Inter-clonal cross breeding influences adult behaviour in the parthenogenetic ant *Cerapachys biroi*

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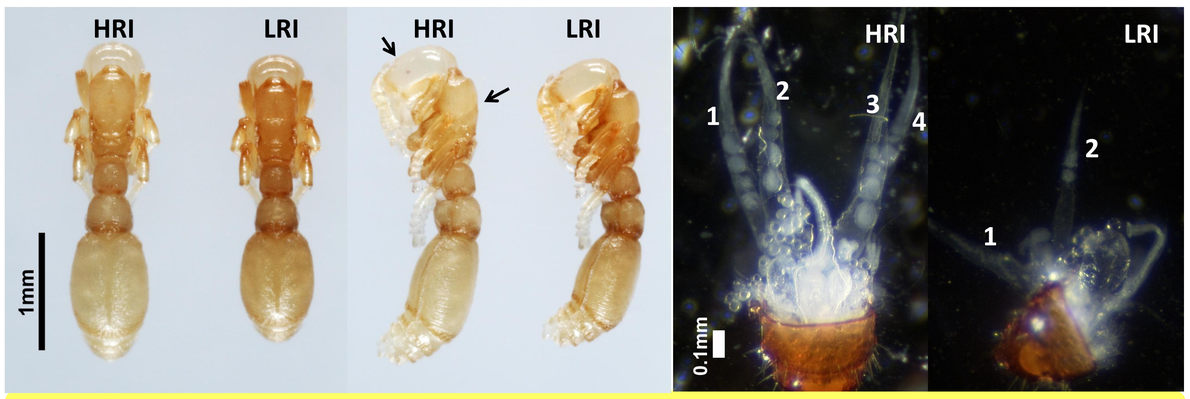
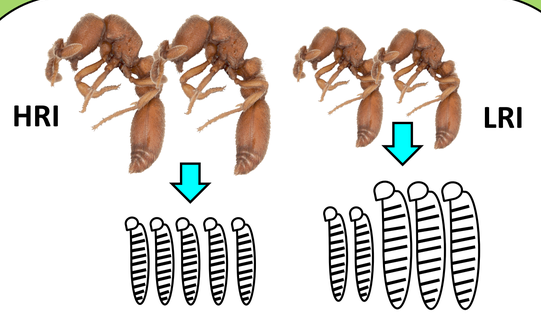
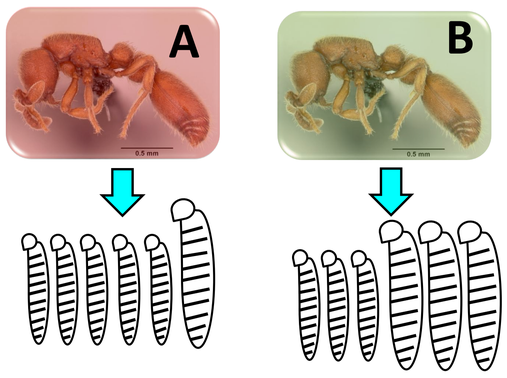
The ant *Cerapachys biroi* reproduces exclusively by thelytokous parthenogenesis. Colonies are monoclonal, and several clonal lineages occur in the wild. Two categories of individuals exist in colonies, Lowly Reproductive Individuals (LRIs) and Highly Reproductive Individuals (HRIs). While HRIs lay eggs throughout their life, LRIs become sterile foragers at 4-5 months of age.



Differences in morphology and reproductive physiology

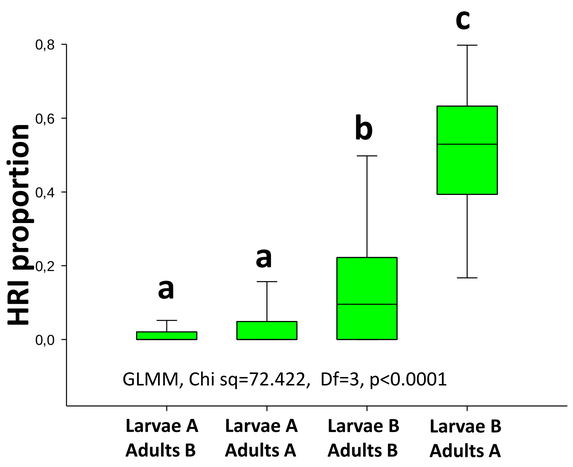


HRI production depends on the fertility level of the colony



Different clonal lines produce different proportions of HRIs

Preliminar results



Inter-clonal cross fostering experiments showed that the rearing environment influences the HRI/LRI ratio.

Does this regulation also modify the behaviour of individuals besides reproductive physiology ?

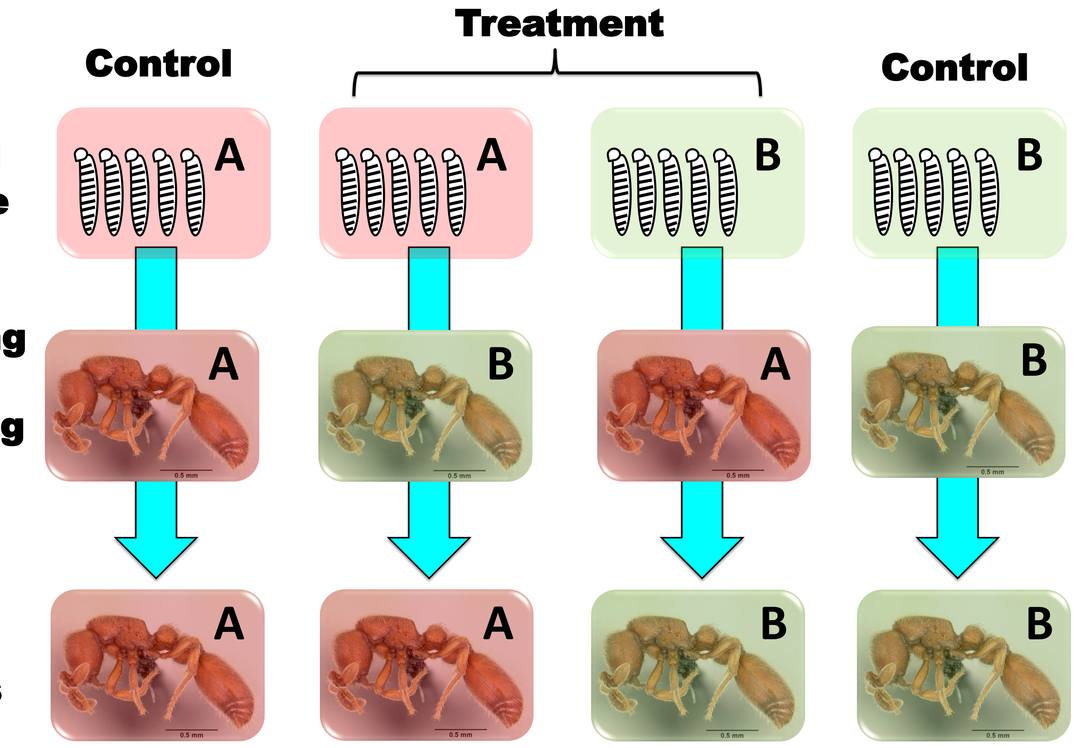
Behavioral continuum

HRIs: brood care, immobility upon and near the brood

LRIs: exploration outside and inside the nest.

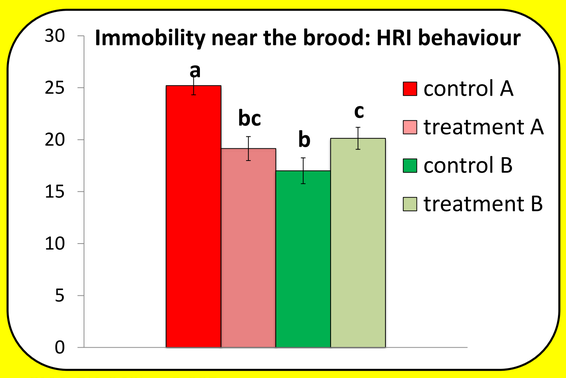
Do larvae bred by a different clonal lineage show biases in their behaviour as adults, i.e. they behave more like HRIs or LRIs ?

Cross fostering protocol

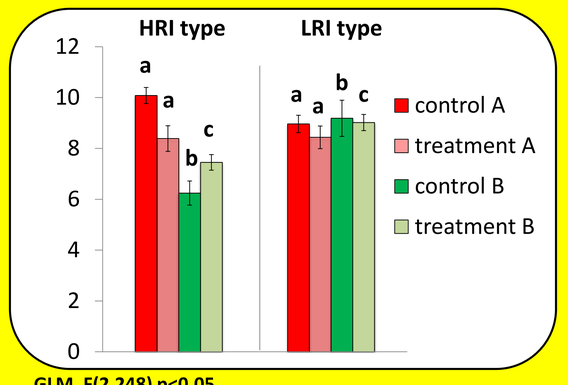


Focal individuals observed at adult stage

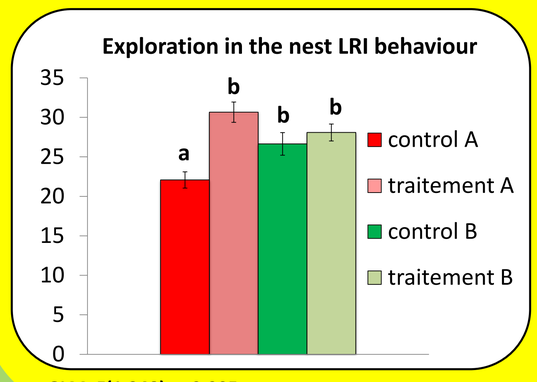
Results: behaviour



GLM, F(1,248) p<0.005

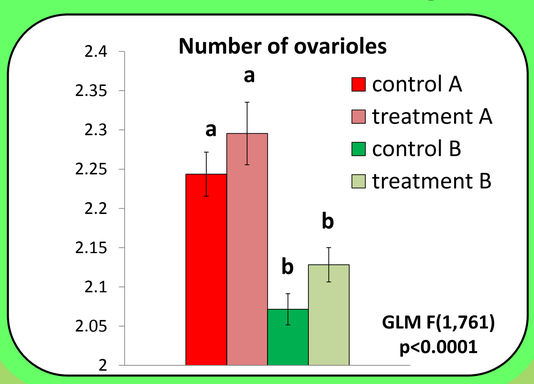


GLM, F(2,248) p<0.05



GLM, F(1,248) p<0.005

Results: fertility



GLM F(1,761) p<0.0001

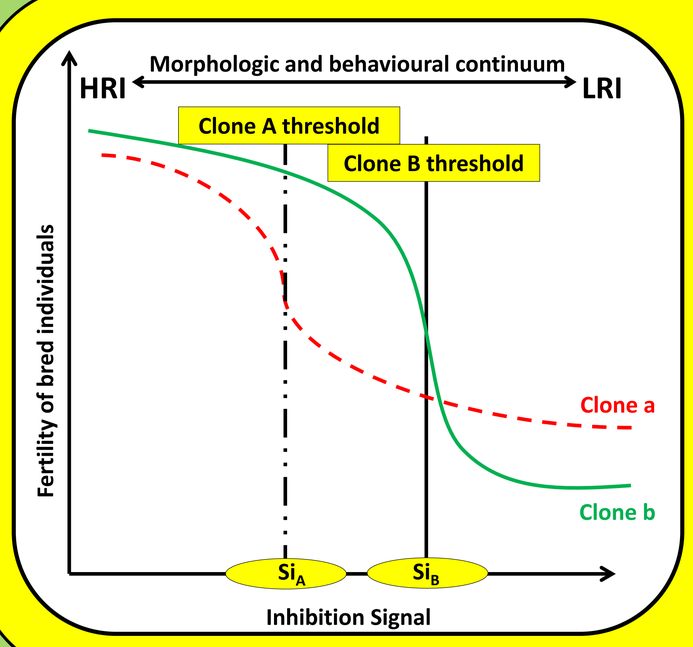
Conclusions:

In clone A, which produces less HRIs by default, LRI show a more generalist behaviour, while in clone B, which produces more HRIs by default, LRIs are more specialized in ergonomic work.

Clone A individuals are more fertile and exhibit a behaviour that is similar to the one of HRIs. Clone B individuals show the opposite trend. Reproductive physiology mirrors behavioural observations.

When cross-bred, clone A LRIs tend to be more specialized in ergonomic tasks; clone B LRIs, on the other hand, become more prone to reproduction and brood care, and work less.

The breeding environment of larvae influences their behaviour as adults.



The adults influence larval development. This regulation of larval fate is differentially calibrated in the two clones we studied. Our results reflect an environment-dependent adjustment of behaviour and division of labour.