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

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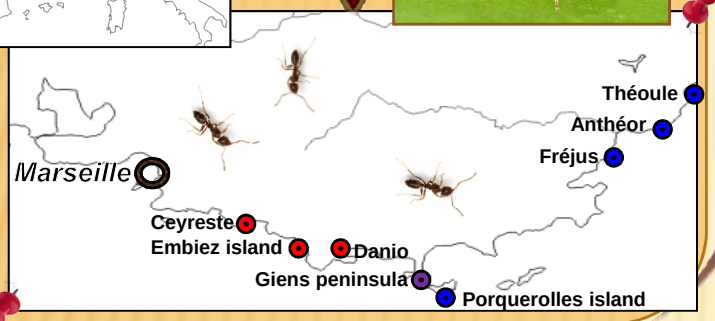
Introduction :

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 squale ?

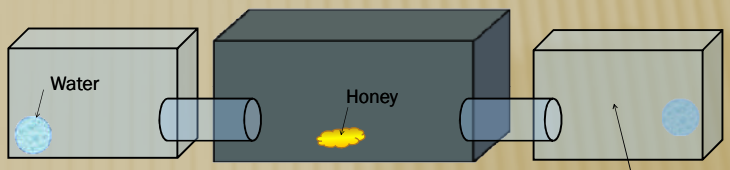


Materials & Methods :

- 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 agression 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 9x 5 cm).
- Workers were kept in artificial nests for one hour of acclimation.



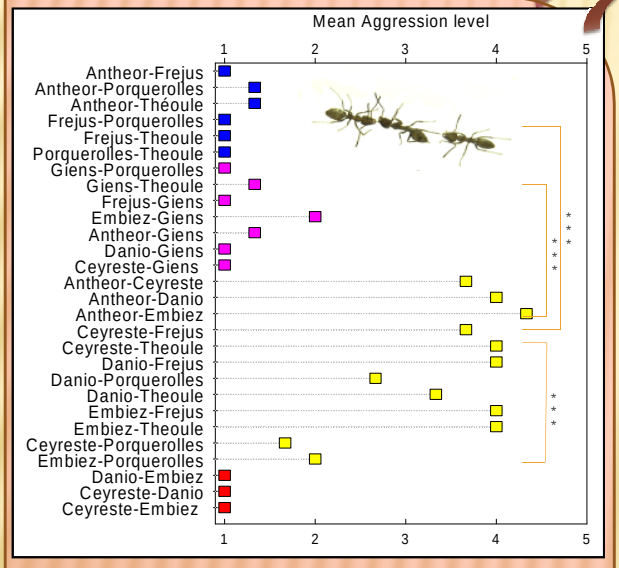
-Behavioural tests were conducted during 20 min, using a scale :

--1 : Touch (antennation)
-- 2 : Avoidance (contacts, one ant running away)
-- 3 : Aggression (lunging, bitting)
-- 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.

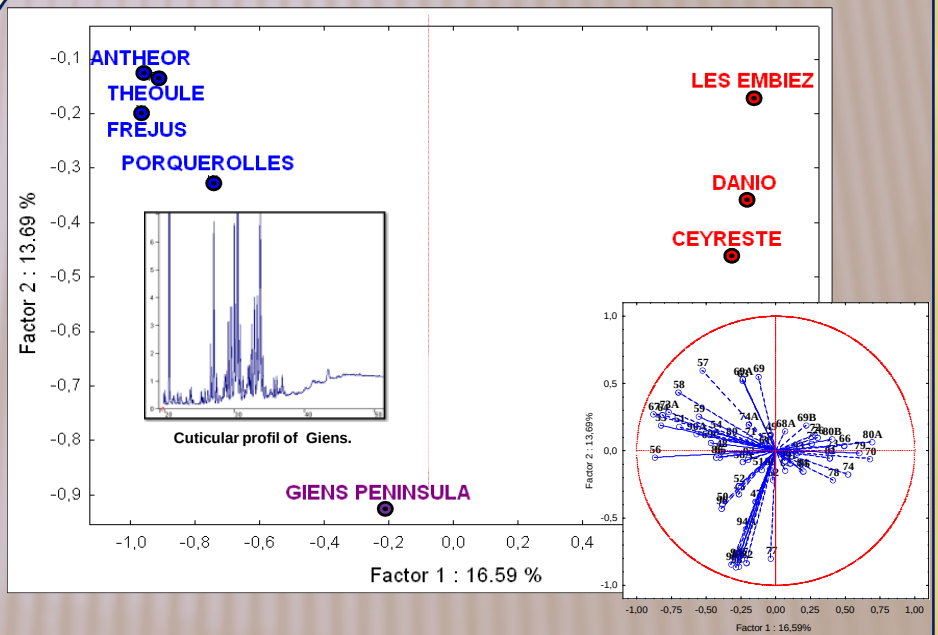
Behavior results :



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

Blue dots represent the results of behavioural tests between two sites belonging to Maln Europeen 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 Maln Supercolony are represented in yellow.

Chemical results:



The PCA performed on all sites revealed a marked discrimination between colonies. Discrimination was achieved throught 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 profil of the Giens colony share a part of the chemical characteristics of both European surpercolonies.
- 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.

Blight. O., M. Renucci., A. Tirard., J. Orgeas., & E. Provost. (2009) A new colony structure of the invasive Argentine ant (*Linepithema humile*) in Southern Europe. Biol Invasions. (In press)
Giraud. T., Pedersen. J.S & Keller. L., (2002). Evolution of supercolonies : the Argentine ant of southern Europe. Proc. Natl. Acad. Sci. 99 : 6075-6079