

First Data On Centipedes (Myriapoda: Chilopoda) From The Cíes Islands (North-West Spain)

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Abstract

Preliminary data on the centipede fauna detected in a short-term survey on 8th August 2023 on Monteagudo Island are provided. *Geophilus easoni* Arthur, Foddai, Kettle, Lewis, Luczynski & Minelli, 2001 and *Lithobius borealis* Meinert, 1868 are first reported in a Spanish archipelago. *Pachymerium ferrugineum* (C.L. Koch, 1835) and *Lithobius borealis* Meinert, 1868 are first recorded in Galicia and Pontevedra. Centipede species potentially occurring in the Cíes Islands are commented on.

Key words: Coastal environments, Galicia, *Geophilus easoni*, *Lithobius borealis*, *Lithobius pilicornis pilicornis*, mixed forests, Monteagudo Island, *Pachymerium ferrugineum*, Pontevedra.

Introduction

Studies on centipedes from insular areas of Spain have mostly been carried out in the Balearic (Koch, 1882; Serra, 1983; Sammler *et al.*, 2006; Vadell, 2007a, 2007b; Vadell & Pons, 2008, 2009, 2010; Vadell & Martínez, 2011; Cabanillas & García-Febrero, 2020; Cabanillas & Robla, 2022) and the Canary Islands (Latzel, 1895; Brölemann, 1900; Serra, 1984; Eason, 1985; Zapparoli, 1990; Eason & Enghoff, 1992; Akkari & Ganske, 2018). Nevertheless, the centipede fauna of small islands that lie just off-shore of the Iberian Peninsula have been poorly researched, with only a couple of known records from the island of Terreros (Almería, south-eastern Iberian Peninsula) (Gómez de Dios *et al.*, 2022).

The Cíes Islands are located in the mouth of the Vigo estuary (Pontevedra, Galicia), in the north-west of the Iberian Peninsula. They are composed of three granite islands (Illa de Monteagudo, Illa do Faro and Illa de San Martiño) and small granite islets. The most representative environments in the Cíes Islands are cliffs, sand and pebble beaches, saline lagoons, dune systems and mixed forests of pine and eucalyptus. The climate of the archipelago has been defined by some authors as “sub-humid Mediterranean with an Atlantic tendency” due to dry and warm summers and rainy and mild winters (mean annual temperature is between 13-15°C and mean annual precipitation is around 1000 millimetres). More information about the natural environment, history and cultural heritage of the National Park of the Atlantic Islands of Galicia can be consulted in Organismo Autónomo de Parques Naturales (2014).

Studies on terrestrial arthropods from the Cíes Islands are scarce and only a few works on heteropteran, orthopteroid and coleopteran insects are available (Novoa *et al.*, 1999; Novoa & Baselga, 2000; Vázquez *et al.*, 2003). Aiming to keep on expanding knowledge on the arthropods of this archipelago, preliminary data on the centipede fauna from the Cíes Islands are provided.

Material & methods

Methodology. Centipedes were searched for beneath rocks, logs and under bark of rotten wood on Monteagudo Island (Fig. 1) during a non-systematic and short-term survey on 8th August 2023.

Literature on the morphology and identification of centipedes was consulted in determining the identity of specimens (Serra, 1980; Arthur *et al.*, 2001; Gregory & Barber, 2010; Bonato *et al.*, 2014; Iorio & Voigtländer, 2019). Taxonomical criteria of Bonato *et al.* (2016) were followed for Geophilidae and Ganske *et al.* (2020) for Lithobiidae. *Habitus in vivo* of specimens was photographed *in situ* with a Panasonic Lumix DMC-FZ300 camera equipped with a Raynox DCR-250 macro lens and edited with Adobe Photoshop 2022 and PhotoScape. Coordinates are expressed in the Universal Transverse Mercator system.



Figure 1: Sampling localities on Monteagudo Island. A) Praia da Cantareira. B) Ecotone on Praia da Cantareira. C) Praia de Rodas. D) Mixed forest of pine and eucalyptus.

Results and discussion

Class Chilopoda

Order Geophilomorpha

Family Geophilidae

Geophilus easoni Arthur, Foddai, Kettle, Lewis, Luczynski & Minelli, 2001

Material examined: Illas Cíes - Illa de Monteagudo, Praia da Cantareira: 1 juvenile with 53 leg pairs (Fig. 2A), under bark of a pine log in the boundaries of a mixed forest of cluster pine (*Pinus pinaster* Ait.) and blue gum (*Eucalyptus globulus* Labill.) (29T 508175 4675048) and 1♀ with 53 leg pairs (Fig.

2B), 08/08/2023, under a rock in the ecotone between the terrestrial and the coastal area of a pebble beach (29T 508168 4676076).

Geophilus easoni (Fig. 2A-B) was first reported in Spain from coastal grasslands, moorlands and woodlands in Pontevedra and Ourense (northwestern Iberian Peninsula) (Gregory & Lewis, 2015). Later, the species was found in eucalyptus plantations in Asturias (northern Iberian Peninsula) (Cabanillas, 2019). New data from the Cíes Islands provide the first record from an insular territory of Spain and the third report for the country. Specimens fitted the description given by Gregory & Lewis (2015) for the Galician individuals (*i.e.*, stout and bluntly rounded teeth on the labral mid-piece and number of leg pairs), except the minimum number of coxal pores (6 on each coxa), as previously observed in British populations (Arthur *et al.*, 2001).

***Pachymerium ferrugineum* (C.L. Koch, 1835)**

Material examined: Illas Cíes - Illa de Monteagudo, Praia de Rodas: 1 juvenile with 53 leg pairs, 08/08/2023, under a rock at the end of a sand beach (29T 508071 4674835).

Pachymerium ferrugineum is widespread in the Iberian Peninsula in both coastal and inland habitats (Cabanillas & Robla, 2022). Also known from the Spanish archipelagos of the Balearic and the Canary Islands (Latzel, 1895; Brölemann, 1900; Cabanillas & Robla, 2022). The record from the Cíes Islands made it possible to first report the species in Galicia and Pontevedra. Although a juvenile, the specimen could be attributed to the coastal form due to body colour, number of leg pairs and its presence in a hypersaline environment.



Figure 2: Habitus in vivo of some centipedes from the Monteagudo Island.

- A) Juvenile *Geophilus easoni*. B) Female *Geophilus easoni*. C) Male *Lithobius borealis*.
D) Female *Lithobius pilicornis pilicornis*.

Order Lithobiomorpha

Family Lithobiidae

Lithobius borealis Meinert, 1868

Material examined: Illas Cíes - Illa de Monteagudo: 1♂/1♀, 08/08/2023, under a rock in a mixed forest of cluster pine (*Pinus pinaster* Ait.) and blue gum (*Eucalyptus globulus* Labill.) (29T 508142 4675808).

Lithobius borealis (Fig. 2C) is a common species in pine forests, oak groves, eucalyptus plantations, meadows, moorlands and mountainous environments of the northern Iberian Peninsula (Serra, 1980; Salinas, 1990; Iorio & Voigtländer, 2019; Cabanillas, 2019). The new findings provided the first record in Galicia and Pontevedra and made it possible to first report the species in a Spanish archipelago. Specimens fitted the description given by Serra (1980) for Iberian specimens.

Lithobius pilicornis pilicornis Newport, 1844

Material examined: Illas Cíes - Illa de Monteagudo: 1♂/1♀, 08/08/2023, under a rock in a mixed forest of cluster pine (*Pinus pinaster* Ait.) and blue gum (*Eucalyptus globulus* Labill.) (29T 508142 4675808).

Lithobius pilicornis pilicornis (Fig. 2D) is considered one of the most common centipedes in the northern Iberian Peninsula, with many records in pine forests, riverbank woodlands, eucalyptus plantations, meadows, moorlands, mountainous environments and caves (Demange, 1959; Serra, 1980; Salinas, 1990; Iorio & Voigtländer, 2019; Cabanillas, 2019). Previously recorded in Galicia by Iorio & Voigtländer (2019) in the provinces of Pontevedra and Ourense. Also known from the Spanish archipelago of the Canary Islands (Akkari & Ganske, 2018). Specimens fitted previous descriptions given by Serra (1980, 1981) for Iberian specimens.

Centipede community of the Cíes Islands

Preliminary results were too limited to accurately represent the composition of the centipede fauna of the Cíes Islands, as only a single short-term survey was conducted during the driest season. Nevertheless, exploring the habitat diversity of the Cíes Islands made it possible to surmise which centipede species could be living in this archipelago. Since the four centipede species found on Monteagudo Island are particularly frequent in the northern Iberian Peninsula (Serra, 1980; Salinas, 1990; Gregory & Lewis, 2015; Iorio & Voigtländer, 2019; Cabanillas, 2019; Cabanillas & Robla, 2022), it is reasonable to believe that a significant portion of the centipede species inhabiting the Atlantic and Cantabric regions may also dwell in the Cíes Islands. For instance, mixed forests of pine and eucalyptus are most likely inhabited by the silvicolous species *Lithobius variegatus* Leach, 1814, *Lithobius validus* Meinert, 1872, *Lithobius derouetae* Demange, 1958, *Lithobius crassipesoides* Voigtländer, Iorio, Decker, Spelda, 2017, *Strigamia crassipes* (C.L. Koch, 1835) species complex, *Geophilus truncorum* Bergsøe & Meinert, 1866 or *Stigmatogaster souletina* (Brölemann, 1907). Other common species in the northern Iberian Peninsula, such as *Cryptops (Cryptops) hortensis* (Donovan, 1810), *Cryptops (Cryptops) anomalans* Newport, 1844 or *Scutigera coleoptrata* (Linnaeus, 1758), are also expected to be present in the Cíes Islands. Additionally, Gregory & Lewis (2015) documented the presence of *Arenophilus peregrinus* Jones, 1989 in a neighbouring location in the north-western Iberian Peninsula and suggested a widespread Atlantic distribution for the species. Although the distribution of *A. peregrinus* in the Iberian Peninsula needs further investigation, the possibility exists that the species is also present in the Cíes Islands. Other habitats, such as cliffs, rocky beaches, saline lagoons and other coastal environments could provide suitable habitats for the settlement of the halobiont centipedes *Hydroschendyla submarina* (Grube, 1872), *Strigamia maritima* (Leach, 1817) or *Schendyla peyerimhoffi* Brölemann & Ribaut, 1911, amongst others. In light of the aforementioned considerations, further studies should be oriented to fully characterise the centipede community of the Cíes Islands.

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