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Dung beetles (Coleoptera: Hydrophilidae) new to Madeira

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ABSTRACT: This is the first report from the Madeira Archipelago of three coprophilous species from the subfamily Sphaeridinae: *Cercyon obsoletus* (Gyllenhal, 1808), *Cryptopleurum minutum* (Fabricius, 1775) and *Sphaeridium scarabaeoides* (Linnaeus, 1758). All were taken from cow dung.

Keywords: coprophagous Sphaeridinae, first record, Madeira Island.

RESUMO: Neste artigo, os autores fornecem pela primeira vez informação sobre a ocorrência de três espécies coprófagas da subfamília Sphaeridinae na Madeira: *Cercyon obsoletus* (Gyllenhal, 1808), *Cryptopleurum minutum* (Fabricius, 1775) e *Sphaeridium scarabaeoides* (Linnaeus, 1758). Todas elas foram colhidas em bostas de vaca.

Palavras-chave: Sphaeridinae coprófagos, novos registos, ilha da Madeira.

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INTRODUCTION

Dung beetles (coprophagous beetles), which feed on the faeces of large herbivores, are a relatively recent addition to Madeira's fauna. The island was colonised in the 15th century after its discovery by Portuguese sailors. The only land mammals encountered by the first settlers on Madeira were bats (MATHIAS, 1988). All other mammals that live on Madeira today were accidentally or deliberately introduced with the help of humans. With the domestic animals came the associated invertebrates, including the beetles that inhabit their dung. To date, nine terrestrial species of Hydrophilidae have been found in Madeira, living in a variety of organic detritus and animal faeces: *Cercyon inquinatus* Wollaston, 1854, *C. littoralis* Gyllenhal, 1808, *C. nigriceps* (Marsham, 1802), *C. quisquilius* (Linnaeus, 1761), *C. terminatus* (Marsham, 1802), *Dactylosternum abdominale* (Fabricius, 1792), *Megasternum concinnum* (Th. Marsham, 1802), *Pachysternum capense* (Mulsant, 1844) and *Sphaeridium bipustulatum* Fabricius, 1781 (WOLLASTON, 1857; SERRANO, 1987; ERBER & HINTERSEHER, 1988, 1990; BOIEIRO *et al.*, 2008; AGUIAR & CARVALHO, 2016). The only one of these species that has reached Madeira without human intervention is *C. littoralis*. It is widespread along the coasts of the northern hemisphere and lives on algae that are washed up on the beaches by the sea.

MATERIAL AND METHODS

The beetles mentioned in the present note were collected during a 10-day visit to Madeira from 8 to 17 March 2023 (two first authors), except for four specimens of *Sphaeridium scarabaeoides* and associated unpublished data from the collection of the Laboratório de Qualidade Agrícola (third author). All were obtained from cow dung in pastures at altitudes above 800 m *a.s.l.* on the plateau in the western part of the island. The standard collecting method for these species was used, *i.e.* the beetles were picked up from the ground with entomological forceps as they were escaping from the cow pats being examined. The results below contain the dates and locations of capture as well as information on the distribution and ecology of each species. The voucher specimens are deposited in the first two authors' collections and ICLAM, the collection of the Laboratório de Qualidade Agrícola (third author). In the case of specimens from the ICLAM collection, their collection numbers are given.

RESULTS

Cercyon obsoletus (Gyllenhal, 1808)

Madeira: near Lagoa do Bardo, Porto Moniz, 32° 50' 09" N 17° 11' 18" W, [UTM: BB9535], 815 m *a.s.l.*, pasture, cow dung, 9 March 2023, 2♂♂, 1♀, leg. Czesław Greń.

This species is known from almost all of Europe, the Azores, the Canary Islands, Algeria (North Africa) and Iran (Asia) (FIKÁČEK *et al.*, 2015; MACHADO & OROMÍ, 2000). It lives mainly in the dung of herbivores, especially artiodactyls, but has also been found on carrion and in manure (VORST, 2009).

Cryptopleurum minutum (Fabricius, 1775)

Madeira: Paúl da Serra plateau, near Pico das Pedras 32° 43' 52" N 17° 03' 26" W, 1359 m *a.s.l.*, pasture, cow dung, [UTM: CB0723], 11 March 2023, 1 ex., leg. Czesław Greń.

This species, which is widespread in the Palaearctic but not found in North Africa (FIKÁČEK *et al.*, 2015), was accidentally introduced to Hawaii, from where it spread to North America (D' ORCHYMONT, 1937). It lives mainly in animal faeces but is also often found in plant detritus and on carrion (BOUKAL *et al.*, 2007).

SERRANO (1987) recorded a representative of the genus *Cryptopleurum* in Madeira, based on a single beetle from cattle dung in Queimadas (860 m *a.s.l.*). He identified it only as *Cryptopleurum* sp. It could be *C. minutum*, but without examining the specimen one cannot be sure of the identification, as there is a possibility that other members of this genus may have been accidentally introduced.

Sphaeridium scarabaeoides (Linnaeus, 1758)

Madeira: near Lagoa do Bardo, Porto Moniz 32° 50' 09" N 17° 11' 18" W, [UTM: BB9534], 815 m *a.s.l.*, pasture, cow dung, 9 March 2023, 4♂♂, 3♀♀, leg. Czesław Greń; Paúl da Serra plateau, near Pico da Urze 32° 45' 07" N 17° 06' 36" W, 1398 m *a.s.l.*, pasture, cow dung [UTM: CB0225], 11 March 2023, 6♂♂, 8♀♀, leg. Czesław Greń, 6♂♂, 17♀♀, leg. Krzysztof Lubecki; Paúl da Serra plateau, near Pico das Pedras 32° 43' 52" N 17° 03' 26" W, 1359 m *a.s.l.*, pasture, cow dung [UTM: CB0723], 11 March 2023, 3♂♂, 2♀♀, leg. Czesław Greń; ICLAM-02932: Canhas, Ponta do Sol 32° 44' 22" N 17° 06' 18" W, [UTM: CB0224], 1211 m *a.s.l.*, secondary

dirt road 4 km NE of Canhas, cow dung, 29 April 2010 1♀, leg. José Jesus; ICLAM-07988: Fonte do Bispo, Fajã da Ovelha (Calheta) 32° 47' 19" N 17° 11' 04" W, [UTM: BB9529], 1230 m *a.s.l.*, cow dung, 16 May 2019 1♂, leg. José Jesus; ICLAM-07989: Fonte do Bispo, Fajã da Ovelha (Calheta) 32° 47' 21" N, 17° 11' 07" W, [UTM: BB9530], 1234 m *a.s.l.*, cow dung, 16 May 2019 2♂♂, leg. José Jesus.

This Palaearctic species was accidentally introduced to Africa, Australia and North America (FIKÁČEK *et al.*, 2015). It lives mainly in the dung of various herbivores, especially artiodactyls (BOUKAL *et al.*, 2007). In addition, *Sphaeridium bipustulatum*, was caught, albeit only in single specimens, at all three locations mentioned above.

It is worth mentioning that members of the genus *Sphaeridium* Fabricius, 1775 (*Sphaeridium marginatum*) were only recently discovered in the Canary Islands (SUÁREZ *et al.*, 2018), so it is obvious that they were not included in previous catalogues for these areas (paper versions) (MACHADO & OROMÍ, 2000; FIKÁČEK *et al.*, 2015). Even more interesting is the fact that they are not included in the updated online version of the Catalogue of Palearctic Coleoptera (PRZEWOŹNY, 2022).

DISCUSSION

All of the above species are widespread throughout Europe, so their introduction to Madeira is no surprise. One may wonder why they were not recorded there earlier. This remark applies in particular to *S. scarabaeoides*, which we found to be far more numerous than *S. bipustulatum* Fabricius, 1781, which was first recorded in Madeira a very long time ago (WOLLASTON, 1857), especially as it is not a small, easily overlooked beetle. It seems that coleopterologists have so far focussed their efforts on the island's endemic species, neglecting environments that can only harbour introduced species (including, of course, cattle dung).

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