



## Peaceful border zone of the Argentine ant in south-eastern France

Laurence Berville, Olivier Blight, Marielle Renucci, Alain Tirard, Erick Provost

### ► To cite this version:

Laurence Berville, Olivier Blight, Marielle Renucci, Alain Tirard, Erick Provost. Peaceful border zone of the Argentine ant in south-eastern France. The World Conference on Biological Invasions and Ecosystem Functioning (BIOLIEF), Oct 2009, Porto, Portugal. hal-03873221

**HAL Id: hal-03873221**

**<https://hal.science/hal-03873221>**

Submitted on 26 Nov 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# PEACEFUL BORDER ZONE OF ARGENTINE ANT IN SOUTH-EASTERN OF FRANCE

L. Berville\*\*, O. Blight\*\*, M. Renucci \*, A. Tirard\* & E. Provost\*

\* IMEP-CNRS & IRD, Université Paul Cézanne, Bâtiment Villémin, Domaine du Petit Arbois, Avenue Philibert-BP 80 – 13545 Aix-en-Provence Cedex 04 – France

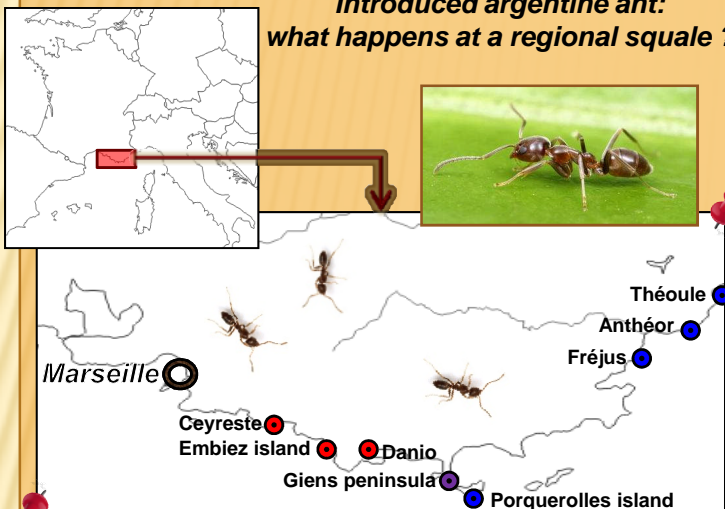
\*\* Université Paul Cézanne, IMEP, UMR & IRD

## Introduction :

**Study context :** In introduced areas, Argentine ant (*Linepithema humile*) is known to form huge colony structured called supercolony with free exchange of individuals among nests.

**Study goal :** Here, we present analyzes of Argentine ant recognition cues (cuticular hydrocarbons) and aggressive interactions between 8 coastal sites in Provence-Côte d'Azur (France).

### Introduced argentine ant: what happens at a regional scale ?

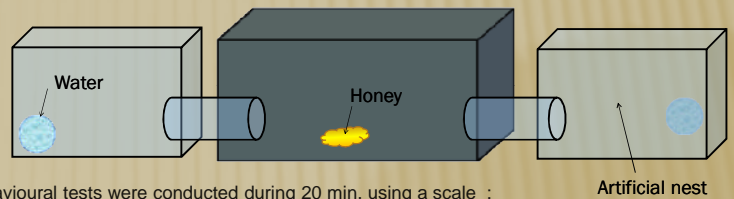


## Materials & Methods :

- 8 different fragments of *L. humile* colonies from Provence (France).

### Behavioural assays :

- We assessed the intraspecific aggression rate using a test which measure the level of aggression between two groups of **100** individuals.
- For each test, workers were placed in closed artificial nests (6 x 4.5 x 5 cm) with soil.
- Artificial nest were connected via plastic tubes to a common foraging arena (6 x 9 x 5 cm).
- Workers were kept in artificial nests for one hour of acclimation.



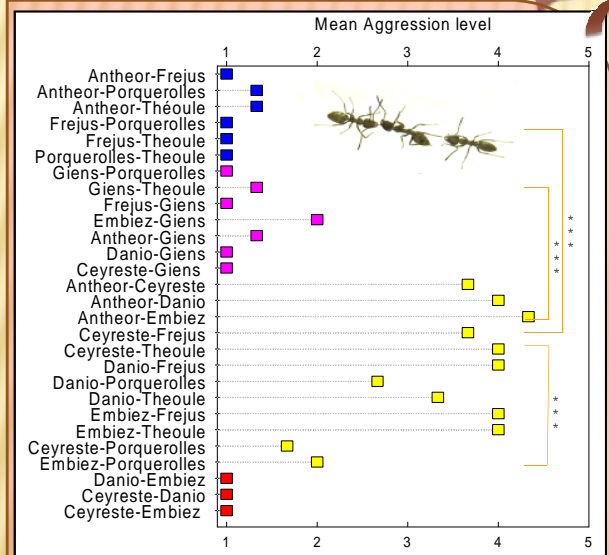
- Behavioural tests were conducted during 20 min, using a scale :

- 1 : Touch (antennation)
- 2 : Avoidance (contacts, one ant running away)
- 3 : Aggression (lunging, biting)
- 4 : Asymmetrical intense aggression (one individuals without reaction, lunging, biting, pulling legs..)
- 5 : Symmetrical intense fighting (gaster flexion, death a few seconds after the beginning of fights)

- 3 or 4 replicates were conducted for each pair of colonies.

**Chemical analysis:** We perform gas chromatography of 1 worker for each colony, 10 replicates were conducted for each colony.

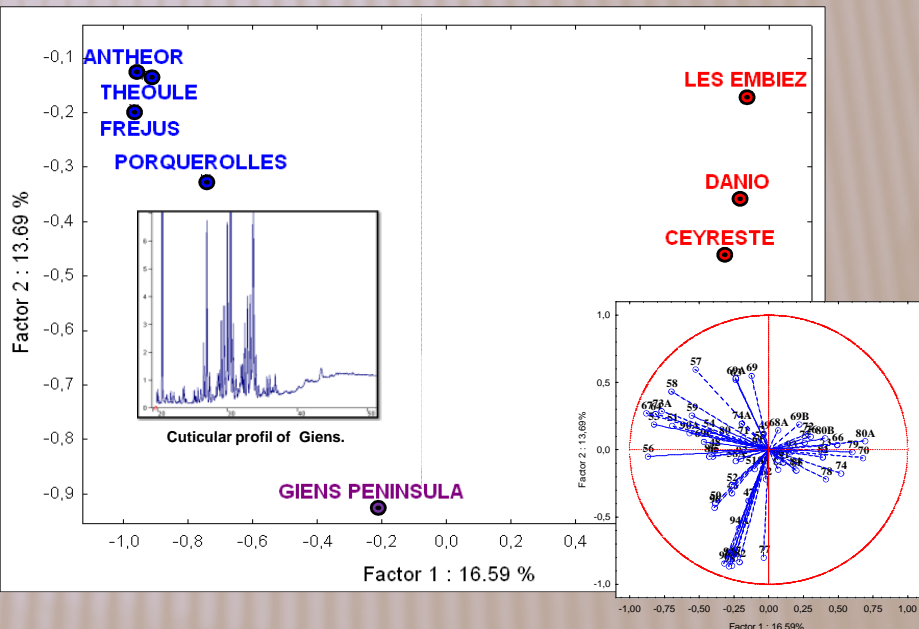
## Behavior results :



Results of behavioral test of 200 workers. Dots show the main aggression level between workers coming from different location. The difference \* in main aggression level between groups is statistically significant (Mann-Whitney test,  $p < 0.001$ ).

Blue dots represent the results of behavioural tests between two sites belonging to Main European Supercolony (Giraud & al., 2002). Behavioral tests between Giens and the other supercolonies are represented in pink. Red dots represent the results of behavioral tests between two sites belonging to a New Supercolony (Blight & al., 2009). The behavioral test between the New Supercolony and the Main Supercolony are represented in yellow.

## Chemical results:



The PCA performed on all sites revealed a marked discrimination between colonies. Discrimination was achieved through 65 peaks of their major cuticular hydrocarbons. Chemical profiles between the colonies differed qualitatively and quantitatively.

The Giens population share a part of the chemical characteristics of each of the two groups. Giens profiles present peaks which were also found on chemical profiles of the Mean supercolony (eg. 90A). Furthermore, others peaks (eg. 67) were found only on the profile of the New supercolony (Blight, & al, 2009).

## Conclusion :

- We noticed that the Giens population is much less aggressive against both of the existing European supercolonies than expected.
- Chemical profile of the Giens colony share a part of the chemical characteristics of both European supercolonies.
- This peaceful colony of Giens may results from colony fusion act and can be considered as an hybrid colony at the boundary of two distinct colonies