



## The first hypogean dipluran from Portugal: description of a new species of the genus *Litocampa* (Diplura: Campodeidae)

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Knowledge of Portuguese Campodeidae is scant, with only 7 previous papers (Wygodzinsky 1944a; Condé 1951; Sendra 1990; Sendra & Moreno 2004, 2006; Gama *et al.* 2000a,b), with a total of 13 epigeal species: *Eutrichocampa* Silvestri (1 sp.), *Campodea* Westwood (6 spp.) and *Podocampa* Silvestri (6 spp.). Three of these species are endemic to mainland Portugal: *C. machadoi* Condé, 1951, *P. jorgei* Wygodzinsky, 1944 and *P. seabrai* Wygodzinsky, 1944. Only one species, *Podocampa cardini* Silvestri, 1932, has been recorded from a Portuguese cave environment (Condé 1955); this species previously had been known as an epigeal species from Sierra de Aralar in Navarra, Spain (Silvestri 1932). Intensive sampling efforts over the last four years in Portuguese karstic caves revealed the presence of a morphospecies originally assigned to *Podocampa fragiloides* Silvestri, 1932, which is often found in moist epigeal environments of the Iberian Peninsula influenced by the Atlantic Ocean (A. Sendra, pers. obs.).

The genus *Litocampa* Paclt, 1957 has five species recorded from the Iberian Peninsula, all in subterranean habitats of the Cantabrian and Basque mountains (Condé 1949, 1982; Sendra *et al.* 2003), the Pyrenean region (Sendra 1985) and an isolated location in eastern Spain (Bareth & Condé 1981). The new species described in this paper was collected in Gruta de Ibne Ammar, the biggest known cave in southern Portugal, in the Jurassic karstic massif of the Algarve (Almeida & Romariz 1989).

The “Gruta de Ibne Ammar” and three other caves in the Algarve karstic massif were sampled over a one-year span (2009). In Ibne Ammar cave three different areas were sampled: i) just beyond twilight zone, ii) a dry gallery very near the surface and iii) the deepest part beyond an anchialine lake. Sets of five pitfall traps (each trap 6 cm diameter and 7 cm deep, with a 1-cm-diameter tube fixed inside at the centre) were used in each zone. The traps were partially filled with 1,2-propanediol, and pork liver was used as a lure. The traps were supported and covered loosely by small stones to prevent flooding and disturbance by bigger animals. Traps were checked every three months. Monitoring of pitfalls was supplemented by 1 hour of active direct search during each sampling visit.

Physico-chemical parameters were measured in order to characterize the environment of the cave. A pH meter (model WTW 330/SET-2, Wissenschaftlich-Technische Werkstätten, Weilheim) was used for pH measurements, and air relative humidity was measured with an Aspiration Psychrometer 761 (Lambrecht, Göttingen).

Most of the collected specimens were preserved in 70% ethanol. All individuals were washed in distilled water and mounted on glass slides in Marc André II solution. After study the preparation was rehydrated and the specimens were returned to 70% ethanol for storage. A stereomicroscope and a phase-contrast microscope were used for examination. The illustrations were made with a drawing tube, and measurements were made with an ocular micrometer. To avoid possible errors due to specimen contraction, we took as an estimate of the total body length the HTL head-plus-thorax length (mm) (sum of the head length plus each notum of the thorax: pro, meso and metanotum, without consideration of the intersegmentary cuticle), as follows: for the head, from the base of the frontal process distal macrochaeta to the posterior edge of the cephalic capsule; for each of the thoracic nota, from the base of the medial-anterior macrochaetae to the base of the posterior marginal setae (Sendra 1988).

Abbreviations and indexes used in this article are based on those used by Condé (1955), including *ma*: medial-anterior; *mp*: medial-posterior; *la*: lateral-anterior; *lp*: lateral-posterior.

Four specimens were critical point-dried in a CPD 030 (Bal-tec, Balzers), mounted onto a stub with double-faced carbon tape, and sputter-coated with gold-palladium for SEM with a Hitachi S-4100 field emission scanning electron microscope.