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New species of *Pseudosinella* (Collembola: Entomobryidae) from Iberian Peninsula

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Abstract

Two new taxa of *Pseudosinella* from Iberian Peninsula are described and illustrated, *P. luenganensis* **sp. nov.** and *P. jordanai* **sp. nov.**, and a new record for *P. zaragozana* Arbea, 2006 is given. Two new species are established after the redescriptions of two species which differ from the original descriptions, one from Spain and the other from China. A key for all the species in the genus from the Iberian Peninsula is included.

Key words: Collembola, Entomobryidae, *Pseudosinella*, Iberian Peninsula, new taxa

Introduction

Studies of the genus *Pseudosinella* from the Iberian Peninsula were begun in the 20's by F. Bonet (1929, 1931) who described a total of 13 species, Gisin since 1967 alone or in collaboration with Gama 22; Simón Benito with several coauthors, Selga, Luciáñez, Bach, added 10, Dallai in 1976 described a new species and Jordana, Arbea and other specialists named an additional 16. A total of 57 species have been described from this European region.

During the 90's several samples of soil were collected in different localities from the Macizo Central and the Montes de León. As a result of the study of these samples we have found two new species from the genus *Pseudosinella*, which are described here in. If the species of this genus from Azores, Baleares, Canaries Islands and Iberian Peninsula are counted together, there are about 100 species. For the descriptions of the new taxa and the key, we use the system of Gisin (1967) and we give the formula of Christiansen *et al*. (1990) and the following abbreviations: Abd. I–VI = abdominal segments I to VI; Ant. I–IV = antennal segments I to IV; Th. I–III = Thoracic segments I to III.

Species description

Pseudosinella zaragozana Arbea, 2006

Figs. 1–5

Material examined. Spain, Madrid. Loeches. UTM: 30TVK67, 17.xii.1992: sample C: 1830, (three specimens, one male, 2 females) from soil of *Quercus faginea*; sample C: 1842 (one male) from soil of *Quercus coccifera*.

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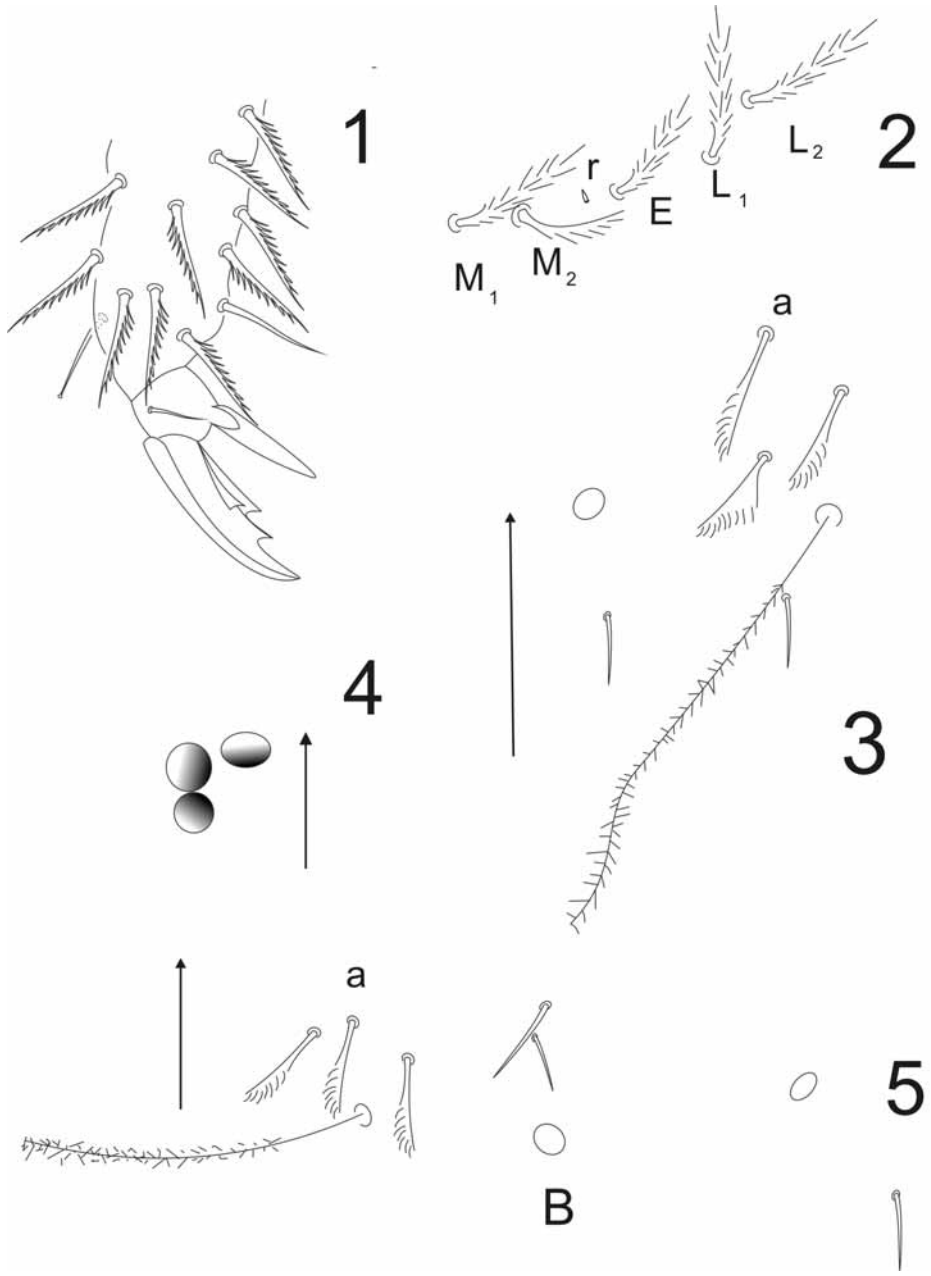
Redescription. Length: 1.2 mm. Body without pigment, 3+3 eyes with pigment, two anterior ocelli of the same size, the posterior one 0.75 smaller (Fig. 4). Antenna without pigment, 1.55 as long as head. Ratio of Ant. I:II:III:IV as 14:32:30:55, second and third antennal segments subequal. Labial formula: M1 M2 rEL1 L2, all ciliated, except r which is a microseta (Fig. 2).

Dorsal macroseta formula: R011/10/0201+2.Chaetotaxy of Abd. II: -aB Q1 q2, (Figs. 5). Without accessory seta "s" on Abd. IV, (Fig. 1–3). Tibiotarsus with capitate tenent hair. Unguis with an internal median tooth, located about 69% from base to tip of the internal side of unguis, and a basal pair of teeth, one of them almost twice as the large as the other, and located at 50% of internal side of unguis and the other is more distal and smaller located about 62,5%. Empodium lanceolate and approximately half the length of unguis. Legs without scales (Fig. A). Ventral tube with 7+7 seta and 2+2 in the median posterior region. Retinaculum with 4+4 teeth and no seta at the base. Mucro bidentate and with one seta on its base.

Remarks. This species was recently described by Arbea (2006) from Zaragoza province, this is the first record since its description.



FIGURES 1–5. *Pseudosinella zaragozana* Arbea: 1, unguis III; 2, labium; 3, chaetotaxy of Abd. IV; 4, eyes; 5,chaetotaxy of Abd. II.

***Pseudosinella luenganensis* sp. nov.**
Figs 6–10, Table 1 and 3

Material examined. Type material. Holotype male, Spain, Palencia, Redondo-Areñas, Puerto de Piedras Luengas, UTM: 30TVN86, 14.vii.1995, litter in *Fagus sylvatica* forest, sample C: 2296. Paratypes: female same data as holotype, sample C: 2296, three males same data as holotype, sample C: 2294. Holotype and paratypes in Universidad Autónoma de Madrid, Unidad de Zoología, Laboratorio de Entomología.

Description. Length 0.96 to 1 mm. Body without pigment, 4 + 4 eyes with pigment, two anterior corneola of the same size, the two posterior smaller, rate 0.76 (Fig. 7).

Antenna without pigment, its proportion with head is 1.40. Rate of Ant. I:II:III:IV is 15:22:18:42. Ant. IV without apical bulb. Apical organ of third antennal segment peg or rod-like. Labial formula: M1 M2REL1 L2, all ciliated, ratio R with seta M1 is 2.1. R is one microseta (Fig. 6).

Dorsal macroseta formula: R001/10/0101+2. Chaetotaxy of Abd. II: -aBq1q2 (Fig. 10). Without accessory seta "s" on Abd. IV (Fig. 8, Tab. 1).

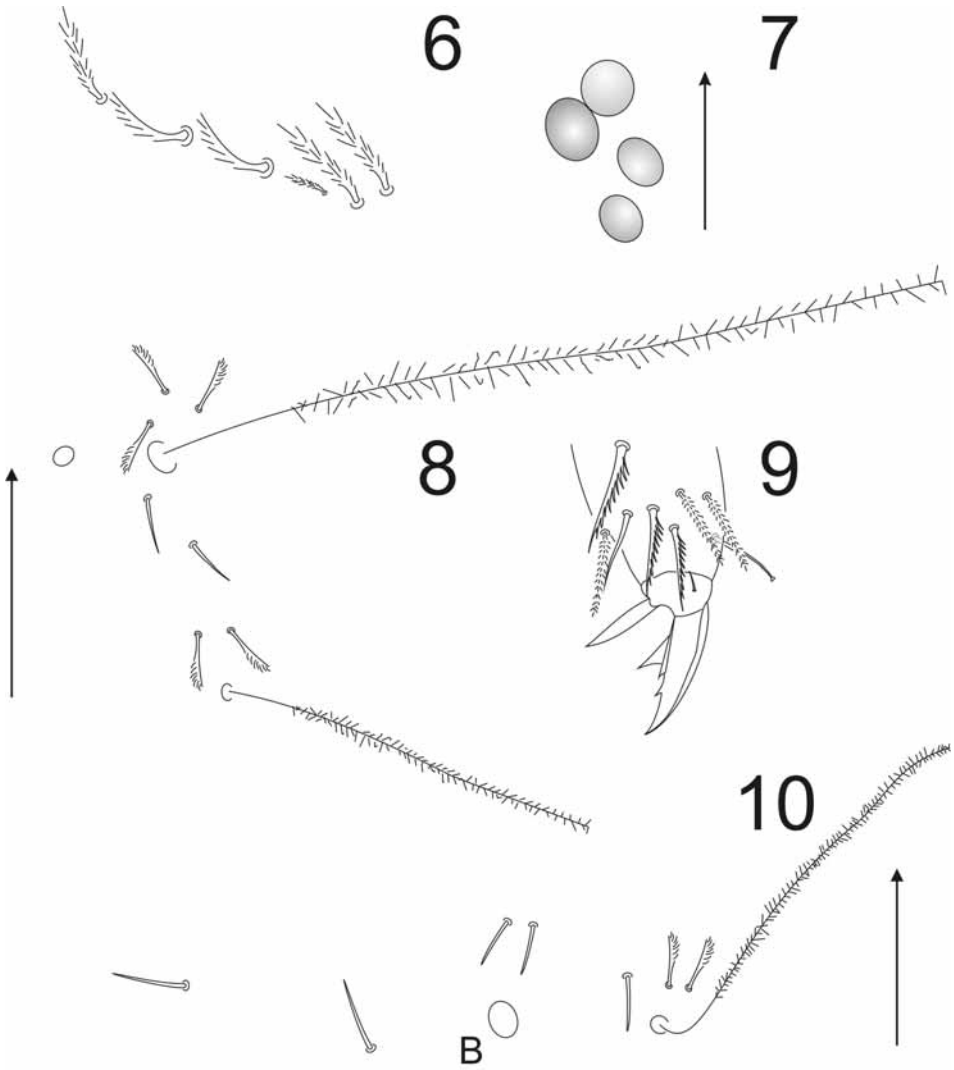


FIGURE 6–10. *Pseudosinella luenganensis* **sp. nov.**: 6, labium; 7, eyes; 8, chaetotaxy of Abd. IV; 9, unguis III; 10, chaetotaxy of Abd. II.

Tibiotarsus with capitate tenent hair, but specimens from sample C: 2294 have tenent hair acuminate, its rate with the length of internal unguis 0.78, differentiated inner seta on hind tibiotarsus clear acuminate.

Unguis with an intermedian tooth, located about 64% of the length of the internal side of the unguis. There is a basal pair of teeth, one of them better developed, almost twice the size of the other, and located at 35% of internal side of unguis and the other is more distal and smaller, located about 53.5%. Empodium lanceolate and approximately 0,78 the length of unguis. Legs without scales (Fig. 9). All other characters after Christiansen *et al*. (1999) (Tab. 3). Retinaculum with 4+4 teeth and no seta in the base. With 2 inner and 2 outer seta in the manubrial plaque. Mucro bidentate, with one seta on its base.

Remarks. The new species presents the same dorsal chaetotaxy than: *P. oromii* Gama, *P. decui* Gruia, *P. bohemica* Rusek and *P. pallida* Gruia. They differ from all of them mainly by the number of eyes, chaetotaxy of Abd. II and the labial seta formula (Table 1).

TABLE 1. Characters differentiating *P. luenganensis* **sp. nov.** from the other species with the same chaetotaxy

Species	Eyes	Dorsal macroseta	Labial chaetotaxy	Abd. II	s IV	Tenent hair
P. oromii Gama**,** 1996	0	R001/10/0101+2	m-rel$_2$l$_2$	-aBq$_1$q$_2$	-	-
P. decui Gruia**,** 1995	0	R001/10/0101+2	M-rEL$_1$L$_2$	-aBq$_1$q$_2$	-	+
P. bohemica Rusek**,** 1979	2	R001/10/0101+2	M$_1$M$_2$rELL$_2$	paBq$_1$q$_2$	-	+
P. pallida Gruia, 1977	2	R001/10/0101+2	M$_1$M$_2$rELL$_2$	paBq$_1$q$_2$	-	+
P. luenganensis **sp. nov.**	4	R001/10/0101+2	M$_1$M$_2$RELL$_2$	-aBq$_1$q$_2$	-	+, -

***Pseudosinella jordanai* sp. nov.**
Figs. 11–15, Table 2 and 3

Material examined. Type material. Holotype male. Spain, Madrid, Valdelatas, UTM: 30TVK48, 14.viii.1991, *Quercus ilex* subssp. *ballota* forest, soil sample C: 1047. Paratype female. Spain, Madrid, Soto del Real. UTM: 30TVL31, 14.viii.1991, *Pinus pinaster*, forest cultivated, litter sample C: 1074. Holotype and paratype in Universidad Autónoma de Madrid, Unidad de Zoología, Laboratorio de Entomología.

Etymology. This species is dedicated to our dear colleague Dr. Rafael Jordana, for his contribution to the study of this group of springtails.

Description. Length from 0.96 to 1 mm. Body without pigment, 1+1 eyes with pigment, (Fig. 12).Antenna without pigment, its proportion with head is 1.25. Ratio of antennal segments I:II:III:IV is 10:15:20:40. Ant. IV without apical bulb. Apical organ of third antennal segment peg or rod-like. Labial formula: M1M2rEL1L2 all setae ciliated, except r which is a microseta (Fig. 14).

Dorsal macroseta formula: R011/10/0101+2.Chaetotaxy of abd. II: -aBq1q2 (Fig. 15). Without accessory seta “s” on abdominal tergum IV (Fig. 13).

Tibiotarsus with acuminate tenent hair, its ratio with the length of internal unguis is 0.58, differentiated inner seta on hind tibiotarsus, clear acuminate. Unguis with an internal median tooth, located about 66% of the distance from the base to apex of inner unguis. There is a basal pair of teeth, the proximal is located at 40% of the distance from base to apex of inner unguis and the distal is located about 50%.Empodium lanceolate, 0.6, as long as unguis (Fig. 11). Legs without scales. Retinaculum with 4+4 teeth and no seta in the base.With 2 inner and 2 outer seta in the manubrial plaque. Mucro bidentate and with one seta on its base.

Remarks. In table 2, there are all the species with the same dorsal chaetotaxy as *P.jordanai* **sp. nov.** The new species is clearly different from the other mentioned species in the following combination of characters: number of eyes, labial and abdomen II chaetotaxy, absence of supplementary setae s, shape of the tenent hairs and the empodium.

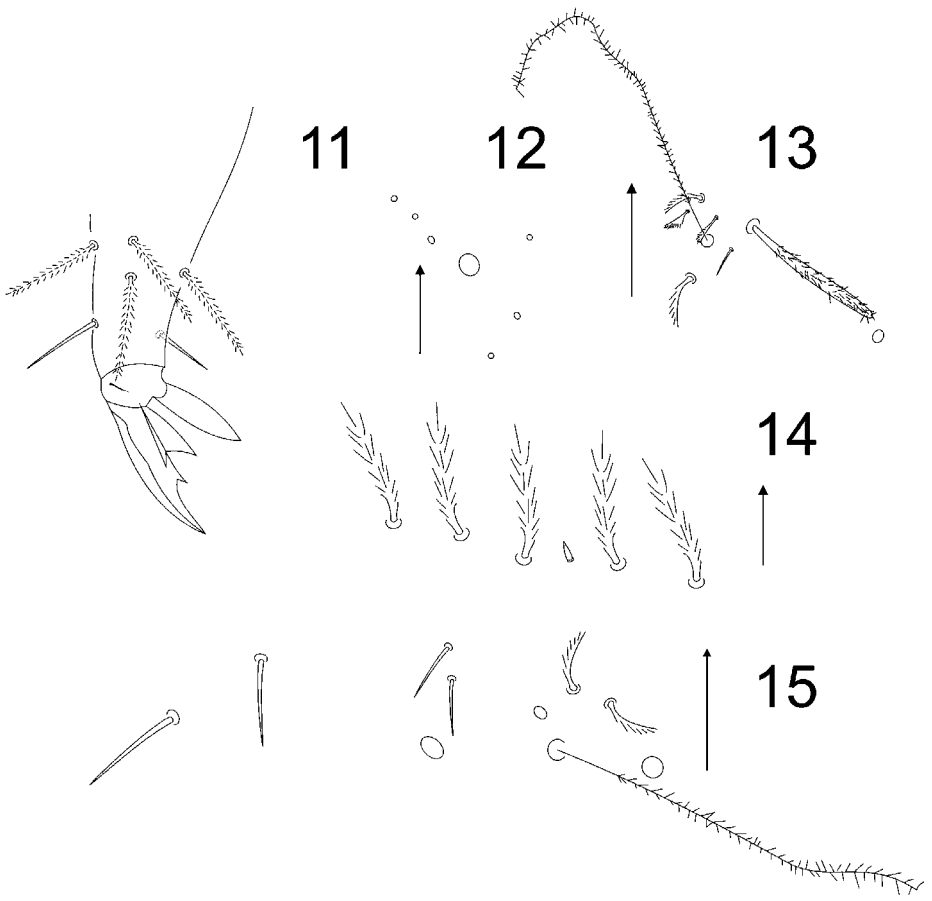


FIGURE 11–15. *Pseudosinella jordanai* **sp. nov.**: 11, unguis III; 12, eyes; 13, chaetotaxy of Abd. IV; 14, labium; 15, chaetotaxy of Abd. II.

TABLE 2. Characters differentiating *P. jordanai* **sp. nov.** from the other species with the same chaetotaxy

Species	Eyes	Dorsal chaetotaxy	Labial formula	II Abd.	s IV	Empodial tooth	Tenent hair acuminate
P. paprivata Ellis, 1976	1–3	R011/10/0101+2	M-ELL	--Bqq	-	-	-
P. jordanai **sp. nov.**	1	R011/10/0101+2	MMrELL	-aBqq	-	-	+
P. aidamar Luciañez *et* Simón, 1994	2	R011/10/0101+2	MMrELL	-aBqq	+	-	-
P. cobosae Luciañez *et* Simón, 1994	2	R011/10/0101+2	MMrELL	-aBqq	+	+	-
P. leclerci Stomp *et al.*, 1982	2	R011/10/01?01+2	mmrell	pA?Bqq*	+	-	+
P. angelae Gama, 2004	2	R011/10/0101+2	MMrELL	paBqq	-	-	+
P. paprivata Ellis, 1976 *sensu* Gruia *et al.* 1999	3	R011/10/0101+2	M-ELL	-aBqq	-	-	-
P. cordobensis Simón *et al.*, 1986	3	R011/10/0101+2	MMrELL	-aBqq	+	-	-
P. annemariae Stomp, 1972	3	R011/10/0101+2	Mmrell	apBqq	+	-	-
P. arretzi Simón, 1979	3	R011/10/0101+2	MMrELL	-aBqq	+	+	-
P. espagnoli Simón *et* Selga, 1977	3	R011/10/0101+2	MMrELL	-aBqq	-	+	-
P. zygophora Schille, 1908 *sensu* Stomp, 1971	5	R011/10/0101+2	MMrELL	paBq	-	-	-
P. variabilis Gama *et* Busmachiu, 2004	5	R011/10/0101+2	MRELL	paBqq	-	-	-

*In the description of Stomp *et al.* (1982), the dorsal chaetotaxy given for *P. leclerci* is R011/10/0101+2 and for the second abdominal segment it is given pABqq, but not any drawing appears, that is why there is a question mark.

TABLE 3. Comparison of *P. luenganensis* **sp. nov.** and *P. jordanai* **sp. nov.** State of characters after Christiansen *et al*. (1990).

Characters/ Species	*P. luenganensis* **sp. nov.**	*P. jordanai* **sp. nov.**
1. Dorsal cephalic macroseta S	absent (1)	absent (1)
2. Dorsal cephalic macroseta T	absent (1)	present (2)
3. Ventral labial m1	ciliated macroseta (4)	ciliated macroseta (4)
4. Ventral labial m2	ciliated macroseta (4)	ciliated macroseta (4)
5. Ventral labial r	ciliated microseta (2)	smooth microseta (1)
6. Ventral labial e	ciliated macroseta (4)	ciliated macroseta (4)
7. Ventral labial l1	ciliated macroseta (4)	ciliated macroseta (4)
8. Ventral labial l2	ciliated macroseta (4)	ciliated macroseta (4)
9. Second abd. seta a	smooth microseta (1)	smooth microseta (1)
10. Second abd. seta b	ciliated macroseta (4)	ciliated macroseta (4)
11. Second abd. seta p	absent (1)	absent (1)
12. Second abd. seta q1	smooth microseta (1)	smooth microseta (1)
13. Second abd. seta q2	smooth microseta (1)	smooth microseta (1)
14. Posterior thoracic seg. 2 macroseta	acuminate (1), truncate(3)	acuminate (1), truncate(3)
15. Posterior th. seg. 2. Number of macroseta	1 (one)	1 (one)
16. Posterior th. seg. 3. Shape	absent (3)	absent (3)
17. Thoracic seg. 3 macroseta number	none	none
18. Antero-lateral (P) fouth abdominal dorsal macroseta	one (2)	one (2)
19. Mediam (M) 4 abd. dorsal macroseta	two (2)	two (2)
20. Complementary seta s, 4th abd. seg.	absent (1)	absent (1)
21. Tenent hair shape	acuminate (1), clavate(2)	acuminate (1)
22. Number of teeth in the inner unguis	three (2)	three (2)
23. Ungual wing tooth	present (2)	present (2)
24. Unguiculus wing tooth	absent (1)	absent (1)
25. Unguiculus shape	acuminate (1)	acuminate (1)
26. Number of eyes per side	four (4)	one (1)
27. Inner setae manubrial plaque	two (2)	two (2)
28. Outer setae manubrial plaque	two (2)	two (2)
29. Habitat	surface (2)	surface (2)
30. Region located	Europe and North Africa (1)	Europe and north Africa (1)
31- Apical antenal bulb	absent (1)	absent (1)
32. Apical organ of third antennal segment	peg or rod like (1)	peg or rod like (1)
33. Maximun length	1 mm.	1 mm.
34. Distance distal unpaired ungula tooth from base /total unguis %	53 %	58 %
35. Antenal/cephalic diagonal	0.76	0.80
36. Differentiated inner seta on hind tibiotarsus	clear, acuminate (2)	clear, acuminate (2)
37. Cephalic seta R0	present (2)	present (2)
38. Cephalic seta R1	present (2)	present (2)
38. Cephalic seta R2	present (2)	present (2)
40. Cephalic seta R3	absent (1)	absent (1)

Key to the species of *Pseudosinella* from Iberian Peninsula, Balearic, Azores and Canary Islands

1 Abd. IV with 0+2 macroseta 2
- Abd. IV with other chaetotaxy 10
2 Th. II with one macroseta 3
- Th. II without macroseta 7
3 With eyes in the head 4
- No eyes in the head ..... *infrequens* Gisin *et* Gama
4 With 5+5 eyes ..... *fjellbergi* Gama
- Less than 5+5 eyes 5
5 With 4+4 eyes ..... *canariensis* Gama
- Less than 4+4 eyes 6
6 With 3+3 eyes ..... *trioculata* Gama
- Less than 2+2 eyes ..... *insularum* Dallai
7 At least one of labial seta m1m2el1l2 is smooth 8
- Labial seta M1M2EL1L2 ciliated 9
8 Abd. II with 3 macroseta ..... *ashmoleorum* Gama
- Abdomen II with 1 macroseta ..... *ksenemani* Gisin *sensu* Gisin y Gama
9 Head with macroseta T ..... *substygia* Gisin *et* Gama
- Head without macroseta T ..... *granda* Christiansen *et* Bellinger
10 Abd. IV with 1+2 macroseta 11
- Abd. IV with 1+3 macroseta 86
11 Abd. II with one macroseta 12
- Abd. II with more than one macroseta 45
12 Without macroseta on Th. II–III 13
- With macroseta on Th. II and/or Th. III 30
13 Labial seta M1M2EL1L2 ciliated 14
- At least one labial seta m1m2el1l2 is smooth 22
14 Abd. IV with microseta s 15
- Abd. IV without microseta s 18
15 Head without macroseta S, T 16
- Head with macroseta S or T 17
16 Unpaired tooth of unguis 75 % the length of internal side of unguis ..... *duodecimoculata* Bonet *sensu* Jordana *et* Baquero
- Unpaired tooth of unguis 60% the length of internal side of unguis ..... *luquei* Beruete *et* Jordana
17 Head with 6+6 eyes ..... *duodecimoculata* Bonet *sensu* Gisin *et* Gama
- Head with 2–3 eyes ..... *lleidensis* Gama
18 Less than 6+6 eye 20
- With 6+6 eyes 19
19 Head with macroseta S ..... *duodecimocellata* Handschin
- Head without macroseta S ..... *subduodecima* Gisin *et* Gama
20 Labial seta R ciliated 21
- Labial seta r not ciliated ..... *substygia* Gisin *et* Gama
21 Head with 4+4 eyes ..... *aramendiai* Beruete *et* Jordana
- Head with less eyes ..... *burgalensis* Jordana *et* Baquero
22 Abd. IV with microseta s 25
- Abd. IV without microseta s 23

23 Abd. II without microseta p 24
- Abd. II with microseta p ..... *azorica* Gama
24 With 5+5 eyes ..... *wahlgreni* Börner *sensu* Huther
- With 1+1 eyes ..... *ksenemani* Gisin *sensu* Gisin *et* Gama
25 Head without macroseta T 27
- Head with macroseta T 26
26 Abd. II without microseta p; with 6+6 eyes ..... *huescensis* Kseneman
- Abd. II with microseta p; with 1+1 eyes ..... *intemerata* Gisin *et* Gama
27 Labial seta R ciliated 28
- Labial seta r not ciliated ..... *riojana* Beruete *et* Jordana
28 Tenent hairs acuminate 29
- Tenent hairs clavate ..... *suboculata* Bonet
29 Ungues with internal tooth; one pair of basal normal teeth ..... *superoculata* Gisin *et* da Gama
- Ungues without internal tooth; one pair of basal teeth acuminate, lanceolate ..... *goughi* Gisin *et* Gama
30 Th. II with one macroseta 33
- Th. II with more than one macroseta 31
31 Labial seta r not ciliated 32
- Labial seta R ciliated ..... *chapmani* Gama
32 Tenent hairs clavate ..... *bachae* Luciáñez *et* Simón
- Tenent hairs acuminate ..... *gajui* Luciáñez *et* Simón
33 Head with macroseta T 35
- Head without macroseta T 34
34 With 4+4 eyes; labial seta R ciliated ½ of M1 ..... *luengasensis* **sp. nov.**
- Without eyes; labial seta r minus, no ciliated, 1/8 of M1 ..... *oromii* Gama
35 Abd. II without microseta p 39
- Abd. II with microseta p 36
36 Labial seta r not ciliated; less than 6+6 eyes 37
- Labial seta R ciliated; with 6+6 eyes ..... *charoae* Villanueva *et* Jordana.
37 Tenent hairs clavate, with 4+4 or more eyes 38
- Tenent hairs acuminate, 2+2 eyes ..... *angelae* Gama
38 With 5+5 eyes ..... *albida* Stach *sensu* Stomp
- With 4+4 eyes ..... *picta* Börner
39 Abd. IV without microseta 40
- Abd. IV with microseta 43
40 Empodium with an proximal thick teeth 41
- Empodium without a thick teeth in the proximal side 42
41 With 3+3 eyes ..... *arretzi* Simón
- With 2+2 eyes ..... *cobosae* Luciáñez *et* Simón
42 With 3+3 eyes ..... *cordobensis* Simón, Bach *et* Gaju
- With 2+2 eyes ..... *aidamar* Luciáñez *et* Simón
43 Empodium without a thick proximal teeth 44
- Empodium with a thick distal teeth ..... *espagnoli* Simón
44 With 1+1 eyes, tenent hairs acuminate ..... *jordanai* **sp. nov.**
- With 2+2 eyes, tenent hairs clavate ..... *selgae* Simón
45 Abd. II with 3 macroseta 84
- Abd. II with 2 macroseta 46
46 Th. II–III without macroseta 47

- Th. II–III with macroseta 51
47 Labial seta R ciliated 48
- Labial seta r no ciliated or without it 50
48 Abd. II with q microseta 49
- Abd. II with Q macroseta ..... *turiasonensis* Arbea
49 Head with macroseta T ..... *superduodecima* Gisin *et* Gama
- Head without macroseta T ..... *navarrensis* Ardanaz *et* Jordana
50 Head with 3+3 eye ..... *sexoculata* Schött *sensu* Gisin *et* Gama
- Head with 5+5 eyes ..... *encrusae* Gisin *et* Gama
51 Th. II with more than one macroseta 61
- Th. II with one macroseta 52
52 Abd. II with Q macroseta 57
- Abd. II with q microseta 53
53 Head without macroseta S 56
- Head with macroseta S 54
54 Abd. II with microseta p 55
- Abd. II without microseta p ..... *binoculata* Kseneman
55 With 3+3 ..... *occidentals* Dallai
- With 1+1 eyes ..... *binoculata* Kseneman
56 At least one of labial seta m1m2el1l2 is smooth ..... *fallax* Börner
- Labial seta M1M2EL1L2 ciliated ..... *alba* (Packard)
57 With less than 4+4 eyes 58
- With 4+4 eyes ..... *xabieri* Ardañaz *et* Jordana
58 With 3+3 eyes 59
- With less than 3+3 eyes 60
59 Abd. IV with microseta s ..... *templadoi* Simón *et* Selga
- Abd. IV without microseta s ..... *zaragozana* Arbea
60 With 2+2 eyes ..... *turolensis* Arbea
- Without eyes ..... *stygia* Bonet
61 Th. III with 2 macroseta 62
- Th. III with more than 2 macroseta 65
62 Empodium without a thick proximal teeth 63
- Empodium with a thick proximal teeth ..... *petterseni* Börner *sensu* Wang *et al*.
63 Labial seta r no ciliated 64
- Labial R ciliated. Abd. II without microseta p ..... *decepta* Gisin *et* Gama
64 Head with macroseta T ..... *pseudodecepta* Arbea *et* Jordana
- Head without macroseta T ..... *helenae* Arbea *et* Jordana
65 Th. II with 3 macroseta 66
- Th. II with 4 macroseta 82
66 Th. III with one macroseta 67
- Th. III with 2 macroseta 69
67 Head without macroseta T 68
- Head with macroseta T ..... *illiciens* Gisin
68 At least one of labial seta m1m2el1l2 is smooth ..... *subcentralis* Gama
- Labial seta M1M2EL1L2 ciliated ..... *aeolica* Dallai
69 Head with macroseta S 70
- Head without macroseta S 71

70 Head without macrosetae T ..... *subvirei* Bonet
- Head with macrosetae T ..... *gineti* Cassagnau *sensu* Christiansen
71 Head without macrosetae T 72
- Head with macrosetae T 73
72 Labial seta m1 always smooth ..... *jesus,* Beruete *et* Jordana
- Labial seta m1 sometimes smooth ..... *immaculate* (Lie-Pettersen)
73 Tenent hairs acuminate 74
- Tenent hairs clavate ..... *arrasatensis* Beruete *et* Jordana
74 Head with one macrosetae S 75
- Head with two macrosetae S ..... *pyrenaica* Bonet *sensu* Gisin *et* Gama,
75 Unpaired tooth about 30–40% the length of the internal side of ungues..... 79
- Unpaired tooth between 45 and 60% of the length of internal side of unguis..... 76
76 Posterior proximal pair of tooth reaches the unpaired median teeth 78
- Posterior proximal pair of tooth no reaches the lone median teeth 77
77 Proximal posterior tooth similar than proximal one ..... *inflata* Bonet *sensu* Christiansen
- Proximal posterior tooth twice the thick than proximal one ..... *subinflata* Gisin *et* Gama
78 Antennae are 2.6–2.8 times as long as cephalic diagonal ..... *tarraconensis longicornis* Bonet
- Antennae are 2.1–2.3 times as long as ..... *tarraconensis* Bonet
79 Width of basal pair of teeth is bigger than length 80
- Length of basal pair of teeth is bigger than width ..... *pieltaini* Bonet
80 Proximal posterior tooth very developed, more than twice width and the anterior; unpaired median tooth reaches 33% the internal length of ungues 81
- Proximal posterior tooth twice the thick than proximal one; unpaired median tooth reaches 27% the internal length of ungues .....*unguiculata* Bonet
81 Ant. II with one leaf-like microseta s ..... *subterranean* Bonet
- Ant. II with 2–4 leaf-like microseta s ..... *subterranea baztanensis* Beruete *et* Jordana
82 At least one labial seta mmell smooth 83
- Labial seta M1M2 EL1L2 ciliated ..... *recipiens* Gisin
83 Tip of the proximal tooth reaches the as far as the anterior one; unpaired tooth of the same size than the posterior proximal one ..... *barcelonensis* Gisin *et* Gama
- Tip of proximal tooth reaches further than anterior one, both teeth of the same size; unpaired tooth of different size than the proximal one ..... *decipiens* Denis
84 Th. II with one macroseta 85
- Th. II without macroseta ..... *gamae* Gisin
85 With 2+2 eyes ..... *imparipunctata* Gisin
- With 4+4 eyes ..... *octopunctata* Börner
86 Labial seta smooth 87
- All labial seta, except r, are ciliated ..... *unguilonginea* Jordana *et* Beruete
87 Th. II with 4–5 macroseta ..... *cabidochei* Deharveng *et* Gouze
- Th. II with 3 macroseta 88
88 Head with macroseta S and T ..... *antennata* Bonet
- Head without macroseta S/T..... *centralis* Gisin *et* Gama

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References

Arbea, J.I. (2006) Nuevas especies de *Pseudosinella* (Collembola, Entomobryidae)de Aragón, España. *Boletín Sociedad Entomológica Aragonesa*, 38, 1–9.

Bonet, F. (1929) Colémbolos cavernícolas de España. *Eos*, 5, 5–32.

Bonet, F. (1931) Estudio sobre los colémbolos cavernícolas con especial referencia a los de la fauna española. *Memorias de la Real Sociedad Española de Historia Natural*, 14, 231–403.

Christiansen, K., Bellinger, P. & Gama, M.M. (1990) Computer assisted identification of specimens of *Pseudosinella* (Collembola Entomobryidae). *Revue d'Ecologie et Biologie du Sol*, 27, 231–246.

Dallai, R. (1976) Ricerche sui collemboli XXI. Precisazioni morfologiche e corologiche sulle *Pseudosinella* italiane del grupo "fallax". *Redia*, 59, 51–58.

Ellis, W.N. (1976) Autumn fauna of Collembola from Central Crete. *Tijdschrft voor Entomologie*, 119, 221–326.

Gama, M.M. da (1996) Systématique évolutive des *Pseudosinella*. XV. Une espèce nouvelle provenant des Iles Canaries (Insecta: Collembola). *Revue de suisse Zoologie*, 104, 13–16.

Gama, M.M. da (2004) Une espèce nouvelle de *Pseudosinella* provenant du Portugal (Insecta: Collembola). XVIIe contribution. *Revue suisse de Zoologie*, 111, 563–565

Gama, M.M. da & Bushmachiu, G. (2004) New species of the genus P*seudosinella* from Moldavia and Ukraine (Collembola: Entomobryidae). XVIII contribution. *Revue Suisse de Zoologie*, 111, 743–747.

Gisin, H. (1967) Espèces nouvelles et lignées évolutives de *Pseudosinella* endogés (Collembola). *Memórias e Estudos do Museu Zoológico da Universidade de Coimbra*, 301, 1–25.

Gruia, M. (1977) Collemboles euédaphiques de la Vallé Motru Sec. *Travaux de l'Institut de Spéologie "Émile Racovitza"*, 16, 77–84.

Gruia, M. (1995) Collembola from Israel. *In*: Decu, V. Nitzu, E., Por, F.D. & Dimentman, Ch. (Ed.). *Soil Fauna of Israel 1*. Romanian Academy and Israel Academy of Sciences abd Humanities. Bucarest. 111–128.

Gruia, M.; Poliakov, D. & Broza, M. (1999) Collembola of Northern Israel, I. *Israel Journal of Zoology*, 45 175–198.

Luciáñez, M.J. & Simón, J.C. (1994) Cinco especies nuevas del género *Pseudosinella* (Collembola: Entomobryidae) de la Península Ibérica. *Annales de la Société Entomologique de France*, 30, 319–327.

Rusek, J. (1979) Three new *Pseudosinella* species from Czechoslovakia (Collembola, Entomobryidae). *Acta entomologica bohemoslovaca*, 76, 255–265.

Schille F. (1908) Przyczynek do fauny Szczeciogonek (Apterygogenea) Galicyi. *Sprawozdanie Komisyi Fizyograficznej, Akademia Umiejętności w Krakowie*, 41, 3–17.

Simón, J.C. (1979) *Pseudosinella arretzi* nov. sp. de la Sierra de Gredos (Collembola). *Eos*, 55–56, 215–218.

Simón, J.C. & Selga, D. (1977) Colémbolos de suelo de sabinar en la provincia de Segovia (Nota I). *Graellsia*, 31, 213–230.

Simón, J.C., Bach, C. & Gaju, M. (1986) Colémbolos de la provincia de Córdoba (España) (Nota I). *Eos*, 62, 297–306.

Stomp, N. (1971) Contribution à l'étude des *Pseudosinella* endogés. Espèces européennes de *Pseudosinella* à 5+5 yeux (Collembola, Entomobryidae). *Revue d'Écologie et Biologie du Sol*, 8, 173–188.

Stomp, N. (1972) Deux nouvelles espèces de *Pseudosinella* endogés d'Europe (Collemboles, Entomobryides). *Revue Suisse de Zoologie*, 79, 279–286.

Stomp, N., Massoud, Z. & Thibaud, J.M. (1982) Insectes collemboles de quelques départements du sud de la France. *Nouvelle Revue d'Entomologie*, 12, 9–24