nausithous and its host *Myrmica rubra*

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Introduction

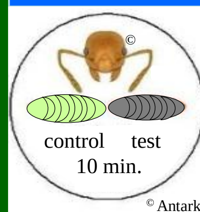
P. nausithous larvae are obligate myrmecophiles adopted into *M. rubra* ant colonies. The ability to recognize intruders is important for ant colony integrity. Selection on host colonies to avoid infestation leads into a co-evolutionary arms race between parasite mimicry and host colony defence. To screen for compounds involved in parasite mimicry and host-parasite co-evolution, several *M. rubra* populations with and without *P. nausithous* were chemically, genetically and behaviourally assayed.

M. rubra **carrying** ***Phengaris*** **larva**

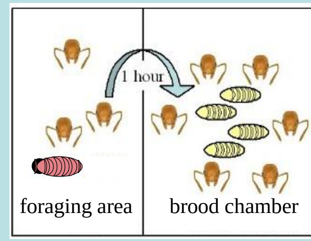
P. nausithous **adult**

Material & Methods

Workers from *M. rubra* colonies of an uninfested population were tested in choice essays in which they had to choose between the solvent control and a test item
i) own brood solvent extracts
ii) synthetic candidate compound



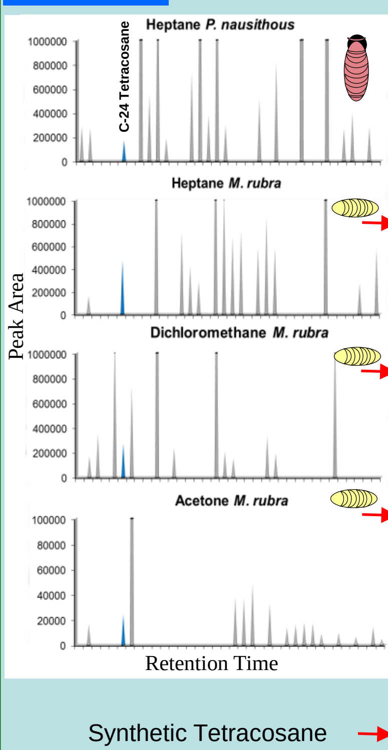
Ant brood was extracted with different solvents. Compounds common to active extracts were identified in GC-MS analyses. The antennation and the retrieval of *P. nausithous* were studied to test for local adaptation in infested and non-infested populations

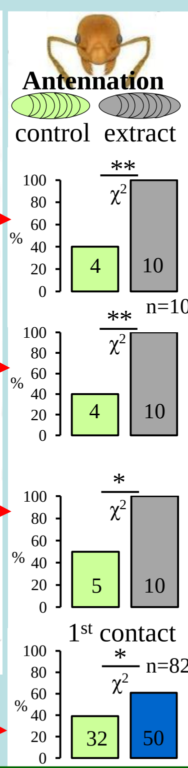


Population genetics: *M. rubra* workers were genotyped at five microsatellite loci to estimate the allelic richness and the frequency of mono- and polygynous colonies in infested and uninfested populations

Results

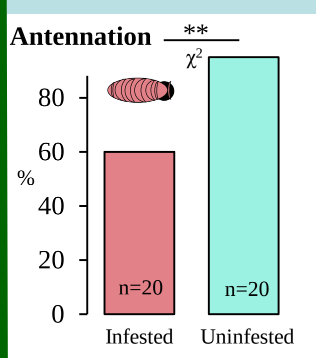
GC analyses and choice test



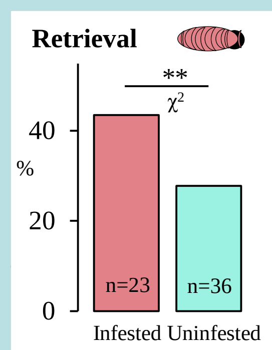


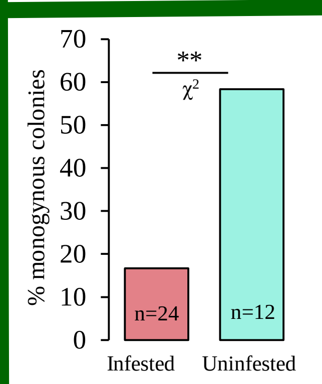
infested vs. unifested population

(Solazzo et al. 2013 Insect Soc)



P. nausithous larave are less often inspected (left) but more often retrieved (right) by ants of the infested host population, which may suggest local adaptation.





Population genetics

Unifested populations had a signifcantly higher frequency of mongynous colonies (60%) compared to infested ones (17%). The genetic diversity was however not significantly different (MWU-test)

Allelic richness
Infected = 2.4±0.25 (N=36)
Uninfected = 2.4±0.29 (N=36)

(Solazzo et al. 2014 J Insect Conserv)

*p<0.05 **p<0.01

Conclusion

P. nausithous attract *M. rubra* foragers with tetracosane (C-24) as a major compound. The infestation is more frequent in populations with polygynous colonies. Monogyny in the host population may therefore facilitate the decline and eventually local extinction of *P. nausithous*. After a period of parasite absence, polygyny may be promoted again rendering the population more susceptible again for *P. nausithous* infestations. Hence oscillating equilibria might be expected in this host – parasite system.