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SHORT NOTE

First Record of the Exotic Ant *Hypoponera ergatandria* in Italy: Indoor Alate Swarms and Stinging Queens

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Abstract

Until recently, *Hypoponera ergatandria* was commonly misidentified as *H. punctatissima*, both of which are widespread tramp ant species. Today, *H. ergatandria* has been recorded in eleven European countries, while most existing *H. punctatissima* records are doubtful. Its geographic origins, like in the case of *H. punctatissima*, remain unclear. Here, we present the first record of *H. ergatandria* in Italy, which also hosts *H. punctatissima.* We report on a large swarm of alate queens from the basement of a building in the city of Teramo, Central Italy. As reported in Florida under the name *H. punctatissima,* the species seems capable of producing surprisingly large alate swarms, and alate queens can become a nuisance due to their stinging ability against humans. However, *Hypoponera* stings are not known to pose any public health threat. Furthermore, *H. ergatandria* and *H. punctatissima* are not known to have any ecological impact and are usually confined to a very scattered distribution in Europe.

The few ponerine ant species occurring in Europe belong to five genera: *Anochetus*, *Brachyponera*, *Cryptopone*, *Hypoponera*, and *Ponera* (Guénard et al., 2017). Most of them have a wide distribution range and are characterized by a cryptic lifestyle as predatory endogean species living in small colonies (Bolton & Fisher 2011; Seifert, 2018; Báthori et al., 2022; Csősz et al., 2022). They are all armed with functional stingers, which are usually not considered harmful to humans (Seifert, 2018). A recent addition, the Asian needle ant *Brachyponera chinensis*, introduced in Italy, is the only exception: it has a very different lifestyle, is capable of stinging humans painfully, and may pose an ecological threat to the invaded areas (Menchetti et al., 2022). On the other hand, all other non-native ponerine species in Europe belong to the genus *Hypoponera*, occur worldwide, and are not so remarkably different from native species (Bolton & Fisher 2011; Schifani 2019).

Forel (1893) described *Hypoponera ergatandria* from the West Indian island of St. Vincent. Still, there were reports of this species before Taylor (1968), who, in revising the genus, designated it as a junior synonym of *H. punctatissima*. After some contentious disagreements, researchers now generally follow Seifert's (2013) separation of *Hypoponera ergatandria* as a distinct species. While both species certainly occur in Europe, most available records belong to *H. punctatissima* but were published before the recognition of *H. ergatandria* and are therefore doubtful (Guénard et al., 2017). Indeed, the presence of *H. punctatissima* in Europe dates back at least 1600 years (Seifert, 2018). So far, the presence of *H. ergatandria* has been assessed in eleven European countries: Czech Republic, Denmark, France, Germany, Netherlands, Poland, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom (Seifert, 2013; Boer et al., 2014; Pech, 2014; Gjershaug et al., 2016; Klesniaková et al., 2016; Schär et al., 2017; Blatrix et al., 2018).

In Italy, *H. punctatissima* records have been published from the country's North, Sardinia, and Sicily. Still, all of them are older than the recognition of *H. ergatandria*, while the latter has never been recorded (Schifani, 2022). The only exception is the record published by Nicoli Aldini et al. (2014), one year after the separation of *H. ergatandria*, but the authors did not seem to be aware of the recent taxonomic change. The Sardinian *Ponera sulcitana* Stefani, 1970 is currently considered a junior synonym of *H. punctatissima*, but that should be verified again to exclude synonymy with *H. ergatandria* (Bolton & Fisher, 2011; Schifani et al., 2021a).

Here, we present the first record of *H. ergatandria* in Italy, based on discovering an indoor population from the basement of a building in the city of Teramo (Abruzzo region, Central Italy). The discovery followed reports of the massive number of alate ants swarming in the basement cyclically across the year and occasionally stinging people, an event that was witnessed by locals for at least five years (Fig. 1). As reported by locals, attempts to eradicate these ants using commercially available toxic baits were unsuccessful.

Table 1. Linear morphometric data of scape length (SL) and cephalic width (CW), and corresponding discriminant function values (D) of the *H. ergatandria* queens identified in this study. Measurements are given in mm.

SL	CW	D
0.464	0.595	-1.485
0.477	0.616	-0.758
0.469	0.651	-2.094
0.474	0.633	-1.331
0.462	0.614	-2.009
0.443	0.572	-2.863

We received a total of six specimens at our labs, which we morphologically identified as queens of *H. ergatandria* following the key of Seifert (2018). In the Italian fauna, *H. ergatandria* queens differ from those of *H. abeillei* (André, 1881) by its larger size and less elongated head shape (Schifani et al., 2021b), from *H. eduardi* (Forel, 1894) by having the frontal groove extending to the midocellus (Bolton & Fisher, 2011), and from *H. ragusai* (Emery, 1894) due to its different petiole shape in a way similar to what is observed for workers (Bolton & Fisher, 2011). Distinction from the cryptic *H. punctatissima* is relatively easy to accomplish by measuring the cephalic width (CW) and scape length (SL). Negative values of the following discriminant function identify *H. ergatandria*, while positive values indicate *H. punctatissima*: 85.902*SL – 18.541*CW – 30.312 (measurements in mm, see Seifert, 2018; Tab. 1). We recorded morphometric characters using a Zeiss Stemi 508 microscope with an Axiocam Erc 5s and Zeiss Zen Core Software. Voucher specimens were stored at the IEES Lab (Dept. of Chemistry, Life Sciences and Environmental Sustainability) of the University of Parma (Italy).

The discovery of *H. ergatandria* in Italy further encourages us to consider past Italian *H. punctatissima* records doubtful. However, both species appear to be present in the country: a flying *H. punctatissima* queen was recently caught in Lipari (Aeolian Islands, Sicily – 06.VII.2023, 38.467749, 14.957488, E. Schifani legit), and additional verified Italian records of *H. punctatissima* are soon to be published (Menchetti et al. in prep.). Some Mediterranean records of *H. ragusai* could also belong to either *H. ergatandria* or *H. punctatissima* (Bolton & Fisher, 2011). Stinging reports referring to *Hypoponera* ants are generally rare and not known to have medical consequences, but *H. punctatissima* has attracted some attention in Florida for

Fig 1. On the left, thousands of dead sexuals were found on the floor of the basement in Teramo. On the right, head view of a queen of *Hypoponera ergatandria* collected in the same site.

a high number of complaints based on swarms of stinging alates: according to Deyrup et al. (2000), this species seems to produce disproportionately large numbers of dispersing females (well in accordance with the tendency of colonizing resource-rich but ephemeral spots), and these queens readily sting when accidentally touched or trapped on human skin. While it is possible that the observations made by Deyrup et al. (2000) were based on *H. ergatandria*, both species likely have a similar biology (Seifert, 2018).

Eradication attempts using commercially available toxic baits may be difficult due to the more strictly predatory habits of *Hypoponera* ants as compared to other ants that are found indoors; however, the occurrence of *Hypoponera* ants indoors is generally infrequent, except for greenhouses, plant nurseries, butterfly gardens, and other sites characterized by high moisture, hot temperatures, and small arthropods available as prey. *Hypoponera ergatandria* is unlikely to pose any significant ecological threat. Its stinging abilities should not pose any public health threat, unlike in the case of *B. chinensis* or the fire ant *Solenopsis invicta*, both recently discovered in Italy (Menchetti et al., 2022; 2023). However, as observed for other introduced species that tend to occupy anthropogenic habitats, a non-specialized public may contribute significantly to monitoring efforts (Castracani et al., 2020).

Authors' Constribution

ES: Conceptualization, Investigation, Writing - Original Draft, Visualization
AP: Investigation
CC: Resources, Writing - Review & Editing
DAG: Supervision, Writing - Review & Editing

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