal setae long, projecting beyond apex of rostrum; rostral setae well-developed and strongly pubescent, except for *O. alami*, where they are small, fine, and smooth. Lamellar setae sometimes strongly thickened, with coarse spines (*O. nigra*, *O. dudichi*) or fine and nearly smooth (*O. colchica*); usually, lamellar setae seta-like, only in *O. alami* club-shaped, with small teeth. Trichobothria rather long, usually seta-like, less frequently spindle-shaped and smooth (*O. alami*) or short, club-shaped, and well-pubescent (*O. bromeliarum*).

[10] In the same publication, *O. kasmiriensis* Kardar, 1975 was described from a single specimen. It possesses 11 pairs of notogastral setae, similarly to species of the subgenus *Multoribatella*. According to the description of the author (Kardar, 1975), however, it possesses more than 4 pairs of porosae areas (5 pairs are shown in the figure), with the location strongly untypical not only for Oribatellidae, but for all the oribatid mites belonging to Poronoticae.

Notogaster wide, its surface more or less finely punctate, with 4 pairs of porosae areas [11] and 11–14 pairs of notogastral setae. If the species of *Oribatella* s. str. possess 10 pairs of notogastral setae,[12] representatives of the subgenus *Multoribatella* possess additional pairs of median dorsal setae (c_1, *da*, *dm*, and *dp*). For example, the type species *O. bromeliarum* possesses 14 pairs of notogastral setae (c_1, *da*, *dm*, and *dp*); *O. nigra*, 13 pairs (*da*, *dm*, and *dp*); 12 pairs found in *O. kurchevi* (*dm* and *dp*) and *O. alami* (additional *da* and *dm*). The following species possess 11 pairs of notosetae: *O. serrata*, *O. szaboi* (additional *da*), *O. dudichi*, and *O. colchica* (additional *dp*).

The structure of the ventral side in representatives of the subgenera *Multoribatella* and *Oribatella* is virtually similar.

Species of the subgenus *Multoribatella* are mainly monodactyle, excluding *O. nigra* and *O. alami*, possessing 3 claws on leg tarsi.

Diagnosis. The subgenus *Multoribatella* is characterized by a significant morphological diversity: body size varies from 310 to 750; length of lamellae and their cuspids vary; lamellae free, or connected by translamella, or fused at base and at apex of cuspids; intralamellar setae long and covered with spines, or short and smooth; lamellar setae wide and large; trichobothria seta-like, spindle-shaped, or club-shaped, more or less long; notogaster with 11–14 pairs of setae and 4 pairs of porosae areas; legs with 1 claw or 3 claws.

Differential diagnosis. The main difference from the nominotypical subgenus *Oribatella* s. str. includes the presence of more than 10 pairs of notogastral setae.

Taxonomic notes. Previously (Subías, 2004), the subgenus *Multoribatella* included species of *Oribatella* with 12–44 pairs of notogastral setae, whereas species with 10–11 pairs of notosetae were included into the subgenus *Oribatella* s. str. After our investigations, we think it reliable to include species with 11 pairs of notogastral setae also into the subgenus *Multoribatella*. The tendency of reduction of notogastral setae of the median series (*da*, *dm*, and *dp*), observed in species of the genus *Oribatella*, is similarly expressed in the families of Oppiidae (Subías, 1978) and Ceratozetidae.

The Caucasian fauna of the subgenus includes three species: *O. nigra*, *O. colchica*, and *O. kurchevi*.

As far as the structure of *Oribatella nigra* does not fit the original description completely (the number of notosetae is different) and the holotype is lost, we give the redescription of this species basing on the specimens from the collection of IPEE.

Oribatella* (*Multoribatella*) *nigra Kuliev, 1967 (Fig. 13)

Material. 1 specimen, Georgia, Batumi, D.A. Krivolutsky, 1964; 2 specimens, Abkhazia, Bzyb Canyon, collector not mentioned, 5.VIII.1969.

Description. Body large, length 740–750, width 450–600, integument dark brown.

Dorsal side (Fig. 13, *1*). Length of prodorsum 200–250. Rostrum rounded, with pointed terminal tooth. Pointed apex of tutorium projecting beyond rostrum. Lamellae large, fused at base for distance of 25–40; length of slit between lamellae 180–190. Teeth of cuspids (88–100) nearly equal in length, but inner teeth usually longer than outer ones. Surface of lamellae at outer margin covered with fine longitudinal sclerotized carinae; in center, with short transverse sinuous lines. Lamellar setae very large (130–140), strongly thickened, covered with long spines. Interlamellar setae long (245–270), projecting beyond margin of rostrum. Trichobothria long (145–170), seta-like, covered with small spines.

Notogaster more or less wide (width 450–600), with punctate surface. Notogaster with 4 pairs of oval porosae areas; average size of *Aa*, A_1, A_2, and A_3 constituting 27 × 17, 23 × 15, 22 × 15, and 19 × 12, respectively. Species is characterized by presence of 13 pairs of very large notogastral setae covered with small spines. Together with 10 setae usual for *Oribatella* s. str., 3 additional pairs of setae (*da*, *dm*, *dp*) present in center of notogaster. Average size of notogastral setae 103, humeral setae longest (128), posterior marginal setae shortest (84).

Ventral side (Fig. 13, *2*). Structure of ventral side typical of *Oribatella*. Epimeral formula 2 : 1 : 2 : 2. Epimeral setae (25–30) fine, smooth. Custodium (43) with large, densely pubescent seta. Genital aperture

[11] In the original description of *O. alami*, apparently, 3 pairs of porosae areas are mentioned erroneously. This species needs redescription.

[12] *c2*, *la*, *lm*, *lp*, h_1, h_2, h_3, and p_1, p_2, p_3 according to Subías, 1978.

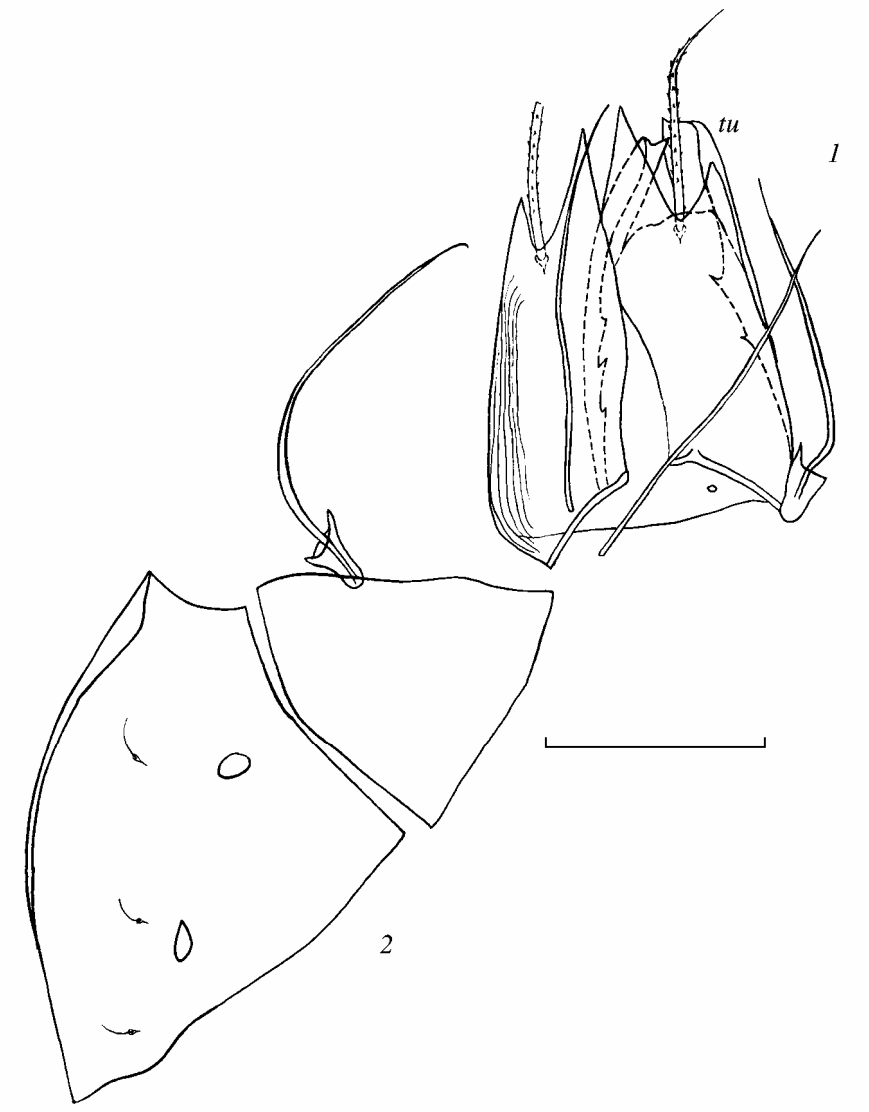

Fig. 14. *Oribatella* (*Multoribatella*) *colchica*: (*1*) proterosoma [*tu*, tutorium]; (*2*) anterolateral fragment of notogaster. Scale 80 μm.

73–80 × 75; anal aperture 120–130 × 113–145. Anterior part of anal aperture significantly narrower than posterior part. Number of genital, aggenital, anal, and adanal setae constituting 6, 2, 1, and 3 pairs, respectively. Length of anal setae 30, agenital setae 38, adanal setae 43–53; genital setae in specimens examined broken.

Legs with 3 claws, central claw larger than lateral claws. Tibia and tarsi I and II with large seta covered with small spines.

Distribution. Caucasus: Krasnodar Territory (Sochi), Karachay-Cherkessia (Teberda), North Ossetia, Georgia (Martkopi, Tsagveri, Banguriani, Batumi, Ritsa, Myusera, Bzyb Canyon, Novyi Afon), Azerbaijan (Lenkoran, Zakataly, Sheki), and Armenia (Armavir, Dilizhan).

Diagnosis. *O. nigra* is characterized by the following combination of characters: body large (740–750); lamellae fused at base; teeth of cuspids nearly equally long; lamellar and interlamellar setae projecting beyond apex of rostrum; lamellar setae very large, wide, with coarse spines; surface of notogaster punctate; 4 pairs of porosae areas and 13 pairs of very large notogastral setae present; legs with 3 claws.

Differential diagnosis. The main differences from other species of the subgenus are the following: large body size; presence of 13 pairs of notosetae; lamellae fused at bases; similar length of cuspid's teeth;

presence of 3 claws in each leg, and other small characters.

Taxonomic notes. In the original description, Kuliev (1967) mentioned that *O. nigra* possessed 10 pairs of notogastral setae; however, Krivolutsky in his key (A Key to the Mites, 1975) mentioned the presence of 13 pairs of notosetae in *O. nigra*; according to this character, the species was transferred (Subías, 2004) into the subgenus *Multoribatella*. It is doubtful that Kuliev described another species differing only in the number of notosetae. In the redescription of *O. nigra*, Dzhaparidze (1989) erroneously points to the presence of 8 pairs of notogastral setae (at least 11 pairs are seen in the figure). Undoubtedly, in this case, the species *O. nigra* is described, because setae *da*, *dm*, and *dp* are present.

Because of a very brief description of *O. colchica*, we decided to redescribe it from the holotype deposited at IPEE. However, it was impossible because of the poor preservation state of the holotype. When the slide was remade anew, the proterosoma and a part of the notogaster were figured (Fig. 14) and only some supplements to the redescription were made.

The rostrum of *O. colchica* is rectangular (Fig. 14, *1*); the tutorium is not so long as figured in the original description, straightly cut distally; its upper margin bears several small teeth and its outer surface is smooth; interlamellar setae (135) and trichobothria (105) are fine and nearly smooth; the median margin of the bothridium bears a long pointed tooth; lamellar setae (77) bear slightly visible spines; they are slightly longer than interlamellar setae. Angles of pteromorphs are rounded (Fig. 14, *2*). Porosae areas *Aa* rounded (15 × 13); porosae areas A_1 oval (15 × 8). An additional pair of setae *dp* is not shown in the figure placed in the original description, although this mistake was corrected in the *Key to Soil Sarcoptiformes Mites* (1975). Because of the deformed notogaster, we failed to clarify the number and arrangement of notosetae; the length of setae c_2, *la*, and *lm* constitutes 13.

O. kurchevi is similar to species morphologically closely related to *O. ornata*, because of the absence of the translamella and single-claw tarsi. However, this species differs in the presence of 12 (not 10) pairs of notogastral setae, with 2 pairs (*dm* and *dp*) shifted towards the center of notogaster; its lamella possess short cuspids not reaching the apex of the rostrum. This species is recorded only from Rostov Province.

A Key to Species of Oribatella of the Caucasus[13]

1. Notogaster with 10 pairs of notosetae (subgenus *Oribatella*) ..... 2.

—Notogaster with more than 10 pairs of notosetae (subgenus *Multoribatella*) ..... 21.

2. Trichobothria club-shaped, very short, their ends reaching only level of translamellae (Fig. 2, *1*); club and stalk of trichobothria of equal length (Fig. 2, *3*). Length 290 .... *O.* (*O.*) *abdurachmanovi* sp. n.

—Trichobothria significantly longer, with another ratio between length of club and stalk ..... 3.

3. Legs with 2 claws. Trichobothria spindle-shaped, projecting beyond middle of lamellae. Length 290–325 ..... *O.* (*O.*) *superbula.*

—Legs with 1 or 3 claws ..... 4.

4. Legs with single claw ..... 5.

—Legs with 3 claws ..... 9.

5. Translamella present. Inner teeth of cuspids significantly shorter than outer teeth. Trichobothria club-shaped, with strongly thickened rounded club (Fig. 7). Length 330–360 ..... *O.* (*O.*) *sexdentata.*

—Translamella absent (Figs. 3, *1*; 4, *1*) or slightly distinct. Another ratio between length of cuspids. Trichobothria seta-like ..... 6.

6. Rostrum pointed ..... 7.

—Rostrum of another shape ..... 8.

7. Inner teeth of cuspids twice as long as outer teeth, of same shape; translamella slightly distinct. In dorsal view, notosetae projecting beyond margin of notogaster. Length 345–410 ..... *O.* (*O.*) *ornata.*

—Inner teeth of cuspids thrice as long as outer teeth, differing in shape (Fig. 3, *1*). Notosetae very short; in dorsal view, c_2, *la*, *lm*, *lp*, and h_3 not reaching margin of notogaster. Length 292 .... *O.* (*O.*) *heterodentata.*

8. Rostrum rounded, with very small pointed apex. Anterior margin of notogaster with fine parallel lines. Length 331 ..... *O.*(*O.*) *tenuis*.

[13] Despite the fact that the southeuropean species *O.* (*O.*) *tridactyla* and *O.* (*O.*) *willmanni* so far have not been found in the Caucasus, they are discussed in this paper and, thus, are included in the key.

—Rostrum with rounded, more or less smooth margin (Fig. 4, *1*). Anterior margin of notogaster without parallel lines. Length 310–350 ..... *O*. (*O*.) *bulanovae*.

9. Notogaster with reticulate structure (Fig. 6, *1*). Rostrum rounded. Length 350 ..... *O*. (*O*.) *reticulata*.

—Notogaster without reticulate structure. Rostrum pointed, rounded, or with 3 teeth ..... 10.

10. Outer tooth of cuspids developed better, long and straight; inner tooth strongly bent. Rostrum pointed. Translamella present. Length 480–560 ..... *O*. (*O*.) *inflexa*.

—Teeth of cuspids of same length or inner teeth longer ..... 11.

11. Notosetae saber-shaped, long, bending under notogaster, covered with large teeth (Fig. 8, *1*). Inner and outer teeth of lamellar cuspids of same length. Length 384–414 ..... *O*. (*O*.) *krivolutskyi*.

—Notosetae seta-shaped, significantly shorter, not bending under notogaster, smooth or weakly pubescent ..... 12.

12. Rostrum with 3 teeth, looking like anchor. Trichobothria spindle-shaped, pointed; bent margin of pteromorphs serrate. Length 375–405 ..... *O*. (*O*.) *shaldybinae*.

—Rostrum pointed or rounded ..... 13.

13. Trichobothria club-shaped or spindle-shaped, with blunt apex ..... 14.

—Trichobothria with pointed apex (narrow spindle-shaped or seta-shaped) ..... 18.

14. Rostrum rounded ..... 15.

—Rostrum pointed ..... 17.

15. Large mites. Trichobothria club-shaped. Epimeral setae *4c* longer and thicker than others. Length 462–550 ..... *O*. (*O*.) *quadricornuta*.

—Small mites (300–380). Trichobothria spindle-shaped, blunt ..... 16.

16. Interlamellar tooth well-developed, strong, pointed. Setae *4c* short, thick, pubescent. Length 362–375 ..... *O*. (*O*.) *tridactyla*.

—Interlamellar tooth indistinct or absent. Epimeral setae *3c* and *4c* slightly longer and thicker than others. Length 300–380 ..... *O*. (*O*.) *willmanni*.

17. Teeth of cuspids very narrow (Fig. 5). Epimeral setae *4c* short and fine, similarly to other epimeral setae. Length 390–420 ..... *O*. (*O*.) *exilicornis*.

—Teeth of cuspids wider. Epimeral setae *4c* longer and thicker than other setae. Length 475–520 ..... *O*. (*O*.) *berlesei*.

18. Large mites. Inner teeth of cuspids slightly longer than other teeth (Fig. 12, 1). Length 610–670 ..... *O*. (*O*.) *calcarata*.

—Body length less than 600 ..... 19.

19. Anal and adanal setae long, pubescent, thicker than other ventral setae (Fig. 9, *2*); length of adanal setae similar to width of anal folds. Length 420 ..... *O*. (*O*.) *asiatica*.

—Anal and adanal setae short, significantly shorter than anal folds ..... 20.

20. Histerosoma rounded (Fig. 10, *1*). Length 420–600 ..... *O*. (*O*.) *foliata*.

—Histerosoma trapeziform, with blunt angles on posterior margin. Length 522–554 ..... *O*. (*O*.) *angulosa*.

21. Notogaster with 11 pairs of notosetae. Rostrum rectangular, tutorium straightly cut, with smooth anterior margin (Fig. 14, *1*). Angles of pteromorphs rounded (Fig. 14, *2*). Length 310–320 ..... *O*. (*M*.) *colchica*.

—Notogaster with more than 11 pairs of notosetae ..... 22.

22. Notogaster with 12 pairs of notosetae; 2 pairs of setae shifted towards center of notogaster. Length 440 ..... *O*. (*M*.) *kurchevi*.

—Notogaster with 13 pairs of notosetae (Fig. 13, *1*). Length 740—750 ..... *O*. (*M*.) *nigra*.

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REFERENCES

1. Balogh, J. and Mahunka, S., "New Data on the Knowledge of the Oribatid Fauna of the Neogea (Acari): IV," Acta Zoologica Academiae Scientiarum Hungaricae **25** (1–2), 35–60 (1979).
2. Balogh, J. and Mahunka, S., "The Scientific Results of the Hungarian Soil Zoological Expeditions to South

America: 10. Acari: Oribatids, Collected by the Second Expedition. I," Acta Zoologica Academiae Scientiarum Hungaricae **15** (1–2), 1–21 (1969).
3. Bayartogtokh, B. and Aok, J., "New and Little Known Species of Óribatid Mites (Acari: Oribatida) from Mongolia," Bull. Inst. Environ. Tech. Yokogama Nath. Univ. **24**, 121–135 (1998).
4. Behan-Pelletier, V.M. and Paoletti, M.G., "A New Species of *Oribatella* Banks, 1895 (Acari: Oribatida) from Bromeliads in Northern Venezuela," Tropical Zoology (Special Issue 1), 31–38 (1993).
5. Bernini, F. and Avanzati, A.M., "Notulae oribatologicae XXIX. Le Oribatellidae (Acarida, Oribatida) viventi sul massino sardocordo," Labori della societa italiana di biogeografia. Nuova serie **8**, 347–400 (1983).
6. Bernini, F., "Notulae oribatologicae V. Secondo contributo alla conoscenza degli Oribatei (Acarida) delle Alpe Apuane," Redia **8**, 373–386 (1972).
7. Bernini, F., "Notulae oribatologicae X. *Oribatella* ornatI (Coggi) e due nuove specie ad essa affini (Acarida, Oribatei)," Redia **55**, 409–437 (1974).
8. Bernini, F., "Notulae oribatologicae XIII. La famiglia Oribatellidae (Acarida, Oribatei) nell'Arci-pelago Toscano," Labori della societa italiana di biogeografia. Nuova serie **5**, 429–501 (1975).
9. Bernini, F., "Notulae oribatologicae XVII. Nuovi dati genere *Oribatella* in Italia (Acarida, Oribatei)," Redia **60**, 457–505 (1977).
10. Bernini, F., "Notulae Oribatologicae XX. Il genere *Oribatella* in Italia (Acarida, Oribatida)," Redia **61**, 503–538 (1978).
11. Csiszar, J. and Jeleva, M., "Oribatid Mites (Acari) from Bulgarian Soils," Acta Zool. Hung. **8** (3–4), 273–301 (1962).
12. Dzhaparidze, N.I., "Oribatid Mites Oribatei of the Genus *Oribatella* Banks, 1895 of the Fauna of Georgia," in *Fauna and Ecology of Invertebrates of Georgia* (Metsniereba, Tbilisi, 1989), pp. 64–70 [in Russian].
13. Grabovsky, W.B., "A New Genus of the Oribatid Mite (Cryptostigmata: Oribatellidae)," Proc. Entomol. Soc. Wash. **73** (1), 44–47 (1971).
14. Hammer, M., "Investigations on the Oribatid Fauna of North-West Pakistan," Biologiske Skrifter af Det Kongelige Danske Videnskabernes Selkab. **21** (4), 1–71 (1977).
15. Hammer, M., "Investigations on the Oribatid Fauna of the Andes Mountains: I. The Argentine and Bolivia," Biologiske Skrifter af Det Kongelige Danske Videnskabernes Selkab. **10** (1), 1–129 (1958).
16. Hammer, M., "Investigations on the Oribatid Fauna of the Andes Mountains: III. Chile," Biologiske Skrifter af Det Kongelige Danske Videnskabernes Selkab. **13**, 1–296 (1962).
17. Kardar, M.F.H., "Two New Species of *Oribatella* Banks, 1895 (Oribatei, Oribatellidae) from India," Ann. Zool. Japon. **48** (1), 60–64 (1975).
18. Karppinen, E. and Shtanchaeva, U.Ya., "New Oribatid Mites (Acarina, Oribatei) from Caucasus," Ann. Entomol. Fenn. **53**, 61–65 (1987).
19. A Key to Soil Sarcoptiformes Mites (Nauka, Moscow, 1975) [in Russian].
20. Krivolutsky, D.A. and Ryabinin, N.A., "New Species of Oribatid Mites (Oribatei) of Siberia and Russian Far East," Zool. Zh. **53** (8), 1169–1177 (1974).
21. Krivolutsky, D.A., "New Oribatid Mites of the USSR," Zool. Zh. **53** (12), 1880–1885 (1974).
22. Kuliev, K.A., "*Gendzella* Kuliev gen. n. Type Species *Gendzella cribraria*," Doklady Akad. Nauk Azer. SSR **33** (5), 55–57 (1977).
23. Kuliev, K.A., "New Species of Oribatid Mites of the Genera *Joelia*, *Scheloribates*, *Zygoribatula*, *Trichoribates*," Doklady Akad. Nauk Azerb. SSR **35** (9), 84–90 (1979).
24. Kuliev, K.A., "New Species of the Genera *Oribatula* and *Oribatella* (Acariformes, Oribatei) of Azerbaijan," Trudy Azerb. Ped. Inst. **20**, 77–81 (1962).
25. Kuliev, K.A., "On Representatives of the Genera *Machuella*, *Oribatella*, *Oppia*," Uchenye Zapiski Azerb. Gos. Univ. Ser. Biol. **4**, 59–67 (1967).
26. Mahunka, S. and Mahunka-Papp, L., *The Oribatid Species Described by Berlese (Acari)* (Hung. Nat. Hist. Mus., Budapest, 1995).
27. Mahunka, S., "Neue und interessante Milben aus dem Genfer Museum XXV. On some Oribatids collected by Dr. P. Strinati in Guatemala (Acari: Oribatida)," Acarologia **21** (1), 133–142 (1979).
28. Norton, R.A. and Kethley, J.B., "Berlese's North American Oribatid Mites: Historical Notes, Recombinations, Synonymies and Type Designations," Redia **62** (2), 421–499 (1989).
29. *Oribatid Mites. Morphology, Development, Phylogeny, Ecology, Methods of Investigation* (Nauka, Moscow, 1995) [in Russian].
30. Perez-Inigo, C., *Acari. Oribatei. Poronota. Fauna Iberica* (Mus. Nacion. Cien. Nat., Madrid, 1993), Vol. 3.
31. Shtanchaeva, U.Ya., "Catalogue of the Oribatid Mites (Acariformes, Oribatida) of Caucasus," Acarina **9** (2), 177–221 (2001).
32. Subías, L.S., "*Anomaloppia canariensis* n. gen., n. sp. (Acarida, Oribatida, Oppiidae) de las Islas Canarias. Consideraciones filogeneticas sobre la familia," Redia **61**, 565–574 (1978).
33. Subías, L.S., "Listado sistematico, sinonimico y biogeografico de los acaros oribatidos (Acariformes, Oribatida) del mundo (1758–2002)," Graellsia **60**, 3–305 (2004).
34. Weigmann, G., "Contribution to the Taxonomy of European Poronota I. *Oribatella* and *Anachipteria* (Acari, Oribatida)," Spixiana **24** (3), 235–240 (2001).