Micronella najtae n. sp. (Collembola: Brachystomellidae), a new species from Tierra del Fuego with a key to the species

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ABSTRACT
A new species, *Micronella najtae* n. sp. is described. It has the following combination of characters: six sensilla on antennal segment IV, sensory organ of antennal segment III with two inner sensory "clubs", 7-8 vesicles in postantennal organ, unguis without inner tooth and ratio of ordinary chaetae: sensory chaetae on abdominal tergites I-III as 1: 2.3-2.6. The dorsal chaetotaxy places the new species in an isolated position in the genus. An identification key to the five species of the genus *Micronella* Arlé, 1959 is given.

KEY WORDS
Chaetotaxy,
neotropic,
Argentina,
Southern part
of South America,
new species.

RÉSUMÉ
Micronella najtae *n. sp. (Collembola: Brachystomellidae), une espèce nouvelle de la Terre de Feu, avec une clé des espèces.*
Une espèce nouvelle, *Micronella najtae* n. sp., est décrite. Elle presente la combinaison de caractères suivante : article antennaire IV avec six sensilles, organe sensoriel de l'article antennaire III avec deux sensilles internes en « club », organe postantennaire avec 7-8 vesicules, griffe sans dent interne et ratio soies ordinaires : soies sensorielles des terguites abdominaux I-III au nombre de 1:2.3-2.6. La chétotaxie dorsale place la nouvelle espèce dans une position isolée dans l'ensemble du genre. Une clé d'identification pour les cinq espèces du genre *Micronella* Arlé, 1959 est donnée.

MOTS CLÉS
Chaetotaxie,
néotropical,
Argentine,
sud de l'Amérique du Sud,
espèce nouvelle.

INTRODUCTION

The Argentinean Tierra del Fuego belongs to the Patagonian biogeographic region (region 36 of Christiansen & Bellinger 1995). The first paper on Collembola from this region was by Schäffer (1897), which described a new species of *Brachystomella* Ågren, 1903 under the name *Schoettella subcrassa*. Other authors who published papers on the Brachystomellidae Stach, 1949 of the region were Wahlgren (1906), Rapoport & Rubio (1968), Najt (1973), Najt & Massoud (1974), and Weiner & Najt (1997, 2001).

The family Brachystomellidae has a world-wide distribution and currently comprises 38 genera and 131 species (Bellinger *et al.* 1996-2016). However, half of the genera are monospecific and with restricted distributions. The family is represented in the Patagonian region by eight described species in only five genera: *Brachystomella ronderosi* Najt, 1973; *B. subcrassa* (Schäffer, 1897); *B. tuberculata* (Wahlgren, 1906); *Brachystomellides navarinensis* Weiner & Najt, 1997; *Cassagnella alba* Najt & Massoud, 1974; *C. sergioi* (Najt, 1973); *Parastomella mylodontis* Rapoport & Rubio, 1968; and *Setanodosa fueguensis* Najt, 1973.

The genus *Micronella* was erected by Arlé (1959) in order to separate the species *Brachystomella porcus* Denis, 1933 from its congeners, and is currently composed of four described species (Queiroz & Mendonça 2013; Bellinger *et al.* 1996-2016). *Micronella najtae* n. sp., the fifth species in the genus with a Neotropical distribution is described here. This species was found among an abundant material of Collembola collected in the steppes of Tierra del Fuego, Argentina.

MATERIAL AND METHODS

Specimens were mounted in Hoyer's medium, after clearing in Nesbitt's solution. Material is deposited in the National Museum of Natural Sciences of Madrid, Spain and in the Muséum national d'Histoire naturelle of Paris, France.

In the description I use the nomenclature of morphological features as proposed by Massoud (1967), Jordana *et al.* (1997), and D'Haese (2003). The formula for the tibiotarsal chaetotaxy used is the total number of chaetae (number of chaetae in the distal whorl (A + T) and the number of chaetae in the proximal whorl B).

Abbreviations

Body parts

Abd	abdominal segments;
AIIIO	sensorial organ of Ant III;
Ant	antennal subsegments;
Cx	coxae;
Fe	femur;
PAO	postantennal organ;
Scx	subcoxae;
s-chaetae	sensory chaetae;
Th	thoracic segments;
Tita	tibiotarsi;
Tr	Trochanter.

Antennal sensilla

S1-8	following the unified system of D'Haese (2003).

Body chaetae

a1-6	anterior row of chaetae;
m1-6	medial row of chaetae;
p1-6	posterior row of chaetae.

Cephalic chaetae

a0	unpaired anterior chaeta;
d1-5	dorsal chaetae;
sd1-5	subdorsal chaetae;
oc1-3	ocular chaetae;
c2	anterior occipital chaetae;
p1-5	posterior occipital chaetae.

Labial chaetae

A	labial papilla;
b, c, d, e	chaetae of mentum;
E, F, G, f	chaetae of submentum.

Institutions

MNCN	National Museum of Natural Sciences, Madrid;
MNHN	Muséum national d'Histoire naturelle, Paris.

SYSTEMATICS

Family BRACHYSTOMELLIDAE Stach, 1949
Genus *Micronella* Arlé, 1959

Micronella najtae n. sp.
(Figs 1, 2; Tables 1, 2)

Type material. — **Holotype**. ♀, Tierra de Fuego, near Rio Grande, Argentina, *Chiliotrichum* Cass. dense scrub, with *Festuca gracillima* Hook. F. and *Chiliotrichum diffusum* (G.Forst), S. M. Bonaventura and V. Mascitti leg., II.2001, deposited in MNCN.
Paratypes. All specimens from same locality as holotype, 2 ♀ and 1 juvenile. ♀ paratype deposited in MNCN, ♀ and juvenil paratypes in MNHN.

Type locality. — Argentina, Tierra del Fuego, near Rio Grande (53°36'S, 68°04'W).

Diagnosis. — Habitus and buccal cone typical for the genus *Micronella*. Ant IV with six sensilla. PAO with 7-8 vesicles. Whitout eyes. On Abd tergites s-chaetae 2.3-2.6 times longer than ordinary chaetae, formula of s-chaetae per half tergum: 022/211110. Head with chaetae a0 and without chaeta d0/dx. Th I with 3 + 3 chaetae. Th II with a2 chaetae. Abd I-III with s-chaetae in position p4. Furca absent. Tibiotarsi I, II and III with 17, 17 and 16 chaetae, respectively. Claw without inner tooth. Each anal valve with 1 hr microchaetae.

Etymology. — The new species is dedicated to the late Judith Najt, a prominent Argentinean-French researcher of Collembola.

Description

Body

Habitus typical of the genus. Body length of holotype female: 0.63 mm; body length of paratypes: 0.54-0.70 mm. Colour in ethanol: white, no pigmentation.

FIG. 1. — *Micronella najtae* n. sp.: **A**, dorsal chaetotaxy; **B**, ventral chaetotaxy; **C**, PAO and its surrounding chaetae. Abbreviations: see Material and methods. Scale bars: A, B, 0.1 mm; C, 0.03 mm.

TABLE 1. — Dorsal chaetotaxy of *Micronella najtae* n. sp. Abbreviations: see Material and methods.

Cephalic chaetotaxy						
	sd	**d**	**a0**	**oc**	**c**	**p**
N. chaetae	5	5	1	3	1	5
Chaetae	sd1-5	d1-5	a0	oc1-3	c2	p1-5

Body chaetotaxy						
	a	**m**	**p**	**Chaetae**		
Th I	–	3	–	–	m1,2,3	–
Th II	4	2	5	a1,2,4,6	m5,6	p1,2,3,4,6
Th III	3	2	5	a1,4,6	m5,6	p1,2,3,4,6
Abd I	3	–	6	a1,3,6	–	p1,2,3,4,5,6
Abd II-III	3	–	5	a1,3,6	–	p1,2,3,4,5
Abd IV	4	–	4	a1,2,4,5	–	p1,2,3,5
Abd V	2	–	3	a1,3	–	p1,2,3
Abd VI	2	2	2+1	a1,2	m1,2	p1,2 + p0

TABLE 2. — Main characters of species of *Micronella* Arlé, 1959. Symbols: **+**, present; **–**, absent; **?**, unknown. Abbreviations: see Material and methods.

Species	***M. checayensis* Massoud, 1967**	***M. itacaman* Queiroz & Mendonça, 2013**	***M. longisensilla* Queiroz & Mendonça, 2013**	***M. porcus* (Denis, 1933)**	***M. najtae* n. sp.**
Ant IV sensilla	?	5	4	6	6
Shape of sensilla of AIIIO	curved, opposite sense	one bilobed, one "club"	"cloverleaf"	"club"	"club"
PAO vesicles	15	7-8	12-13	6-8	7-8
Ratio ordinary chaetae: s-chaetae on Abd I-III	?	1:1	1:2	1:1.3	1:2.3-2.6
Serrated chaetae on body	?	+	–	–	–
Unguis tooth	+	+	–	–	–
a2 chaetae on Th II	?	–	–	–	+
position of s-chaetae on Abd I-III	?	p3	p3	p3	p4
Type locality	Peru	Brazil	Brazil	Costa Rica	Tierra del Fuego

Antennae

Ratio head diagonal: antenna = 1:0.66. Ant I with 7 chaetae. Ant II with 12 chaetae. Ant III and IV fused dorsally, ventral separation marked. AIIIO with 2 small club shaped sensilla, 2 longer and subcylindrical guard sensilla; ventral microsensillum present. Ant IV with simple apical bulb and 6 sensilla (S1-4, S7, S8), two weakly differentiated from ordinary chaetae (S3 and S8); dorsolateral microsensillum present; subapical organite round; with about 30 short ventral chaetae (Fig. 2D, E).

Head

Without eyes. PAO with 7-8 vesicles disposed in rosette (Fig. 1C). Maxilla rectangular with 5 teeth (Fig. 2F). Labral formula: 2/2334. Labium typical of *Brachystomella* (Fig. 2G), labial palp with one papillated chaeta (A) and 4 proximal chaetae (a1-2, p1-2); mentum with 5 chaetae (b, c, d, e, e'); submentum with 4 chaetae (E, F, G, f).

Dorsal chaetotaxy (Fig. 1A)

Head with chaeta a0, 3 + 3 oc chaetae and without d0/dx chaeta. Dorsal chaetotaxy composed of ordinary smooth chaetae and s-chaetae becoming longer towards the distal segments of the body. Ratio of Abd I-III ordinary chaetae: s-chaetae = 1:2.3-2.6. Th I with 3 + 3 chaetae. Sensillar formula by half tergum: 022/211110. Th II and III with s-chaetae in position p3 and m6; microsensillum adjacent to m6 s-chaetae on Th II. Abd I-III with s-chaetae in position p4; one s-chaeta also present on Abd I as p6. Abd IV-V with s-chaetae s in position p3 and p2 respectively. Full description of dorsal chaetotaxy is given in Table 1.

Ventral chaetotaxy (Figs 1B; 2A)

Head with 2 + 2 postlabial chaetae. Th I-III sterna without chaetae. Ventral tube with 3 + 3 distal chaetae. Abd I-III sterna with 0, 1 + 1, 3 + 3 chaetae respectively. Furca completely absent, with well-defined furcal area with six microchaetae arranged in two rows: anterior row with four microchaetae and posterior row with two microchaetae (Fig. 2H). Abd IV sternum chaetotaxy, according to nomenclature of Massoud & Najt (1975): 6 + 6 peripheral chaetae, central polygon formed by 3 + 3 chaetae, 1 + 1 anterior chaetae and 2 + 2 posterior chaetae (Fig. 2A). Abd V sternum with 4 + 4 chaetae between macrochaetae. Each anal valve with 11 chaetae and 1 hr microchaetae.

Legs

Chaetotaxy of legs I-III as follows: Scx I- 1, 2, 2; Scx II- 0, 2, 2; Cx- 3, 6, 7; Tr- 5, 5, 5; Fe- 12, 10, 10; Tita- 17(10 + 7), 17(10 + 7), 16(10 + 6). Tenent hair on tibiotarsi acuminate; unguis of legs I-III without median inner tooth (Fig. 2B, C).

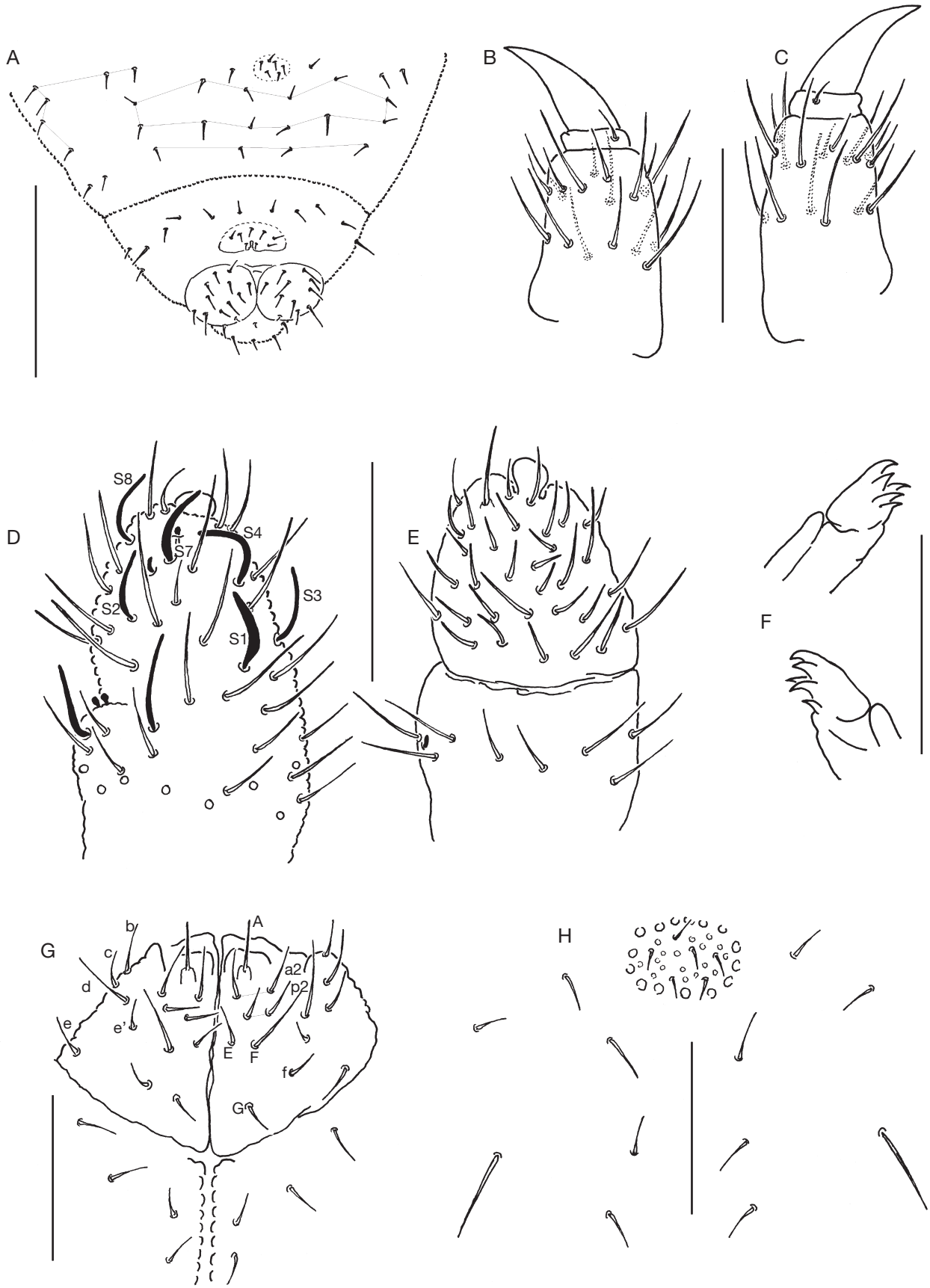

FIG. 2. — *Micronella najtae* n. sp.: **A**, anal valves and ventral view of Abd IV-VI; **B**, tita of leg I; **C**, tita of leg III; **D**, dorsal view of Ant III-IV; **E**, ventral view of Ant III-IV; **F**, maxillae; **G**, labium; **H**, furcal area and its surrounding chaetae. Abbreviations: see Material and methods. Scale bars: A, 0.1 mm; B-H, 0.03 mm.

KEY TO THE SPECIES OF *MICRONELLA* ARLÉ, 1959
(PARTIALLY AFTER QUEIROZ & MENDONÇA 2013)

1. PAO with up to 13 vesicles; unguis without or with minute inner tooth 2
— PAO with 15 vesicles, unguis with inner tooth ..... *Micronella checayensis* Massoud, 1967

2. Th II with a2 chaetae; Abd I-III with s-chaetae in position p4 ..... *Micronella najtae* n. sp.
— Th II without a2 chaetae; Abd I-III with s-chaetae in position p3 3

3. PAO with up to eight vesicles; ratio ordinary chaetae:s-chaetae on Abd I-III approximatly 1:1 4
— PAO with 12-13 vesicles; ratio ordinary chaetae: s-chaetae on Abd I-III = 1:2 .....
..... *Micronella longisensilla* Queiroz & Mendonça, 2013

4. Ant IV with six sensilla; smooth chaetae on body; unguis without inner tooth ..... *Micronella porcus* (Denis, 1933)
— Ant IV with five sensilla; serrated chaetae on body; unguis of Tita I and II with minute inner tooth .....
..... *Micronella itacaman* Queiroz & Mendonça, 2013

DISCUSSION

The new species, *Micronella najtae* n. sp., is well characterised in the genus. It can be distinguished from its congeners by dorsal chaetotaxy (a2 chaetae present on Th II and s-chaetae on Abd I-III in position p4). In relation to sense organs on antennae and number of vesicles on PAO, the new species is most similar to *M. porcus*, as they have six sensilla on Ant IV, sensory "clubs" on AIIIO and 6-8 vesicles on PAO. Main differences between all *Micronella* species are summarized in Table 2.

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