

# INVASIVE SPECIES: The Argentine ant (*Linepithema humile*) distribution and supercolony presence on Majorca island

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## Introduction

**Invasive species** can influence the structure and function of invaded ecological communities. This is an effect of global dimension. (Roura-Pascual et al., 2009).

The **argentine ant**, *Linepithema humile* (Mayr, 1868) (Hymenoptera: Formicidae) is native from the Paraná river basin. Thanks to its adaptation capacity this ant has successfully invaded most of the dry subtropical and Mediterranean-like habitats around the world, furthermore is an indoor pest in cold climates (Gómez and Espadaler, 2005).

The **aim** of this study is to elaborate a distribution map for Majorca Island of the argentine ant and the supercolony of pertinence for each population found.

## Background to Research

Usually ant species defend its territory against other ant species at the same aggression level than when defending it from its own species. Some ants have an extraordinary social organization, called **unicolonality**, whereby individuals mix freely among physically separated nests (Giraud et al., 2002).

Worldwide introduced Argentine ants, due to **bottleneck effect**, has mostly lost of the inter-nest aggression attitude. In Europe, this resulted in the formation of two immense supercolonies, which effectively work like two unicolonial populations: the **Main** and the **Catalonian** supercolonies (Giraud et al., 2002; Gómez and Espadaler, 2005).

The Main supercolony is the most common and is distributed all around Europe, the Catalanian supercolony is mostly still limited to the upper middle half of the Iberian peninsula Mediterranean coast and Balearic Islands of Ibiza and Formentera (Espadaler, 2014)

## Study site



Localization of Majorca in Balearic islands

**Balearic islands:** archipelago found near the eastern coast of the Iberian peninsula (western Mediterranean Sea)

Study locations: **Majorca island**

**Climate:** Mediterranean with markedly higher precipitation in the Serra de Tramuntana. Summers are hot in the plains and winters mild to cool, getting colder in the Tramuntana range.



Picture 1. material used for the aggression test

## Material & Methods

### Field data record

We identify and collected ants in 48 different points, 20 within in Palma de Mallorca city and 28 around the rest of the island.

Of each population we note the date and GPS coordinates and live specimens was collected and stored in a container for posterior aggression test.

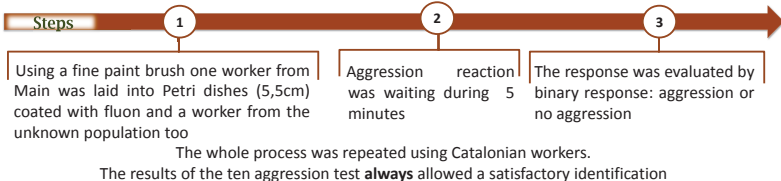
### Supercolony identification: AGGRESSION TEST

With the aim to identify the supercolony of pertinence five replicates of one-to-one **aggression test** methodology were done (Suarez, 1999):

To realize the aggression test ants from two confirmed populations, which were used as touchstones against the news populations:

• **Main** : Cerdanyola del Vallés, Barcelona; 41°29'30.96"N 2°8'52.84"E

• **Catalonian**: Sant Cugat del Vallés, Barcelona; 41°28'29.24"N 2°4'39.03"E

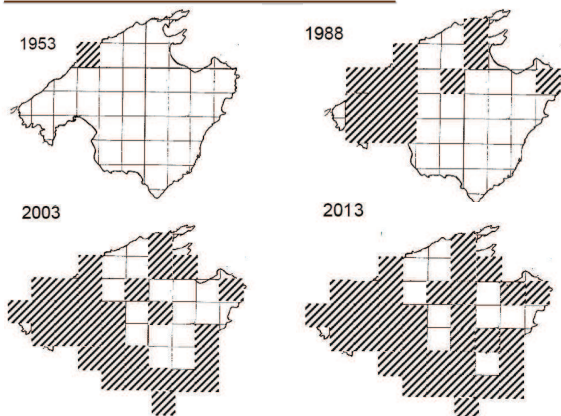


### Map realization

Coordinates for each locality were mapped with DMAP for Windows ver. 7.1.d (<http://www.dmap.co.uk/>).

## Results & Discussion

### Historical evolution of argentine ant presence

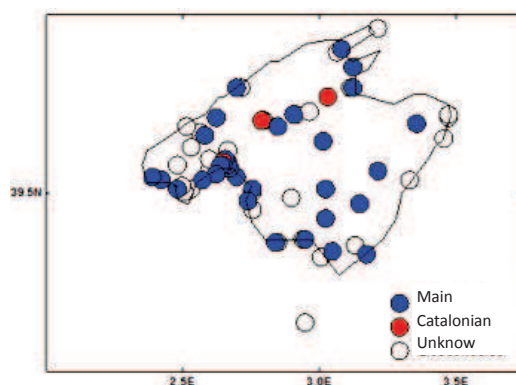


**Figure 1.** Historical evolution of Argentine ant in Majorca Island based on presence/absence in square of 10x10km. Elaborated from Gómez and Espadaler (2005)

The distribution map clearly shows the constant presence of the ant all **around the coast** except in the North-Western cause of the abrupt topography, probably enlaced with less favourable ecological conditions.

In the **central dry area** same pattern was observed, and the few population in the dry areas are related with irrigated urban habitat (Espadaler and Gómez, 2003).

### Supercolony distribution



**Figure 2.** Supercolony distribution map of the Argentine ant for Majorca. The unknown points are points cited before this study (supercolony is unknown).

Most of the populations pertain to the **Main** supercolony. There are only four points with the **Catalonian** supercolony: two in Palma de Mallorca city, a third in Sa Pobla and the fourth in Alaró. These four points follow a line from the South-East to the North-West **following the main highway** of the Island, Ma-13, and the only railway.

This pattern is explicable by human transport way and commonly reported by many researchers (Gómez and Espadaler, 2005)

## Conclusions

- The study of invasive species distribution can play an important role in species and ecosystem conservation because of the damages they cause.
- The knowledge of the argentine ant distribution can be helpful to prevent his expansion and be **proactive** in the protection of threatened species and habitats.
- The study of the different supercoloniality pattern in the argentine ant can help to find genetic or behavioural factors than can be used to **fight against** this invasive specie.

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