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Technomyrmex vexatus (SANTSCHI, 1919) from Gibraltar (Hymenoptera: Formicidae): a new ant species for Europe and genus for Iberia

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Abstract

The ant species *Technomyrmex vexatus* (SANTSCHI, 1919) (Formicidae: Dolichoderinae) is recorded from Gibraltar on the Iberian Peninsula. This comprises the first record of the species in Europe and of the genus *Technomyrmex* MAYR, 1872 in Iberia. The species was found on the Rock of Gibraltar, where it is apparently common in thick maquis vegetation.

Key words: *Technomyrmex vexatus*, Dolichoderinae, Europe, Iberia, Gibraltar.

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Introduction

The ant genus *Technomyrmex* MAYR, 1872 (Dolichoderinae: Dolichoderini) are generalist ants found primarily in the tropics and subtropics of the Old World. There are now 90 valid species, up from the 59 recorded in BOLTON's (1995) catalogue. However, the genus includes some tramp species that are widespread in distribution (BOLTON 2007). Some of these tramp species have been recorded in Europe, within Austria (STEINER & al. 2002), the Czech Republic (ŠEFROVÁ & LAŠTŮVKA 2005) and Madeira (WETTERER & al. 2007). DONISTHORPE (1927) lists the *Technomyrmex* species recorded from British hothouses.

Only one species is native to the Western Palaearctic: *T. vexatus* (SANTSCHI, 1919), which is found in Morocco (SANTSCHI 1919, CAGNIANT & ESPADALER 1993). The species was originally described as *Tapinoma vexatum* by SANTSCHI (1919) based on males captured in Tangier, but was placed within the genus *Technomyrmex* by CAGNIANT & ESPADALER (1993) following examination of workers. Tangier lies in northern Morocco on the southern shore of the Strait of Gibraltar, a sea crossing of some 14 km at its narrowest (Fig. 1). Furthermore, a "*Technomyrmex* sp." was recorded from Ceuta (Sebta) □ which lies directly opposite Gibraltar in North Africa □ by CAGNIANT & ESPADALER (1993) and this has been confirmed as *T. vexatus* (B. Bolton, pers. comm.).

Until the present, the genus *Technomyrmex* was not known from Iberia (GOMEZ & ESPADALER 2007). The British Territory of Gibraltar lies at the southernmost tip of the Iberian Peninsula (36° 08' N, 5° 21' W), neighbouring Cádiz Province in Andalucía, Spain. With this paper we provide the first records of *Technomyrmex vexatus* for Europe, from the Rock of Gibraltar.

Fig. 1: Map of the Strait of Gibraltar showing the location of Gibraltar (1), Ceuta (2), and Tangier (3). The location of the Strait is shown in reference to the Iberian Peninsula (inset). ➔

Material and methods

General surveying of ants took place on the Rock of Gibraltar from May to October 2007. A variety of methods were used: ants were searched for on the ground and on vegetation, nests were located within trees and shrubs, in the ground and under rocks and stones, and vegetation was beaten. In addition, a Rothamsted light trap was operated on a nightly basis. A number of habitats were surveyed: rocky slopes with garigue vegetation, open pseudosteppe, tall thickets of maquis (or matorral), gardens and wooded areas, sand dunes and sand slopes with littoral habitat. These surveys produced a series of an ant species belonging to the subfamily Dolichoderinae FOREL, 1878. This ant was found to belong to the genus *Technomyrmex* using keys in HÖLLDOBLER & WILSON (1990) and BOLTON (1994). The species was kindly identified by Mr. Barry Bolton.

Results

The genus *Technomyrmex* is similar to the closely-related dolichoderine genus *Tapinoma* FOERSTER, 1850. The two genera can be distinguished by the following features: five gastral tergites are visible when *Technomyrmex* is exa-

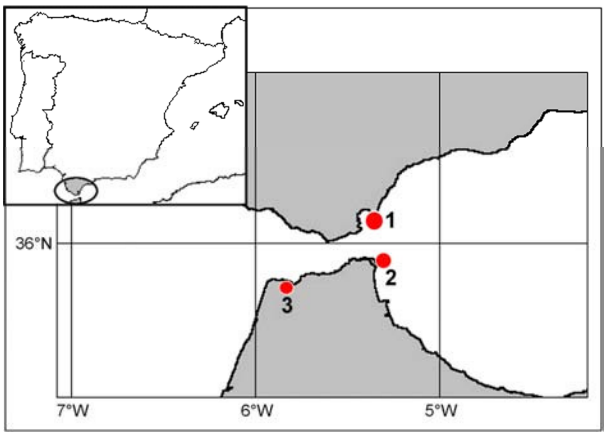

Fig. 2: *Technomyrmex vexatus* worker from Gibraltar in dorsal (upper panel) and lateral (lower panel) view.

mined in dorsal view (Fig. 2), whereas only four tergites are visible in *Tapinoma* with the fifth tergite reflexed below the fourth (HÖLLDOBLER & WILSON 1990, BOLTON 1994). *Technomyrmex vexatus* can be separated from tramp species belonging to the "*T. albipes*" group by a somewhat shiny appearance and a lack of dorsal setae, including on the gaster (B. Bolton, pers. comm.). A description of the worker caste of *T. vexatus* is included in BOLTON (2007).

Workers were located by searching on or beating vegetation, whereas all males were captured in flight with a light trap. Workers and males are illustrated (Figs. 2, 3). 42 workers were collected in the Upper Rock Nature Reserve, Gibraltar, between 21.VIII.2007 and 24.VIII.2007. 253 males were captured between 6.VII.2007 and 18.X. 2007 at the Gibraltar Botanic Gardens, with peaks of 19 on 23.VII.2007, 27 on 13.IX.2007, 23 on 17.IX.2007, 23 on 24.IX.2007 and 23 on 8.X.2007. All specimens leg. R. Guillem & K. Bensusan. 4 workers and 2 males collected on 24.VIII.2007 det. B. Bolton. All other specimens det. R. Guillem.

Discussion

These records of *Technomyrmex vexatus* from Gibraltar provide the first records of a new species and genus for the Iberian Peninsula, and a new species for Europe. So far *T. vexatus* has only been recorded from Gibraltar, Tangier (SANTSCHI 1919), and Ceuta (CAGNIANT & ESPADALER 1993, B. Bolton, pers. comm.). All of these sites lie close to the shore of the Strait of Gibraltar (Fig. 1). The species thus appears to have a very restricted distribution. There are two other ant species that are roughly restricted to the hinterland of the Strait: *Anochetus ghilianii* (SPINOLA, 1951) (Ponerinae) and *Amblyopone emeryi* (SAUNDERS, 1890) (Amblyoponinae) (TINAUT 1989, GOMEZ & ESPADALER 2007). Given its current known distribution, it is possible that *T. vexatus* comprises a third species with such a distribution. It is interesting to note that, like the genus *Anochetus*, *Technomyrmex* is a largely tropical genus.

Fig. 3: *Technomyrmex vexatus* male from Gibraltar, in lateral (upper panel) and frontal (lower panel) view.

The most closely related species to *T. vexatus* appears to be *T. gibbosus* WHEELER, 1906, which is found in Japan and Korea. BOLTON (2007) discusses the disjunct distributions of these two seemingly closely-related species briefly, and proposes that the morphological similarity of these two species could be the result of convergent evolution. Although this is possible, the disjunctive distribution of another species is worth mentioning. The azure-winged magpie *Cyanopica cyanus* (PALLAS, 1776) is a species of corvid (Aves) that is found in south-western Iberia, easternmost Russia, Mongolia, China, Korea and Japan, be-

ing absent from a gap of some 9000 km in-between (CRAMP & PERRINS 1994, KRYUKOV & al. 2004). These isolates seem to be Tertiary relics, following subdivision of a continuous range during the Pleistocene. This is supported by genetic analyses which suggest that eastern and western populations comprise two good species (KRYUKOV & al. 2004). Only analyses of the DNA of the two *Technomyrmex* species would settle the question whether their morphological similarity reflects a close phylogenetic relationship or convergence.

In Gibraltar, *T. vexatus* has been found within the thick maquis of the Upper Rock Nature Reserve, at altitudes between 170 m and 350 m above sea level. In addition, a large number of males have been captured with a light trap at the Gibraltar Botanic Gardens, a garden consisting of a range of native and exotic plants that lies close to sea level. The species has been recorded on a range of plants: *Olea europaea* L. (Oleaceae), *Osyris quadripartita* SALZM. EX DECNE. (Santalaceae), *Teucrium lusitanicum* BOISS. (Labiatae), *Pinus pinea* L. (dead) (Pinaceae), *Clematis cirrhosa* (Ranunculaceae) and *Pistacia lentiscus* L. (Anacardiaceae). Workers have been observed tending scale insects on *Olea europea*.

We have not yet surveyed habitats in nearby Spain for *T. vexatus*. However, TINAUT (1989) surveyed the area neighbouring Gibraltar and did not find the species. Furthermore, this author carries out expeditions to habitats on the Spanish shore of the Strait on an annual basis, and has never detected a *Technomyrmex* (A. Tinaut, pers. comm.). SAUNDERS (1890), whose study of the ants of the region included Gibraltar and Morocco, does not mention any *Technomyrmex* species either, although his list of species seems incomplete. Any surveys for the species in the area neighbouring Gibraltar should be carried out in habitats similar to those in which the species has been found at Gibraltar. A light trap appears to be an effective method of capturing males.

Technomyrmex vexatus seems well established and common within Gibraltar and is the only wild species of *Technomyrmex* currently inhabiting continental Europe, the other tramp species being restricted mainly to hothouses (B. Bolton, pers. comm.). Tramp species of *Technomyrmex* will commonly forage indoors (DEYRUP 1991, WARNER 2003). *T. vexatus* has also been observed foraging indoors in Gibraltar.

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Zusammenfassung

Die Ameisenart *Technomyrmex vexatus* (SANTSCHI, 1919) (Formicidae: Dolichoderinae) wird erstmals für Gibraltar auf der Iberischen Halbinsel gemeldet. Gleichzeitig stellt unser Fund den ersten Nachweis der Art in Europa und der Gattung *Technomyrmex* MAYR, 1872 auf der Iberischen Halbinsel dar. Die Art wurde am Felsen von Gibraltar gefunden, wo sie in dichter Macchia offenbar häufig ist.

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