SUPPLEMENTARY DESCRIPTION OF THREE SPECIES OF THE GENUS SUCTOBELBELLA JACOT, 1937 (ACARI, ORIBATIDA, SUCTOBELBIDAE)

Vasiliy B. Kolesnikov^{1*} and Dmitry A. Efimov²

¹Voronezh State Pedagogical University, Voronezh, Russia ²Kemerovo State University, Kemerovo, Russia ^{*}corresponding author; e-mail: jukoman@yandex.ru

ABSTRACT: The supplementary description of three mite species of the genus *Suctobelbella* Jacot, 1937 (Oribatida, Suctobelbidae) is presented, based on the material from Russia. Typical materials from museum collections were used to redescribe two of the species. The main morphological traits for these species are summarized.

KEY WORDS: Suctobelbid mites, redescription, morphology, systematics.

DOI: 10.21684/0132-8077-2017-25-2-109-127

INTRODUCTION

The main goal of our paper is to redescribe and illustrate three mite species of the genus *Suctobelbella* Jacot, 1937, all from the nominative subgenus (Oribatida, Suctobelbidae): *S. amurica* (Krivolutsky, 1966), *S. granifera* Chinone, 2003 and *S. opistodentata* (Golosova, 1970) based on the material from Russia.

Suctobelbella amurica (Krivolutsky, 1966) (Acari, Oribatida, Suctobelbidae) was described by Krivolutsky (1966) based on the specimens sampled from the soil in birch forest on the first terrace above the floodplain of the Amur River in the vicinity of Blagoveshchensk, Eastern Russia. Currently, this species is known from most of the Palaearctic Region (except North) and India (Tripura) (Subias 2017): e.g., the Amur Region (Krivolutsky 1966, Ryabinin 2015), the Primorsky Territory, the Khabarovsk Region (Ryabinin 1977, 2015, Golosova et al. 1983), Transnistria (Yavornitsky and Melamud 1991), the Volga Region (Gatilova and Krivolutsky 1968), Central Asia (Krivolutsky 1966; Rakhimbaeva 1995), Poland (Niedbala and Olszanowski 2008), the Transcarpathian Region (Melamud 2009, Karppinen et al. 1992), Nizhny Novgorod (Ermilov 2008), the North of the Iberian Peninsula (Moraza 2009), and Tripura (Chakraborti and Bhattacharya 1991, 1992; Sanyal 2000).

Suctobelbella granifera was described by Chinone (2003) from the vicinity of Mt. Raus, on the Shiretoko Peninsula, Hokkaido, from the forest litter under Betula ermani and Picea jezoensis; from Shibetsu Toge, Hokkaido, from the forest litter under Picea jezoensis, Quercus mongolica grosseserrata and Betula ermani; and at Mt. Kiyosumi, Chibakenin, from the forest litter under Abies firma. It was also observed in the Caucasus (Shtanchaeva and Subias 2009; Abdurakhmanov and Davudova 2013) and in Spain (Subias and Shtanchaeva 2011, 2012). This species has a number of morphological similarities with *S. amurica*, but their common features are not considered in the publications.

Suctobelbella opistodentata was described by Golosova (1970) from the Kuril Islands. So far, this species is known from the Palaearctic Region: e.g., the Kuril Islands (Golosova 1970; Golosova and Pan'kov 1978; Ryabinin and Pan'kov 1987; Pan'kov 1989; Pan'kov et al. 1997; Ryabinin 2015), the Amur and Khabarovsk Regions, the Kamchatka Peninsula, the Sakhalin Island, and the Primorsky Territory (Golosova et al. 1983; Golosova 1989; Ryabinin and Pan'kov 1987, 2009; Ryabinin 2015), West Siberia (Bragin et al. 2003, Tolstikov et al. 2003), the Caucasus (Gazaliev 2000; Shtanchaeva and Subias 2005, 2009; Shtanchaeva 2001), Mongolia (Lebedeva and Lebedev 2007), Central Asia (Rakhimbaeva 1995), the Transcarpathian Region (Karppinen et al. 1992), the Iberian Peninsula (Subias and Arillo 2001; Moraza 2009; Subias and Shtanchaeva 2011, 2012), Upper Silesia and Poland (Skubala and Duras 2008; Skubala and Marzec 2013; Skubala et al. 2016). It differs from S. amurica by the structure of the bothridial setae and by non-contiguous vertices of the rostrum teeth (Golosova 1970; Krivolutsky 1975). Morphological comparison of this biological species with S. granifera is not provided. The redescription of this species was partially performed by Mahunka (1979) and Subias and Arillo (2001).

In this paper, we provide the first record of *S. amurica* in the Sakhalin Island and the Voronezh Region of Russia, and the first records of *S. granifera* in Sakhalin Island and the Kemerovo Region. We redescribe and illustrate *S. amurica* based on the type specimens and our personal collections; *S. opistodentata*—based on the type specimens; *S. granifera*—based on our personal collection.

MATERIAL AND METHODS

Material. The type material of *S. amurica,* holotype (A-Or-02) and paratype, was received from the collection of the Zoological Institute of the Russian Academy of Sciences (ZIN). The paratype damaged, partly dried (Figs. 48, 50–56), the holotype dried, badly damaged, not informative (Fig. 49). In addition, we collected this species in two localities in Russia:

a) locality 1—3 specimens, Sakhalin Island, 47°4'1.47" N 142°4'13.47" E, thicket *Larix kurilensis* and 47°4'1.47" N 142°4'29.63" E, thicket *Sasa kurilensis*;

b) locality 2—2 specimens, Voronezh region, 51°53′58.21″ N 39°17′3.01″ E and 51°56′12.70″ N 39°28′22.92″ E, mixed forest (*Pinus silvestris* and *Quercus rubur*).

We studied the species *S. granifera* only on the basis of author collections in two localities in Russia: a) locality 1—2 specimens, Sakhalin Island, 47°4'1.47" N 142°4'13.47" E, thicket *Larix kurilensis* and 47°4'1.47" N 142°4'29.63" E, thicket *Sasa kurilensis*;

b) locality 2—5 specimens, Kemerovo region, 52°49′21.96″ N 87°56′21.27″ E and 55°33′59.57″ N 85°51′3.61″ E, pine forest (*Pinus silvestris*).

The type material of *S. opistodentata*: holotype (A-Or-71) was received from the collection of the Zoological Institute of the Russian Academy of Sciences. The holotype is damaged, partly dried (Figs. 40–47, 57).

Methods. Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. The body length was measured in lateral view, starting with the tip of the rostrum to the posterior edge of the ventral plate. Notogastral width refers to the maximum width in dorsal aspect. Length of body setae was measured in lateral aspect. All body measurements are in micrometers.

Formulas for leg setation are given in parenthesis 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. Morphological terminology used in this paper follows that of F. Grandjean: see Travé and Vachon (1975) for references, Norton (1977) for leg setal nomenclature, and Norton and Behan-Pelletier (2009) for overview.

Drawings were made with a drawing tube using a transmission light microscope "Biomed 6 variant.3".

SYSTEMATICS

Suctobelbella (Suctobelbella) amurica (Krivolutsky, 1966)

(Figs. 1-16, 48-56)

Measurements. Body length: 176 (holotype), 180–210 (5 specimens from Sakhalin Island and the Voronezh Region), notogastral width: 105 (holotype), 100–110 (5 specimens from Sakhalin Island and the Voronezh Region). Because the paratype is crushed, it is impossible to measure the dimensions accurately.

Integument (Figs. 1–2). Body color light brown. Body surface smooth, only rostrum, interbothridial region, median and lateral parts of prodorsum (anterolaterally and laterally to bothridia) tuberculate (diameter of tubercles up to 2).

Prodorsum (Figs. 1, 3, 5, 48-50, 52-53, 54-56). Rostrum rounded, with one pair of rounded lateral tubercles (rt)—it is poorly visible in dorsal view—and two pairs of lateral teeth (t)—strong, their ends are close together with each other, wide indentation between them. Tectopedial fields (tf) with irregular inner margin, elongate oval in shape and acute anteriorly. Median knob-like tubercle (kt)comparatively large, rather rounded, but narrow and truncate anteriorly. Rostral setae (ro, 26 for all specimens) geniculate, ciliate unilaterally mediodistally, inserted dorsolaterally. Lamellar (le, 10 (paratype)-12), interlamellar (in, 6 (paratype)—10) and exobothridial (ex, 4 (paratype)—8) setae setiform, smooth, le inserted on knob-like tubercle. Bothridial setae (bs, 28 (paratype)-48) with long stalk and shorter, unilaterally dilated and barbed head, having pointed apex (the length of which can be up to 1/3 of the length of the head). One pair of interbothridial (pmt) and one pair of postbothridial tubercles (plt) present, pmt rounded distally, *plt* slightly doubled.

Notogaster (Figs. 1, 3, 5, 51–51). Anterior margin slightly convex. Humeral tubercles (*nmt*, *nlt*) fused, triangular, rounded anteriorly, directed towards the interbothridial and postbothridial tubercles respectively, *nmt* slightly larger than *nlt*. Ten pairs of notogastral setae setiform, smooth, h_1 , p_1 , p_2 and p_3 (14 (paratype)—16) shorter than the other setae (20 (paratype)—30). Setae *c* are located at the base of the humeral tubercles. Notogastral lyrifissures *ia*, *im*, *ip*, *ih* and *ips* and opisthonotal gland openings (*gla*) distinct, *im* located above *gla*.

Gnathosoma (Figs. 6–8, 50, 54). Subcapitulum longer than wide (34 (paratype) 40×22 (paratype)–26). Subcapitular setae setiform, smooth; *h* (10 for all specimens), *a* (6 for all specimens)



Figs. 1–4. *Suctobelbella amurica* (Krivolutsky, 1966), adult from Sakhalin: 1—dorsal view (legs not illustrated); 2—ventral view (gnathosoma and legs not illustrated); 3—lateral view (gnathosoma and legs not illustrated); 4—genital plates. Scale bars 100 µm (1–3), 10 µm (4).



Figs. 5–8. *Suctobelbella amurica* (Krivolutsky, 1966), adult, paratype from ZIN (5) and specimen from Sakhalin (6–8): 5—dorsal view (legs illustrated schematically; 6—subcapitulum, ventral view; 7—chelicera, left, antiaxial view; 8— palp, right, paraxial view. Scale bars 100 µm (5), 10 µm (6–8).



Figs. 9–16. *Suctobelbella amurica* (Krivolutsky, 1966), adult from Sakhalin: 9—trochanter, femur and genu of leg I, left, dorsal view; 10—tibia and tarsus of leg I, left, paraxial view; 11—femur and genu of leg II, right, paraxial view; 12—tibia and tarsus of leg III, left, antiaxial view; 13—trochanter and femur of leg IV, left, antiaxial view; 14—genu of leg IV, right, antiaxial view; 15—tibia of leg IV, left, antiaxial view; 16—tarsus of leg IV, left, paraxial view. Scale bar 25 μm.

longer than *m* (8 for all specimens). Palps (30 (paratype)–40) with setation $0-1-0-2-6(+\omega)$. Two setae *ul* fused mediobasally. Chelicerae (37–42 for all specimens) with *cha* setae. Trägårdh's organ indistinctly visible.

Epimeral and lateral podosomal regions (Figs. 2, 3). Epimeral setal formula 3–1–3–3. Epimeral setae setiform, smooth, *1a*, *2a* and *3a* (5–6 for all specimens) shorter than the other setae (8–10 for all specimens). Two pairs of lateral tubercles (*lat* and *lpt* approximately of the same size) present, rounded distally. Discidia (*dis*) elongate triangular, rounded distally.

Anogenital region (Figs. 2–4). Six pairs of genital $(g_1, 12 \text{ (paratype)} -15; g_2-g_6, 6-8 \text{ for all specimens})$, one pair of aggenital (ag, 20-22 for all specimens), three pairs of adanal $(ad_1, 11; ad_2, 14-16; ad_3, 20 \text{ for all specimens})$ and two pairs of anal $(an_1, an_2, 10 \text{ for all specimens})$ setae setiform, smooth. Setae g_4 are positioned as shown in Fig. 4. Distance ad_3-ad_3 less than ag-ag. Adanal lyrifissures (iad) in paraanal position.

Legs (Figs. 9–16). All claws smooth. Formulas of leg setation and solenidia: I (1-5-2-4-20) [1–2–2], II (1-5-2-4-16) [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. Famulus (ϵ) of tarsi I thickened, straight. Setae *p* setiform on tarsi I, and very short, conical on tarsi II–IV. Setae *a*" and *pv*" on tarsi IV more heavily developed, terminating pinnate. Setae *s* strong, with 1–2 teeth.

Remarks. The redescription allowed to clarify and supplement the morphological characteristics of *S. amurica* unspecified in the original descriptions. Particularly noteworthy is the presence of lateral tubercles in rostrum *S. amurica* and the presence of sharp spikes at the distal end of the bothridial setae, the length of which can be up to 1/3 of the length of the head. In addition, the morphological variability of some features is shown: *S. amurica* can have an asymmetric arrangement of genital setae. Body size *S. amurica* by Krivolutsky (1966) is 176, from Voronezh and Sakhalin is 180–210.

SUCTOBELBELLA (SUCTOBELBELLA) GRANIFERA CHINONE, 2003

(Figs. 17–31, 58–61)

Measurements. Body length: 220–250 (7 specimens from the Kemerovo Region and Sakhalin Island); notogastral width: 120–130 (7 specimens from the Kemerovo Region and Sakhalin Island).

Integument (Figs. 17, 19, 20). Body color light brown. Body surface smooth, only rostrum, interbothridial region, median and lateral parts of prodorsum (anterolaterally and laterally to bothridia) tuberculate (diameter of tubercles up to 2–3).

Prodorsum (Figs. 17, 18, 19, 20, 30, 31, 59, 60). Rostrum rounded, with one pair of lateral tubercles and three pairs of lateral teeth. The first two pairs of lateral teeth are strong, their ends are close together with each other, wide indentation between the them. Third pair of lateral teeth short, blunted, covers the base of the second prong. The third tooth is well seen in the dorsal and ventral aspects, but is weakly visible in the lateral one. Tectopedial fields with irregular inner margins, elongate oval in shape and acute anteriorly. Median knob-like tubercle comparatively large, rather rounded, but narrow and truncated anteriorly. Rostral setae (24-28) geniculate, ciliate unilaterally in medial parts, inserted dorsolaterally. Lamellar (14-16), interlamellar (9-10) and exobothridial (8-9) setae setiform, smooth, le inserted on knob-like tubercle. Bothridial setae (46–53) with long stalk and shorter, unilaterally dilated and barbed head, having pointed apex (the length of which can be up to 1/3 of the length of the head). One pair of *pmt* and one pair of *plt* present, pmt rounded distally, plt slightly doubled.

Notogaster (Figs. 17, 19, 20, 58, 61). Anterior margin slightly convex. Humeral tubercles fused, triangular, rounded anteriorly, directed towards the interbothridial and postbothridial tubercles respectively, *nmt* slightly larger than *nlt* (in Kemerovo specimens humeral tubercles approximately equal in size). Ten pairs of notogastral setae setiform, smooth, h_1 , p_1 , p_2 and p_3 (18) shorter than the other setae (35). Setae *c* are located at the base of the humeral tubercles. Notogastral lyrifissures *ia*, *im*, *ip*, *ih* and *ips* and opisthonotal gland openings distinct, *im* located above *gla*.

Gnathosoma (Figs. 21–23). Subcapitulum longer than wide (43–50×28–30). Subcapitular setae setiform, smooth, *h* and *m* (10–11) longer than *a* (6). Palps (38–44) with setation 0–1–0–2–6 (+ ω). Two setae *ul* fused mediobasally. Chelicerae (51–55) with *cha* setae. Trägårdh's organ indistinctly visible.

Epimeral and lateral podosomal regions (Figs. 18, 19). Epimeral setal formula 3-1-3-3. Epimeral setae setiform, smooth, *la*, *2a* and *3a* (6–7) shorter than the other setae (8–10). Two pairs of lateral tubercles (*lat* and *lpt* approximately the same size) present, rounded distally. Discidia elongate triangular, rounded distally.



Figs. 17–19. *Suctobelbella granifera* Chinone, 2003, adult from Sakhalin: 17—dorsal view (legs not illustrated); 18—ventral view (gnathosoma and legs not illustrated); 19—lateral view (gnathosoma and legs not illustrated). Scale bar 100 µm.



Figs. 20–24. *Suctobelbella granifera* Chinone, 2003, adult from Kemerovo region (20) and Sakhalin (21–24); 20 dorsal view (legs not illustrated); 21—subcapitulum, ventral view; 22—chelicera, left, antiaxial view; 23—palp, left, paraxial view; 24—notogastral seta *la*. Scale bars 100 μm (20), 10 μm (21–24).



Figs. 25–31. *Suctobelbella granifera* Chinone, 2003, adult, from Sakhalin (25–30) and Kemerovo region (31): 25 femur and genu of leg I, right, dorsal view; 26—tibia and tarsus of leg I, right, paraxial view; 27—trochanter, femur and genu of leg IV, left, dorsal view; 28—tibia of leg IV, left, antiaxial view; 29—tarsus of leg IV, left, paraxial; 30, 31—rostrum, dorsal view. Scale bars 25 μm (25–29), 10 μm (30–31).

Anogenital region (Figs. 18, 19). Six pairs of genital $(g_1, 12; g_2-g_6, 7-8)$, one pair of aggenital (18–20), three pairs of adanal $(ad_1, 12; ad_2, 16; ad_3, 19-20)$ and two pairs of anal (10) setae setiform, smooth. Distance ad_3-ad_3 less than ag-ag. Adanal lyrifissures in paraanal position.

Legs (Figs. 25–29). All claws smooth. Formulas of leg setation and solenidia: I (1-5-2-4-20)[1-2-2], II (1-5-2-4-16) [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. Famulus of tarsi I thickened, straight. Setae *p* setiform on tarsi I, and very short, conical on tarsi II–IV. Setae *a*" and *pv*" on tarsi IV more heavily developed, terminating pinnate. Setae *s* strong, with 1–2 teeth.

Remarks. The redescription made it possible to clarify and supplement the morphological characteristics of not specified in the original descriptions. Particularly noteworthy is the location of the third lateral teeth from S. granifera and presence of sharp spike at the distal end of bothridial setae, the length of which can be up to 1/3 of the length of the head. In addition, the morphological variability of some features of S. granifera is shown: size of humeral tubercle nmt can be greater than (specimens from Sakhalin Island) or equal (specimens from the Kemerovo Region) to *nlt*, notogastral setae c can reach their ends the base of setae lm (specimens from Sakhalin Island) or not reach their ends at the base of setae *lm* (specimens from the Kemerovo Region). Chinone (2003) and Shtanchaeva and Subias (2009) reported about a possible disappearance of one of the three teeth of the rostrum in S. granifera. However, these authors do not mention which particular tooth disappears, and they do not provide any specific description of the morphology of the two-toothed S. granifera. Our materials, like the drawings of the first descriptions, show that the third teeth is present (although it can be somewhat truncated; Figs. 30, 31). A distinctive feature of the third tooth is that it covers the second tooth. This can create the impression of being two-toothed, when seen from above. Shtanchaeva and Subias (2009) noted a decrease in the body size of S. granifera from the Caucasian specimens up to 215-225, whereas typical specimens are characterized by the presence of 2-3 pairs of teeth and the length of the body 245–280 (Chinone 2003). The body size of S. granifera from Sakhalin Island is 220; from the Kemerovo Region-220-250.

SUCTOBELBELLA (SUCTOBELBELLA) OPISTODENTATA (GOLOSOVA, 1970)

(Figs. 32–47, 57)

Measurements. Because the material is crushed, it is impossible to accurately measure the dimensions. Therefore, here we present the data from the first description. Body length: 230; notogastral width: 111. Subias and Arillo (2001) indicate close sizes for Iberian specimens: body length—225.

Integument (Figs. 32, 41). Body color light brown. Body surface smooth, only rostrum, interbothridial region, median and lateral parts of prodorsum (anterolaterally and laterally to bothridia) tuberculate (diameter of tubercles up to 2).

Prodorsum (Figs. 32, 41-45, 57). Rostrum rounded, with one pair of lateral tubercles and two pairs of lateral teeth-strong, their ends close with each other, wide indentation between them. Tectopedial fields with irregular inner margin, elongate oval and acute anteriorly. Median knob-like tubercle comparatively large, rather rounded, but narrow and truncate anteriorly. Rostral setae (26) geniculate, ciliate unilaterally in medial parts, inserted dorsolaterally. Lamellar (12), interlamellar (10) and exobothridial (7) setae setiform, smooth, le inserted on knob-like tubercle. Bothridial setae (55) with long stalk and elongated unilaterally dilated and barbed head, without a spike on the distal end. One pair of pmt and one pair of plt present, pmt rounded distally, plt slightly doubled.

Notogaster (Figs. 32, 41). Anterior margin slightly convex. Humeral tubercles fused, triangular, rounded anteriorly, directed towards the interbothridial and postbothridial tubercles respectively, *nmt* slightly larger than *nlt*. Ten pairs of notogastral setae setiform, smooth, h_1, p_1, p_2 and p_3 (14) shorter than the other setae (24). Most of the setae not preserved. Setae *c* located at the base of the humeral tubercles. Notogastral lyrifissures *ia*, *im*, *ip*, *ih* and *ips* and opisthonotal gland openings distinct, *im* located above *gla*.

Gnathosoma (Figs. 34, 35, 43). Subcapitulum longer than wide (45×30). Subcapitular setae setiform, smooth; *h* and *a* (10) longer than m (6). Palps (40) with setation 0-1-0-2-6 (+ ω). Two setae *ul* fused mediobasally. Chelicerae (51) badly visible on the drug.

Epimeral and lateral podosomal regions (Fig. 40). Epimeral setal formula 3-1-3-3. Epimeral setae setiform, smooth, *la*, *2a* and *3a* (6) shorter than the other setae (10). Two pairs of lateral tubercles (*lat* and *lpt* approximately of the same size) present, rounded distally. Discidia (*dis*) elongate triangular, rounded distally.



Figs. 32–33. *Suctobelbella opistodentata* (Golosova, 1970), adult, holotype from ZIN: 32—dorsal view; 33—genital plates. Scale bars 100 µm (32), 10 µm (33).



Figs. 34–37. *Suctobelbella opistodentata* (Golosova, 1970), adult, holotype from ZIN: 34—subcapitulum, ventral view; 35—palp, left, ventral; 36—leg I (trochanter not illustrated), left, paraxial view; 37—femur and genu of leg II, left, antiaxial view. Scale bars 10 μm (34–35), 50 μm (36–37).



Figs. 38–39. *Suctobelbella opistodentata* (Golosova, 1970), adult, holotype from ZIN: 38—leg III, left, antiaxial view; 38—leg IV, left, antiaxial view. Scale bar 50 μm.



Figs. 40–47. *Suctobelbella opistodentata* (Golosova, 1970), adult, holotype from ZIN collection, microscope images: 40—ventral view; 41—dorsal view; 42—prodorsum, dorsal view; 43—subcapitulum, ventral view, 44—right lateral teeth, dorsal view; 45—median knob-like tubercle and *ro*, dorsal view; 46—anal plate, 47—genital plate. Scale bars 100 μm (40–41), 15 μm (42–46), 5 μm (47).



Figs. 48–56. *Suctobelbella amurica* (Krivolutsky, 1966), adult, holotype (49) and paratype (48, 50–56)- from ZIN collection, microscope images: 48—paratype, dorsal view; 49—holotype, dorsal view; 50—rostrum and subcapitulum, ventral view; 51—notogaster, dorsal view; 52—right propodosomal and notogastral tubercle, dorsal view; 53—median knob-like tubercle and bothridium, dorsal view; 54—propodosoma, ventral view; 55—left bothridium setae; 56—right bothridium setae. Scale bars 50 µm (48–49, 51, 54), 10 µm (50, 53), 5 µm (52, 55–56).



Figs. 57–61. *Suctobelbella opistodentata* (Golosova, 1970), adult, holotype from ZIN collection, microscope images (57), *Suctobelbella (S.) granifera* Chinone, 2003, adult from Sakhalin (58–60) and Kemerovo region (61): 57—ventral view; 58—notogastral setae *la*; 59—propodosoma and bothridial setae, dorsal view; 60—rostrum, dorsal view; 61—dorsal view. Scale bars 100 μm (57), 50 μm (61), 2 μm (58–60).

Anogenital region (Figs. 33, 40, 46–47). Number of genital setae asymmetric: right genital plate with six pairs of genital setae $(g_1, 12; g_2-g_6, 8)$, left genital plate with five genital setae (absent g_2 or g_3 , g_4 based relative to its position). One pair of aggenital (size unknown), three pairs of adanal $(ad_1, 12; ad_2, 15; ad_3, 20)$ and two pairs of anal (10) setae setiform, smooth. Distance ad_3-ad_3 less than ag-ag. Adanal lyrifissures in paraanal position.

Legs (Figs. 36–39, 57). All claws smooth. Formulas of leg setation and solenidia: I (1–5–2–4–20) [1–2–2], II (1–5–2–4–16) [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. Famulus of tarsi I thickened, straight. Setae *p* setiform on tarsi I, very short, conical on tarsi II–IV. Setae *a*" and *pv*" on tarsi IV more heavily developed, terminating pinnate. Setae *s* strong, with one tooth.

Remarks. The redescription made it possible to clarify and supplement the morphological characteristics of S. opistodentata not specified in the original descriptions. Particularly noteworthy is the availability of lateral tubercles in rostrum S. opistodentata and absence of sharp spike at the end bothridial setae. The structure of the lateral rostrum is the same as in S. opistodentata and S. amurica. They have rounded lateral tubercles and two pairs of lateral teeth (t). Given the small size of the mites, the difficulty of detecting the teeth at the dorsal aspect and the possible distortion of the material in the preparation, we believe that the degree of contraction of the teeth to each other with their distal ends. This feature given as diagnostic one in the definition of these species in the original description (Golosova 1970; Krivolutsky 1975), is not sufficiently informative for identification and can cause difficulties. At the same time, the differences in the structure of the bothridial setae allow for more successful identification of each of these species. First, it is worth paying attention to the presence or absence of a long spike on the end of the head (present in S. amurica, absent in S. opistodentata). Proportions of bothridial setae are not informative because of their bending in the drug. Therefore, Mahunka (1979), working with the holotype S. opistodentata, notes the petiole of the sensillus to be much shorter and somewhat thicker.

ACKNOWLEDGEMENTS

The authors are grateful to Sergei V. Mironov (Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia) for his kind help with checking the material in ZIN; Olga Titova for her help in collecting the material from Sakhalin; Nikolay A. Ryabinin (Institute of Water and Ecology Problems, Far Eastern Division of the Russian Academy of Science); Umukusum Ya. Shtanchaeva (Caspian Institute of Biological Resources, Daghestan Scientific Center, Russian Academy of Sciences, Makhachkala, Russia) for consultations; and Vasily Grebennikov (Ottawa, Canada) for helping to translate the text.

REFERENCES

- Abdurakhmanov, G.M. and Davudova, E. Z. 2013.
 Obyomy rodov i vidovoy sostav oribatid (Acariformes, Oribatida) vnutrennego gornogo Dagestana
 [Volume of the genus and the species composition of oribatids (Acariformes, Oribatida) of the inland mountainous Dagestan]. *Ecology of Animals. The South of Russia: Ecology, Development*, 1: 21–37.
 [In Russian]
- Bragin, E.A. and Tolstikov, A.V. 2002. Communities of arboreal oribatid mites (Acariformes: Oribatida) of aspen-birch forests of West Siberia. Communication 2. Species diversity and abundance. *Acarina*, 10 (2): 175–187.
- Chakraborti, P. and Bhattacharya, T. 1991. Influence of human activities on soil oribatid community of a rubber plantation and an adjacent wasteland in Tripura, India. *Journal of Soil Biology and Ecolol*ogy, 11 (2): 90–95.
- Chakraborti, P. and Bhattacharya, T. 1992. Soil microarthropods of a rubber plantation and adjacent wasteland in Tripura, India. *Proceedings of the Zoological Society, Calcutta* 45 (2): 163–172.
- Chinone, S. 2003. Classification of the soil mites of the family Suctobelbidae (Oribatida) of Japan. *Edaphologia*, 72: 1–110.
- Ermilov, S.G. 2008. Itogi issledovaniy oribatidnyikh kleshchey (Acari, Oribatida) nizhegorodskimi akarologami. Povolzhye, N. Novgorod, pp. 1–74. [In Russian]
- Fujita, M. and Fujikawa, T. 1987. List and description of oribatid mites introduced into crop fields II. *Edaphologia*, 36: 1–11.
- Gatilova, F.G., Krivolutskiy, D.A. 1968. Fauna pantsirnyikh kleshchey (Oribatei) dubrav Evropeyskoy chasti SSSR [The fauna of oribatd mites (Oribatei) of oak forests in the European part of the USSR]. *In*: Materialy po faune i ekologii pochvoobitayuschih bespozvonochnyih. Izdatelstvo Kazanskogo Universiteta, Kazan, pp. 134–143. [In Russian]
- Gazaliev, N.A. 2000. Specific features of the oribatid fauna in high-mountain pine forests of the Eastern Caucasus in relation to altitudinal zonality. *Russian Journal of Ecology*, 31 (1): 32–35.

- Golosova, L.D. 1970. Novyie vidyi pantsirnyikh kleshchey (Acariformes,Oribatei) iz yuzhnoy chasti Primorskogo Kraya i s Kurilskikh ostrovov [New species of oribatid mites (Acariformes, Oribatei) from southern part of the Primorskiy Territory and the Kuril Islands]. *Zoologicheskiy Zhurnal*, XLIX, 5: 694–701. [In Russian]
- Golosova, L.D. 1989. Pantsirnyie kleschi Severnogo Primorya [Oribatid mites of the Northern Primorye]. Pochvennyie bespozvonochnyie yuga Dalnego Vostoka: 20–25. [In Russian]
- Golosova L.D. and Pan'kov A.N. 1978. Pantsirniye kleshchy Kurilskikh ostrovov [Oribatid mites of the Kuril Islands]. *In*: L.D. Golosova (Ed.). Ekologiya Zhivotnykh i Faunistika. Collection of Scientific Papers No. 58. Tyumen State University Publishing House, Tyumen, pp. 3-18.
- Golosova, L.D., Karppinen, E. and Krivolutsky, D.A. 1983. List of oribatid mites (Acarina, Oribatei) of Northern Palaearctic region. 11. Siberia and the Far East. *Acta Entomologica Fennica*, 43: 1–14.
- Karppinen, E., Melamud, V.V., Miko, L. and Krivolutsky, D.A. 1992. Further information on the oribatid fauna (Acarina, Oribatei) of the Northern Palearctic region: Ukraine and Czechoslovakia. *Entomologica Fennica*, 30, IV: 41–56.
- Krivolutskiy, D.A. 1968. O pantsirnykh kleshchakh pochv Sredney Azii [On oribatid mites of soils of Central Asia]. *Zoologicheskiy Zhurnal*, XLV, 11: 1628–1639. [In Russian]
- Krivolutskiy, D.A. 1975. Semeystvo Suctobelbidae Grandjean, 1954 [The familty Suctobelbidae Grandjean, 1954]. *In*: M.S. Ghilyarov and D.A. Krivolutsky (Eds.). Opredelitel obitayushchikh v pochve kleshchey. Nauka, Moskva, pp. 196–206. [In Russian]
- Krivolutsky, D.A. 1966. Nekotoryie materialy po pantsirnym kleshcham (Oribatei, Acariformes) iz okrestnostey g. Blagoveshchenska [Some materials on oribatid mites (Oribate, Acariformes) from vicinities of the city of Blagoveshchensk]. *Byulleten Moskovskogo obschestva ispyitateley prirodyi*, *otdel biologichesky*, 4: 125–129. [In Russian]
- Lebedeva, N.V. and Lebedev, V.D. 2007. Diversitiy of oribatid mites (Acari, Oribatei) and other soil microarthropods in plumage of raptors. *Caucasian Entomological Bulletin*, 3 (1): 9–18.
- Mahunka, S. 1979. Complementary data to the knowledge of some Oribatid species (Acari). *Folia Entomologica Hungarica*, 32 (2): 139–152.
- Melamud, V.V. 2009. Katalog pantsirnikh kleshchey (Acari: Oribatida) Zakarpatskoy oblasti—II [The catalog of oribatid mites (Acari: Oribatida) of the Transcarpathia Region—II]. *Naukoviy Vipusk*

Uzhgorodskogo Universiteta. Seriya Biologiya, vipusk 26: 77–90. [In Russian]

- Moraza, M. L. 2009. La comunidad de ácaros oribátidos (Acari: Cryptostigmata) en diversos hábitats naturales y alterados de Navarra (Sur de Europa). *Revista Ibérica de Aracnología*, 17: 71–82.
- Niedbala, W. and Olzanowski, Z. 2008. *Mechowce* (*Oribatida*). *Fauna of Poland: characteristics and checklist of species*. Museum i Instytut Zoologii RAN, Warszawa, vol. 3, pp. 79–93.
- 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*: D.L. Dindal (Ed.). Biology of Oribatid Mites. SUNY College of Environmental Science and Forestry, Syracuse, pp. 33–61.
- Norton, R.A. and Behan-Pelletier, V.M. 2009. Oribatida. Chapter 15, pp. 430–564. *In*: G.W. Krantz and D.E. Walter (Eds.). A Manual of Acarology. 3rd edn. Texas Tech University Press, Lubbock, 816 pp.
- Pan'kov, A.N. 1989. Pantsirnyie kleshchi v pochvakh shirokolistvennykh lesov Kurilskikh ostrovov [Oribatid mites in soils of broad-leaved forests of the Kuril Islands]. *Pochvennyie bespozvonochnyie yuga Dalnego Vostoka*: 25–30. [In Russian]
- Pan'kov, A.N., Ryabinin, N.A. and Golosova, L.D. 1997. Katalog pantsirnyikh kleschey Dalnego Vostoka Rossii. Ch. 1. Katalog pantsirnyikh kleshchey Kamchatki, Sakhalina i Kurilskikh ostrovov. Dalnauka, Vladivostok–Khabarovsk, pp. 1–87. [In Russian]
- Rakhimbaeva, A.K., 1995. K faune pantsirnykh kleshchey Kazakhstana [On the fauna of oribatid mites of Kazakhstan]. *Metodicheskiye ukazaniya k izucheniyu kursa zoologii bespozvonochnykh i spetskursa "Printsipy teorii sistematiki"*: 1–40. [In Russian]
- Ryabinin, N.A. 1977. Fauna i ekologiya pantsirnyikh kleshchey yuga Khabarovskogo kraya [Fauna and ecology of oribatid mites of the south of the Khabarovsk Region]. *Voprosyi Geografii Dalnego Vostoka*, 17: 89–110. [In Russian]
- Ryabinin, N.A. 2015. Oribatid mites (Acari, Oribatida) in Soils of the Russian Far East. *Zootaxa*, 3914 (3): 201–244.
- Ryabinin, N.A. and Pan'kov, A.N. 1987. Rol partenogeneza v biologii pantsirnykh kleschey [The role of parthenogenesis in the biology of oribatid mites] *Ecologia*, 4: 62–64. [In Russian]
- Ryabinin, N.A. and Pan'kov, A.N. 2009. Suktsessii pantsirnykh kleshchey (Acariformes: Oribatida) na narushennykh territoriyakh [Successions of oribatid mites (Acariformes: Oribatida) in disturbed territories]. *Izvestiya RAN. Seriya Biologicheskaya*, 5: 604–609. [In Russian]

- Sanyal, A.K. 2000. Oribatid mites (Acari: Oribatei). Zoological Survey of India. State Fauna Series 7: Fauna of Tripura, part 2: 33–112.
- Shtanchaeva, U.Ya. 2001. Catalog of oribatid mites (Acariformes: Oribatida) of the Caucasus. Acarina, 9 (2): 177–221. [In Russian]
- Shtanchaeva, U.Ya. and Subias, L.S. 2005. Pantsirnye kleshchy (Acariformes: Oribatida) lesnykh biotopov vnutrennego gornogo Dagestana [Oribatid mites (Acariformes: Oribatida) of forest biotopes of inland mountainous Dagestan]. *Ecosistemas montañosos y sus componentes*, 2: 171–175. [In Russian]
- Shtanchaeva, U.Ya. and Subias, L.S. 2009. A review of oribatid mites of the family Suctobelbidae from the Caucasus. *Entomological Review*, 89 (7): 849–873.
- Skubala, P. and Duras, M. 2008. Do decaying logs represent habitat islands? Oribatid mite communities in dead wood. *Annalies Zoologici*, 58 (2): 453–466.
- Skubala, P. and Marzec, A. 2013. Importance of different types of beech dead wood for soil microarthropod fauna. *Polish Journal of Ecology*, 61 (3): 545–560.
- Skubala, P., Rola, K. and Osyczka, P. 2016. Oribatid communities and heavy metal bioaccumulation in selected species associated with lichens in a heavily contaminated habitat. *Environ Science and Pollution Research*, 23: 8861–8871.
- Subías, L.S. 2017. Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes: Oribatida) del mundo (excepto fósiles). *Graellsia*, 60 (número extraordinario): 3-305 (2004). Actualizado en junio de 2006, en abril de 2007, en mayo de 2008, en abril de 2009, en julio de 2010, en febrero de 2011, en abril de 2012, en

mayo de 2013, en febrero de 2014, en marzo de 2015, en febrero de 2016 y en febrero de 2017). Available at http://www.ucm.es/info/zoo/Artropodos/Catalogo.pdf (accessed 11 January 2017).

- Subias, L.S. and Arillo, A. 2001. Fauna Ibérica. Vol. 15. Acari ,Oribatei, Gymnonota. II. Museo Nacional de Ciencias Naturales Consejo Superior de Investigaciones Científicas: 1–281.
- Subias, L.S. and Shtanchaeva, U.Ya. 2011. Listado sistemático de los ácaros oribátidos (Acari: Oribatida) iberocaucásicos. *Revista Ibérica de Arac*nología, 19: 55–132.
- Subias, L.S. and Shtanchaeva, U.Ya. 2011. Oribátidos ibéricos (Acari: Oribatida): Listado sistemático, incluyendo nuevas citas de una familia, cuatro géneros y veinticinco especies. *Revista Ibérica de Aracnología*, 20: 85–103.
- Tolstikov, A.V., Bragin, E.A., Kuzmin, I.V. and Nekrasov, A.L. 2003. Communities of arboreal oribatid mites (Acariformes: Oribatida) of aspen-birch forests of West Siberia. Communication 2. Seasonal dynamics patterns. *Acarina*, 11 (2): 247–252.
- Travé, J. and Vachon, M. 1975. François Grandjean. 1882–1975 (Notice biographique et bibliographique). *Acarologia*, 17 (1): 1–19.
- Woas, S. 1986. Beitrag zur Revision der Oppioidea sensu Balogh, 1972 (Acari, Oribatei). Andrias 5: 21–224.
- Yavornitsky, V.I. and Melamud, V.V. 1991. Pantsirnyie kleshchy (Acariformes, Oribatei) grabovyikh dubrav Pridnestrovya [Oribatid mites (Acariformes, Oribatei) of hornbeam-oak forests of Transnistria]. *Vestnik Zoologii: Fauna i Sistematika*, 1: 17–22. [In Russian]

Table 1

Leg	Tr	Fe	Ge	Ti	Ta
Ι	v'	d, (l), bv", v"	(l), σ	(<i>l</i>), (<i>v</i>), ϕ_1, ϕ_2	(ft), (tc), (it), (p), (u), (a), s, (pv), v', (pl), l", ε , ω_1 , ω_2
II	v'	d, (l), bv", v"	<i>(l),</i> σ	(l), (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv), $l^{"}$, ω_{1} , ω_{2}
III	l', v'	d, l', ev'	<i>l',</i> σ	l', (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv)
IV	v'	d, ev'	d, l'	l', (v), φ	ft", (tc) , (p) , (u) , (a) , s , (pv)

Leg setation and solenidia of *Suctobelbella amurica* (Krivolutsky, 1966), *Suctobelbella granifera* Chinone, 2003 and *Suctobelbella opistodentata* (Golosova, 1970)

Explanations: Roman letters refer to normal setae, Greek letters to solenidia (except ϵ —famulus). Single prime (') marks setae on the anterior and double prime ('') setae on the posterior side of a given leg segment. Parentheses refer to a pair of setae. Tr—trochanter, Fe—femur, Ge—genu, Ti—Tibia, Ta—tarsus.