



Four new *Pseudosinella* (Collembola: Entomobryidae) from La Rioja, Spain

JOSÉ C. SIMÓN BENITO¹ & JOSÉ G. PALACIOS-VARGAS²

¹Comisión Docente de Zoología, Departamento de Biología, C/Darwin, 2, Universidad Autónoma de Madrid, 28049 Madrid, Spain.
E-mail: carlos.simón@uam.es

²Laboratorio de Ecología y Sistemática de Microartrópodos, Dpto. Biología, Facultad de Ciencias, UNAM, 04510 México, D. F., México. E-mail: jgpv@ph.fciencias.unam.mx

Abstract

Four new species of *Pseudosinella* from La Rioja, Spain are described and illustrated. They are *P. logrognensis* **sp. nov.**, *P. leivaensis* **sp. nov.**, *P. gutierrezae* **sp. nov.** and *P. torcuatoensis* **sp. nov.**, which were found in soils of different field crops. Identification keys are given for some of them, based on the chaetotaxy or the number of eyes, in order to compare the new species with those having 5 + 5 eyes.

Key words: Collembola, Entomobryidae, *Pseudosinella*, Spain, La Rioja, new species

Introduction

Even though the genus *Pseudosinella* has been well studied in the Iberian Peninsula, new species continue to be found. In a recent study of agricultural soils from La Rioja Region of Spain, we found four species, which were identified as new thanks to the electronic keys posted on the web page by Christiansen (2007).

For the description of the new species and the keys, we use the system of Gisin (1967) and we give the formula of Christiansen *et al.* (1990) and the same abbreviations as we used in our recent contribution to this genus (Simón Benito & Palacios-Vargas 2007).

Species description

Pseudosinella logrognensis **sp. nov.**

Figs 1–4, Table 1

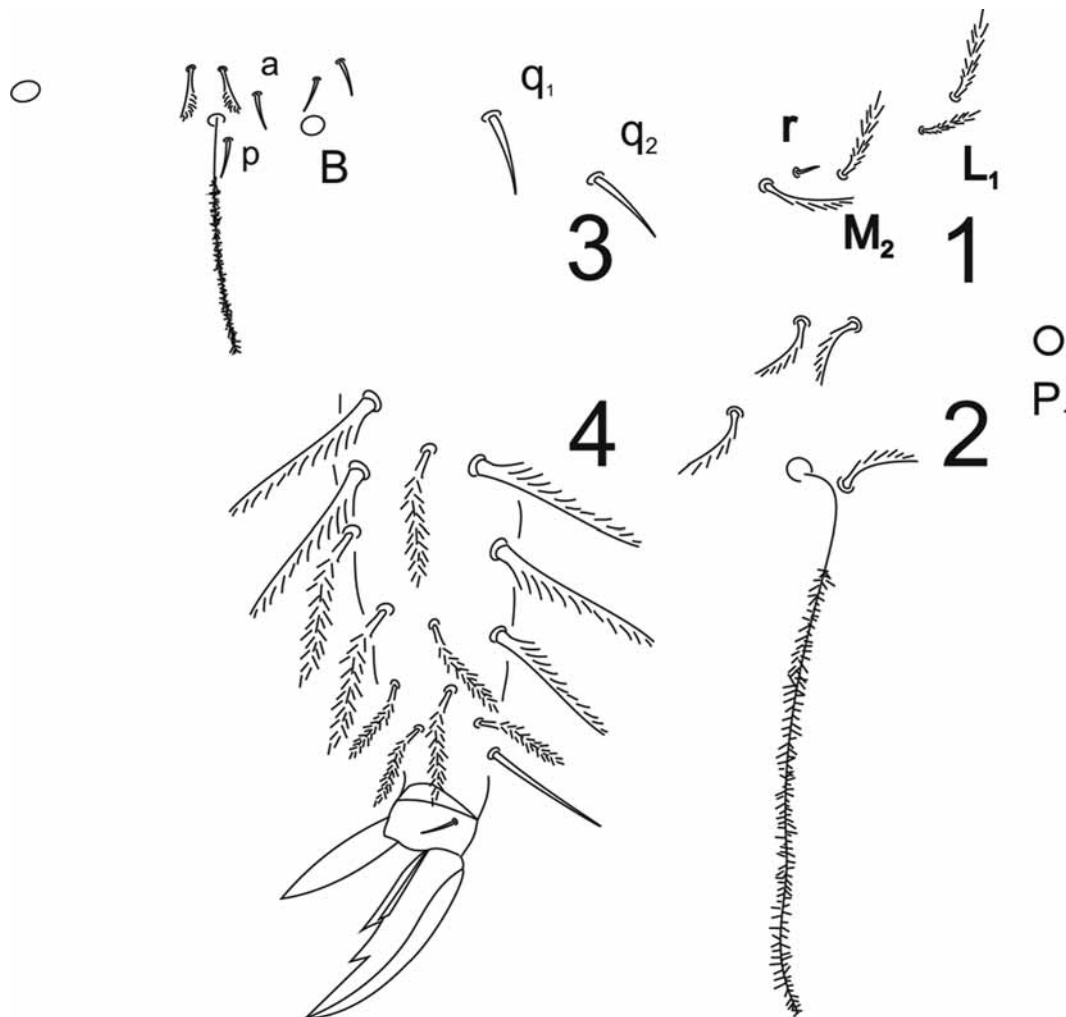
Material examined. Spain, La Rioja, Leiva: male (holotype) in the sample of ecologic horticultural 4LEHE4, 20.i.2004; male (paratype) from a sample of soil of conventional fruit plantation 4LEFRC1, 15.xi.2003; two specimens (paratypes) from a sample of soil of conventional fruit plantation 4LEFRC4, 15.xi.2003; one specimen (paratype) from a sample of soil of conventional fruit plantation 4LEFRC5, 15.xi.2003. Santo Domingo: one specimen from the sample of ecologic horticultural 4STHE3, 12.v.2003. C. Gutiérrez Martín coll. All the specimens on slides in the laboratory of Zoology of the Universidad Autónoma de Madrid, Spain.

Etymology. This species is named after Logroño, capital of La Rioja.

Description. Length 1.25–1.3 mm. Body without pigment, 5+5 eyes.

Antenna without pigment or scales, its proportion with head 1.2. Ant. IV without apical bulb. Apical organ of third antennal segment with two straight short rods, easy to observe.

Head with macrosetae R0, R1 and R2, S, T and Po macrosetae. R3 absent. Labial formula: $-M_2rEL_1L_2, L_1$ is half the length of L_2 (Fig.1). Differentiated setae of outer labial papilla (E) straight and its apex no reaching apex of papilla, with three sublobal setae on the external part of maxillary outer lobe. Four ciliated setae along the ventral cephalic furrow. Four triangular labral papillae.



FIGURES 1–4. *Pseudosinella logrognensis* sp. nov.: 1, labium; 2, chaetotaxy of anterior bothriotrichal complex of Abd. IV; 3, chaetotaxy of Abd. II; 4, apex of tibiotarsus III, unguis and unguiculus.

Legs without scales, tibiotarsus with ciliate and acuminate macrosetae and acuminate tenent hair, smaller than the internal length of unguis. Unguis with inner distal unpaired tooth located about 55 % the length of unguis. Basal pair of inner unguual teeth of similar size, distal tooth about 41 % of the internal side of unguis and the other about 33 % (Fig. 4). Unguiculus smooth and about half the length of unguis.

Dorsal macrosetae formula: R111/00/0101+2. Chaetotaxy of Abd. II: paBq₁q₂, a is one smooth seta (Fig. 3) Bothriotrichal complex on Abd. IV without accessory seta “s” (Fig. 2).

Ventral tube with 5+5 smooth distal setae and 2+2 in the posterior medial region. Retinaculum with 4+4 teeth and one seta on the base. Distal part of manubrium dorsally with two internal and 3–4 external setae separated by two pseudopores. Mucro bidentate, mucronal spine smooth.

Remarks. The differences among most similar species with 5 eyes and the same thoracic and abdominal macrochaetotaxy species are shown in table 1.

TABLE 1. Comparison of differentiate characters of species with the same number of eyes and dorsal thorax-abdomen chaetotaxy close to *P. logrognensis* **sp. nov.**

Species	Author	Eyes	Dorsal macrosetae	S and or T	Labial formula	Labial R	II Abd.	Tenent hair
<i>horaki</i>	Rusek	5	R001/00/0101+2	absent	M ₁ M ₂ REL ₁ L ₂	ciliated	paBqq	clavate
<i>mucronata</i>	Gouze & Deharveng,	6–5	R000/00/0101+2	absent	m ₁ M ₁ m ₂ Rel ₁ l ₂	ciliated	-aBqq	acuminate
<i>hutheri</i>	Stomp	5	R001/00/0101+2	absent	M ₁ m ₂ Rel ₁ L ₂	ciliated	-aBq	clavate
<i>mauli</i>	Stomp	5	R001/00/0101+2	absent	M ₁ M ₂ rELL ₂	not ciliated	paBq	clavate
<i>sandelsorum</i>	Gruia	5	R001/00/0101+2	absent	M ₁ M ₂ RELL ₂	ciliated	paBqq	clavate
<i>theodoridesi</i>	Gisin & Gama	5	R011/00/0101+2	present	M ₁ M ₂ REL ₁ L ₂	ciliated	paBqq	acuminate
<i>logrognensis</i>	sp. nov.	5	R111/00/0101+2	present	-M ₂ rEL ₁ L ₂	not ciliated	paBqq	acuminate

Key to world species of *Pseudosinella* with 5 + 5 eyes

- 1 Abd. IV with other combination of setae.....2
- Abd. IV with two median macrosetae 4
- 2 Abd. IV with three median macrosetae3
- Abd. IV with one median macrosetae..... *lahainaensis* Christiansen & Luther
- 3 Labial setae M, E and L ciliate*stompi* Gisin &Gama
- Labial setae m, e and l smooth..... *dubia* Christiansen
- 4 Th. II without macrosetae 5
- Th. II with macrosetae14
- 5 Abd. II with two macrosetae per side6
- Abd. II with one macroseta per side 7
- 6 Labium with seta R ciliate *turiasonensis* Arbea
- Labium with seta r smooth *encrusae* Gisin & Gama
- 7 Labial seta R ciliate 9
- Labial seta r smooth.....8
- 8 Head without seta S and T *mauli* Stomp
- Head with seta S and T *logrognensis* **sp. nov.**
- 9 Abd. II with seta p 11
- Abd. II without seta p10
- 10 Tenent hairs clavate, seta L₂ of labium ciliated..... *hutheri* Stomp
- Tenent hairs acuminate; seta l₂ of labium smooth..... *mucronata* Gouze & Deharveng
- 11 Labial setae M, E and L ciliate, Abd. IV with 1+2 macrosetae.....12
- M₂ and E smooth, all the other setae are ciliate, Abd. IV with 0+2 macrosetae
..... *georgia* Christiansen & Bellinger
- 12 Head without seta S and T 13
- Head with seta T *theodoridesi* Gisin & Gama
- 13 Labial seta M₁ and M₂ of the same length *horaki* Rusek
- Labial seta M₁ twice as M₂ and the last subequal to R *sandelsorum* Gruia
- 14 Labial seta r smooth15
- Labial seta R ciliate *variabilis* Gama & Busmachiu
- 15 Some setae M, E and L smooth or lacking16
- Labial setae M₁, M₂, E, L₁ and L₂ always present and ciliated *zygophora* Schille, *sensu* Stomp

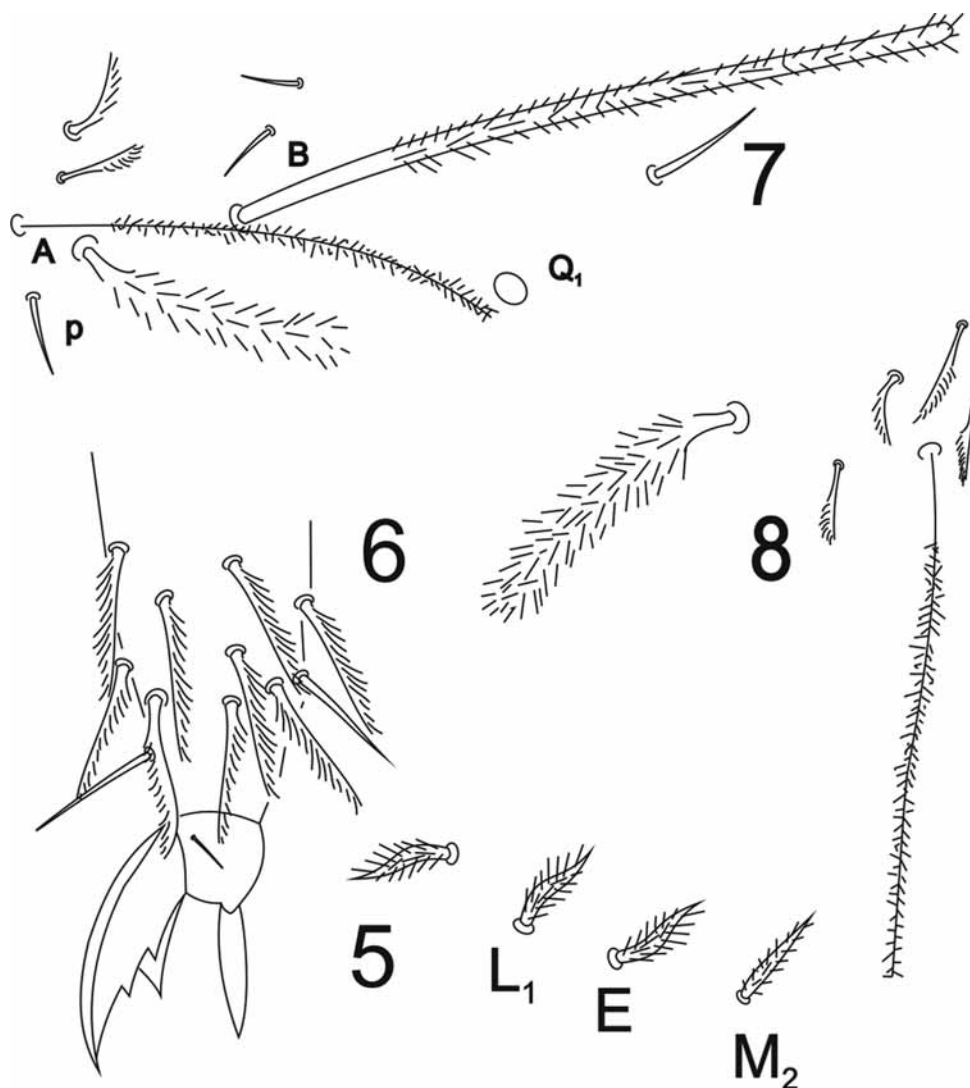
- 16 Th. II with one macroseta17
 - Th. II with three macrosetae *pygmaea* Gama & Busmachiu
 17 Abd. IV with anterior lateral P macroseta *albida* (Stach), *sensu* Stomp
 - Abd. IV without anterior lateral P macroseta *fjellbergi* Gama

The following species have 5+5 eyes but were not included in the key because their chaetotaxy has not been described: *confusa* Izarra, *decemoculata* Guthrie, *difficilis* Denis, *joupai* Denis and *pseudolanuginosa* Yosii.

***Pseudosinella leivaensis* sp. nov.**

Figs 5–8, Table 2

Material examined. Spain, La Rioja, Leiva: female (holotype) from ecologic horticultural sample 4LEHE4, 20.i.2004; two specimens (paratypes) the same data as holotype in the samples 4LEHE 1 and 2; one specimen from ecological fruit culture sample 4LEFRE2, 20.i.2004; Bañares: one specimen from a sample of soil of conventional fruit plantation 4BCFRC2, 15.viii.2003. C. Gutiérrez Martín coll. All the specimens on slides in the laboratory of Zoology of the Universidad Autónoma de Madrid, Spain.



FIGURES 5–8. *Pseudosinella leivaensis* sp. nov.: 5, labium; 6, apex of tibiotsarsus III, unguis and unguiculus; 7, chaetotaxy of Abd. II; 8, chaetotaxy of Abd. IV.

Etymology. This species is named after the Villa de Leiva, La Rioja.

Description. Length 1.1–1.2 mm. Body without pigment, no eyes.

Antenna without pigment or scales, its proportion with head 1.14. Ant. IV without apical bulb. Apical organ of third antennal segment with two small straight rods, easy to observe.

Head with macrosetae R0, R1, R2, S, T and Po, macroseta R3 absent. Labial formula: $-M_2-EL_1L_2$ (Fig. 5). Differentiated setae of outer labial papilla (E) straight and its apex almost reaching apex of papilla, with 3 sublobular setae on the external part of maxillary outer lobe. Four ciliated setae along the ventral cephalic furrow. Four triangular labral papillae.

Legs without scales, tibiotarsus with ciliate and acuminate macrosetae and with acuminate tenent hair, its rate with the length of internal unguis 0.78. Unguis with distal unpaired tooth located about 57 % the length of inner unguis membrane. Basal paired teeth with distal tooth twice the basal and about 52 % the length of the internal side of unguis; basal tooth about 35 % the length of the inner unguis membrane (Fig. 6). Unguiculus smooth and about 67 % the length of unguis.

Dorsal macrosetae formula: R111/00/0301+2. Chaetotaxy of Abd. II: pABQ₁q₂ (Fig. 7). Bothriotrical complex on Abd. IV without accessory seta “s” (Fig. 8).

Ventral tube with 6+6 smooth distal setae and 2+2 in the posterior medial region. Retinaculum with 4+4 teeth and one seta on the base. Distal part of manubrium with two internal and two external setae separated by two pseudopores. Mucro bidentate, with smooth basal spine.

Remarks. The new species is similar to *P. vita* Christiansen & Bellinger, 1980, *P. folsomi* (Mills, 1931), *P. gamae* Gisin, 1967, and *P. ioni* Gama & Busmachiu, 2002 in the absence of eyes and the chaetotaxy of Abd. II. Besides differing in cephalic chaetotaxy the new species is easy to distinguish because it has ciliate setae in the labium. *Pseudosinella leivaensis* **sp. nov.** is clearly isolated from *P. ioni* because it has different labial and thoracic chaetotaxy (Table 2).

TABLE 2. Comparison of differentiate characters of species with the same number of eyes and dorsal abdomen chaetotaxy close to *P. leivaensis* **sp. nov.**

Species	Author	Eyes	Dorsal macrosetae	Labial formula	for-	Abd. II	Abd. IV seta s	Posterior unguicular tooth	Tenent hair
vita	Christiansen & Bellinger	0	R110/43/0301+2	$M_1m_2rel_1l_2$		pABQq	?	absent	acuminate
folsomi	Mills	0	R000/00/0301+2	$m_1m_2-el_1l_2$		pABQq	?	absent	clavate
gamae	Gisin	0	*001/00/0301+2	$M_1m_2rel_1l_2$		pABQq	present	present	clavate
ioni	Gama & Busmachiu	0	R111/10/0301+2	$-M_2rEL_1L_2$		pABQq	absent	absent	acuminate
leivaensis	sp. nov.	0	R111/00/0301+2	$-M_2-EL_1L_2$		pABQq	absent	absent	acuminate

*According description of Gisin, macrosetae R are absent

***Pseudosinella gutierrezae* sp. nov.**

Figs 9–12, Table 3

Material examined. Spain, La Rioja, Bañares: female (holotype) and three specimens (paratypes) from ecologic fruit culture 4BCFRE5, 15.viii.2003. C. Gutiérrez Martín coll. All the specimens on slides in the laboratory of Zoology of the Universidad Autónoma de Madrid, Spain.

Etymology. This species is dedicated to our colleague and friend Carmen Gutiérrez, Senior Researcher at the Consejo Superior de Investigación Científica of Spain.

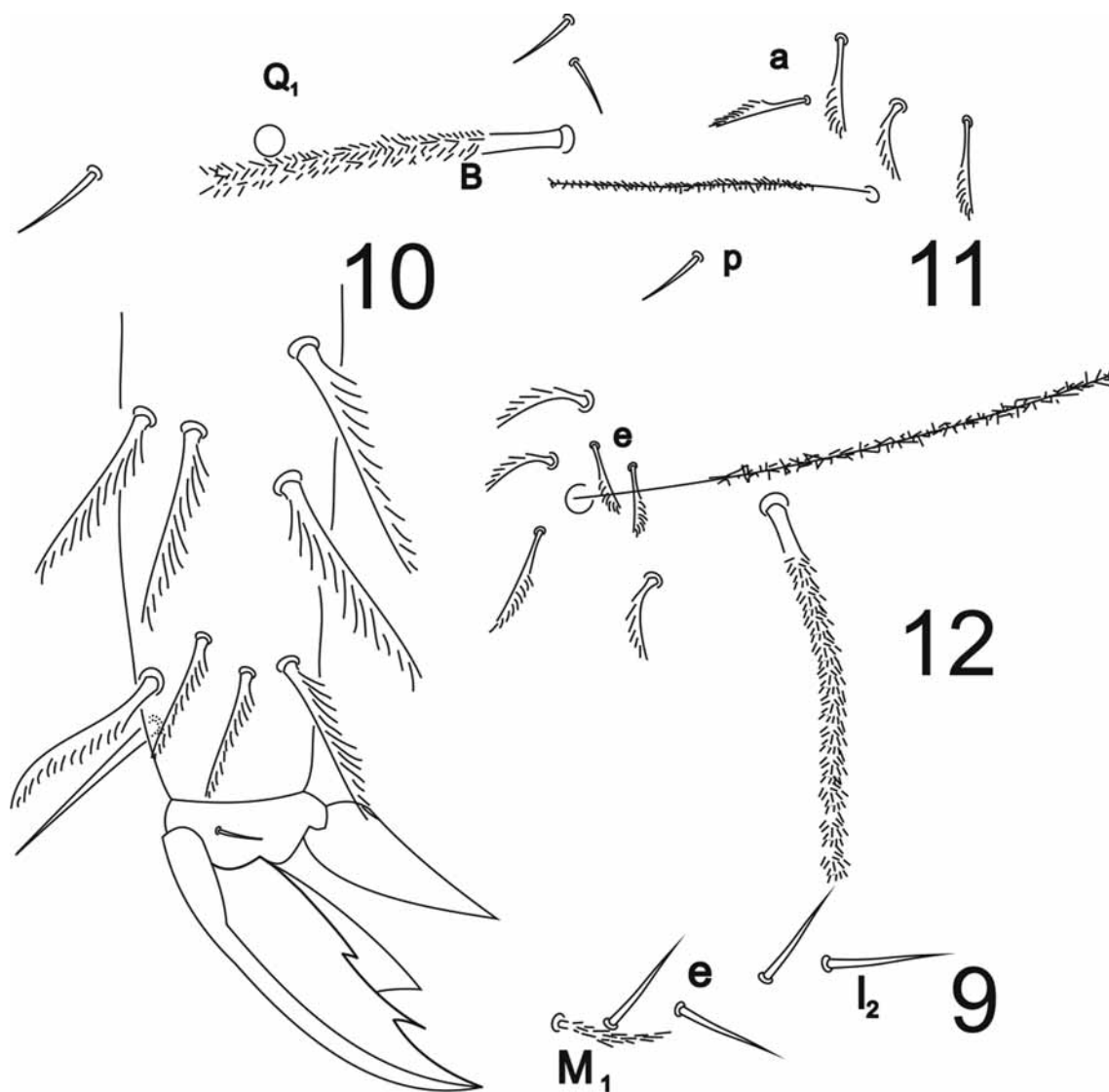
Description. Length 1.25 mm. Body without pigment, 3+3 eyes, two anterior corneola and one posterior far from the others.

Antenna without pigment, its proportion with head 1.45. Ant. IV without apical bulb. Apical organ of third antennal segment with two small rods.

Head with macrosetae R0, R1 and R2, T and Po, macrosetae R3 and S absent. Labial formula: $M_1m_2-el_1l_2$ (Fig. 9). Differentiated setae of outer labial papilla (E) straight and its apex almost reaching apex of papilla, with three sublobular setae on the external part of maxillary lobe. Four ciliated setae along the ventral cephalic furrow. Four triangular labral papillae.

Legs without scales, tibiotsarsus with ciliate and acuminate macrosetae, with acuminate tenent hair, its rate to the length of internal unguis 0.57. Unguis with distal inner unpaired tooth located at 75 % the length unguis. Inner basal paired teeth with distal tooth twice the basal, inserted at about 66 % the length of inner membrane from the base, the other tooth inserted at about 47 % the length of the unguis (Fig. 10). Unguiculus smooth and about 76 % the length of unguis.

Dorsal macrosetae formula: R011/00/0201+2. Chaetotaxy of Abd. II: paBQ₁q₂ (Fig. 11). Anterior bothriotrical complex of Abd. IV with accessory seta "s" (Fig. 12). Ventral tube with 6+6 smooth distal setae and 2+2 in the posterior medial region. Retinaculum with 4+4 teeth and one ciliate seta. Distal part of manubrium with two pseudopores, 2 internal and 2 external setae. Mucro bidentate, mucronal spines smooth.



FIGURES 9–12. *Pseudosinella gutierrezae* sp. nov.: 9, labium; 10, apex of tibiotsarsus III, unguis and unguiculus; 11, chaetotaxy of Abd. II; 12, chaetotaxy of Abd. IV.

Remarks. The new species *P. gutierrezae* **sp. nov.** has the same dorsal chaetotaxy and number of eyes as *P. sexoculata sensu* Gisin & Gama (1972), *P. sexoculata sensu* Wang *et al.* (2004), and *P. simoni* Jordana *et al.*, but it differs from the others in having a tibiotarsus acuminate tenent hair. Besides, it can be distinguished from the first species by the lack of r seta in the labial base. From the second and third species it differs in having smooth $m_2e_{11}l_2$ seta and from *P. simoni* in not having the p seta in the II abdominal segment.

In table 3 the differences from this species and *P. sexoculata sensu* Christiansen & Bellinger (1980) are shown, this latter species has the dorsal chaetotaxy different from the others.

TABLE 3. Comparison of *P. gutierrezae* **sp.nov.** and the nearest species, with the same numbers of eyes and dorsal thorax-abdomen chaetotaxy. Number of the state characters follow Christiansen *et al.* (1990). Only differentiated characters are given.

	<i>sexoculata sensu</i> Gisin & Gama	<i>sexoculata sensu</i> Christiansen & Bellinger	<i>sexoculata sensu</i> Wang <i>et al.</i>	<i>simoni</i> Jordana <i>et al.</i>	<i>gutierrezae</i> sp. nov.
1. dorsal cephalic macrosetae S	absent (1)	present (2)	absent (1)	absent (1)	absent (1)
2. dorsal cephalic macrosetae T	present (2)	absent (1)	present (2)	present (2)	present (2)
4. Labial m_2	smooth macrose- tae (3)	smooth macrose- tae (3)	ciliated macrose- tae (4)	ciliated mac- rosetae (4)	smooth macrosetae (3)
5. r (ventral labial)	smooth microse- tae (1)	absent (5)	absent (5)	smooth microse- tae (1)	absent (5)
6. e (ventral labial)	smooth macrose- tae (3)	smooth macrose- tae (3)	ciliated macrose- tae (4)	ciliated mac- rosetae (4)	smooth macrosetae (3)
7. L1 (ventral labial)	smooth macrose- tae (3)	smooth macrose- tae (3)	ciliated macrose- tae (4)	ciliated mac- rosetae (4)	smooth macrosetae (3)
8. L2 (ventral labial)	smooth macrose- tae (3)	smooth macrose- tae (3)	ciliated macrose- tae (4)	ciliated mac- rosetae (4)	smooth macrosetae (3)
9.a (second abd seta)	smooth microse- tae (1)	smooth macrose- tae (3)	smooth macrose- tae (3)	ciliated microse- tae (4)	ciliated microsetae (4)
10.b (second abd seta)	ciliated macrose- tae (4)	smooth macrose- tae (3)	macrosetae (?)	ciliated mac- rosetae (4)	ciliated macrosetae (4)
11. p (second abd seta)	present (2)	present (2)	present (2)	absent (1)	present (2)
12. q_1 (second abd seta)	ciliated macrose- tae (4)	smooth macrose- tae (3)	ciliated macrose- tae (4)	ciliated mac- rosetae (4)	ciliated macrose- tae(4)
21. tenent hair shape	clavate (2)	clavate (2)	clavate (2)	clavate (2)	acuminate (1)
25. unquiculus shape	basally swollen (3)	acuminate (1)	acuminate (1)	acuminate (1)	acuminate (1)
27. inner setae manubrial plate	?	3(3)	2(2)	2(2)	2(2)
28. no. outer setae manubrial plate	?	range: 4–10 (5)	2(2)	2(2)	2(2)
29. habitat	both cave and sur- face (3)	both cave and sur- face (3)	surface (2)	surface (2)	surface (2)
31. apical antennal bulb	absent (1)	absent (1)	?	absent (1)	absent (1)
32. apical organ of third anten- nal segment	peg or rod-like (1)	peg or rod-like (1)	?	?	peg or rod-like (1)
33. maximum length	1.4 mm.	1.7 mm.	1.7 mm.	1.3 mm.	1.25 mm.
34. distance distal unpaired ungual tooth from base total unguis %	75 %	77 %	67 %	70 %	75 %
35. antennal cephalic diagonal	1.3–1.4	1.3	1.1–1.5	1.3–1.5	1.45
36. differentiated inner seta on hind tibiotarsus	?	unclear or absent (1)	clear acuminate (2)	?	clear acuminate (2)

Pseudosinella torcuatoensis sp. nov.

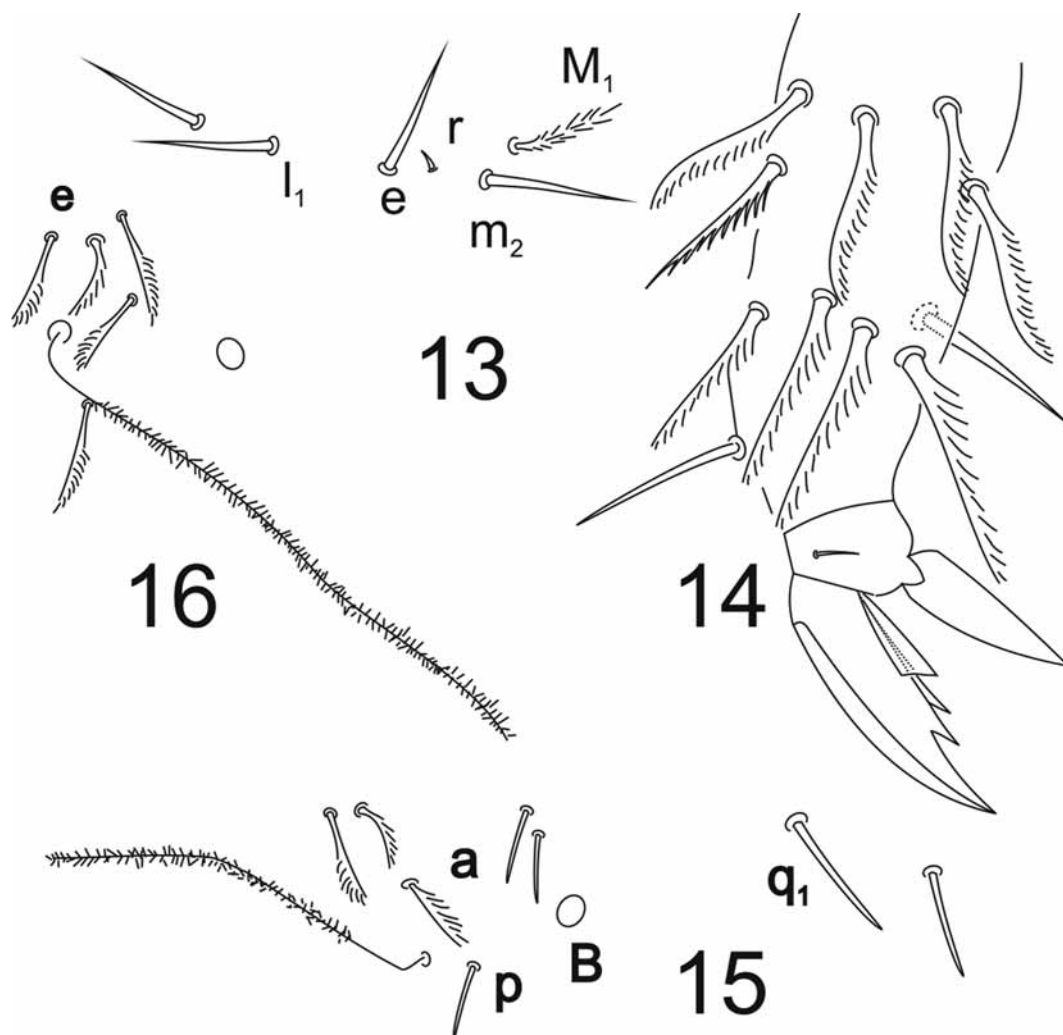
Figs. 13–16

Material examined. Spain, La Rioja, Torcuato: female (holotype) and two specimens (paratypes), from natural vegetation, soil sample 4TOZN4, 20.i.2004. C. Gutiérrez Martín coll. All the specimens on slides in the laboratory of Zoology of the Universidad Autónoma de Madrid, Spain.

Etymology. This species is named after La Villa de San Torcuato, La Rioja.

Description. Length 1.1 mm. Body without pigment, 3+3 eyes, two anterior corneola and one posterior far from the others.

Antenna without pigment, its proportion with head 1.3. Ant. IV without apical bulb. Apical organ of third antennal segment with two small rods.



FIGURES 13–16. *Pseudosinella torcuatoensis* sp. nov.: 13, labium; 14, apex of tibiotarsus III, unguis and unguiculus; 15, chaetotaxy of Abd. II; 16, chaetotaxy of Abd. IV.

Head with macrosetae R0, R1 and R2, T and Po, macrosetae R3 and S absent. Labial formula: $M_1m_2rel_1l_2$ (Fig. 13). Differentiated setae of outer labial papilla (E) straight and its apex almost reaching apex of papilla, with three sublobular setae on the external part of maxillary outer lobe. Four ciliated setae along the ventral cephalic furrow. Four triangular labral papillae.

Legs without scales, tibiotarsus with ciliate and acuminate macrosetae, with acuminate tenent hair, its rate to the length of internal unguis 0.78. Unguis with distal inner unpaired tooth, located at 59 % of the length of internal unguinal membrane. Inner basal paired teeth with the distal tooth twice the basal tooth and inserted

about 59 % the length of inner membrane from the base , the other tooth inserted about 50 % the inner length of unguis (Fig. 14). Unguiculus smooth and about 69 % the length of unguis. Legs without scales, tibiotarsus with ciliate and acuminate macrosetae.

Dorsal macrosetae formula: R011/00/0101+2. Chaetotaxy of Abd. II: paBq₁q₂ (Fig. 15). Anterior bothriotrical complex of Abd. IV with accessory seta "s" (Fig. 16).

Ventral tube with 4+4 smooth distal setae and 5+5 in the posterior medial region. Retinaculum with 4+4 teeth and one seta on the base. Distal part of manubrium with 2 pseudopores, 2 internal and 2 external setae. Mucro bidentate, teeth of different size, mucronal spines smooth.

Remarks. This new species presents the same dorsal chaetotaxy as *P. aramendiai* Beruete & Jordana, *P. azorica* Gama, *P. burgalensis* Jordana & Baquero, *P. berueti* Jordana & Baquero, *P. huescensis* Gisin & Gama, *P. intemerata* Gisin & Gama, *P. lesi* Jordana *et al.*, *P. lleidensis* Gama, *P. obanae* Gruia, *P. subduodecima* Gisin & Gama and *P. theodoridesi* Gisin & Gama. Differences between *P. torcuatoensis* **sp. nov.** and similar species can be seen in the table 4.

TABLE 4. Comparison of differentiate characters of species with the same number of eyes and dorsal thorax- abdomen chaetotaxy close to *P. torcuatoensis* **sp. nov.**

Species	Author	Eyes	Dorsal macrosetae	T	Labial formula
<i>yuca</i>	Christiansen	3	R001/00/0101+2	absent	M ₁ M ₂ rEL ₁ L ₂
<i>reddelli</i>	Christiansen	3	R000/00/0101+2	absent	m ₁ m ₂ -el ₁ l ₂
<i>lleidensis</i>	Gama, 1984	2-3	R011/00/0101+2	present	M ₁ M ₂ REL ₁ L ₂
<i>burgalensis</i>	Jordana & Baquero	2-3	R011/00/0101+2	present	M ₁ M ₂ REL ₁ L ₂
<i>torcuatoensis</i>	sp nov.	3	R011/00/0101+2	present	M ₁ m ₂ rel ₁ l ₂

continued.

Species	Labial setae MMELL	Labial R	II Ab	s IV	Tenent hair
<i>yuca</i>	all ciliated	not ciliated	paBqq	present	truncate
<i>reddelli</i>	some smooth	absent	-aBqq	present	truncate
<i>lleidensis</i>	all ciliated	ciliated	pa?B?-q2	present	truncate
<i>burgalensis</i>	all ciliated	ciliated	-aBqq	absent	truncate
<i>torcuatoensis</i>	some smooth	not ciliated	paBqq	present	acuminate

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References

Christiansen, K.A. (2007) *Pseudosinella* Data Base Page. Grinnell College. Available from <http://www.math.grinnell.edu/~twitchew/coll/>

- Christiansen, K.A. & Bellinger, P.F. (1980) *The Collembola of North America, North of the Rio Grande, a taxonomic analysis. Part 3. Family Entomobryidae*. Grinnell College, Grinnel, Iowa, pp. 784–1042.
- Christiansen, K., Bellinger, P. & Gama da, M.M. (1990) Computer assisted identification of specimens of *Pseudosinella* (Collembola Entomobryidae). *Revue d'Écologie et Biologie du Sol*, 27, 231–246.
- Gama da, M.M. & Busmachiu, G. (2002) Systématique évolutive des *Pseudosinella*. XVI. Espèces édaphiques de la Moldavie (Insecta: Collembola). *Revue suisse de Zoologie*, 109, 679–685.
- Gisin, H. (1967) Espèces nouvelles et lignées évolutives de *Pseudosinella* endogènes (Collembola). *Memorias e estudos do Museu Zoológico da Universidade de Coimbra*, 301, 1–25.
- Gisin, H. & Gama, da M.M. (1972) *Pseudosinella* cavernicoles d'Espagne (Insecta: Collembola). *Revue suisse de Zoologie*, 79, 261–278.
- Mills, H.B. (1931) New nearctic Collembola. *American Museum Novitates*, 464, 1–11
- Simón Benito, J.C. & Palacios-Vargas, J.G. (2007) New species of *Pseudosinella* (Collembola: Entomobryidae) from Iberian Peninsula. *Zootaxa*, 1479, 9–19.
- Wang, F., Chen, J.X. & Christiansen, K. (2004) A survey of the genus *Pseudosinella* (Collembola: Entomobryidae) from East Asia. *Annales of the Entomological society of America*, 97, 364–385.