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Aphaenogaster finzii Müller, 1921, a trans-Ionian species new to Italy (Hymenoptera, Formicidae)

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ABSTRACT

The first data on the presence of the ant *Aphaenogaster finzii* Müller, 1921 in Italy are presented. Mainly distributed across the Balkans, from Greece to Croatia, *A. finzii* was discovered in Calabria, in the South-Eastern part of the Italian peninsula. As in the case of many other species of ants and other organisms found in this region, a trans-Ionian dispersal appears to be the most likely explanation of its distribution.

INTRODUCTION

The Italian ant fauna currently counts about 270 taxa (Antweb, 2019), including many only added during the last two decades, as a result of either taxonomic (Rigato 1999, Radchenko et al. 2006, Csósz et al. 2007, Schulz et al. 2007, Elmes et al. 2008, Steiner et al. 2010, Seifert 2012, Rigato 2011, Seifert et al. 2017, Wagner et al. 2017, Steiner et al. 2018, Alicata & Schifani 2019) or faunistic investigations (Bonelli et al. 2004, Rigato & Toni 2011, Schifani 2017, Schifani & Alicata 2018). Additional diversity is expected to be

discovered, especially from the South of the country, which is less explored. A comprehensive analysis of the biogeography of the Italian myrmecofauna was never attempted in the past, and although such step is highly desirable in the future, it would probably be premature now, since many new discoveries may be expected.

Due to its particular geographic position, the Italian territory is the easternmost distribution area of many Western-Mediterranean species, where they are often limited to Liguria or Sicily regions (examples

are *Aphaenogaster dulcinea* Emery, 1924, *A. gibbosa* (Latreille, 1798), *Camponotus barbaricus* Emery, 1905, *C. cruentatus* (Latreille, 1802), *C. ruber* Emery, 1925, *C. sylvaticus* (Olivier, 1792), *Messor barbarus* (Linnaeus, 1767), *M. bouvieri* Bondroit, 1918, *Plagiolepis grassei* Le Masne, 1956). At the same time, Italy also contains the westernmost occurrences of many Eastern-Mediterranean species. Some of these species are relatively widespread across the Italian territory, as in the case of *Camponotus dalmaticus* (Nylander, 1849) and *Liometopum microcephalum* (both are absent from Sardinia, see Baroni Urbani 1971), while in other cases their presence is mainly limited to the North-Eastern part of the country (usually Veneto and Friuli-Venezia Giulia regions), and/or to the South-Eastern part of the peninsula, mainly in Apulia, Basilicata and Calabria regions (but sometimes also Sicily). The South-Eastern part of the peninsula is an area rich of trans-Adriatic and trans-Ionian taxa, presumably due to hypothetical quaternary land bridges with the Balkans or older Miocene fragmentation of the Aegaeis (Gridelli 1950; Jesse et al., 2009; Çıplak et al. 2010; Korábek et al. 2014; Blain et al. 2016). For example, *Crematogaster schmidti* (Mayr, 1853) and *Prenolepis nitens* (Mayr, 1853) are limited to the North-Eastern portions of the Italian territory (Baroni Urbani 1971),

while *Tetramorium diomedea* Emery, 1908 is only known from the Southern part of the Italian peninsula and Sicily (Sanetra et al. 1999). The Italian endemism *Cataglyphis italica* (Emery, 1906) seemingly has an Eastern origin (Emery 1906) and is only present in South-Eastern Italy (Baroni Urbani 1971), and the same can be noted regarding *Tetramorium sanetra* Schulz & Csösz, 2007 (Csösz et al. 2007), while some members of the *Aphaenogaster testaceopilosa* group distributed from the Adriatic coast to Sicily may also have an Eastern origin (Centorame et al. 2018). Finally, *Aphaenogaster muelleriana* Wolf, 1915 and *Camponotus tergestinus* Müller, 1921 are present both in South-Eastern and in North-Eastern Italy, with apparently unconnected populations (Scupola 2017, Bračko 2017, Schifani & Alicata 2018).

Gridelli (1950), working on Coleoptera, presented an interesting biogeographic framework to classify current distribution patterns of species present both in the Balkans and in Italy, which may easily be used to interpret the condition of many of the abovementioned taxa.

Here we report and discuss on the discovery of an additional Eastern ant species in Italy, *Aphaenogaster finzii* Müller, 1921, which was collected in Southern Italy (Calabria).



Fig. 1 *Aphaenogaster finzii* Müller, 1921, holotype worker from Croatia, stored in Museo Civico di Storia Naturale di Trieste, Italy. From left to right: dorsal view, head view, lateral view. Photos by Silvia Castro-Delgado.



Fig. 2 *Aphaenogaster finzii* Müller, 1921, worker collected during 2018 near Pallagorio, Calabria, Antonio Alicata personal collection. From up to down: dorsal view, head view, lateral view. Photos by Enrico Schifani.

MATERIALS AND METHODS

Workers of *A. finzii* were collected in two localities, both North-East-facing slopes of hills characterized by a moist habitats of evergreen oaks: Vallone Suvaro, Pallagorio (KR), Calabria, Italy, WGS84 coordinates: 39.321814 and 16.916941, 485m, open patches in a *Quercus ilex* L. forest, among mossy stones, direct sampling, 15.iv.2016 and 13.iv.2018, A. Alicata legit; San Nicola dell'Alto (KR),

Calabria, Italy, 39.290411, 16.980319, 500m *Quercus suber* L. forest, litter sampling, 05.iv.19, G. Sabella & D. Mifsud legit. All samples are currently preserved in the Antonio Alicata personal collection (Catania, Italy) – AACI.

The original worker description of *A. finzii* (Müller 1921) and especially the following descriptions of its male and queen (Müller 1923) may be insufficient for the species identification. However, *A. finzii* is a remarkable species in its appearance (Figs. 1, 2), which should not be confused with most of the Italian congeneric species even at first glance when workers are observed. The combination of their very shiny aspect, long mesosoma hairs, mesosoma shape and body proportions (e.g. legs length, short scapes, relatively small eyes) immediately distinguish them as members of the *A. pallida* group (*sensu* Boer 2013). Müller (1921) emphasizes also a similarity to *A. subterranea* (Latreille, 1798), especially regarding the size and shape of the propodeal spines, but members of the *A. subterranea* group have a much deeper metanotal groove (Alicata & Schifani 2019) in addition to a usually more developed sculpture and shorter hairs on the mesosoma. Among the Italian representatives of the *A. pallida* group, *A. finzii* workers can be easily separated from *A. pallida* (Nylander, 1849), present in Sicily and Southern Italy, due to its lack of propodeal spines, and from *A. dulciniae*, only present in Liguria, due to their different mesosoma (including shorter spines) and head shape. The shape of mesosoma is an unreliable and misleading character for workers identification in some ant species (e.g. *Camponotus lateralis* (Olivier, 1792), see Seifert 2018) but proved to be one of the most reliable and easy characters in some recently revised species of *Aphaenogaster* Mayr, 1853 (Alicata & Schifani 2019). *Aphaenogaster finzii* workers are also distinguished by a larger size and significantly developed, usually horizontal, propodeal spines when compared to most of the similar species of the Balkans (Agosti and Collingwood 1978).

DISCUSSION

Most of the species of the *A. pallida* group (*sensu* Boer 2013) are Eastern-Mediterranean: *A. lesbica* Forel, 1913, *A. finzii* Müller, 1921, *A. holtzi* (Emery, 1898), *A. subterranooides* Emery, 1881 are distributed from the Balkans to Anatolia. On the other hand, *A. pallida* and its two closely related forms, *A. pallida laurenti* Santschi, 1939 and *A. leveillei* Emery, 1881, which need further taxonomic investigation, are distributed from the Italian peninsula and Corsica south to Sicily and the Maghreb as well as in Southern Spain. *Aphaenogaster dulciniae* is mainly distributed through Iberia and Mediterranean France, barely reaching the Italian territory (Baroni Urbani 1971, Cagniant 1996, Casevitz-Weulersse & Galkowski 2009, Collingwood & Yarrow 1969, Collingwood & Prince 1998).

Aphaenogaster finzii ranges from Greece (including the Peloponnese) north to Croatia (where the northernmost records are from the Dinaric region, very close to the Italian territory – see Baroni Urbani 1971) through Macedonia, Serbia, Montenegro and Bosnia and Herzegovina (Bračko 2006, Bračko et al. 2014, Karaman 2011, Salata & Borowiec 2018, Petrov 2006, Vesnic & Skrijelj 2013). It is probably unrecorded in Albania only due to a lack of sufficient investigation. Data on its habitat preferences is relatively scarce, but the few published localities with coordinates (Bračko et al. 2014, Salata & Borowiec 2018), the habitats described by Karaman (2011) and the present finding roughly point to a preference for hilly habitats characterized by oak forests and open patches (which also seem to occur near most of the localities presented by Müller 1921, Zimmermann 1934, Bračko 2006, Petrov 2006). A scarcity of myrmecological exploration in Southern Italy appears to be the most likely reason to justify the absence of previous records of the species in this area. Furthermore, many Mediterranean species of the genus *Aphaenogaster* have often been

confused with each other as the genus has sometimes been overlooked by specialists (e.g. see Boer 2013, Alicata & Schifani 2019). Although *A. finzii* is very easily distinguished among the congeneric Italian species, it cannot be excluded that it may still have been confused with others in the past. Finally, its distribution range in Calabria and neighbouring areas could be relatively small, and a proper investigation effort is required on this matter.

Many ant species are being introduced in the Mediterranean region, thriving mostly in anthropogenic habitats (Schifani 2019). Historic intra-Mediterranean introductions are still very little-studied and their contribution to the current fauna assemblages is almost completely unknown (Schifani 2019). Sometimes, they may represent the most credible explanation to actual distributions that were previously attributed to older biogeographic processes (Jowers et al. 2015). However, nothing particularly suggests *A. finzii* to be an introduced species in Calabria, considering its discovery in a natural habitat and above all the biogeography of the area, which hosts geographically isolated populations of many other taxa either currently present in the Balkans or whose closest relatives are located in the Balkans. Since its apparent absence through the rest of the peninsula, and the location of the current findings rather south, *A. finzii* does not seem to be a trans-Adriatic species: a trans-Ionian dispersal appears to be the most likely explanation of its distribution in Italy, and may be ultimately verified and analysed in detail only once an adequate set of molecular data on this species becomes available.

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