

## ***Superodontella* STACH, 1949 (Collembola, Odontellidae) of Ukraine: new species, comparative morphological analysis and distribution**

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Received: 2 March 2009

Accepted: 10 April 2009

KAPRUS<sup>\*</sup> I. J. 2009. *Superodontella* STACH, 1949 (Collembola, Odontellidae) of Ukraine: new species, comparative morphological analysis and distribution. *Acta zoologica cracoviensia*, **52B**(1-2): 21-34.

**Abstract.** Three new species *Superodontella andrzeji* sp. n., *S. rotunda* sp. n. and *S. tyverica* sp. n. are described. *Superodontella montemaceli* ARBEA & WEINER, 1992 is redescribed based on Ukrainian material. These species differ in the number of sensilla on antennal segment IV, hr-chaetae on anal valves, ordinary chaetae on antennal segment II, head, thoracic terga II-III, abdominal sterna II-III and on tibiotarsi, in the shape of dental chaetae and in the chaetotaxy of labium. An identification key to nine Ukrainian species of the genus *Superodontella* is provided.

**Key words:** Collembola, *Superodontella*, new species, Ukraine.

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### I. INTRODUCTION

Now, the genus *Superodontella* STACH, 1949 contains 56 species (BELLINGER et al. 1996-2008). In the Ukrainian fauna six *Superodontella* species were found (KAPRUS<sup>\*</sup> et al. 2006). The recent taxonomical study of cited material of *Superodontella* in Ukraine revealed seven new species of this genus, three of them were described previously (KAPRUS<sup>\*</sup> & WEINER 2007). The presence of *Superodontella lamellifera* (AXELSON, 1903) and *Superodontella montemaceli* ARBEA & WEINER, 1992 was confirmed. However, four of cited species were not found in the study materials. The present paper provides descriptions of the three new species, redescription of *S. montemaceli* and an identification key to nine known species of the genus *Superodontella* from Ukraine. Comparative morphological analysis of diagnostic characters and geographical distribution of Ukrainian *Superodontella* species are given in Table 1.

### II. MATERIAL AND METHODS

In the descriptions, we used the morphological nomenclature as follows: for the dorsal chaetotaxy of head, thorax and abdomen, after JORDANA et al. 1997; for the perilabial chaetotaxy, after

Table 1

Diagnostic characters and geographical distribution of Ukrainian *Superodontella* species

Characters	Number of sensilla on Ant. IV	Number of chaetae on Ant. III	m1 chaetae on Th. tr. II, III and Abd. tr. IV	c2 chaetae on head and m4 chaetae on Th. tr. II and III	Presence of chaetae on labium	Number of chaetae on Abd. st. II, III	Chaeta on tenaculum	Number of chaetae on tibiae I, II and III	Empodial appendage	Number of hr-chaetae on anal valves	Ratio mucro / dens	Anal spines	Distribution
<i>S. andrzeji</i> sp. n.	9	10	+	-	A, B, C, e, F, f, G	3+3, 5+5	-	15, 15, 15	+	2+2+2	≈ 1.0	+	Podillya Hills, Carpathians, Ciscairpathia
<i>S. luculica</i> KAPRUS' & WEINER, 2007	7	12	+	-	A, c, d, e, F, f, G	3+3, 5+5	-	16, 16, 15	+	3+3+3	0.20	+	Carpathians, Transcarpathia
<i>S. lamellifera</i> (AXELSON, 1903)	12	12	-	-	e, F, f, G	3+3, 5+5	-	15, 15, 14	-	3+3+3	≈ 1.0	+	West part of Ukraine
<i>S. multisensillata</i> KAPRUS' & WEINER, 2007	13-14	13	+	-	F, f, G	4+4, 6+6	-	16, 16, 15	-	3+3+3	0.75	+	Podillya Hills, Carpathians
<i>S. montemaceli</i> ARBEA & WEINER, 1992	8	12-13	+	-	A, B, C, e, F, f, G	3+3, 5+5	-	16, 16, 15	+	2+2+2	≈ 1.0	+	Carpathians, Transcarpathia, Crimean Mt.
<i>S. rotunda</i> sp. n.	8	12	+	+	A, B, d, E, F, f, G	3+3, 6+6	-	14, 14, 14	-	3+3+3	≈ 1.0	+	Podillya Hills, Carpathians
<i>S. ruta</i> KAPRUS' & WEINER, 2007	7	12	+	-	A, c, d, e, F, f, G	3+3, 5+5	-	16, 16, 15	+	3+3+3	≈ 1.0	+	Carpathians, Transcarpathia
<i>S. tyverica</i> sp. n.	8	16-17	+	+	a, B, C, c, E, F, f, G	3+3, 6-7+6-7	-	17, 17, 16	-	3+3+3	≈ 1.0	-	Carpathians, Ciscairpathia
<i>S. cf. montemaceli</i> ARBEA & WEINER, 1992	9	11	+	-	(A, B, C, e, F, f, G)?	3+3, 5+5	+	16, 16, 15	+	3+3+3	≈ 1.0	+	Crimean Mt.

GAMA 1988; for the labial chaetotaxy, after MASSOUD 1967; for the structure of maxilla, after DEEHARVENG 1981; for the chaetae classification of anal valves, after HÜTHER 1962.

Abbreviations used in the text:

EPP – postero-external processus of fulcrum;

IPP – postero-internal processus of fulcrum;

2 and 3 st. ch. – group of chaetae of second and third abdominal sterna;

mn. v. – manubrial vertige;

Ant. III and IV – third and fourth antennal segments;

Th. tr. II and III – second and third thoracic terga;

Abd. tr. IV – fourth abdominal tergum;

Abd. st. II, III – second and third abdominal sterna;

slc – spine-like chaetae.

The materials examined are preserved in the collections of State Natural History Museum, Ukrainian National Academy of Sciences in L'viv (SNHMU) and in the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Kraków (ISEZP).

### III. SPECIES DESCRIPTIONS

#### *Superodontella andrzeji* sp. n.

(Figs 1-11)

*Superodontella* cf. *nana*: KAPRUS' 2000: 287

*Superodontella montemaceli*: KAPRUS' 1999: 260 (in part)

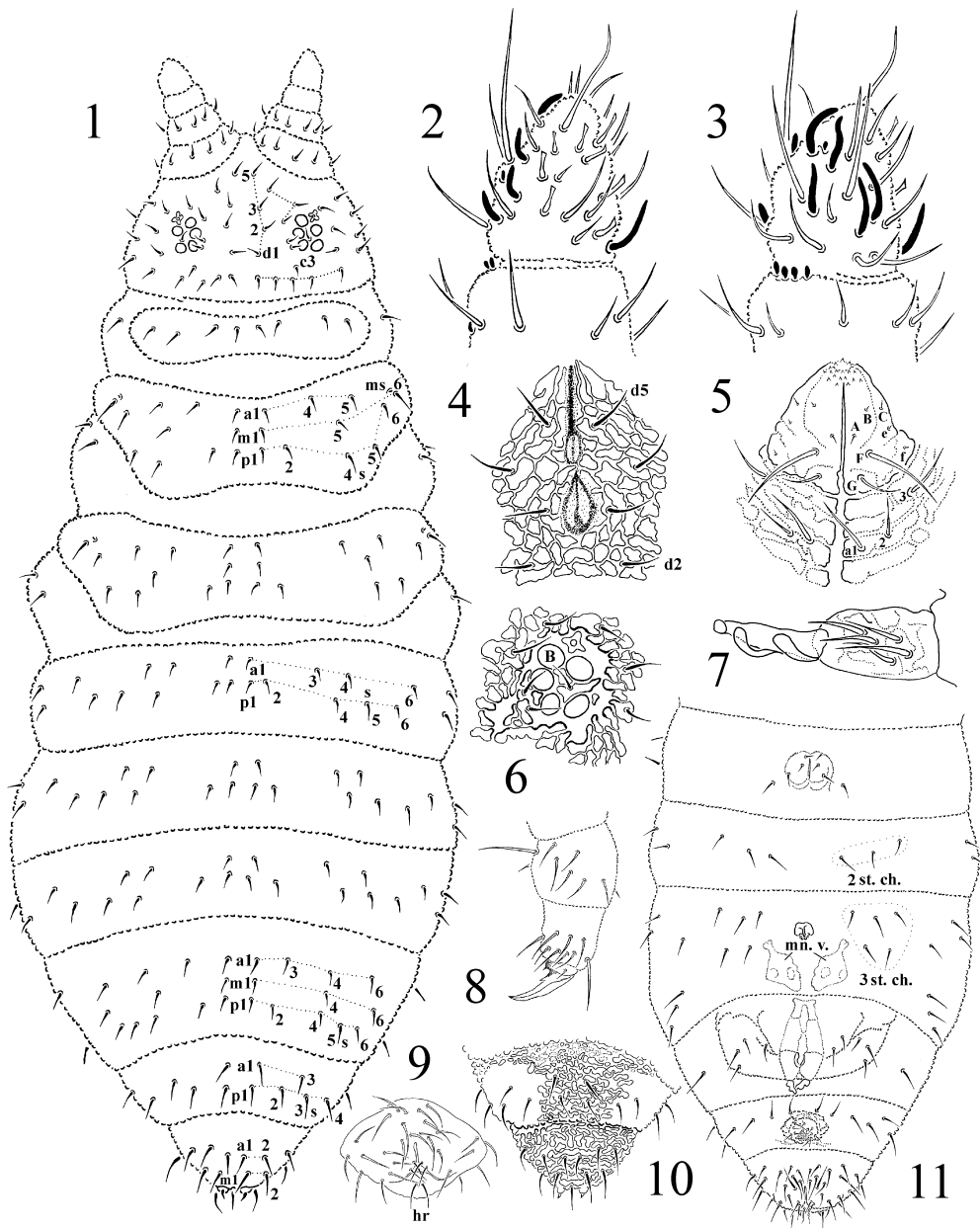
**D i a g n o s i s.** Postantennal organ about 0.94-1.0 times larger than ocellus B, amoeboid-like, with four lobes. Antennal segment IV with 9 subcylindrical curved sensilla, antennal segment III with 10 ordinary chaetae. Head without chaetae c2, chaetae c3 present. Thoracic terga II and III with m1, m5 and m6 chaetae in m-row (m4 absent). Labium (per half) with six papillate chaetae and seven ordinary chaetae: F as macrochaeta, G as mesochaeta and A, B, C, e, f as microchaetae. Perilabial area with 3+3 subequal a-chaetae. Abdominal sternum II with 3+3 chaetae, abdominal sternum III with 5+5 chaetae. Furca well developed with 5 identical chaetae on each dens. Each anal valve with two identical hr-chaetae. Tibiotarsi I, II and III with 15, 15 and 15 chaetae, respectively. Empodial appendage as a very small bristle. Anal spines present.

**T y p e m a t e r i a l.** Holotype – male on slide, Ukraine, Zakarpattia district, Polonyn'sky ridge, Borzhava mountain pasture-ground, 1000 m alt., *Fagus* virgin forest, leaf litter, 5.vii.1996, leg. L. Soukovata. Paratypes – 1 male and 3 females on slide, the same data as holotype.

**O t h e r m a t e r i a l.** 5 subadult females on slide, Ukraine, Ternopil' district, near Zbruch river, Krencliv village, *Carpinetum* forest with *Allium ursinum* L., leaf litter, 27.v.1994, leg. I. KAPRUS'; 2 females on slide, Ukraine, L'viv district, near Chodoriv town, *Quercus* forest, leaf litter, 19.iii.1999, leg. V. Javornyts'kyi; 1 juvenile specimen on slide, Ukraine, L'viv district, Skolivs'ki Beskydy, near Ghusne village, *Picea* forest, leaf litter, 7.vi.1991, leg. I. KAPRUS'. The material is preserved in the following collections: SNHMU – holotype and paratypes (2 males and 3 females) and other material; ISEZP – other materials (2 females).

**D e s c r i p t i o n.** Holotype (female) length 0.97 mm, paratypes (one males and three females) length 0.78-0.88 mm. Colour in alcohol spotted pale bluish, ocular plate blue-black. Body integument strongly granulated. The central granulated area on head between d2 and d5 chaetae as in Fig. 4, abdominal terga V-VI granulation as in Fig. 10.

Antennae about 4/3 of head length. Antennal segments I, II and III with 7, 10 and 10 chaetae, respectively. Sensory organ of antennal segment III with equivalent sensilla (S1 and S4) and sensory



Figs 1-11 – *Superodontella andrzeji* sp. n. 1 – dorsal chaetotaxy; 2 – antennal segments III and IV, ventral side; 3 – antennal segments III and IV, dorsal side; 4 – central area of head between d2 and d5 chaetae; 5 – labial and perilabial chaetotaxy; 6 – postantennal organ and ocelli; 7 – dens and mucro; 8 – distal part of leg III; 9 – anal valves chaetotaxy; 10 – abdominal terga V and VI; 11 – chaetotaxy of abdominal sterna I-VI.

rods (S2 and S3) with ventral microsensillum present (Fig. 5). External sensillum as long as 1.0-1.2 internal sensory rod. Antennal segment IV chaetotaxy: with about 22 ordinary chaetae, 9 trumpet-shaped chaetae and 9 subcylindrical curved sensilla, dorsoexternal microsensillum and subapical organite (Figs 2, 3).

Ocelli 5+5. Postantennal organ about 0.94-1.00 times larger than ocellus B, amoeboid shape with four lobes (Fig. 6). Buccal cone rather short. Two mandibles present; maxilla stipa bowed; I.P.P. and E.P.P. apparently articulated with fulcrum arm; I.P.P. strongly longer than E.P.P.

Labrum very difficult to observe, prelabral chaetae absent. Labium (per half) with six papillate chaetae and seven ordinary chaetae: F as macrochaeta, G as mesochaetae and A, B, C, e, f as microchaetae (Fig. 5). Perilabial area with 3+3 subequal chaetae a (a1-3), 1+1 chaetae m (m3) and 2+2 chaetae p (p1-2) (Fig. 5). Chaetae p1 about 2.2 times larger than chaetae a1.

Dorsal chaetotaxy as in Fig. 1. Ordinary chaetae subequal, smooth and pointed, not long on thoracic terga I-III and abdominal terga I-IV, abdominal terga V-VI with longer and slightly serrate chaetae. Formula of sensory chaetae s per half tergum: 022/11111. Microsensilla present on thoracic terga II and III. Head without chaeta a0 and with chaetae c3. Thoracic tergum I with 4+4 chaetae, thoracic terga II and III with 11+11 chaetae (m1, m5 and m6 present in m-row, m4 absent). Abdominal terga I-III with 9+9 chaetae, abdominal tergum IV with 12+12 chaetae (m1 chaetae present), chaeta s = p5.

Thoracic sterna without chaetae. Chaetotaxy of abdominal sterna as in Fig. 11. Ventral tube with 3+3 setae. Abdominal sternum I with 1 + 1 chaetae at the base of tubus ventralis, abdominal sternum II with 3+3 chaetae (2 st. ch.), abdominal sternum III with 5+5 chaetae (3 st. ch). The shape of manubrial vertige (mn. v.) on abdominal sternum III as in Fig. 11.

Furca well developed with 5 identical chaetae on each dens, approximately (Fig. 7). Manubrium with 11+11 chaetae posteriorly. Mucro typical of the genus, as long as the dens. Tenaculum with 3+3 teeth and without chaeta. Each anal valve with two identical hr-chaetae (Fig. 9).

Tibiotarsi I, II and III with 15, 15 and 15 pointed chaetae. Femora I, II and III with 10-11, 10-11 and 9-11 chaetae, trochanters I, II and III with 4-5, 5 and 4 chaetae, coxae I, II and III with 3, 5 and 5 chaetae, 2.subcoxae I, II and III with 0, 2 and 2 chaetae, 1.subcoxae I, II and III with 1, 2 and 2 chaetae, respectively. Legs without spine-like chaetae. Claws with an inner tooth in basal 1/3 and a single pair of lateral teeth (Fig. 8). Empodial appendage as a very small bristle. Anal spine rather short with strong granular papillae (Fig. 10).

**D i s c u s s i o n.** The new species is closest to *Superodontella subiasi* ARBEA & WEINER, 1991 known from Spain by the similar type of body chaetotaxy and labium, the presence of anal spines and rudimentary empodial appendage, number chaetae on dens, abdominal sternum III and posterior side of manubrium and the shape of postantennal organ. The species differ from each other by the number of chaetae on antennal segment III (10 in the new species and 12 in *S. subiasi*) and tibiotarsi I-III (15, 15, 15 in *S. andrzeji* and 16, 16, 15 in *S. subiasi*), the ratio of IPP/EPP (postero-internal procesus of fulcrum 6 times longer than postero-external one in the new species, postero-internal procesus of fulcrum 2.8 times longer than postero-external one in *S. subiasi*) and different location of nine sensilla on antennal segment IV in both species.

**E t y m o l o g y.** The species is dedicated cordially to Professor Andrzej Szeptycki, one of the first researcher of Ukrainian Protura.

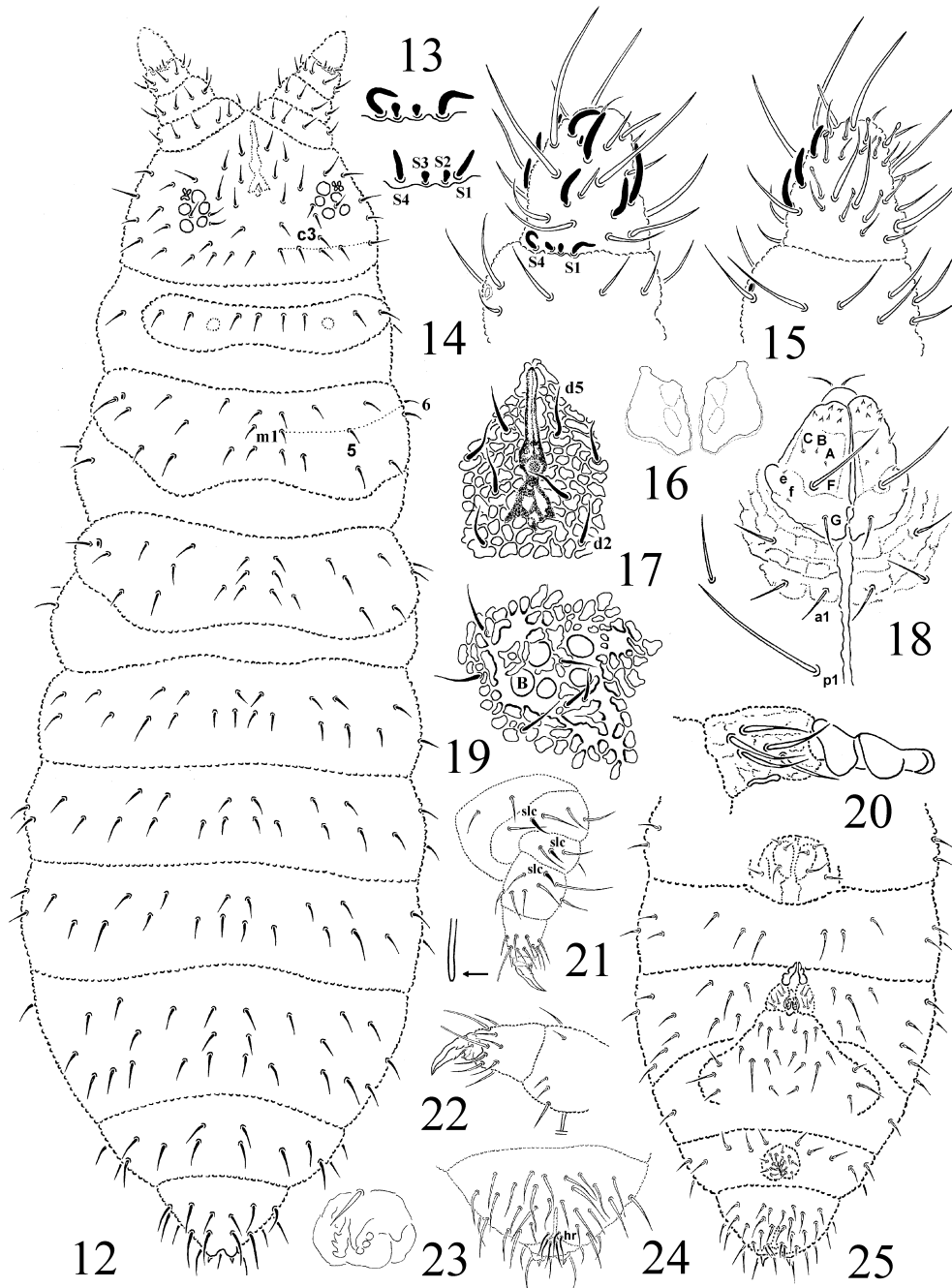
***Superodontella montemaceli* ARBEA & WEINER, 1992**

(Figs 12-25)

*Odontella pseudolamellifera*: KLYMOVS'KA & RUKAVETS' 1988: 136, (in part)

*Odontella empodialis*: KAPRUS' 1997: 652

*Superodontella* cf. *scabra*: KOZLOVSKY et al. 2000: 129, (in part)



Figs 12-22, 24, 25 – *Superodontella montemaceli* ARBEA et WEINER, 1992; 23 – *Superodontella* cf. *montemaceli* ARBEA et WEINER, 1992. 12 – dorsal chaetotaxy; 13 – sensilla and sensory rods of antennal III sense organ; 14 – antennal segments III and IV, dorsal side; 15 – antennal segments III and IV, ventral side; 16 – manubrial vertige on abdominal sternum III; 17 – central area of head between d2 and d5 chaetae; 18 – labial and perilabial chaetotaxy; 19 – postantennal organ and ocelli; 20 – dens and mucro; 21 – leg II; 22 – distal part of leg III; 23 – tenaculum; 24 – anal valves chaetotaxy; 25 – chaetotaxy of abdominal sterna I-VI.

**M a t e r i a l e x a m i n e d.** 4 subadults females and 5 juveniles on slides, Ukraine, Ivano-Frankivs'k district, Karpats'ky National Park, near Vorochta village, Chornohora ridge, Pozhyzhevskaya Mt., 1500 m alt., *Juniperus* bush, leaf litter, 27.vi.1991, leg. I. KAPRUS'; 3 subadults males, 8 subadults females and 6 juveniles specimens on slides, Ukraine, Zakarpattia district, Julivs'ky Mt., near Novoselytsia village, forest with *Quercus* and *Garpinus*, leaf litter and soil, 6.iv.1989, leg. I. KAPRUS'; 4 subadult females and 2 subadult males on slides, Ukraine, Zakarpattia district, Synevyr National Park, Synevyr'ska Poliana village, moss near stream, 14.ix.2005, leg. I. KAPRUS'; subadult male and juvenile specimen on slides, Ukraine, L'viv district, near Kamianka village, Skolivs'ki Beskydy ridge, 1000 m alt., crooked forest with *Fagus*, leaf litter and soil, 25.x.1989, leg. I. KAPRUS'; juvenile specimen on slide, Ukraine, L'viv district, Skolivs'ki Beskydy, near Ghusne village, *Picea* forest, leaf litter, 7.vi.1991, leg. I. KAPRUS'; 4 females and juvenile specimen on slide, Ukraine, L'viv district, near Busovysko village, Verchnio-Dnistrovs'ki Beskydy ridge, 700 m alt., forest with *Fagus* and *Abies*, leaf litter and soil, 6.vii.2002, leg. I. KAPRUS'; 2 females and juvenile specimen on slide, Ukraine, Zakarpattia district, Polonyn'sky ridge, Borzhava mountain pasture-ground, 1000 m alt., *Fagus virgin* forest, leaf litter, 6.vii.1996, leg. L. Soukovata; 4 subadult females and 13 juvenile specimens on slides, Ukraine, Zakarpattia district, Karpatsky Biosphere Reserve, Mala Ugol'ka village, *Fagus* forest, leaf litter and soil, 24.viii.1991, leg. I. KAPRUS'; juvenile specimen on slide, Ukraine, Ivano-Frankivs'k district, near Mykulychyn village, Gorgany ridge, 900 m alt., forest with *Fagus* and *Abies*, leaf litter and moss, 20.vi.1984, leg. V. Javornytsky; male on slide, Ukraine, Crimea, Aj-Petri Mt., near Jalta town, *Pinus* forest, 800 m alt., leaf litter, 20.v.2007, leg. A. Chaustov; juvenile on slide, Ukraine, Crimea, Mys Martian Cape, near Jalta town, *Pinus* forest, leaf litter, 1996, leg. Masalov.

**D e s c r i p t i o n.** Holotype (female) length 1.25 mm, paratypes length 1.00-1.95 mm. Colour in alcohol spotted pale bluish, ocular plate blue-black. Body integument strongly granulated. The central granulated area on head between d2 and d5 chaetae as in Fig. 17, abdominal terga V-VI granulation as in Fig. 10.

Antennae about 4/3 of head length. Antennal segments I, II and III with 7, 10 and 12-13 chaetae, respectively. Sensory organ of antennal segment III consisting of two small rounded internal sensory rods (S2 and S3) and two long bent or straight external sensilla (S1 and S4) with ventral microsensillum present (Figs 13-14). External sensillum as long as 2.5-4.5 internal sensory rod. Antennal segment IV chaetotaxy: with about 26 ordinary chaetae, 10 trumpet-shaped chaetae and 8 subcylindrical curved sensilla, dorsoexternal microsensillum and subapical organite (Figs 14-15).

Ocelli 5+5. Postantennal organ about 0.75-1.06 times larger than ocellus B, amoeboid shape with four lobes (Fig. 19). Buccal cone rather short. Two mandibles present; maxilla stipa bowed; I.P.P. and E.P.P. apparently articulated with fulcrum arm; I.P.P. strongly longer than E.P.P.

Labrum very difficult to observe, prelabral chaetae absent. Labium (per half) with six papillate chaetae and seven ordinary chaetae: F as macrochaeta, G as mesochaetae and A, B, C, e, f as microchaetae (Fig. 18). Perilabial area with 3+3 subequal chaetae a (a1-3), 1+1 chaetae m (m3) and 2+2 chaetae p (p1-2) (Fig. 18). Chaetae p1 about 2.3-3.5 times larger than chaetae a1.

Dorsal chaetotaxy as in Fig. 12. Ordinary chaetae subequal, smooth and pointed, not long on thoracic terga I-III and abdominal terga I-IV, abdominal terga V-VI with longer and slightly serrate chaetae. Formula of sensory chaetae s per half tergum: 022/11111. Microsensilla present on thoracic terga II and III. Head without chaeta a0 and with chaetae c3. Thoracic tergum I with 4+4 chaetae, thoracic terga II and III with 11+11 chaetae (m1, m5 and m6 present in m-row, m4 absent). Abdominal terga I-III with 9+9 chaetae, abdominal tergum IV with 12+12 chaetae (m1 chaetae present), chaeta s = p5.

Thoracic sterna without chaetae. Chaetotaxy of abdominal sterna as in Fig. 25. Ventral tube with 3+3 setae. Abdominal sternum I with 1 + 1 chaetae at the base of tubus ventralis, abdominal sternum II with 3+3 chaetae, abdominal sternum III with 5+5 chaetae. The shape of manubrial vertige on abdominal sternum III as in Fig. 16.



Furca well developed with 5 identical chaetae on each dens, approximately (Fig. 20). Manubrium with 11+11 chaetae posteriorly (Fig. 25). Mucro typical of the genus, as long as the dens. Tenaculum with 3+3 teeth and without chaeta. Each anal valve with two identical hr-chaetae (Fig. 24).

Tibiotarsi I, II and III with 16, 16 and 15 chaetae and possess 1, 2, 2 slightly blunt tenent hair, respectively (in adult specimens) (Figs 21, 22). Femora I, II and III with 12, 10-11 and 10 chaetae, trochanters I, II and III with 5, 5 and 4 chaetae, coxae I, II and III with 3, 5 and 5 chaetae, 2.subcoxae I, II and III with 0, 2 and 2 chaetae, 1.subcoxae I, II and III with 1, 2 and 2 chaetae, respectively. Femora, trochanters and coxae with one spine-like chaetae each (slc) (Fig. 21). Claws with an inner tooth in basal 1/3 and a single pair of lateral teeth (Figs 21, 22). Empodial appendage as a very small bristle. Anal spine rather short with strong granular papillae (Fig. 12).

**R e m a r k s.** *S. montemaceli* was described by ARBEA & WEINER 1992 on the base of subadult specimens from Poland (Pieniny Mt.). This species is characterized by the eight sensillae on antennal segment IV, by the presence of anal spines and rudimental empodial appendage, m1 chaetae on thoracic terga II-III and abdominal tergum IV, 12-13 chaetae on antennal segment III and 2 hr-chaetae on each anal valve, by the absence c2 chaetae on the head and m4 chaetae on thoracic terga II-III. Morphological characters of the Ukrainian specimens generally fit the original description, however there are some differences (external sensilla as long as 2.0 internal sensory rod, postantennal organ about 1.14 times larger than ocellus B and tibiotarsi with pointed tenent hair in *S. montemaceli* from Poland) which extend the range of variability of this species (in obedience to the personal communication of W.M. WEINER).

This species is a near relative of *S. andrzeji* sp. n. Differences and similarity among *S. montemaceli* and *S. andrzeji* are listed in Table 1.

### ***Superodontella rotunda* sp. n.**

(Figs 26-37)

*Superodontella* cf. *scabra*: KOZLOVSKY et al. 2000: 129 (in part).

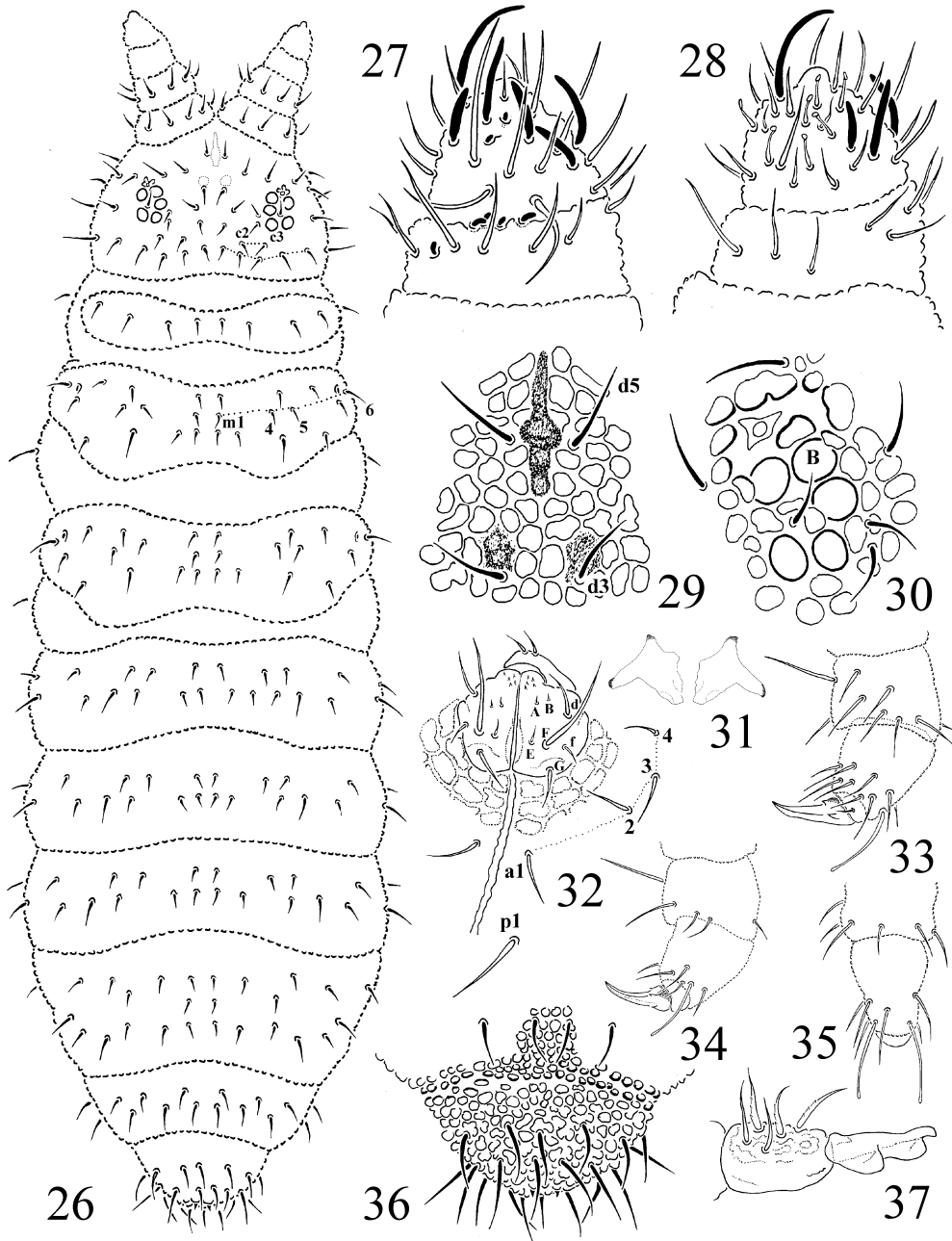
**D i a g n o s i s.** Postantennal organ about 0.85-0.95 times larger than ocellus B, amoeboid-like, with three lobes. Antennal segment IV with 8 subcylindrical curved sensilla, antennal segment III with 12 ordinary chaetae. Head with c2 and c3 chaetae present. Thoracic terga II and III with m1, m4, m5 and m6 chaetae in m-row. Labium (per half) with five papillate chaetae and seven ordinary chaetae: F as macrochaeta, G and d as mesochaetae and A, B, E, f as microchaetae. Perilabial area with 4+4 subequal a-chaetae. Abdominal sternum II with 3+3 chaetae, abdominal sternum III with 6+6 chaetae. Furca well developed with 5 chaetae on each dens, three internal chaetae are stronger and serrate slightly. Each anal valve with three identical hr-chaetae. Tibiotarsi I, II and III with 14, 14 and 14 chaetae, respectively. Empodial appendage absent. Very small anal spines present.

**T y p e m a t e r i a l.** Holotype – female on slide, Ukraine, L'viv district, Stryj region, Rozghirche village, *Fagus* forest, leaf litter, 1.iv.1980, leg. M. SERGIENKO. Paratypes – juvenile on slide, the same place as holotype; subadult female on slide, Ukraine, Khmelnytsk district, Kamianets'-Podil'sky region, Kytajghorod village, *Carpinus* forest, leaf litter, 17.vi.1995, leg. I. KAPRUS'; subadult female and juvenile on slides, Ukraine, Ternopil' district, Lomachyn'ci village, forest with *Quercus* and *Carpinus*, leaf litter and soil, 6.vi.1997, leg. I. KAPRUS'. The material is preserved in the SNHMU.

**D e s c r i p t i o n.** Holotype (female) length 1.23 mm, paratypes length 0.80-0.85 mm. Colour in alcohol spotted pale bluish, ocular plate blue-black. Body integument strongly granulated. The central granulated area on head between d3 and d5 chaetae as in Fig. 29, abdominal terga V-VI granulation as in Fig. 36.

Antennae about 4/3 of head length. Antennal segments I, II and III with 7, 10 and 12 chaetae, respectively. Sensory organ of antennal segment III consisting of two small rounded internal sensory





Figs 26-37 – *Superodontella rotunda* sp. n. 26 – dorsal chaetotaxy; 27 – antennal segments III and IV, dorsal side; 28 – antennal segments III and IV, ventral side; 29 – central area of head between d3 and d5 chaetae; 30 – postantennal organ and ocelli; 31 – manubrial vertige on abdominal sternum III; 32 – labial and perilabial chaetotaxy; 33 – distal part of leg II, external side; 34 – distal part of leg II, internal side; 35 – tibiotalarsus of leg II with clavate tenent hair; 36 – abdominal tergum VI with anal spines; 37 – dens and mucro.

rods (S2 and S3) and two long bent or straight external sensilla (S1 and S4) with ventral microsensillum present (Fig. 27). External sensillum as long as 2.0 internal sensory rod, approximately. Antennal segment IV chaetotaxy: with about 26 ordinary chaetae, 8 trumpet-shaped chaetae and 8 subcylindrical curved sensilla, dorsoexternal microsensillum and subapical organite (Figs 27, 28).

Ocelli 5+5. Postantennal organ about 0.85-0.95 times larger than ocellus B, amoeboid shape with three lobes (Fig. 30). Buccal cone rather short. Two mandibles present; maxilla stipa bowed; I.P.P. and E.P.P. apparently articulated with fulcrum arm; I.P.P. strongly longer than E.P.P.

Labrum very difficult to observe, prelabral chaetae absent. Labium (per half) with five papillate chaetae and seven ordinary chaetae: F as macrochaeta, G and d as mesochaetae and A, B, E, f as microchaetae (Fig. 32). Perilabial area with 4+4 subequal chaetae a (a1-4), 1+1 chaetae m (m3) and 2+2 chaetae p (p1-2) (Fig. 32). Chaetae p1 about 1.7-2.4 times larger than chaetae a1.

Dorsal chaetotaxy as in Fig. 26. Ordinary chaetae subequal, smooth and blunt, not long on thoracic terga I-III and abdominal terga I-III, abdominal terga IV-VI with longer, serrate, blunt or lightly clavate chaetae. Formula of sensory chaetae s per half tergum: 022/11111. Microsensilla present on thoracic terga II and III. Head without chaeta a0 and with chaetae c2 and c3. Thoracic tergum I with 4+4 chaetae, thoracic terga II and III with 12+12 chaetae (m1, m4, m5 and m6 present in m-row). Abdominal terga I-III with 9+9 chaetae, abdominal tergum IV with 12+12 chaetae (m1 chaetae present), chaeta s = p5.

Thoracic sterna without chaetae. Ventral tube with 3+3 setae. Abdominal sternum I with 1 + 1 chaetae at the base of tubus ventralis, abdominal sternum II with 3+3 chaetae, abdominal sternum III with 6+6 chaetae. The shape of manubrial vertige on abdominal sternum III as in Fig. 31.

Furca well developed with 5 chaetae on each dens, three internal chaetae are stronger and serrate slightly (Fig. 37). Manubrium with 11+11 chaetae dorsally. Mucro typical of the genus, as long as the dens. Tenaculum with 3+3 teeth and without chaeta. Each anal valve with three hr-chaetae.

Tibiotarsi I, II and III with 14, 14 and 14 chaetae and possess 1, 2, 2 slightly clavate tenent hair, respectively (Figs 33-35). Femora I, II and III with 11, 11 and 10 chaetae, trochanters I, II and III with 5, 5 and 4 chaetae, coxae I, II and III with 3, 5 and 5 chaetae, 2.subcoxae I, II and III with 0, 2 and 2 chaetae, 1.subcoxae I, II and III with 1, 2 and 2 chaetae, respectively. Legs without spine-like chaetae. Claws with an inner tooth in basal 1/3 and a single pair of lateral teeth (Fig. 34). Empodial appendage absent. Anal spines very small on low papillae (Fig. 36).

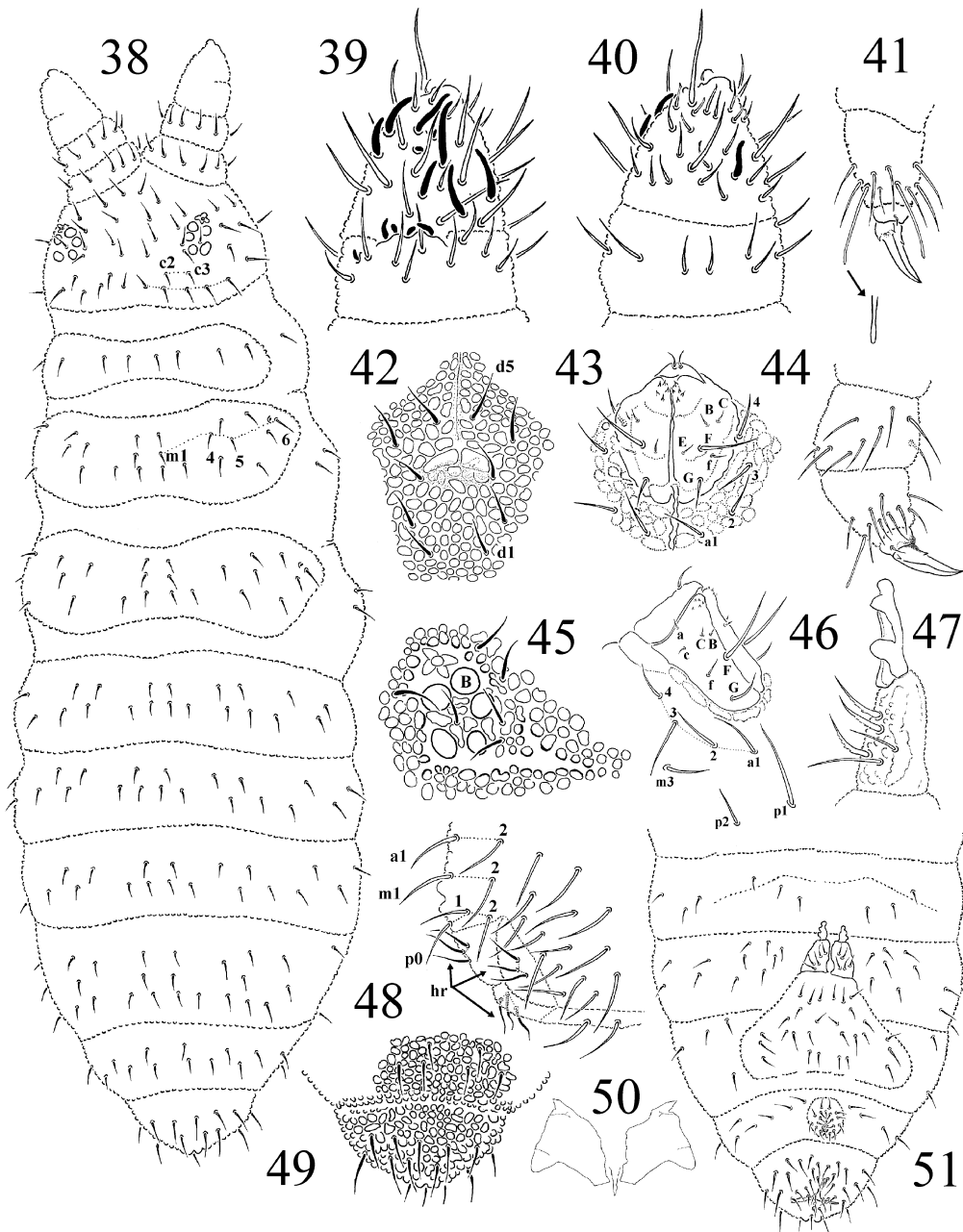
**D i s c u s s i o n.** The same type of body chaetotaxy, the presence of five chaetae on dens and 1, 2, 2, slightly clavate tenent hair on tibiotarsi I, II, III, the absence of empodial appendage, length ratio of mucro and dens show a close relationship between *S. rotunda* sp. n., *S. gisini* (GAMA, 1961) and *S. tyverica* sp. n. (see discription of *S. tyverica* below). The new species distinctly differ from *S. gisini* and *S. tyverica* in the presence of anal spines (absent in two other species), in the number of chaetae on tobiotarsi I-III (14, 14, 14 in the new species, 17, 17, 16 in *S. gisini* and *S. tyverica*) and on abdominal sternum III (6 + 6 in the new species, 5 + 5 in *S. gisini*, 6-7 + 6-7 in *S. tyverica*) and the shape of postantennal organ (with three lobes in the new species, with four lobes in *S. gisini* and *S. tyverica*). *S. rotunda* differ also from *S. gisini* by having seven chaetae on labium (4 in *S. gisini*) and from *S. tyverica* by twelve chaetae on antennal segment III (16-17 in *S. tyverica*).

**E t y m o l o g y.** The name of species derives from the Latin word "rotundus" – wheel-shaped, round.

### ***Superodontella tyverica* sp. n.**

(Figs 38-51)

**D i a g n o s i s.** Postantennal organ about 1.00-1.25 times larger than ocellus B, amoeboid-like, with four lobes. Antennal segment IV with 8 subcylindrical curved sensilla, antennal segment III with 16-17 ordinary chaetae. Head with c2 and c3 chaetae present. Thoracic terga II and III with m1, m4, m5 and m6chaetae in m-row. Labium (per half) with five papillate chaetae and six ordinary chaetae: F as macrochaeta, G as mesochaetae and B, C, a, c, E, f as microchaetae. Perilabial area



Figs 38-51 – *Superodontella tyverica* sp. n. 38 – dorsal chaetotaxy; 39 – antennal segments III and IV, dorsal side; 40 – antennal segments III and IV, ventral side; 41 – distal part of leg III; 42 – central area of head between d1 and d5 chaetae; 43, 46 – labial and perilabial chaetotaxy; 44 – distal part of leg III, external side; 45 – postantennal organ and ocelli; 47 – dens and mucro; 48 – abdominal tergum VI and anal valves chaetotaxy; 49 – abdominal terga V and VI; 50 – manubrial vertige on abdominal sternum III; 51 – chaetotaxy of abdominal sterna II-VI.

with 4+4 subequal a-chaetae. Abdominal sternum II with 3+3 chaetae, abdominal sternum III with 6-7+6-7 chaetae. Furca well developed with 5 chaetae on each dens, three internal chaetae are stronger and serrate lightly. Each anal valve with three hr-chaetae. Tibiotarsi I, II and III with 17, 17 and 16 chaetae, respectively. Empodial appendage and anal spines absent.

**T y p e m a t e r i a l.** Holotype – male on slide, Ukraine, L'viv district, Mykolajiv region, Us-tia village, forest with *Quercus and Carpinus*, leaf litter, 10.vi.1997, leg. I. KAPRUS'. Paratypes – 2 adult females and subadult female on slides, the same place as holotype.

**O t h e r m a t e r i a l.** Male on slide, Ukraine, Ivano-Frankivs'k district, Karpats'ky National Park, near Vorochta village, Chornohora ridge, Pozhzyhevska Mt., 1600 m alt., *Duschekia viridis* bushes, leaf litter, 27.vi.1991, leg. I. KAPRUS'. The material is preserved in the following collections: SNHMU – holotype and paratypes (2 females) and other material; ISEZP – paratype (female).

**D e s c r i p t i o n.** Holotype (female) length 0.97 mm, paratypes length 0.77-1.03 mm. Colour in alcohol spotted pale bluish, ocular plate blue-black. Body integument strongly granulated. The central granulated area on head between d1 and d5 chaetae as in Fig. 42, abdominal terga V-VI granulation as in Fig. 49.

Antennae about 4/3 of head length. Antennal segments I, II and III with 7, 10 and 16-17 chaetae, respectively. Sensory organ of antennal segment III consisting of two small rounded internal sensory rods (S2 and S3) and two long bent or straight external sensilla (S1 and S4) with ventral micro-sensillum present (Fig. 42). External sensillum as long as 2.0 internal sensory rod, approximately. Antennal segment IV chaetotaxy: with about 30 ordinary chaetae, 7 trumpet-shaped chaetae and 8 subcylindrical curved sensilla, dorsoexternal microsensillum and subapical organite (Figs 39-40).

Ocelli 5+5. Postantennal organ about 1.00-1.25 times larger than ocellus B, amoeboid shape with four lobes (Fig. 45). Buccal cone rather short. Two mandibles present; maxilla stipa bowed; I.P.P. and E.P.P. apparently articulated with fulcrum arm; I.P.P. longer than E.P.P.

Labrum very difficult to observe, prelabral chaetae absent. Labium (per half) with five papillate chaetae and seven ordinary chaetae: F as macrochaeta, G as mesochaetae and B, C, a, c, E, f as microchaetae (Figs 43, 46). Perilabial area with 4+4 subequal chaetae a (a1-4), 1+1 chaetae m (m3) and 2+2 chaetae p (p1-2) (Fig. 46). Chaetae p1 about 1.6-1.9 times larger than chaetae a1.

Dorsal chaetotaxy as in Fig. 38. Ordinary chaetae subequal, smooth and blunt, not long on thoracic terga I-III and abdominal terga I-III, abdominal terga IV-VI with longer serrate chaetae. Abdominal terga I-VI possess separate blunt or slightly clavate chaetae. Formula of sensory chaetae s per half tergum: 022/11111. Microsensilla present on thoracic terga II and III. Head without chaeta a0 and with chaetae c2 and c3. Thoracic tergum I with 4+4 chaetae, thoracic terga II and III with 12+12 chaetae (m1, m4, m5 and m6 present in m-row). Abdominal terga I-III with 9+9 chaetae, abdominal tergum IV with 12+12 chaetae (m1 chaetae present), chaeta s = p5.

Thoracic sterna without chaetae. Chaetotaxy of abdominal sterna as in Fig. 51. Ventral tube with 3+3 setae. Abdominal sternum I with 1+1 chaetae at the base of tubus ventralis, abdominal sternum II with 3+3 chaetae, abdominal sternum III with 6-7+6-7 chaetae. The shape of manubrial vertige on abdominal sternum III as in Fig. 50.

Furca well developed with 5 chaetae on each dens, three internal chaetae are stronger and serrate slightly (Fig. 47). Manubrium with 13-14+13-15 chaetae dorsally (Fig. 51). Mucro typical of the genus, as long as the dens. Tenaculum with 3+3 teeth and without chaeta. Each anal valve with three hr-chaetae (Fig. 48).

Tibiotarsi I, II and III with 17, 17, 16 chaetae and possess 1, 2, 2 blunt or slightly clavate tenent hair, respectively (Figs 41, 44). Femora I, II and III with 12, 11 and 10 chaetae, trochanters I, II and III with 5, 5 and 4 chaetae, coxae I, II and III with 3, 5-6 and 5-6 chaetae, 2.subcoxae I, II and III with 0, 2 and 2 chaetae, 1.subcoxae I, II and III with 1, 2 and 2 chaetae, respectively. Legs without spine-like chaetae. Claws with an inner tooth in basal 1/3 and a single pair of lateral teeth (Fig. 41). Empodial appendage absent. Anal spines absent but strong granular papillae present (Fig. 49).

**D i s c u s s i o n.** The new species is related to *Superodontella aspinata* (DEHARVENG & IZARRA, 1979) from France and *S. gisini* (GAMA, 1961) from south-west part of Europe. These three species have the same type of body chaetotaxy, lacking empodial appendage and anal spines, the same number of chaetae on tibiotarsi and dens, the postantennal organ with four lobes and claws with inner tooth and a single pair of lateral teeth. Tibiotarsi I, II and III of all three species with 1, 2, 2 blunt or slightly clavate tenent hair, respectively. They differ in the number of chaetae on labium (6 in the new species, 3 in *S. aspinata* and 5 in *S. gisini*), on antennal segment III (16-17 in the new species, 13-15 in *S. aspinata* and 14 in *S. gisini*) and on manubrium posteriorly (13-14+13-15 in the new species, 10+10 in *S. aspinata* and 11+11 in *S. gisini*). *S. aspinata* and *S. gisini* possess nine sensilla on antennal segment IV, while *S. tyverica* has eight such sensilla. The mucro in *S. aspinata* is small, as long as 1/3-1/2 dens, whereas in *S. gisini* as 2/3 dens and in the new species the same length as the dens, approximately.

**E t y m o l o g y.** The name of species descends from the name of ancient “tyvertsi” nation who existed on the modern territory of West Ukraine.

#### Key to the Ukrainian *Superodontella* species

1. Thoracic terga II, III and abdominal tergum IV without m1 chaetae . . . *S. lamellifera* (AXELSON, 1903)
  - Thoracic terga II, III and abdominal tergum IV with m1 chaetae (Fig. 1). . . . . 2
2. Head with c2 chaetae, thoracic terga II and III with four m-chaetae (m4 present) (Fig. 38) . . . . . 3
  - Head without c2 chaetae, thoracic terga II and III with three m-chaetae (m4 absent) (Fig. 1) . . . . . 4
3. Anal spines present, tibiotarsi I, II and III with 14, 14 and 14 chaetae respectively, antennal segment III with 12 chaetae. . . . . *S. rotunda* sp. n.
  - Anal spines absent, tibiotarsi I, II and III with 17, 17 and 16 chaetae respectively, antennal segment III with 16-17 chaetae . . . . . *S. tyverica* sp. n.
4. Tenaculum with one chaeta (Fig. 23). . . . . *S. cf. montemaceli* ARBEA & WEINER, 1992
  - Tenaculum without chaeta . . . . . 5
5. Antennal segment IV with 13-14 subcylindrical sensilla, labium only with 3+3 chaetae, abdominal sterna II and III with 4+4 and 6+6 chaetae, respectively . . . . .
  - . . . . . *S. multisensillata* KAPRUS<sup>1</sup> & WEINER, 2007
  - Antennal segment IV with 7-9 subcylindrical sensilla, labium with 7+7 chaetae, abdominal sterna II and III with 3+3 and 5+5 chaetae, respectively . . . . . 6
6. Each anal valve with three hr-chaetae (Fig. 48), antennal segment IV with 7 subcylindrical sensilla . . . . . 7
  - Each anal valve with two hr-chaetae (Fig. 9), antennal segment IV with 8-9 subcylindrical sensilla . . . . . 8
7. Mucro very small, about 0.2 of dens, dens with five identical chaetae. . . . .
  - . . . . . *S. huculica* KAPRUS<sup>1</sup> et WEINER, 2007
  - Mucro large, as long as the dens, dens with five chaetae, three of them are serrated and stronger than others . . . . . *S. ruta* KAPRUS<sup>1</sup> et WEINER, 2007
8. Sensory organ of antennal segment III with equivalent sensilla and sensory rods (Fig. 3), antennal segment III with 10 chaetae, tibiotarsi I, II and III with 15, 15 and 15 chaetae, respectively . . .
  - . . . . . *S. andrzejki* sp. n.
  - Sensory organ of antennal segment III with two small sensory rods and two very long sensilla (Figs 13, 14), antennal segment III with 12-13 chaetae, tibiotarsi I, II and III with 16, 16 and 15 chaetae, respectively . . . . . *S. montemaceli* ARBEA & WEINER, 1992

**A c k n o w l e d g e m e n t s.** I am indebted to W. M. WEINER (Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland) for valuable help and detailed information about morphology of some *Superodontella* species.

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