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# Two new species of Anurophorinae (Collembola: Isotomidae) from Magadan Region

# Два новых вида Anurophorinae (Collembola: Isotomidae) из Магаданской области

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KEY WORDS: Collembola, Isotomidae, *Weberacantha*, *Scutisotoma,* new species, Russia.
КЛЮЧЕВЫЕ СЛОВА: Collembola, Isotomidae, *Weberacantha*, *Scutisotoma,* новый вид, Россия.

ABSTRACT. The paper provides descriptions of *Weberacantha striganovae* sp.n. and *Scutisotoma postertriplex* sp.n. The list of the principal publications on the descriptions of Collembola from north-eastern parts of Russia is given.

РЕЗЮМЕ. В работе приведены описания *Weberacantha striganovae* sp.n. и *Scutisotoma postertriplex* sp.n. Приводится список основных работ, связанных с описаниями коллембол на северо-востоке России.

## Introduction

Increased diversity among many animal and plant taxa in north-eastern parts of Russia is a well-known fact. The springtail fauna of the region is not an exception being also rather diverse and highly original. Nevertheless its inventory is obviously far from complete despite notable number of original species descriptions from the region [Schött, 1893; Martynova, 1969, 1970 1976, 1977, 1978, 1981; Martynova et al., 1973, 1977; Martynova & Bondarenko, 1978; Tshelnokov, 1977, 1987, 1988, 1990; Tshelnokov & Bondarenko, 1978; Fjellberg, 1985, 1987; Deharveng, 1987; Babenko, 1994; Potapov, 1997a, b; Potapov & Babenko, 2000; Bretfeld, 2000; Pomorski, 2001; Kaprus' & Pomorski, 2008 and some others]. The present paper devoted to descriptions of two new species from two different but closely related genera [see Potapov et al., 2006] of Anurophorinae is based on material collected in upper reaches of Ola River (~120 km north from Magadan, 60°39′N, 151°61′E).

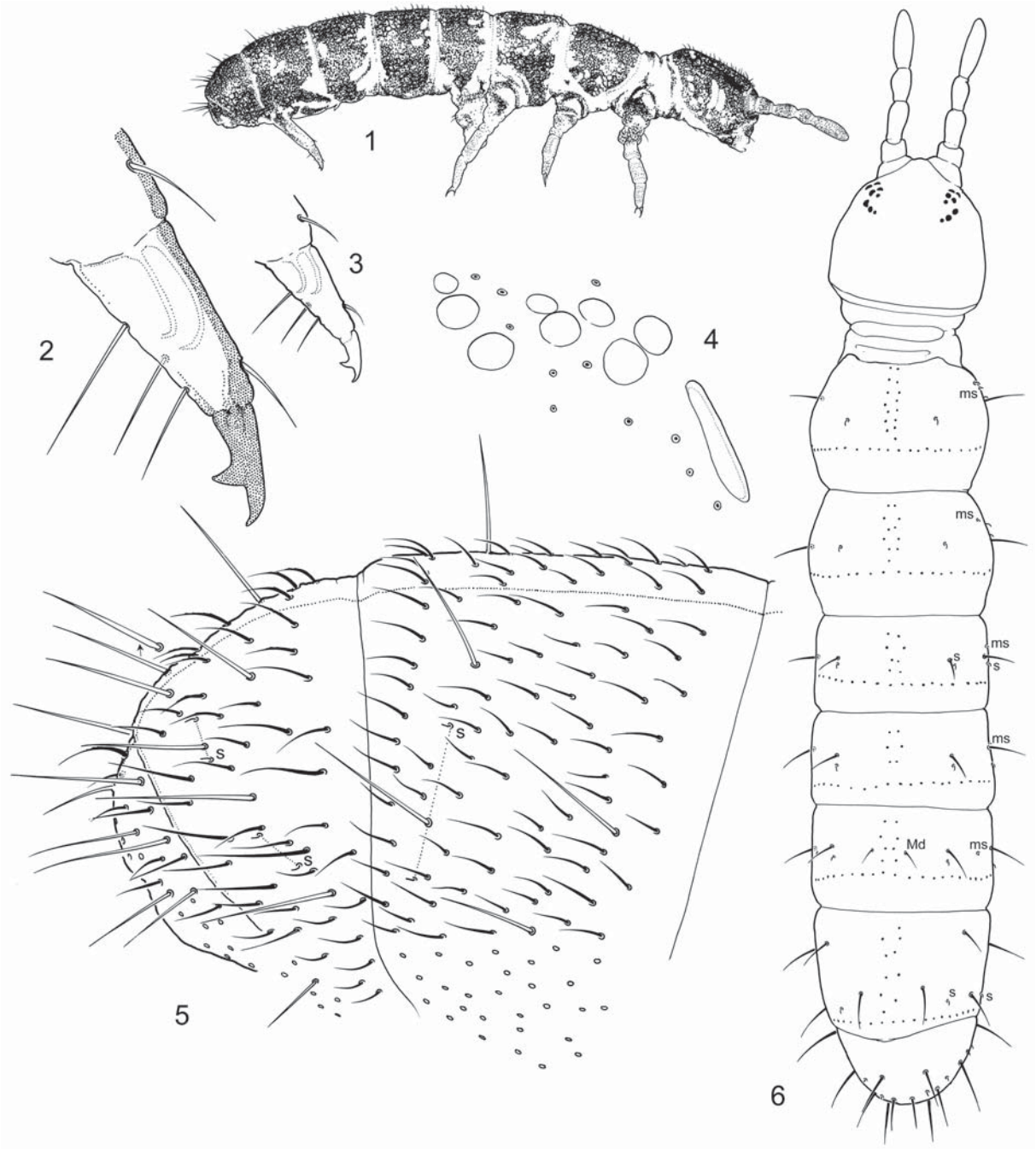
The types of the new species are deposited in the collection of the Department of Zoology & Ecology, Moscow State Pedagogical University (MSPU).

ABBREVIATIONS: Abd.I–VI — abdominal segments; Ant.1–4 — antennal subsegments; *bms* — basal microsensillum; *ms* — microsensillum; MSPU — Moscow State Pedagogical University; PAO — postantennal organ; *p*-row — posterior setal row on tergites; *s* — sensillum; Th.I–III — tergal segments; Ti.1–3 — tibiotarsi of legs; $U_3$ — unguis of leg 3. Notation of setae of femur (*a*, *ae*, *e*, *pe-p-pi-i*) is given after Huang & Potapov (in press).

### *Weberacantha striganovae* **sp.n.**
Figs 1–9.

TYPE MATERIAL: Holotype, subadult female, North East of Russia, upper reachers of Ola River, ~120 km north from Magadan, nival slope with *Oxyria digina*, 1023 m alt., 11.09.2011, leg. A. Babenko (MSPU). Paratypes, adult females, subadult females and males, juveniles: 30 specimens on slides and 25 specimens in alcohol, ibidem (MSPU).

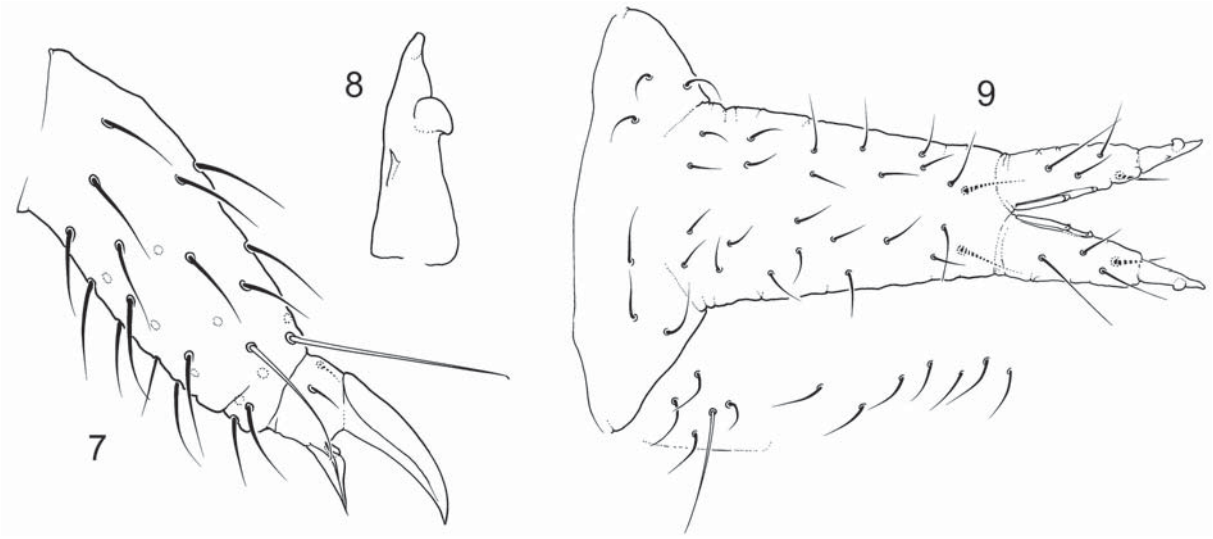
DESCRIPTION. Size up to 1.3 mm (the largest subadult female). Body cylindrical (Fig. 1). Abdominal tip cryptopygic: Abd.VI hidden under the convex and wrinkled Abd.V. Colour blue-violet, extremities paler. Cuticle strongly reticulated, the largest granules elongated, 1.5 longer then common seta socket diameter at posterior edge of Abd.IV. Ocelli 8+8, G and H smaller (Fig. 4). PAO narrow, with indistinct constriction, 1.1–1.3 as long as $U_3$, a little shorter than Ant.1 width (0.8–1.0), three times longer than nearest ocellus (Fig. 4). Maxillary outer lobe with 4 sublobal hairs and bifurcate palp. Maxillary head with short, unmodified lamellae. Labral chaetotaxy as 4/5,5,4. Labium with 3 proximal and 4 basomedian chaetae, papilla E with full set of guards (*e*7 present). Ventral side of head normally with 5+5 postlabial chaetae. Ant. 1 with 11 chaetae, 2 basal microsensilla (*bms*) and 2 sensilla (*s*). Ant.2 with 3 *bms* and 1 *s*, Ant.3 with 1 *bms* and 6 distal *s*, including two lateral sensilla always present in adults and subadults of both sexes, as well as in middle-sized juveniles. Sensilla on Ant.4 weakly differentiated, subapical organite very small, roundish.




Figs 1–6. *Weberacantha striganovae* sp.n.: 1 — coloration; 2–3 — distal half of furca in adult (2) and juvenile individual of 0.6 mm size (3), lateral view; 4 — ommatidia and PAO; 5 — chaetotaxy of Abd.IV–VI; 6 — arrangement of sensilla, microsensilla and macrochaetae on body. *Md* — dorsal macrochaeta, *s* — (macro)sensillum, *ms* — microsensillum.

Рис. 1–6. *Weberacantha striganovae* sp.n.: 1 — окраска; 2–3 — дистальная половина прыгательной вилки у половозрелой (2) и молодой особи размером 0,6 мм (3), вид сбоку; 4 — глазки и постантеннальный орган; 5 — хетотаксия IV–VI сегментов брюшка; 6 — расположение сенсилл, микросенсилл и крупных щетинок на теле. *Md* — спинная макрощетинка, *s* — (макро)сенсилла, *ms* — микросенсилла.

Dorsal axial chaetom of Th.II–Abd.III as 7-10,5-7/4-5,4-6,4-5. Common chaetae thick, most of them moderately serrated on dorsal side of Abd. V (Fig. 5). Thorax without ventral axial chaetae. Macrochaetae pointed, clearly differentiated (Figs 5, 6). Abd.V with several straight and slightly thickened dorsal macrochaetae, about 0.5–0.6 as long as tergite. Abd.IV with 4 macrochaetae of subequal size on each side (Fig. 5). Number of macrochaetae on Th.II–Abd.III 1,1/2,2,2+1* (Fig. 6), dorsal macrochaetae on Abd.III weakly developed (notated as 1* in formula). Sensilla on tergites clearly differentiated, significantly shorter and thinner




Figs 7–9. *Weberacantha striganovae* sp.n.: 7 — tibiotarsus of Leg 3; 8 — mucro, posterior view; 9 — furcal area, posterior view.

Рис. 7–9. *Weberacantha striganovae* sp.n.: 7 — голенелапка третьей пары ног; 8 — мукро, вид с задней стороны; 9 — поле прыгательной вилки, вид с задней стороны.

than ordinary chaetae. Sensillar formula 3,3/2,2,2,2,4 (*s*), 1,1/1,1,1 (*ms*) (Fig. 6). Microsensilla positioned in front of lateral sensilla on Abd.I and II, between lateral and medial sensilla on Abd.III (Fig. 6). Sensilla on Abd.I–III in mid-tergal position. Medial and lateral pairs of sensilla on Abd.V similar in size and set in a transversal line (Fig. 5).

Unguis strong, slightly curved, without inner tooth (Fig. 7). Unguiculus about half as long as unguis (2.0–2.3). Ti.1–3 with 21,21,25–28 chaetae. B-row of chaetae on Ti.1–2 complete. Tibiotarsal tenent chaetae (1-2-2 on Ti.1–3) clavate, 1.2–1.6 as long as $U_3$. Femur 1 with 5 *a*-chaetae, 1 *ae*-chaeta, 3 *e*-chaetae, and 8 (more rarely 7 or 9) chaetae of *pe-p-pi-i*-group. Upper and lower subcoxa with 2 and 6–8 chaetae on Leg 2 and 5–7 and 7–9 on Leg 3. Ventral tube with 4+4 laterodistal and 6–7 posterior chaetae. Tenaculum with 4+4 teeth and 1 chaeta. Anterior furcal subcoxa with 7–10, posterior one with 5 chaetae (Fig. 9). Anterior side of manubrium with a pair of chaetae which also present in juvenile individuals if not of first instar (Figs 2–3). Posterior side with 8–11+8–11 on the main part and 3+3 chaetae on laterobasal lobes (Fig. 9). Dens anteriorly with 1 distal chaeta, posterior side almost smooth, with 3 chaetae. Mucro massive, with two strong teeth and one small denticle on inner side, the latter well visible only in dorso-ventral position of mucro, if lateral it normally hardly identifiable (Figs 8–9). Lamellae not differentiated. Ratio of manubrium : dens : mucro = 3.6-4.7 : 1.6-2.0 : 1.

DISCUSSION. The genus being monotypic for many years includes now 6 species (7 with the new one). They represent a rather homogeneous group which inhabits remote mountainous regions of Eastern Asia (Nepal, Mongolia, and different parts of Siberia). Only the type species of the genus, *W. octa* Christiansen, 1951, is mainly Nearctic but also recorded from East Chukotka [Potapov, 2001]. Due to strong straight abdominal macrochaetae, *W. striganovae* sp.n. is very similar to *W. echinodermata* Potapov et al., 2006 from Yakutia and *W. cylindrica* Huang et Potapov, 2012, recently described on material from Khabarovsk Territory. These three species can be distinguished by the following more or less stable characters:

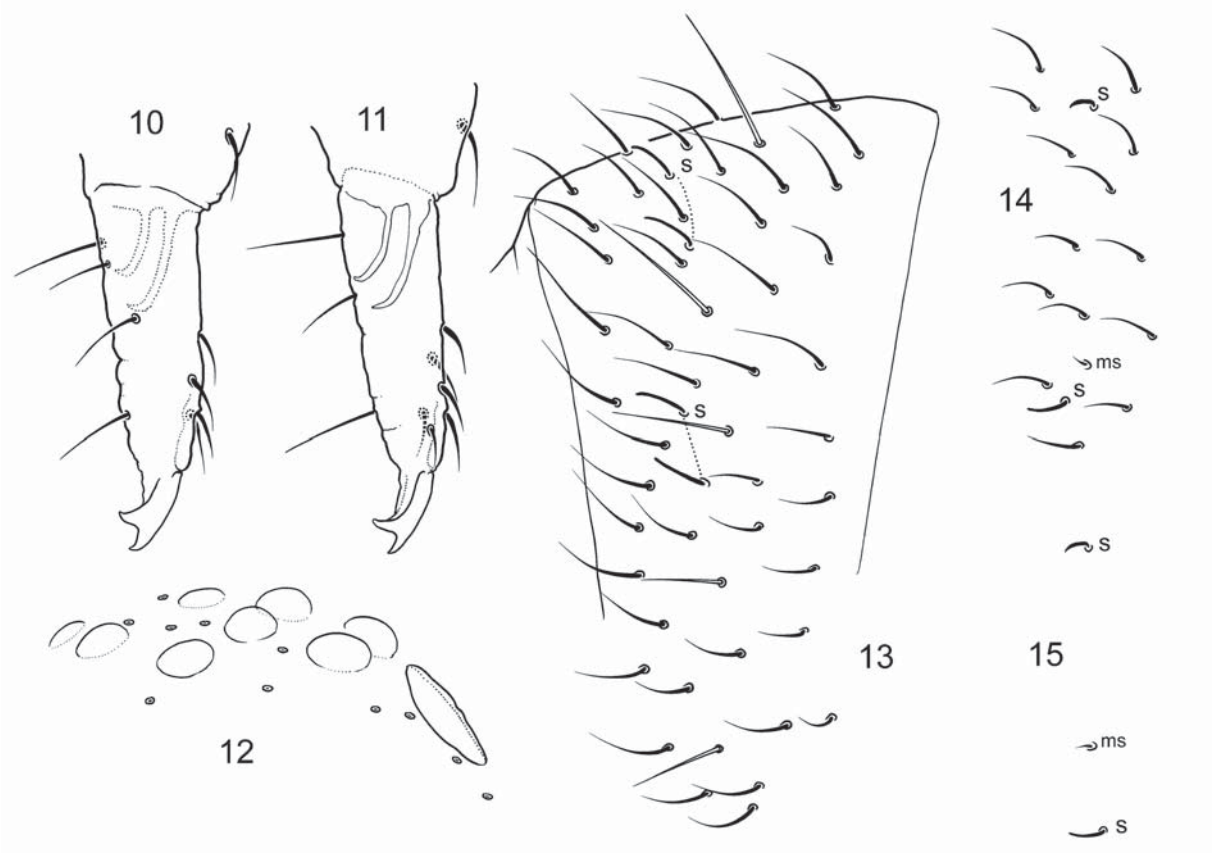
*W. striganovae* sp.n. is also characterized by the presence of denticle on inner side of mucro (absent in two other species). This difference is of lower value since *W. echinodermata* possesses a rudimentary ridge in associated side of mucro which can also be interpreted as a denticle.

| species | a pair of chaetae on anterior side of manubrium | chaetotaxy of dens | macrochaetae on Abd.I–III | Laterodistal chaetae on ventral tube |
|---|---|---|---|---|
| *W. echinodermata* | + | 3/4–5 | 1,1,1 | 6+6 |
| *W. cylindrica* | – | 0/2 | 1+1*,2,2 | 4+4(3+3) |
| *W. striganovae* sp.n. | + | 1/3 | 2,2,2+1* | 4+4 |

* weakly developed

DISTRIBUTION AND ECOLOGY. The species is known only from the type locality. Four «spiny» species (*striganovae*, *echinodermata*, *cylindrica, octa*) inhabit more eastern areas of Asia than other congeners.

NAME DERIVATION. Honours Bella R. Striganova, a prominent Russian soil biologist and ecologist, on the occasion of her 80th birthday.




Figs 10–14. *Scutisotoma postertriplex* sp.n.: 10–11 — distal half of furca, right (10) and left (11) parts of dens in one of the paratypes; 12 — ommatidia and PAO; 13 — chaetotaxy of Abd.V; 14–15 — lateral area of Abd.III, arrangement of *s* and *ms*, variation. *s* — (macro)sensillum, *ms* — microsensillum.

Figs 10–14. *Scutisotoma postertriplex* sp.n.: 10–11 — дистальная половина прыгательной вилки, правая (10) и левая (11) части денс одного из паратипов; 12 — глазки и постантеннальный орган; 13 — хетотаксия V сегмента брюшка; 14–15 — латеральный участок III сегмента брюшка, расположение *s* и *ms*, варианты. *s* — (макро)сенсилла, *ms* — микросенсилла.

*Scutisotoma postertriplex* **sp.n.**
Figs 10–14.

TYPE MATERIAL: Holotype, adult male, North East of Russia, upper reachers of Ola River, ~ 120 km north from Magadan, 1145 m alt., 7–14.08.2011, from pitfall traps in snowfield, leg. A. Babenko (MSPU). Paratypes: one adult female, subadult females and males, juveniles: 12 specimens on slides and 20 specimens in alcohol, ibidem and in different mountain tundra sites nearby, all above 1100 m alt, from pitfall traps and samples extracted with Tullgren funnels (MSPU).

DESCRIPTION. Size from 0.6 to 0.75 mm (adult male and female, respectively). Body of normal shape. Colour blue-violet, extremities paler. Cuticle reticulation thin and regular. Ocelli 8+8, G and H smaller (Fig. 12). PAO elliptical, with indistinct constriction, 0.9–1.2 as long as $U_3$, shorter than Ant.1 width (0.6–0.7), 2–3 times longer than nearest ocellus. Maxillary outer lobe with 4 sublobal hairs and bifurcate palp. Maxillary head with short, unmodified lamellae. Labral chaetotaxy as 4/5,5,4. Labium with 3 proximal and 4 basomedian chaetae, papilla E with full set of guards (e7 present). Ventral side of head with 4+4–5+5 postlabial chaetae. Ant. 1 with 11 chaetae, 2 basal microsensilla (*bms*) and 2 sensilla (*s*). Ant.2 with 3 *bms* and 1 s, Ant.3 with 1 *bms* and 6 distal *s* (including two lateral). Sensilla on Ant.4 weakly differentiated, subapical organite very small, roundish.

Dorsal axial chaetom of Th.II–Abd.III as 7-9,5-6/4-5,4-5,4-5. Common chaetae rather thin, not serrated (Fig. 13). Thorax without ventral axial chaetae. Macrochaetae pointed, hardly differentiated. On Abd.V and VI dorsal macrochaetae better developed, 0.3–0.45 as long as tergite. Sensilla on tergites clearly differentiated, slightly shorter than ordinary chaetae, of the same width. Sensillar formula 3,3/2,2,2,2,4 (*s*), 1,1/1,1,1 (*ms*). On Abd III microsensilla positioned between lateral and medial sensilla, normally close to lateral ones (Figs 14–15). Sensilla on Abd.I–III in mid-tergal position. Medial and lateral pairs of sensilla on Abd.V similar in size and set usually in a transversal line (Fig. 13).

Unguis without teeth. Unguiculus longer than half of unguis (1.6–1.8). Ti.1-3 with 21,21,26–27 chaetae. B-row of chaetae on Ti.1–2 complete. Tibiotarsal tenent chaetae (1-2-2 on Ti.1–3) weakly developed, blunt, 0.8-1.1 as long as $U_3$. Femur 1 with 5 *a*-chaetae, 1 *ae*-chaeta, 3 *e*-chaetae, and 7 chaetae of *pe-p-pi-i*-group.

Upper and lower subcoxa with 1 and 6 chaetae on Leg 2 and 4–5 and 6–8 on Leg 3. Ventral tube with 4+4 laterodistal and 6–7 posterior chaetae. Tenaculum with 4+4 teeth and 1 chaeta. Anterior furcal subcoxa with 13–15, posterior one with 7–8 chaetae. Anterior side of manubrium with a pair of chaetae. Posterior side with 10-11+10-11 on the main part and 4+4 chaetae on laterobasal lobes. Dens anteriorly with 5–6 (rarely 4) chaetae in distal half, posterior side with 3 (rarely 4) chaetae. Mucro bidentate (Figs 10–11). Lamellae not differentiated. Ratio of manubrium : dens : mucro = 5.0–7.0 : 2.5–3.5 : 1.

DISCUSSION. Following the most comprehensive key of the genus mainly covered Palaearctic and north Nearctic congeners [Potapov et al., 2006], Magadan specimens will key to *S. millimetrica* Potapov et al., 2006 described from Khabarovsk Territory. However, the latter species sharing many common features with *S. postertriplex* sp.n. is characterized by different chaetotaxy of dens (6–8/7 in *millimetrica* ver. 5–6/3–4 in the new species). It should be noted that a proportion found in dental chaetotaxy of *S. postertriplex* sp.n., i.e. a strong reduction of posterior but not anterior chaetae, is not usual for the genus. Thus, all so far known congeners having only 2–4 posterior chaetae on dens, namely, *dodecocellata*, *montana*, *stachanoremi*, *baica*, *indigirka*, possess none or only one anterior chaetae.

DISTRIBUTION AND ECOLOGY. The species is common in mountain tundra belt of the type locality.

NAME DERIVATION. The species is well characterized with three posterior chaetae on dens.

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