New species of *Pseudosinella* (Collembola: Entomobryidae) from a cave of Bizkaia (Basque Country), Spain

Nueva especie de Pseudosinella *(Collembola: Entomobryidae) en una cueva de Vizcaya (País Vasco), España*

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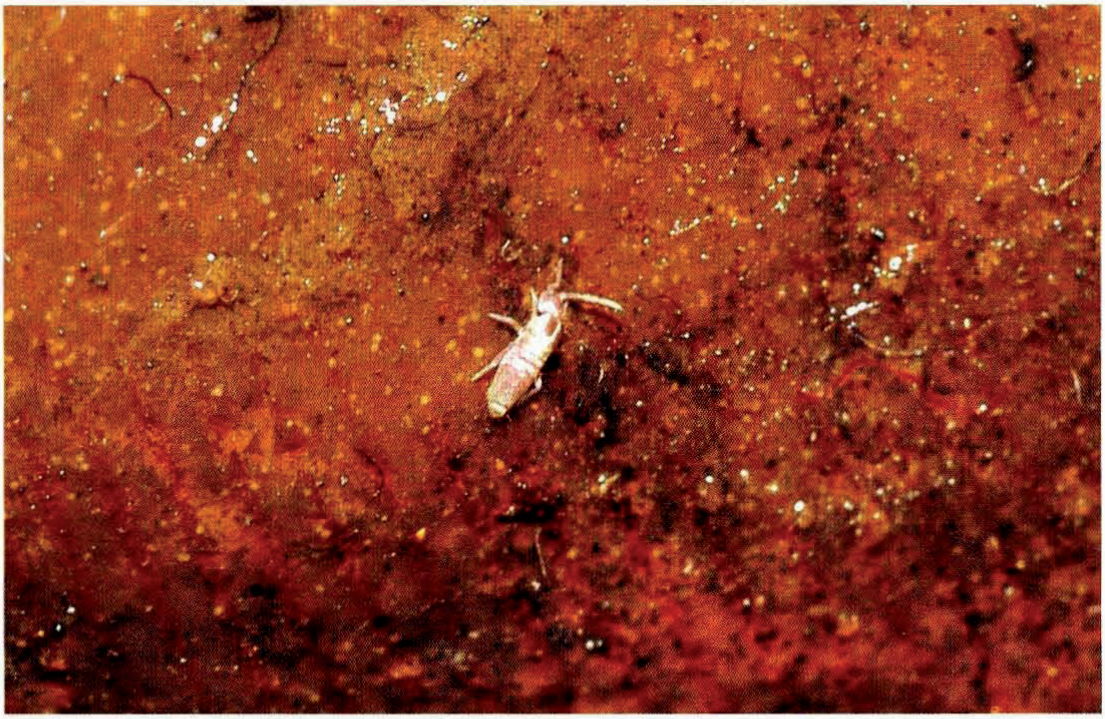
ABSTRACT

A new species of *Pseudosinella* has been found in the Pozalagua cave from Bizkaia, Basque Country. The new species is described and the description of the circumstances of the cave is given.

Key words: Collembola, Entomobryidae, Pseudosinella, new species, cave fauna



INTRODUCTION

The Pozalagua cave is located in the Ranero Mountains, Carranza municipality, (Bizkaia), at 500 m above the sea level. It has been opened to the tourism without previous studies about its faunistic interest. This is the main purpose of the study of the fauna of this cave.

Palabras clave: Collembola, Entomobryidae, Pseudosinella, especie nueva, fauna de cuevas

MATERIAL AND METHODS

Cave description. The Pozalagua cave is opened in the southern part of the Carranza anticlinal. This is constituted by limestone of the urgoniane facies. Most of it was formed from the reef and rocks of this facies, which are present in great formations with massive parallel stratification and intercalations of black and white limestone in metric order. In the fracture areas, irregular dolomite stripes -produced by the hydrothermal water circulation- are found. Every secondary formation is of calcite and aragonite and has a unique hall of 125 m length, 70 m width and 19 m high. The cave has a level difference of 10 m between its extremes, due to the different stages of spaeleothems and collapsed areas on each level. In the inside of the reception building, a metallic door gives entrance to the cavity. Along the cavity, a metallic bridge prevents visitors from entering protected areas.

The specimens were captured using a small brush and were localized on the columns, stalactites and walls, all of them covered with a thin film of water. The specimens were preserved in ethyl alcohol and later, some of them, were mounted in Hoyer medium to facilitate observation with optical microscopy.

DESCRIPTION

Pseudosinella lesi Jordana, Baquero & Janssens n. sp.

Type material. Pozalagua cave, Bizkaia, SPAIN. Date: 20050629. UTM Co-ordinates: X= 468.775 Y= 4.790.060 Z= 500 (Les, J. *Leg.*). **Holotype:** MZNA20050629-01 (1 female on slide). **Paratypes:** MZNA20050629-02 (1 male on slide); B1 to B6 (six specimens on slides). Specimens with code MZ deposited in the of Museum of Zoology of the University of Navarra. Specimens with code B mounted by Frans Janssens and deposited in the Museo Nacional de Ciencias Naturales, C.S.I.C., Madrid.

Description. Maximum length 1.8 mm. Body with scattered little spots of pigment over the ocular area and body dorsum. 1+1 eyes (**Figure 1A**). Antennae small: relationship antenna/cephalic diagonal 1.5. Antennal segments I/II/III/IV are 10/17.5/17.5/25 in micrometers. Antennal sensillae and setae, at light microscope, seem similar to those described by

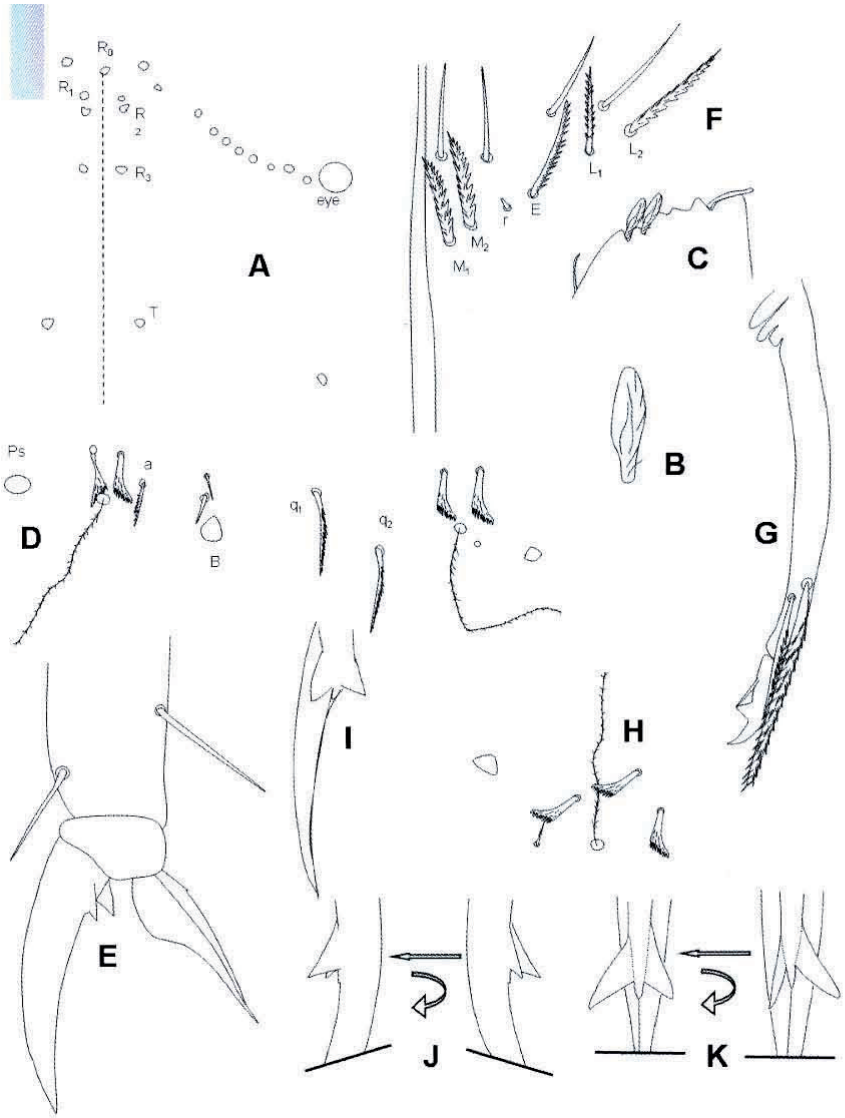


Figure 1. *Pseudosinella lesi* Jordana, Baquero & Janssens n. sp. A: Chaetotaxy of the head. B: Leaf-like sensilla from antennal segments II and III. C: Sensory organ of the antennal segment III. D: Chaetotaxy and setae morphology on second abdominal tergite. E: Unguis and unguiculus of leg III. F: Labial basal row of setae. G: Mucro and end of the dens. H: Setae complex from anterior bothriotrichum of abdominal tergite IV. I: Unguis from ventrolateral view. J: Lateral views. K. Two different views of unguis

Beruete *et al.* (2002), present in all the antennal segments. Sensorial setae 's', short, more or less striated and leaf-shaped (**Figure 1B**): one in the apical dorso-external region of the antennal segment II and two internal 's' setae of the sensory organ of antennal segment III (**Figure 1C**).

In the apical region of the antennal segments II and III, there is a pseudopore in an internal-ventral position, far from the setae line. Apical vesicle absent on antennal segment IV.

Formula of the labial base (**Figure 1F**): **$M_1M_2rEL_1L_2$.** All seta are ciliated, r vestigial in form of a smooth and very small microseta. Formula of the dorsal macrosetae: **R011/0/00/0101+2**. Abdominal tergite II chaetotaxy: **-aBq_1q_2** (**Figure 1D**). 'p' setae absent. Accessory seta 's' in the anterior trichobothrial complex of abdominal tergite IV absent (**Figure 1H**).

Unguis (**Figure 1E**) with dental plate occupying 10-20% of the basal internal edge; basal teeth of similar size, medial tooth barely developed, approximately 20% of the interior length of the unguis. Unguiculus swollen basally, with lateral expansions not reaching the tip. Dorsal tibiotarsi tenent hair thin and pointed. Legs without scales. Retinaculum with 4+4 teeth and one ciliated seta. Three internal and nine external setae related to two distal pseudopores of manubrial plate. Mucro relatively short with anteapical tooth smaller than the distal one (**Figure 1G**).

Table 1.
Measurements of *Pseudosinella lesi* n. sp. The symbol "-" means absence of data. The specimen B2 is a juvenile

	Sample							
	B1	B2	B3	B4	B5	B6	MZ 20050629-01	MZ 20050629-02
Antennal I	80	-	80	75	60	70	80	85
Antennal II	190	-	140	140	120	125	175	180
Antennal III	170	-	170	150	110	130	165	170
Antennal IV	250	-	250	230	170	180	250	240
Antennal length	690		640	595	460	505	670	675
Head	510	200	460	480	310	320	400	350
Ratio Ant.III/Head	1.35		1.39	1.24	1.48	1.58	1.68	1.93
Thorax II	300	-	270	240	200	310	290	250
Thorax III	180	-	170	170	120	170	180	160
Abdominal I	90	-	100	80	70	-	110	80
Abdominal II	110	-	120	90	70	-	130	100
Abdominal III	110	-	160	100	110	100	150	110
Abdominal IV	510	-	500	530	330	400	510	460
Ratio Abd.IV/III	4.64		3.13	5.3	3.00	4.00	3.40	4.18
Abdominal V	115	-	120	-	100	100	90	90
Abdominal VI	90	-	90	-	50	70	80	---
Body length	2015		1990			1380	1940	
Manubrium	380	-	340	325	250	310	350	370
Dens	390	-	420	330	300	330	370	400
Unguis	60	-	50	55	45	45	65	60
Unguiculus	35	-	35	30	20	30	40	40
Tenent hair of Tibiotarsi	22	-	25	22	20	20	25	25

Character number	1	2	3	4	5	6	7	8	**9**	10	11	**12**	**13**	14	15	16	17	18	19	20	**21**
P. lesi n. sp.	1	2	4	4	1	4	4	4	**2**	4	1	**2**	**2**	4	0	3	0	2	2	1	**1**
P. substygia	1	2	4	4	1	4	4	4	**1**	4	1	**1**	**1**	4	0	3	0	2	2	1	**3**

Character number	22	**23**	**24**	25	26	27	**28**	29	30	31	**32**	**33**	**34**	**35**	36	37	38	39	**40**
P. lesi n. sp.	2	**2**	**1**	3	1	3	**9**	1	1	1	**2**	**1.8**	**20%**	**1.55**	2	2	2	2	**2**
P. substygia	2	**1**	**2**	3	1	3	**6-7**	1	1	?	**1**	**2.2**	**40%**	**1.6-1.7**	?	2	2	2	**1**

Table 2.
The 40 characters defined for *Pseudosinella* by Christiansen *et al.* (1991). Data for P. *substygia* obtained from Christiansen (2005). Numbers in bold indicate differences

Biology. This species has the intestine with organic matter and without the characteristic calcium spherules that are found in some cave species.

Discussion. According to the macrosetae dorsal chaetotaxy, R011/00/0101+2, and absence of seta 's' in the anterior trichobothrial complex of the abdominal tergite IV, this species belongs to the group of P. substygia, P. theodoridesi Gisin & da Gama, 1969 and P. subduodecima Gisin & da Gama, 1970. The new species is separated from the last two Pseudosinella by the number of eyes. It differs from P. substygia by **a, q_1, q_2** on the second abdominal segment setae that are smooth, but ciliated in the new species; also by short tenent hair that it is pointed in the new species; ungual wing teeth present in the new species and absent in *P. substygia*; unguiculus always presents a minute tooth in P. substygia and it is present only in prolegs and metalegs in the new species. The rest of the differences are exposed above in the 40 characters' comparison.

Species	Author	Eyes	Tenent hair	Distribution	Chaetotaxy	Abdominal segment II	Labium
P. lesi n. sp.	Jordana, Baquero & Janssens	1	I	E C	R011/00/0101+2/0	-aBqq	MMrELL
P. substygia	Gisin & Gama, 1969	1	Y	E C	R011/00/0101+2/0	-aBqq	MMrELL
P. theodoridesi	Gisin & Gama, 1969	4-6	I	E C	R011/00/0101+2/0	paBqq	mmRell
P. subduodecima	Gisin & Gama, 1970	6	Y	E C	R011/00/0101+2/0	paBqq	MMRELL

Table 3.
I: pointed tenent hair; Y: clavate or truncate tenent hair; E: Europe; C: caves

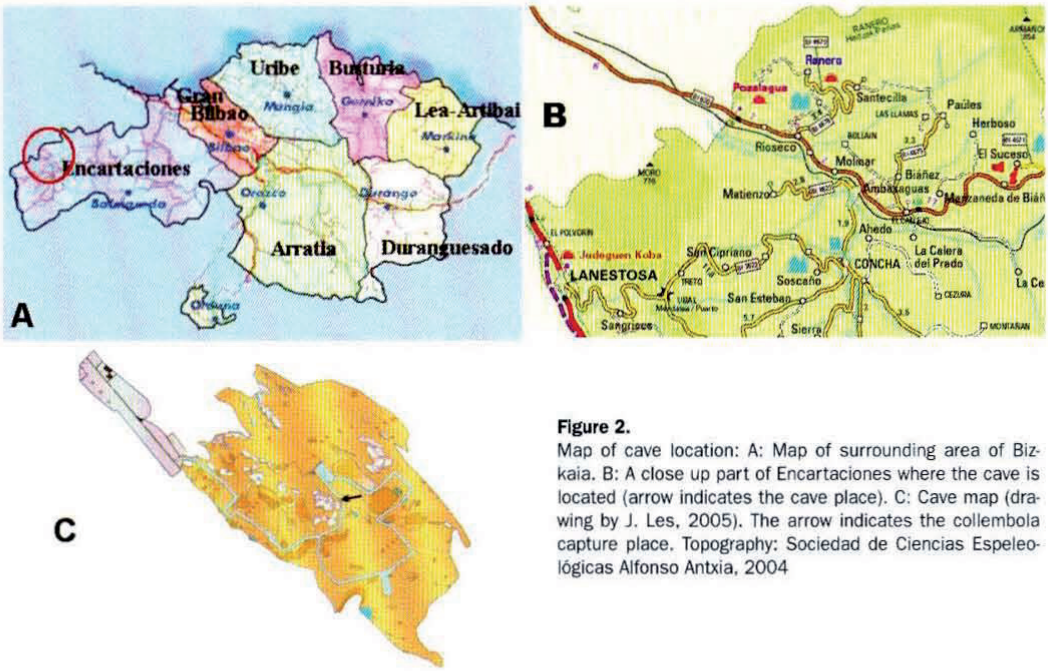


Figure 2.
Map of cave location: A: Map of surrounding area of Bizkaia. B: A close up part of Encartaciones where the cave is located (arrow indicates the cave place). C: Cave map (drawing by J. Les, 2005). The arrow indicates the collembola capture place. Topography: Sociedad de Ciencias Espeleológicas Alfonso Antxia, 2004

Derivatio nomimis – This species is dedicated to Jabier Les, who intends to protect the cave in which this species lives as an endemism.

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