Colony Breeding Structure of the Invasive Termite *Reticulitermes urbis*

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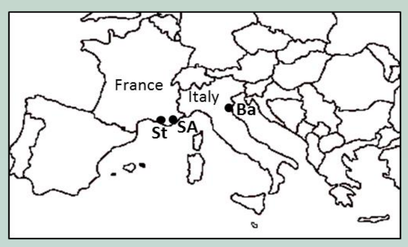
Introduction

Invasive species cause severe environmental and economic problems. The invasive success of social insects often appears to be related to their ability to adjust their social organization to new environments. *R. urbis* is a *Reticulitermes* species recently described in Europe. This distribution and genetic data suggests that *R. urbis* has been introduced by trade in France and Italy, although the source populations of these invasive colonies have not been identified. To gain a better understanding of the biology of invasive termites, this study investigated the social organization of the subterranean termite, *R. urbis*, analyzing the breeding structure and the number of reproductives within colonies from three introduced populations.



Methods

→ **520 samples** from *R. urbis* workers from Saint Cyr sur Mer (St), Sophia Antipolis (SA) in France and Bagnacavallo in Italy (Ba).

→ Genotyping of 8 microsatellite loci.

→ Analysis using population genetic methods with Genepop and *F*stat software.

Figure : Locations of the three populations studied in Europe and map of collection points in St-Cyr-sur-Mer (collection points St), Sophia Antipolis (collection points SA) and Bagnacavallo (collection points Ba). For each population, collection points belonging to the same colony (Table below) are indicated by the same color and symbol.

Results

1- All colonies from the three populations were headed by both primary reproductives (kings and queens) and secondary reproductives (neotenics) to form extended-family colonies.

Simple family

Extended family

2- *F*-statistics values and relatedness coefficient permit to infer a high number of secondary reproductives (>100) only within colonies in semi-urbanized areas (Sophia Antipolis SA).

Colony boundaries	Symbols	Family Structure	Number of secondary reproductives
French populations			
St-Cyr-sur-Mer			
St1, St2, St3, St4, St5, St7	○	Extended	≤ 2
St6	◌	Extended	≤ 2
St8, St9	○	Extended	≤ 2
Sophia Antipolis			
SA1	○	Extended	>100
SA2, SA3, SA4	○	Extended	>100
SA5	○	Extended	>100
SA6, SA7, SA8, SA9, SA10	◌	Extended	>100
Italian population			
Bagnacavallo			
Ba1	○	Extended	≤ 2
Ba2, Ba4	◌	Extended	≤ 2
Ba3	○	Extended	≤ 2
Ba5	○	Extended	≤ 2
Ba6	◡	Extended	≤ 2
Ba7	◌	Extended	≤ 2

Table : *R. urbis* colony collection points from the three populations, family structure and number of secondary reproductives.
Collection points are shown in Figure above.

Conclusion

→ *R. urbis* appears to be the only *Reticulitermes* species with a social organization based solely on extended families in both native and introduced populations, suggesting no change in their social organization due to introduction.

→ The results also imply that the invasive success of *R. urbis* may be based on different reproductive strategies in urban and semi-urbanized areas.

References

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