ARTÍCULO CIENTÍFICO III

# ANT-ASSOCIATED CRICKETS OF THE GENUS *MYRMECOPHILUS* BERTHOLD, 1827 IN THE IBERIAN PENINSULA AND BALEARIC ISLANDS

## [Grillos asociados a hormigas del género *Myrmecophilus* Berthold, 1827 en la Península Ibérica e Islas Baleares]

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**Abstract**

Ant-loving crickets are kleptoparasites living in ant nests. This work aims to sum up the current knowledge on the known distribution and host ant preferences of three *Myrmecophilus* crickets found in the Iberian Peninsula and Balearic Islands: *M. ochraceus*, *M. fuscus* and *M. acervorum.* Older literature was carefully reviewed, while recent literature, particularly after the description of *M. fuscus*, was prioritized to minimize the use of outdated information and reduce the risk of misidentifications. The study underscores the need for re-identification of old specimens and their hosts in light of recent discoveries, providing a review of the current understanding of the myrmecophilous crickets.

**Key words**

Ant nest, distribution, kleptoparasitism, Myrmecophilidae, Orthoptera, Portugal, Spain.

**Resumen**

Los grillos mirmecófilos son cleptoparásitos que viven en los nidos de hormigas. Este trabajo tiene como objetivo resumir el conocimiento actual sobre la distribución conocida y las preferencias de hormigas hospedadoras de los tres grillos *Myrmecophilus* encontrados en Península Ibérica e Islas Baleares: *M. ochraceus, M. fuscus y M. acervorum.* La literatura más antigua fue revisada cuidadosamente, mientras que se dio prioridad a la literatura más reciente, particularmente después de la descripción de *M. fuscus*, para minimizar el uso de información desactualizada y reducir el riesgo de identificaciones erróneas. El estudio destaca la necesidad de reidentificar especímenes antiguos y sus hospedadores a la luz de descubrimientos recientes, proporcionando una revisión de la comprensión actual de los grillos mirmecófilos.

**Palabras clave**

Cleptoparasitismo, distribución, España, hormigueros, Myrmecophilidae, Orthoptera, Portugal

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## Introduction

In nature, animals frequently form various types of relationships to survive, obtain food, find shelter, or meet other needs. These relationships can include commensalism, mutualism, neutralism, competition, predation, and parasitism. This article will focus specifically on parasitism – the type of relationship in which one organism exploits the resources of another animal or a group of animals. A specific example is the ant-loving crickets of the genus *Myrmecophilus* Berthold 1827, which engage in a specialized form of parasitism known as kleptoparasitism (Wetterer & Hugel, 2008; Stalling, 2010; Hölldobler & Kwapich, 2022). The term originates from the Greek word *klepto* (meaning "to steal"). The crickets are known for their close association primarily with ants; however, some species of ant-loving crickets from Greece and Kazakhstan have been reported to live with termites (Stalling, 2010; Temreshev, 2020).

To avoid detection, the crickets use chemical mimicry, acquiring cuticular hydrocarbons from the ants through direct contact. This chemical disguise allows them to blend in within the colony and avoid aggression from their hosts (Komatsu *et al.*, 2010). Most of the *Myrmecophilus* crickets reproduce sexually, but some cases of parthenogenesis have been reported for *Myrmecophilus acervorum* (Panzer, [1799]) (Stalling, 2010). The crickets benefit from the protection, food resources and stable environment provided by the ant nest, while the ants do not appear to receive any direct benefits from them. The crickets can feed on ants' brood, food found within the nest and through trophallaxis (Wetterer and Hugel, 2008; Komatsu *et al.*, 2010; Hölldobler & Kwapich, 2022).

Nowadays genus *Myrmecophilus* comprises 64 species worldwide, while in Europe there are 11 species: *M. acervorum* (Panzer, [1799]), *M. aequispina* Chopard, 1923, *M. balcanicus* Stalling, 2013, *M. baronii* Baccetti, 1966, *M. fuscus* Stalling, 2013, *M. gallicus* Stalling, 2017, *M. hirticaudus* Fischer von Waldheim, 1846, *M. myrmecophilus* (Savi, 1819), *M. nonveilleri* Ingrisch & Pavićević, 2008, *M. ochraceus* Fischer, 1853 and *M. orientalis* Stalling, 2010. Only three species have been identified in the Iberian Peninsula (IP) and Balearic Islands (BI) (Annex A; Fig. 1,2): *M. ochraceus, M. fuscus and M. acervorum*. The distribution of these crickets within the Iberian Peninsula and Balearic Islands remains largely unexplored. Furthermore, much of the older data has become outdated due to the description of the new species and the clarification of the traits of existing ones. For instance, some specimens previously identified as *M. acervorum* in Espadaler & Olmo-Vidal (2011) have since been reclassified to *M. fuscus* (Stalling, 2015). Stalling's research in 2013 in Mallorca (Stalling 2013a) and in 2015 on mainland (Stalling *et al.* 2015) revealed confusion between the newly described *M. fuscus* and the other 2 species. Espadaler & Olmo-Vidal (2011) also reported in their work the confusion between *M. acervorum* and *M. ochraceus* even before the discovery of *M. fuscus*. Consequently, the collected specimens of *Myrmecophilus* crickets in the Iberian Peninsula need to be reexamined in light of the latest findings. The article aims to sum up the current knowledge on the known distribution and host ant preferences of the three *Myrmecophilus* crickets found in the Iberian Peninsula and Balearic Islands.

## Material and Methods

To understand the ecology of crickets, their distribution, and their host ant preferences, various literature sources have been analyzed. Preference was given to recent articles, especially those published shortly before or after the description of *M. fuscus*. This is because newer articles tend to be more accurate, as older publications may often contain species misidentifications, as noted by Espadaler & Olmo-Vidal (2011), Stalling (2013a), and Stalling *et al.* (2015).

The reference year for the "freshness" of articles on these three species of crickets is established as 2011, following Espadaler & Olmo-Vidal (2011), who provided new data on the distribution of *M. ochraceus* and *M. acervorum* in Spain. Subsequent corrections of this work and additional descriptions were made by Stalling (2013a) and Satlling *et al.* (2015), with further research extending to other regions (Stalling & Birrer, 2013; Stalling, 2015, 2016; Stalling *et al.*, 2021; Zafeiriou & Stalling, 2023).

## Results and Discussion

### *Myrmecophilus ochraceus Fischer, 1853*

*M. ochraceus* is a common European ant-loving cricket (Fig. 1A) known from Circum-Mediterranean (Cassar *et al.*, 2023) and found on the South of the Iberian Peninsula. Across its range, this species has been observed in the nests of several ant genera, including *Messor* Forel, 1890, *Tetramorium* Mayr, 1855, *Pheidole* Westwood, 1839, *and Monomorium* Mayr, 1855 (Espadaler & Olmo-Vidal, 2011; Stalling, 2015; Stalling, 2016, Table I). Interestingly, only juvenile crickets have been spotted in the nests of *Tetramorium* and *Pheidole*. The presence of *M. ochraceus* in different *Messor'* nests was consistently confirmed by various authors (Schembri, 1984; Stalling, 2010; Espadaler & Olmo-Vidal, 2011; Stalling, 2016; Cassar *et al.*, 2023), while *Tetramorium* nests were confirmed by Schembri (1984), Cassar *et al.* (2023), Espadaler & Olmo-Vidal (2011), *Pheidole* nests by Schembri (1984), Stalling (2016) and Cassar *et al.* (2023) and *Monomorium* nests by Schembri (1984), Espadaler & Olmo-Vidal (2011), Cassar *et al.* (2023).

In Schembri (1984), *M. ochraceus* was reported in the nests of *Messor structor* (Latreille, 1798) and *Tetramorium caespitum* (Linnaeus, 1758). However, recent morphometric analyses suggest these ants may actually belong to different species within the *M. structor* and *T. caespitum* species

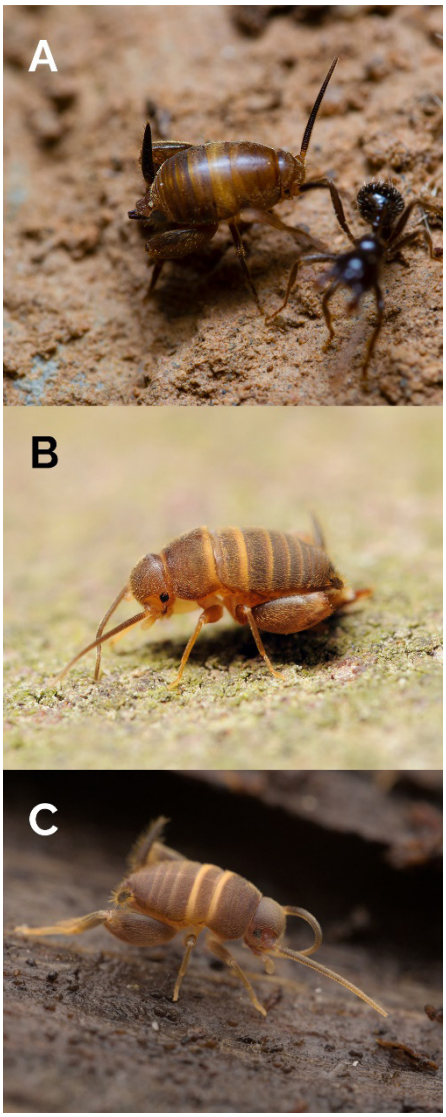


**Figure 1.** Myrmecophilus crickets. A. *M. ochraceus* Fischer, 1853 photo made by David Fernández Martín; B. M. fuscus Stalling, 2013 photo made by Adrià Miralles; C. *M. acervorum* (Panzer, [1799]) photo made by Philipp Hoenle.

**Figura 1.** Grillos Myrmecophilus. A. *M. ochraceus* Fischer, 1853, foto tomada por David Fernández Martín; B. M. fuscus Stalling, 2013, foto tomada por Adrià Miralles; C. *M. acervorum* (Panzer, [1799]), foto tomada por Philipp Hoenle.

groups respectively (Wagner *et al.*, 2017; Steiner *et al.*, 2018; Table I). Therefore, it is prudent to classify them at the group level for accuracy.

Additionally, the cricket was reported to inhabit the nest of *Camponotus amaurus* Espadaler, 1997 (Espadaler & Olmo-Vidal, 2011, Table I). However, this observation has not been confirmed or referenced in subsequent studies. While there is no doubt about the identification of the ant or the presence of the crickets in that particular nest — evidenced by the collection of one male and three females — the lack of additional reports of *M. ochraceus* inhabiting *Camponotus* Mayr, 1861 nests, combined with the subsequent description of *M. fuscus,* which is already known to inhabit *Camponotus* nests, suggests that this observation should, for now, be classified as "Needs verification".

There is also some unpublished data on *M. ochraceus* in the municipalities of Huelva, and Sevilla (Ginés Rodríguez, personal communication) and Granada (Matvey Logachev and Manuel Martín-Vivaldi Martínez) (Fig. 2, Annex A).

| Ant host | Country | Reference |
|---|---|---|
| *Messor barbarus* (Linnaeus, 1767) | Spain (IP) | Espadaler & Olmo-Vidal, 2011 |
| *Messor bouvieri* Bondroit, 1918 | Spain (IP) | Espadaler & Olmo-Vidal, 2011 |
| *Messor capitatus* (Latreille, 1798) | Maltese islands | Schembri, 1984, Cassar *et al.*, 2023 |
| *Messor marocanus* Santschi, 1927 | Spain (IP) | Espadaler & Olmo-Vidal, 2011 |
| *Messor* sp. | Greece, Italy (Sardinia) | Stalling, 2010; Stalling, 2016 |
| *Messor structor* group | Maltese islands | Schembri, 1984 |
| *Monomorium subopacum* (Smith, 1858) | Maltese islands. Spain (IP) | Schembri, 1984; Espadaler & Olmo-Vidal, 2011; Cassar *et al.*, 2023 |
| *Pheidole pallidula* (Nylander, 1849) | Maltese islands | Schembri, 1984; Cassar *et al.*, 2023 |
| *Pheidole* sp. | Italy (Sardinia) | Stalling, 2016 |
| *Tetramorium caespitum* group | Maltese islands | Schembri, 1984 |
| *Tetramorium semilaeve* André, 1883 | Spain (IP) | Espadaler & Olmo-Vidal, 2011; Cassar *et al.*, 2023 |
| **Needs verification** | | |
| *Camponotus amaurus* Espadaler, 1997 | Spain (IP) | Espadaler & Olmo-Vidal, 2011 |

**Table I.** Confirmed ant host species for *Myrmecophilus ochraceus*. "Country" refers to the countries where the host species was confirmed.
**Tabla I.** Hormigas hospedadoras confirmadas para *Myrmecophilus ochraceus*. La columna "Country" se refiere a los países donde la especie hospedadora fue confirmada.

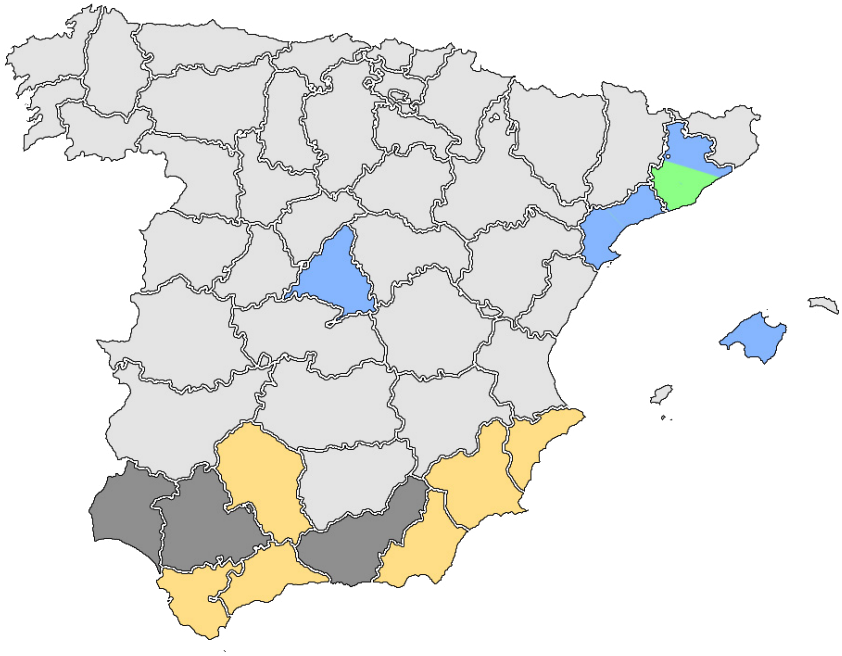

Fig. 2. Distribution of *Myrmecophilus* in the Iberian Peninsula and Balearic Islands.
Yellow – *M. ochraceus* published citations; Grey – *M. ochraceus* unpublished citations; Blue – *M. fuscus*; Green – *M. acervorum*.

Fig. 2. Distribución de *Myrmecophilus* en la Península Ibérica e islas Baleares. En amarillo las citas publicadas de *M. ochraceus*; en gris las citas no publicadas de *M. ochraceus*; en azul *M. fuscus*; y en verde *M. acervorum*

### *Myrmecophilus fuscus Stalling, 2013*

*M. fuscus* is a newly discovered species (Fig. 1B), firstly identified in Balearic Islands (Mallorca) and later reported from the provinces of Barcelona and Madrid (Stalling, 2013a; Stalling *et al.*, 2015, Fig. 2, Annex A). Afterwards the cricket has been found in other countries of the Euro-Mediterranean region – Croatia, France, Italy and Malta (Stalling, 2015; Stalling *et al.*, 2021; Cassar *et al.*, 2023). This cricket is visually similar to other two species, which has led to the reevaluation of earlier identifications of *M. acervorum* and *M. ochraceus* in the region. As a result, some of the old observations turned out to be *M. fuscus* (Stalling, 2013a; Stalling *et al.*, 2015). Within its range, *M. fuscus* has been observed in the nests of several ant species, including *Camponotus lateralis, Crematogaster scutellaris, Formica cunicularia, Lasius grandis, L. lasioides, L. cinereus*, and *L. neglectus* (Table II). And there is also information suggesting its presence in nests of *Pheidole pallidula* (Stalling, 2015, Table II). However, it is not entirely clear, as it could belong to a *Lasius* nest adjacent to a *Pheidole* nest: *"14.v.2013, 4 ad. females, 5 ad. males, and 15 female nymphs in nests of Lasius sp. and Pheidole pallidula, leg. & coll. T. Stalling"* (Stalling, 2015). Additionally, in the work of García García (2013) the author mentions *M. acervorum* in the nest of *Lasius myops* Forel, 1894 and provides photos of the body and tibia of the cricket (Table II). However, the tibia in the photo appears identical to that described for *M. fuscus* (Stalling, 2013a) and the body color more closely resembles *M. fuscus* due to the absence of two distinct bands on the thorax. The author commented that it is indeed *M. fuscus* (F. García García, personal communication).

| Ant host | Country | Reference |
|---|---|---|
| *Camponotus lateralis* (Olivier, 1792) | Spain (IP) | Stalling *et al.*, 2015 |
| *Crematogaster scutellaris* (Olivier, 1792) | Croatia, Spain (IP) | Stalling *et al.*, 2015; Stalling *et al.*, 2021 |
| *Formica cunicularia* Latreille, 1798 | Spain (IP) | Stalling *et al.*, 2015 |
| *Lasius cinereus* Seifert, 1992 | Spain (IP) | Stalling *et al.*, 2015 |
| *Lasius grandis* Forel, 1909 | Spain (IP) | Stalling *et al.*, 2015 |
| *Lasius lasioides* (Emery, 1869) | Spain (BI) | Stalling, 2013a |
| *Lasius* cf. *lasioides* (Emery, 1869) | France | Stalling, 2015 |
| *Lasius myops* Forel, 1894 | Spain (IP) | García García, 2013 |
| *Lasius neglectus* Van Loon, Boomsma & Andrasfalvy, 1990 | Spain (IP) | Stalling *et al.*, 2015 |
| *Lasius* sp. | France, Italy (Sicily), | Stalling, 2015; Iorgu *et al.*, 2023 |
| **Needs verification** | | |
| *Pheidole pallidula* (Nylander, 1849) | France | Stalling, 2015 |

Table II. Confirmed host species for *Myrmecophilus fuscus*. "Country" refers to the countries where the host species was confirmed.
Tabla II. Hormigas hospedadoras confirmadas para *Myrmecophilus fuscus*. La columna "Country" se refiere a los países donde la especie hospedadora fue confirmada.

### *Myrmecophilus acervorum (Panzer, [1799])*

*M. acervorum* is a common cricket found throughout Europe and the Caucasus (Stalling, 2013a; Żurawlew *et al.*, 2022, Fig. 1C). In Spain, as mentioned by Stalling *et al.* (2015) for the mainland, most specimens previously identified as *M. acervorum* in the article by Espadaler & Olmo-Vidal (2011) are actually *M. fuscus*. Despite the corrections made by Stalling and his co-authors, some data regarding *M. acervorum* remained unchanged, indicating the cricket's presence in Barcelona (Fig. 2, Annex A).

In all its range, this species shows a preference to *Lasius* nests (Franc, 2015), but has also been found in nests of various other ant genera, including *Crematogaster* Lund, 1831, *Formica* Linnaeus, 1758, *Tetramorium* Mayr, 1855, and *Myrmica* Latreille, 1804 (Bönsel, 2008; Stalling, 2013a; Franc, 2015; Kaszyca *et al.*, 2018; Hörren *et al.*, 2019; Kettermann *et al.*, 2019; Michlewicz, 2020; Żurawlew *et al.*, 2022; Iorgu *et al.*, 2023; Table III). Although it has been reported in nests of *Camponotus* Mayr, 1861, *Tapinoma* Foerster, 1850, *Messor* Forel, 1890, and *Polyergus* Latreille, 1804 (Bazyluk, 1956; Chopard, 1951, Table III), these findings require further confirmation since the data suggesting *M. acervorum* lives in these nests is based on old sources, and newly published researches have not yet confirmed these associations in practice, only referencing earlier works, some of which were even corrected later. Therefore, the presence of *M. acervorum* in these ant genera needs to be verified.

| Ant hosts | Country | Reference |
|---|---|---|
| *Crematogaster sordidula* (Nylander, 1849) | Romania | Iorgu *et al.*, 2023 |
| *Formica cunicularia* Latreille, 1798 | Germany | Hörren *et al.*, 2019 |
| *Formica fusca* Linnaeus, 1758 | Germany, Poland, Slovakia | Junker, 1997; Franc, 2015; Hörren *et al.*, 2019; Żurawlew *et al.*, 2022; Kaczmarczyk-Ziemba *et al.*, 2024 |
| *Formica gagates* Latreille, 1798 | Romania | Iorgu *et al.*, 2023 |
| *Formica polyctena* Foerster, 1850 | Germany, Poland | Junker, 1997; Żurawlew *et al.*, 2022 |
| *Formica pratensis* Retzius, 1783 | Germany, Poland | Junker, 1997; Bönsel, 2008; Żurawlew *et al.*, 2022 |
| *Formica rufa* Linnaeus, 1761 | Germany, Poland | Junker, 1997; Żurawlew *et al.*, 2022 |
| *Formica sanguinea* Latreille, 1798 | Germany | Junker, 1997 |
| *Formica* sp. | Slovakia | Franc, 2015 |
| *Lasius alienus* (Foerster, 1850) | Germany | Junker, 1997; Kettermann *et al.*, 2019 |
| *Lasius brunneus* (Latreille, 1798) | Germany, Poland, Slovakia | Junker, 1997; Franc, 2015; Kaszyca *et al.*, 2018; Michlewicz, 2020; Żurawlew *et al.*, 2022; Kaczmarczyk-Ziemba *et al.*, 2024 |
| *Lasius cinereus* Seifert, 1992 | Spain (IP) | Espadaler & Olmo-Vidal, 2011 |
| *Lasius emarginatus* (Olivier, 1792) | Germany, Slovakia | Junker, 1997; Franc, 2015 |
| *Lasius flavus* (Fabricius, 1782) | Germany, Poland, Sweden | Junker, 1997; Proess & Meyer, 2003; Stalling *et al.*, 2017; Kaszyca *et al.*, 2018; Hörren *et al.*, 2019; Kettermann *et al.*, 2019; Kleukers *et al.*, 2020; Żurawlew *et al.*, 2022; Iorgu *et al.*, 2023 |
| *Lasius flavus* (Fabricius, 1782) with *Solenopsis fugax* (Latreille, 1798) nest | Poland | Kaszyca *et al.*, 2018; Żurawlew *et al.*, 2022 |
| *Lasius fuliginosus* (Latreille, 1798) | Germany, Poland | Kettermann *et al.*, 2019; Żurawlew *et al.*, 2022 |
| *Lasius neglectus* Van Loon, Boomsma & Andrasfalvy, 1990 | Spain (IP) | Espadaler & Olmo-Vidal, 2011 |
| *Lasius niger* (Linnaeus, 1758) | Denmark, Germany, Poland, Slovakia | Junker, 1997; Bönsel, 2008; Taszakowski *et al.*, 2013; Franc, 2015; Stalling *et al.*, 2017; Kaszyca *et al.*, 2018; Hörren *et al.*, 2019; Kettermann *et al.*, 2019; Michlewicz, 2020; Żurawlew *et al.*, 2022 |
| *Lasius platythorax* Seifert, 1991 | Germany, Poland, Romania, Slovakia | Taszakowski *et al.*, 2013; Franc, 2015; Hörren *et al.*, 2019; Kettermann *et al.*, 2019; Żurawlew *et al.*, 2022; Iorgu *et al.*, 2023; Kaczmarczyk-Ziemba *et al.*, 2024 |
| *Lasius* sp. | Armenia, Bulgaria, Denmark, Germany, Poland, Russia, Slovakia | Bönsel, 2008; Stalling, 2013b; Franc, 2015; Stalling *et al.*, 2017; Hörren *et al.*, 2019; Żurawlew *et al.*, 2022; Iorgu *et al.*, 2023; Zalutsky *et al.*, 2023; Kaczmarczyk-Ziemba *et al.*, 2024 |
| *Lasius umbratus* (Nylander, 1846) | Poland | Michlewicz, 2020; Żurawlew *et al.*, 2022 |
| *Myrmica rubra* (Linnaeus, 1758) | Germany, Poland | Junker, 1997; Kettermann *et al.*, 2019; Michlewicz, 2020; Żurawlew *et al.*, 2022 |
| *Myrmica ruginodis* Nylander, 1846 | Germany | Junker, 1997 |
| *Myrmica rugulosa* Nylander, 1849 | Poland | Żurawlew *et al.*, 2022 |

| Ant hosts | Country | Reference |
|---|---|---|
| *Myrmica sabuleti* Meinert, 1861 | Germany | Junker, 1997 |
| *Myrmica scabrinodis* Nylander, 1846 | Germany | Junker, 1997 |
| *Myrmica* sp. | Germany, Poland, Slovakia | Bönsel, 2008; Stalling, 2013[b]; Franc, 2015; Hörren *et al.*, 2019; Żurawlew *et al.*, 2022 |
| *Tetramorium caespitum* (Linnaeus, 1758) | Germany, Poland, Slovakia | Junker, 1997; Franc, 2015; Hörren *et al.*, 2019; Żurawlew *et al.*, 2022. |
| *Tetramorium* cf. *caespitum* | Romania | Iorgu *et al.*, 2023 |
| *Tetramorium* sp. | Germany | Hörren *et al.*, 2019 |
| **Needs verification** | | |
| *Camponotus, Tapinoma, Messor* and *Polyergus*. | | |

**Table III.** Confirmed host species for *Myrmecophilus acervorum*. "Country" refers to the countries where the host species was confirmed.

**Tabla III.** Hormigas hospedadoras confirmadas para *Myrmecophilus acervorum*. La columna "Country" se refiere a los países donde la especie hospedadora fue confirmada.

## Conclusion

The knowledge about these crickets remains very limited. Furthermore, their distribution in the Iberian Peninsula and Balearic Islands is largely unexplored (Fig. 2) and there is no data regarding their presence in Andorra and Gibraltar.

Currently, South of the Iberian Peninsula is the habitat of only one confirmed species – *M. ochraceus*, which has been observed in all municipalities of Andalusia, Murcia and part of the Valencian Autonomous Community (Annex A; Fig. 2). The data on *M. fuscus* has been thoroughly reviewed thanks to Stalling (2013a) and Stalling *et al.* (2015), while the distribution of *M. acervorum* in the Iberian Peninsula should be investigated as all existing records of this species rely on the omission of corrections in Stalling *et al.* (2015), despite addressing other changes in the same article (Espadaler & Olmo, 2011).

Some interesting observations were also made by Eidmann (1927) regarding an ant-loving cricket in an *Aphaenogaster* Mayr, 1853 nest from Mallorca: *"Myrmecophila ochracea* Fisch., 1 male, associated with *Aphaenogaster testaceopilosa* ssp. *gemella"*. However, Eidmann expressed doubt about his identification, and this skepticism is justified. The presence of any of these three crickets in this ant genus requires additional confirmation.

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**Annex A.** Records of *Myrmecophilus* crickets in the Iberian Peninsula and Balearic Islands.
**Anexo A.** Citas para los grillos *Myrmecophilus* en la Península Ibérica e islas Baleares.

| Sp. | Province | Locality | Year | Host | Reference | Notes |
|---|---|---|---|---|---|---|
| *M. acervorum* | Barcelona | El Muntanyà | 2003 | *Lasius neglectus* | Espadaler & Olmo, 2011 | Stalling *et al*, 2015 does not correct it |
| | Barcelona | El Muntanyà | 2005 | *Lasius cinereus* | Espadaler & Olmo, 2011 | Stalling *et al*, 2015 does not correct it |
| | Barcelona | Begues | 2005 | *Lasius neglectus* | Espadaler & Olmo, 2011 | Stalling *et al*, 2015 does not correct it |
| | Barcelona | Can Miravitges, Bandalona | 2005 | *Lasius neglectus* | Espadaler & Olmo, 2011 | Stalling *et al*, 2015 does not correct it |
| *M. fuscus* | Barcelona | Bellaterra | 1982 | *Lasius grandis* | Espadaler & Olmo, 2011 | Probably *M. fuscus* according to Stalling *et al*, 2015 |
| | Barcelona | Bellaterra | 2003 | *Lasius grandis* | Espadaler & Olmo, 2011 | Probably *M. fuscus* according to Stalling *et al*, 2015 |
| | Barcelona | Bellaterra | 2004 | *Lasius neglectus* | Espadaler & Olmo, 2011 | Probably *M. fuscus* according to Stalling *et al*, 2015 |
| | Barcelona | La Roca del Vallès | 2003 | *Lasius cinereus* | Espadaler & Olmo, 2011 | Corrected by Stalling *et al*, 2015 |
| | Barcelona | Matadepera | 2009 | *Lasius neglectus* | Espadaler & Olmo, 2011 | Corrected by Stalling *et al*, 2015 |
| | Barcelona | La Roca del Vallès | 2013 | *Lasius myops* | Garcia Garcia, 2013 | Reidentified |
| | Barcelona | Bellaterra | 2012 | *Lasius grandis* | Stalling *et al.*, 2015 | |
| | Barcelona | Riera de Fuirosos, La Batlloria | 2008 | *Lasius cinereus* | Stalling *et al.*, 2015 | |
| | Barcelona | Sant Cugat del Vallès | 2014 | *Lasius grandis* | Stalling *et al.*, 2015 | |
| | Madrid | Madrid | 2014 | *Lasius grandis* | Stalling *et al.*, 2015 | |
| | Madrid | Madrid | 2015 | *Lasius grandis* | Stalling *et al.*, 2015 | |
| | Mallorca | Escorca | 2011 | Unknown | Stalling, 2013a | |
| | Mallorca | Esporles | 1962 | *Lasius grandis* | Espadaler & Olmo, 2011 | Corrected by Stalling, 2013a |
| | Mallorca | Artà | 1921 | *Unknown* | Espadaler & Olmo, 2011 | Corrected by Stalling, 2013a |
| | Tarragona | Alcover, Vall del Glorieta | 2012 | *Formica cunicularia* | Stalling *et al.*, 2015 | |
| | Tarragona | Alcover, Mas de Flores | 2014 | *Crematogaster scutellaris* | Stalling *et al.*, 2015 | |
| | Tarragona | Tarragona | 2014 | *Camponotus lateralis* | Stalling *et al.*, 2015 | |

| Sp. | Province | Locality | Year | Host | Reference | Notes |
|---|---|---|---|---|---|---|
| *M.ochraceus* | Alicante | Alicante | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Almería | El Alquián | 1955 | Unknown | Espadaler & Olmo, 2011 | |
| | Almería | Roquetas de Mar | 1980 | *Monomorium subopacum* | Espadaler & Olmo, 2011 | |
| | Almería | El Desierto, Tabernas | 2001 | *Camponotus amaurus* | Espadaler & Olmo, 2011 | Needs confirmation |
| | Almería | Dalías | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Almería | El Ejido | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Almería | Almería | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Almería | Berja | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Cádiz | Puerto de Santa Maria | 2005 | *Messor marocanus* | Espadaler & Olmo, 2011 | |
| | Cádiz | Puerto de Santa Maria | 2005 | *Tetramorium semilaeve* | Espadaler & Olmo, 2011 | |
| | Cádiz | Algeciras | 2005 | *Messor bouvieri* | Espadaler & Olmo, 2011 | |
| | Cádiz | Algeciras | 2005 | *Monomorium subopacum* | Espadaler & Olmo, 2011 | |
| | Cádiz | Tarifa | 2005 | *Messor barbarus* | Espadaler & Olmo, 2011 | |
| | Cádiz | San José del Valle | 2006 | *Messor barbarus* | Espadaler & Olmo, 2011 | |
| | Cádiz | La Suara | 2006 | *Messor barbarus* | Espadaler & Olmo, 2011 | |
| | Cádiz | Algeciras | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Córdoba | Cordoba | – | *Messor barbarus* | Moyano Ayala, 2014 | |
| | Málaga | Entreríos, Mijas | 2003 | *Messor barbarus* | Espadaler & Olmo, 2011 | |
| | Málaga | Entreríos, Mijas | 2004 | *Monomorium subopacum* | Espadaler & Olmo, 2011 | |
| | Málaga | Entreríos, Mijas | 2005 | *Messor barbarus* | Espadaler & Olmo, 2011 | |
| | Murcia | Cartagena | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Murcia | Totana | – | Unknown | Aguirre-Segura *et al.*, 1995 | |
| | Valencia | Unknown | – | Unknown | Aguirre-Segura *et al.*, 1995 | |