
RECENT RESEARCH ACTIVITIES

Update on the yellow crazy ant project: global invasion, myrmecophile and host-microbial interactions

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Overview of the yellow crazy ant project

Yellow crazy ant, *Anoplolepis gracilipes* is an invasive species posing a major threat to native ecosystem and global biota. This article is to provide an update on the progress of ongoing projects concerning this invasive ant in the Laboratory of Urban Pestology.

Global invasion

Using population genomic approach, we identified peninsular Southeast Asia as the most likely origin of the yellow crazy ant, and also unraveled two major historic introduction pathways: one into East Asia and the other into Indonesia/Papua New Guinea. Most Pacific islands received colonization by the ants in the East Asia clade, whereas ants in the other clade are responsible for the invasion into Oceania. The invasion process of this ant is consistent with a biogeographic pattern typical of other introduced ants where most of the invasions tend to originate from neighboring introduced populations.

Myrmecophile

Myrmecophiles refer to organisms that live in association with ants. We assessed diversity and taxonomy of myrmecophilous ant crickets (Fig. 1) associated with the yellow crazy ant across Indo-Pacific regions, and identified the presence of at least eight species. This finding represents to date the highest ant cricket diversity associated with a single ant species. The molecular data indicate that these ant crickets have spread as a hitchhiker with the yellow crazy ant. Our preliminary data also suggest that co-introduction of both the yellow crazy ant and ant cricket has pushed out native ant crickets most likely via host competition.

Host-microbial interactions

Myrmecophiles are generally distantly related to ants (i.e., as in different insect orders), offering a unique opportunity to study how microorganisms are circulating between ants and myrmecophiles. We thus analyzed *Wolbachia* diversity in two species of crazy ants and their associated ant crickets, and showed that sharing the same *Wolbachia* strains between the two parties is rather common (Fig. 2), and this most likely results from frequent horizontal transmissions.

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Figure 1. Interactions between an ant cricket and a yellow crazy ant worker.

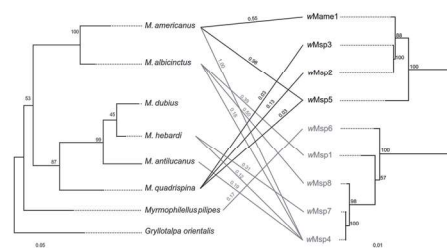


Figure 2. Maximum likelihood phylogeny of ant crickets and their corresponding *Wolbachia* strains.