

***Pedonides alcochetensis* n. g. n. sp. (Insecta, Collembola, Sminthurididae) with two clasping organs from the mainland of Portugal**

Gerhard Bretfeld

Raiffeisenstr. 7B, 24242 Felde, Germany

e-mail: gerhard.bretfeld@kielnet.net

Abstract

A male of the family Sminthurididae is described, which was found in a soil sample from Portugal, near Lisbon. This male not only has clasping antennae but the legs II are also modified for clasping. Because of this uncommon characteristic and of the special shapes of the antennal setae, a new genus and a new species are created for this male.

Key words: Male secondary sexual characteristics, soil habitat

1. Introduction

From the Iberian Peninsula, particularly from northern Spain, two genera and species strange to the European fauna of symphypleonan Collembola have already been described, namely *Vesicephalus europaeus* Ardanaz & Pozo, 1986, and *Navarrella apicalis* Bretfeld & Arbea, 2000. It was speculated that these species belong to a preglacial European fauna (Bretfeld & Arbea 2000).

Now, in a soil sample from Portugal, a further strange symphypleonan male was found. It belongs to a new genus and a new species of the family Sminthurididae (or monophylum Sminthuridida), which are described in the following.

The holotype is deposited at the Senckenberg Museum für Naturkunde Görlitz, Germany.

2. Results

2.1. *Pedonides* n. g.

Type species: *Pedonides alcochetensis* n. sp.

Diagnosis

A genus of the family Sminthurididae Börner, 1906 sensu Betsch 1980 (or monophylum Sminthuridida Bretfeld, 1986) with the following diagnostic characteristics:

Tibiotarsal organ III present. Head and mouthparts of normal form. Antennal segments II and III strongly modified with a protuberance and thick spines. Abdominal segment V without

a large process. Posterior part of large abdomen without pairs of long setae. Mucro narrow, all edges as long as mucro. Like the antennae, legs II also modified for clasping.

Derivatio nominis. The name of this new genus is derived from the Greek pedon (soil) since it was found in a soil sample. The gender is masculine.

Justification. *Pedonides* n. g. would appear in the key of the Sminthuridida in Bretfeld (1999) near the genera *Boernerides* Bretfeld, 1999 and *Sminthurides* Börner, 1900. In both these genera, however, the antennal segments II and III differ distinctly from those of the new genus, and the legs II are not modified for clasping. Therefore, for the single male described here, a new genus had to be created.

2.2. *Pedonides alcochetensis* n. sp.

Holotype. One adult male (on 4 slides), originally mounted on one slide marked 'LSU2, Pro solo, Companhia das Lezírias¹, May 2002, *Stenacidia?*, 2 Ex., *Eucl. ponticus*'. The single male found in this slide has been reprepared by me on 4 slides marked: a) Kopf, b) Ant., c) Beine, Fu, d) Abd., all with the additional label: *Pedonides alcochetensis* n. g. n. sp., Bretf. '05 prep., Portugal, E of Lisbon, NE of Alcochete, May 2002, leg. da Gama et al.²

The holotype is deposited at the Senckenberg Museum für Naturkunde, Görlitz, Germany.

No further specimen known.

Type locality (see Sousa et al. 2004, and pers. com. by M. M. da Gama Assalino, Coimbra). Portugal, 20 km east of Lisbon, consolidated alluvial plain of Tagus river (left bank of Tagus estuary), northeast of Alcochete, *Eucalyptus* stand with a few specimens of *Quercus ruber*, samples from study area LSU2 (also named LUU2), extracted by means of Berlese-Tullgren funnels, May 2002, leg. M. M. da Gama Assalino et al.

Derivatio nominis. The name of the new species is derived from the small town Alcochete, in the vicinity of which the specimen was found.

Diagnosis (of the single male, characteristics of female unknown).

A partially blue species of the genus *Pedonides* Bretfeld, see above, with 4 diagnostic characteristics:

- Thorax segment III with 1+1 vesicles,
- setae of dorsal part of large abdomen short, some blunt,
- antennal segments II and III strongly modified for clasping, with a large protuberance and two strong spines,
- legs II also modified for clasping.

Other diagnostic characteristics as mentioned for the genus.

Description

Measurements and proportions. Total male 0.6 mm, head 0.25 mm, mucro 68 µm, inner edge of claw III 36 µm. Dens : mucro = about 1.9, mucro : inner edge of claw III = 1.9.

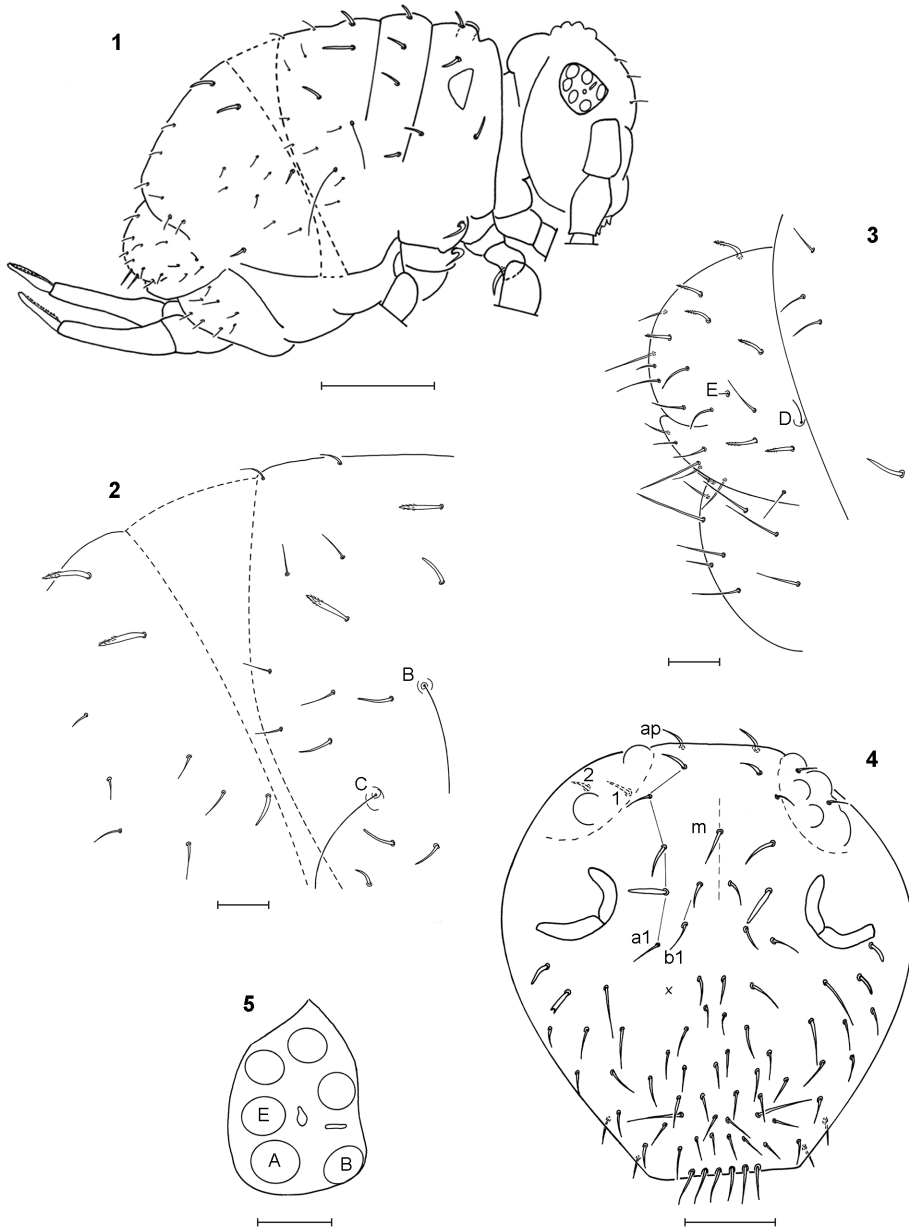
Colour (disturbed by previous mounting) eye patches and frontal eye dark blue, dorsal part of head and antero-dorsal part of abdomen with spotted blue pigment, ventral side and furca unpigmented, antennae and legs with little blue pigment except for the darker antennal segments IV.

Chaetotaxy and special structures. Most setae short, some thick and blunt, antennal segments II and III and legs II and III with strongly modified setae.

Large abdomen (Figs 1, 2). Dorsal side with a few short setae, setae of the anterior part

¹ Owner of the sampling area (see Sousa et al. 2004).

² The two original labels have been added to the four holotype slides on an separate slide

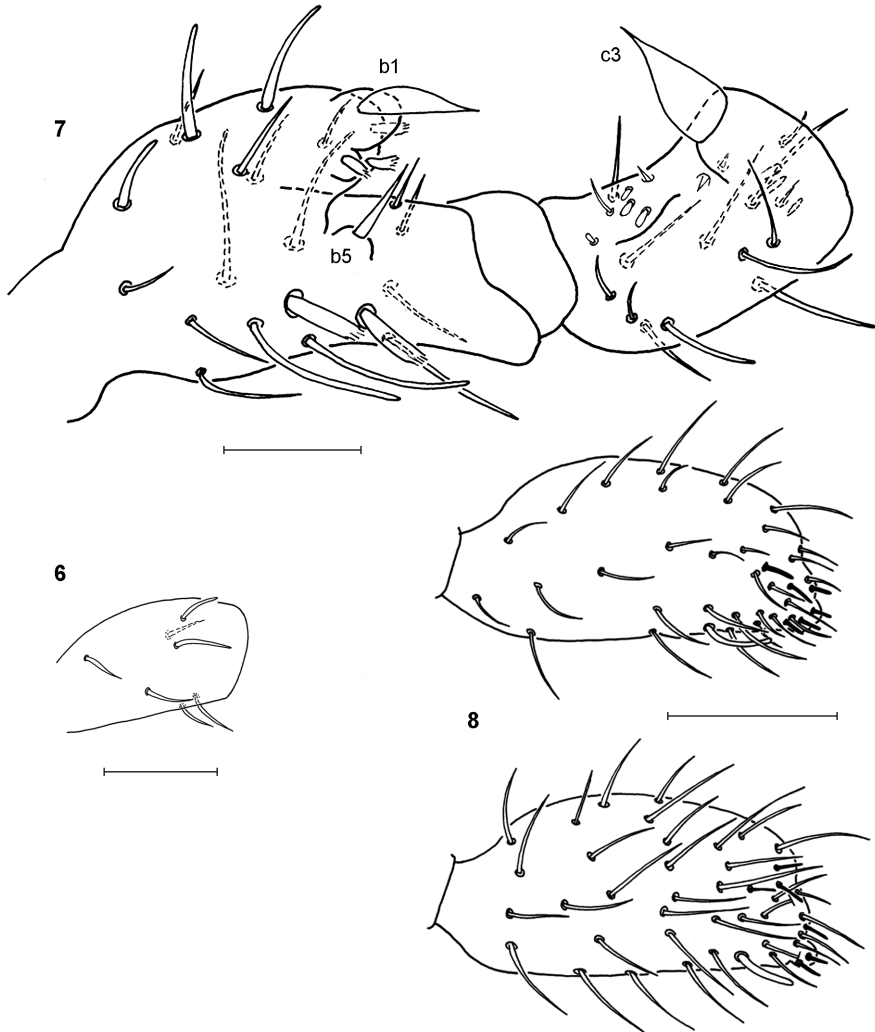


Figs 1–5 *Pedonides alcochetensis* n. sp., 1: Habitus and chaetotaxy of body, broken lines mark a rupture caused by pressure during the first preparation (bar = 100 μ m). 2: Large abdomen, middle part, meaning of broken lines as in Fig. 1 (bar = 25 μ m). 3: Posterior edge of the large abdomen and small abdomen (bar = 25 μ m). 4: Head, x = missing seta (bar = 50 μ m). 5: Right eye patch (bar = 25 μ m).

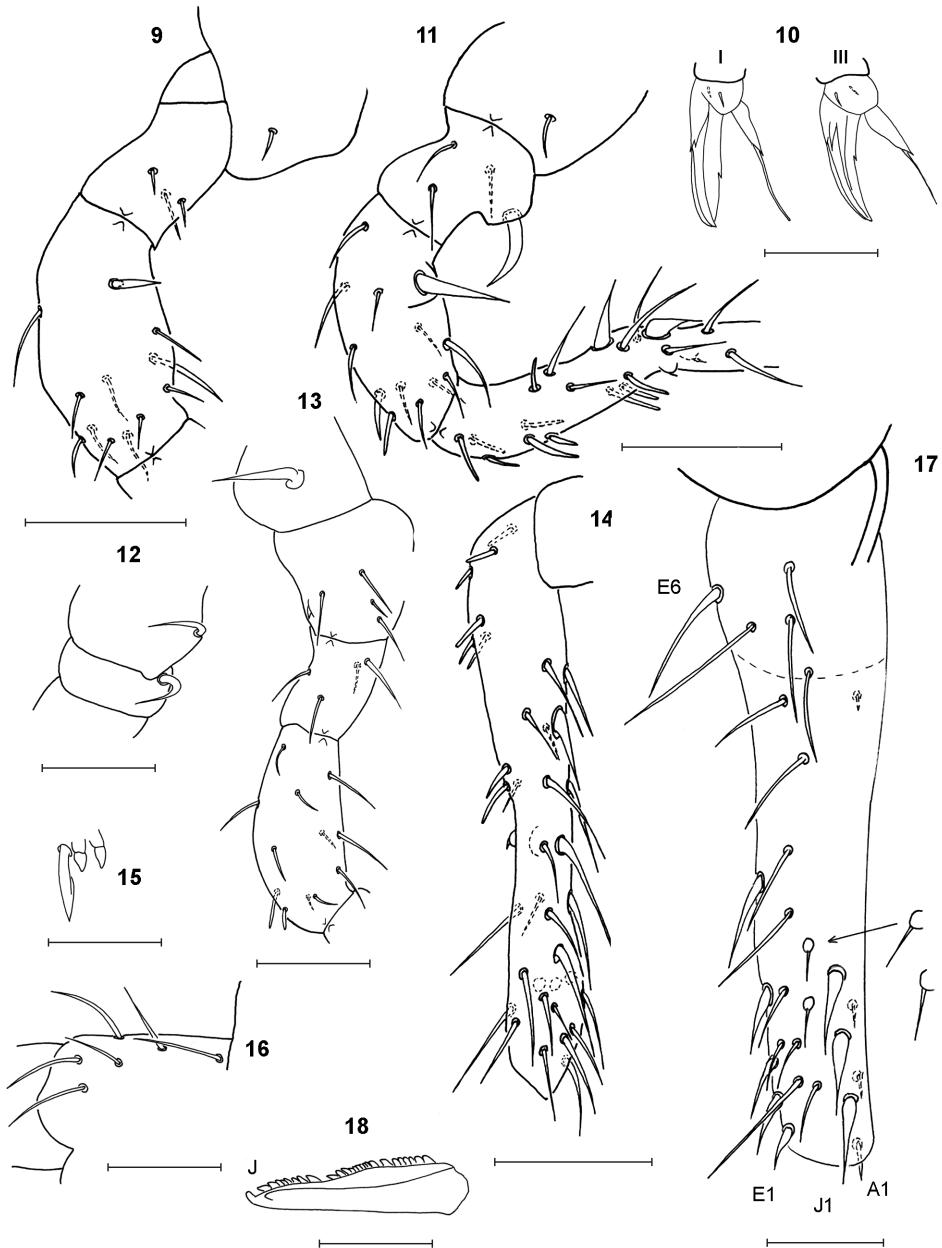
thicker than those of the posterior part, thick setae blunt and ciliate, bothriotrichia B and C recognised, A not distinguished, thorax segment III with 1 pair of vesicles. Ventral side of segment IV with 2+2 setae. Basis of furca with a few thin setae.

Small abdomen (Figs 1, 3). Segments V and VI fused, separated from the large abdomen. Setae of the dorsal part shorter than those of the ventral parts, dorsal part with some thick, blunt and ciliate setae, bothriotrichium D short and thin, E very short. Genital papilla not recognised.

Head (Figs 4, 5). Eye patches with 6+6 large ommatidia, C and D reduced, 2+2 setae. Setae of the head apex ap 1+1, dorsal back of head 2+2, frons rows a 5+5 (a2 thick and blunt),



Figs 6–8 *Pedonides alcochetensis* n. sp., 6: Antennal segment I, anterior view (bar = 25 μ m). 7: Antennal segments II and III, anterior view (bar = 25 μ m). 8: Antennal segment IV, anterior view (upper) and posterior view (lower), curved upper side is the dorsal side (bar = 25 μ m).



Figs 9–18 *Pedonides alcochetensis* n. sp., 9: Leg I, basal parts (bar = 50 µm). 10: Claw and empodium I and III (bar = 25 µm). 11: Leg II, basal parts and proximal part of tibia (bar = 50 µm). 12: Leg III, subcoxa I and II, i. e. upper and lower (bar = 50 µm). 13: Leg III, basal parts (bar = 50 µm). 14: Leg III, tibia, anterior view (bar = 50 µm). 15: Leg III, tibiotarsal organ (bar = 25 µm). 16: Manubrium, from lateral (bar = 25 µm). 17: Dens, posterior view (bar = 25 µm). 18: Mucro, from the outer side (bar = 25 µm).

rows b 2+2, middle part 1 seta, clypeus with many setae, 2+2 thick and blunt setae below the antennae, oval organs not observed, labrum rows a, m, p with 4, 5, 5 strong setae, mouthparts normal, sockets of antennae with a thick ventral border.

Antennae. Total length shorter than body. Segment I (Fig. 6) with 7 setae as usual, setae 2 and 3 blunt. Segment II (Fig. 7) modified with setae b1–b4 on one thick protuberance, b1 rather short, thick and pointed, b2–b4 short with ciliated tip, b5 as a slender spine, anterior side of segment with 2 strong spines with a cut and ciliated tip, whole segment also with several blunt setae, bothriotrichia missing. Segment III (Fig. 7) modified with a thick and pointed seta c3, in front of which are several short pointed or blunt setae, setae c1 and c2 not distinctly differentiated, other setae of normal length, pointed or blunt. Segment IV (Fig. 8) short, with numerous long and pointed setae, tip of segment with short and blunt sensilla, ventral side distally with 2 thick and blunt sensilla.

Legs. Leg I: Most setae of the basal parts (Fig. 9) of normal shape, femur with a thick anterior seta directed towards the posterior, chaetotaxy of tibiotarsus resembles the other legs but with 3 thick and blunt basal outer setae, claw (Fig. 10) slender with small teeth, empodium (Fig. 10) with a long and thick filament protruding beyond the claw. Leg II (Fig. 11): Trochanter and femur each with a thick and pointed seta on the inner side, tibiotarsus with 2 thick setae on the basal part; this leg thus modified for clasping like the antennae; outer side of femur and tibiotarsus with several short and blunt setae, distal part of tibiotarsus not analysed, claw and empodium resemble that of leg I. Leg III: Subcoxa I and II, i. e. the upper and lower one, (Fig. 12) each with a strong and curved spine; most setae of coxa, trochanter and femur (Fig. 13) normal, outer side of tibiotarsus (Fig. 14) basally with some short and blunt setae, inner side and distal part with long setae, some thick and pointed, setae of tibiotarsal organ (Fig. 15) of normal shapes, claw (Fig. 10) slender with small teeth, empodium (Fig. 10) with a thin filament protruding slightly beyond the claw.

Ventral tube. 1+1 distal setae.

Retinaculum. 4+4 teeth and 3 setae.

Furca. Manubrium (Fig. 16) with 6+6 normal setae. Dens (Fig. 17): Distal part of row E with 5 more or less thickened setae, row J with 3 thickened setae, the other 9 postero-distal setae normal, an additional 2 setae thin and appressed on round protuberances, anterior side with 1,1,1...1 short setae, basal part of dens with 5 long posterior setae. Mucro (Fig. 18) slender, inner edge with rough teeth, outer edge smooth, seta missing.

3. Acknowledgement

My thanks are due to Prof. Dr. M. M. da Gama Assalino, Zoological Department, University of Coimbra, Portugal, who allowed me to reprepare and to describe this male. I also wish to thank Dr. D. Russell, Görlitz, Germany, for his help with my English, and two anonymous referees for their valuable comments on my manuscript.

4. References

- Bretfeld, G. (1999): Synopses on Palaearctic Collembola (W. Dunger, ed.), Vol. II, Symphypleona. – *Abhandlungen und Berichte des Naturkundemuseums Görlitz* **71**(1): 1–318.
- Bretfeld, G. & J. I. Arbea (2000): *Navarella apicalis*, a new genus and species of the monophylum Bourletiellidae from northern Spain (Insecta, Collembola, Bourletiellidae). – *Senckenbergiana biologica* **80**: 127–133.

Sousa, J. P., M. M. da Gama, C. Pinto, A. Keating, F. Calh a, M. Lemos, C. Castro, T. Luz, P. Leit o & S. Dias (2004): Effects of land-use on Collembola diversity patterns in a Mediterranean landscape. – *Pedobiologia* **48**: 609–622.

Accepted 03 August 2010