

Reproductive competition between polygynous parasite queens in ant colonies

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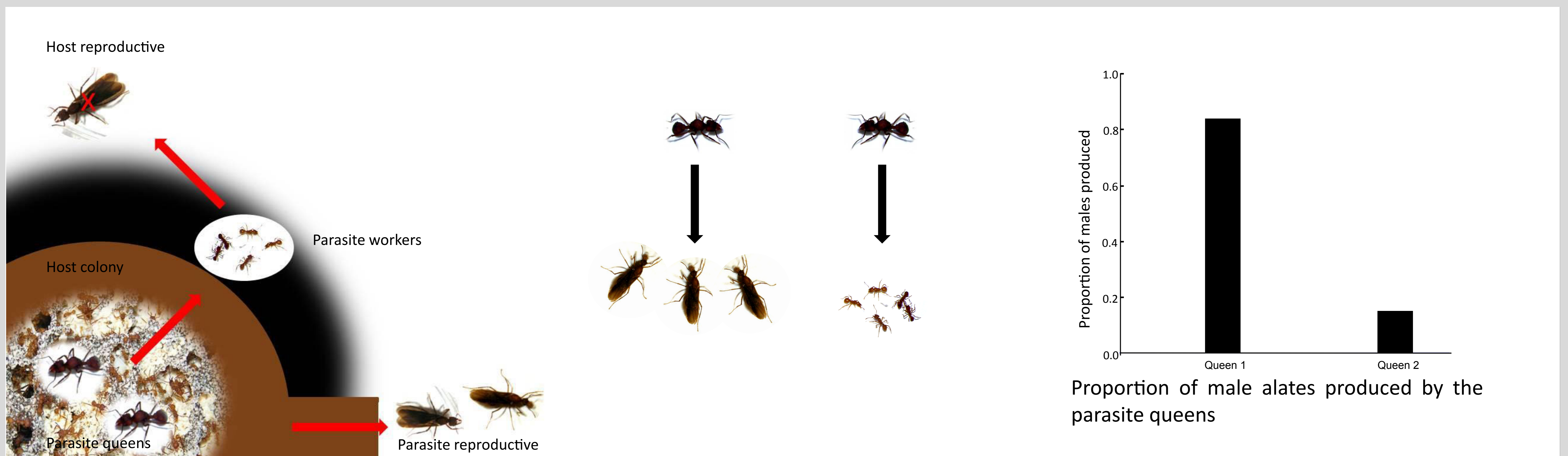
Introduction

Social parasites are specialized in exploiting a complete society, rather than an individual organism. Among the most specialized social parasites are the inquilines that exploit social insect colonies. Inquiline social parasites are usually close relatives of their host and they must fully integrate into their host colony in order to reproduce. Most inquiline ants have lost their sterile worker caste. Exceptions to this are *Acromyrmex insinator* and *Acromyrmex ameliae*, parasites of fungus-growing ants. Studies have shown that a threshold proportion of parasite workers in the colony is essential for parasite reproduction. Multiple invasions of parasite queens into host colonies suggest that each parasite queen may need to produce fewer parasite workers and that the reproductive phase can be achieved more quickly. Polygyny among parasite queens is expected to select for intraspecific hyperparasitism, where some queens might cheat by only producing sexual offspring, effectively parasitizing the worker force produced by other queens.

In this study we investigate hyperparasitism in *A. insinator* by genotyping parasite offspring, workers and alates in polygynous nests to investigate any bias in the production of reproductive castes relative to workers. We also investigated infiltration techniques.

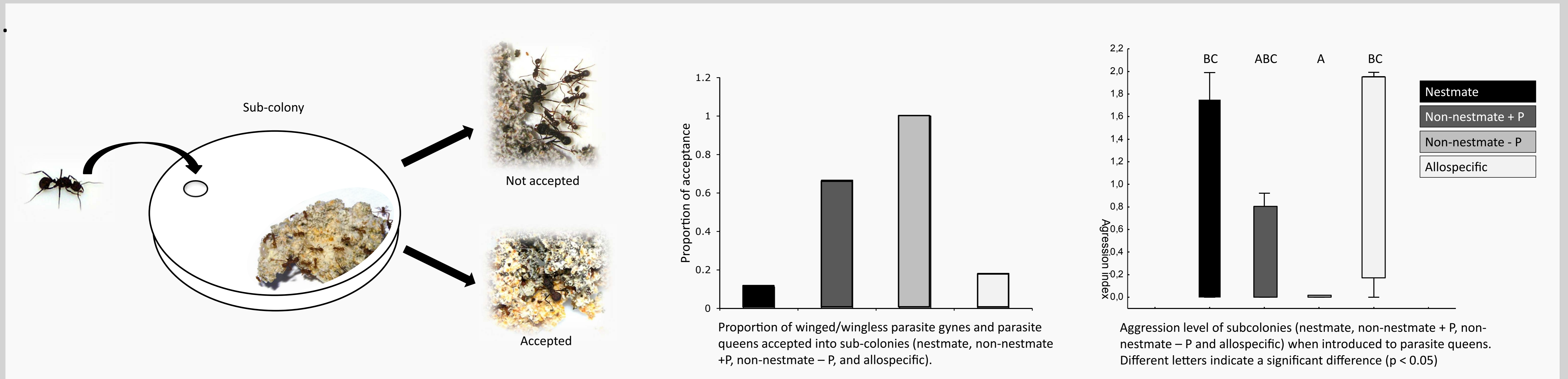
Reproductive competition

In polygynous colonies intraspecific hyperparasitism may occur, where some queens cheat by only producing sexual offspring thereby effectively parasitizing the worker force produced by other queens. We analysed genotypes of 122 male alates and found intraspecific hyperparasitism between parasite queens where one parasite queen produces the majority of sexual offspring.



Infiltration techniques

Parasite queens were individually introduced into different sub-colonies (nestmate, non-nestmate without parasites, non-nestmate with parasites or allospecific) and the level of aggression and acceptance with which they were met were measured. We found that parasite queens were met with less aggression and were more accepted in already parasitized colonies.



Conclusion

We found that parasite queens are more likely to be accepted and are met with less aggression in already parasitized colonies and that intraspecific hyperparasitism between parasite queens in polygynous colonies does occur and one parasite queen produces the majority of sexual offspring and thereby cheats the other queen.

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