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New species of aquatic oligochaetes (Annelida: Clitellata) from groundwaters in karstic areas of northern Spain, with taxonomic remarks on *Lophochaeta ignota* Štolc, 1886

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Abstract

We describe two new species: *Gianius navarroi* **n. sp.** (Phallodrilinae) and *Isochaetides gianii* **n. sp.** (Tubificinae), which were discovered during investigations on the groundwater oligochaete fauna in northern Spain. The present study contributes to the knowledge of the stygobiont oligochaete species in the Iberian Peninsula, which includes 21 species so far. Mature specimens of *Lophochaeta ignota* Štolc, 1886 were also collected at some sites, and are used to supplement the limited description of the reproductive organs known for the species to date. Taxonomy of the genus *Lophochaeta* Štolc, 1886 is discussed.

Key words: Oligochaeta**,** *Gianius, Isochaetides, Lamadrilus*, stygobiont, taxonomy

Introduction

The present contribution is part of a more extensive study on the groundwater oligochaetes from several karstic units in the Cantabric region and the Basque Country, in northern Iberian Peninsula (Spain). The study area is situated within a hypothetical band (between *ca* 42º N and 46º N in Europe) of high biodiversity for terrestrial cave fauna (Culver *et al*. 2006), based on historical (mostly climatic) conditions. Consequently, we also expect a high biodiversity for the aquatic fauna.

Two recent contributions have presented data on the groundwater oligochaetes from northern Spain (Camacho *et al.* 2006; Achurra & Rodriguez 2008). The Ojo Guareña cave system has produced 15 taxa, including a new undescribed Phallodrilinae. The cave is one of the largest karstic systems in Europe (*ca* 60 km explored), and several sampling surveys of epikarstic groundwater fauna were organized by the National Museum of Natural Sciences (Madrid), to study the distribution patterns of subterranean invertebrates in different habitats of the cave (Camacho *et al.* 2006). The karst of Santa Eufemia–Ereñozar was reported to have 47 taxa, including an undetermined Tubificinae. The karst is mostly located within the Urdaibai Biosphere Reserve, it was investigated during two independent sampling surveys (1983–86 and 2005–06), and was suggested to be a "hotspot" of biodiversity for groundwater oligochaetes (Achurra & Rodriguez 2008).

This paper contributes to the knowledge of biodiversity in groundwaters with the description of two new species from the above mentioned collections: *Gianius navarroi* **n. sp.** (Phallodrilinae) and *Isochaetides gianii* **n. sp.** (Tubificinae). Additional data on some morphological features, as well as a detailed description of the reproductive organs of the species *Lophochaeta ignota* Štolc, 1886 are based on mature specimens from sites in the Santa Eufemia–Ereñozar karst unit. Most published records of that species in running waters are based on immature specimens, identified on the basis of their thin outline and chaetal features, and mature individuals have been described on few occasions (Štolc 1886, 1888; Hrabě 1962, 1981; Laakso 1969;

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