

The Special ARN Student Seminar in Humanosphere Science

Title : Revisiting specialist-generalist variation hypothesis, using asian *Myrmecophilus* species as model

Speaker : Po-Wei Hsu (Master student, RISH Kyoto University)

Related RISH mission : Mission 5 (Quality of the Future Humanosphere)

Abstract

Ant cricket, *Myrmecophilus*, is a wingless tiny cricket living closely with ants and therefore evolves into unique lifestyle. They live in or around ant nests and feed on debris, prey on larvae, or even ask food directly through trophallaxis from workers. The ant crickets can be divided into host-specialist and host-generalist according to their host specificity, which makes them a perfect model to study the ecology and evolution of social parasitism. In this study, I will introduce the crickets that are associated with the invasive ant species *Paratrechina longicornis* and *Anoplolepis gracilipes*, which are reported to live with both specialist and generalist crickets.

First part of my talk is about identifying the ecological differences between specialist and generalist crickets. Behavioral observations and CHCs analysis are used to get a comprehensive understanding about how crickets make their lives associated with ants. Results show that specialist crickets can acquire colonial specific chemicals by allo-grooming ants and then apply on their bodies by self-grooming. Secondly, molecular approaches were used to reveal how the ecological differences between specialist and generalist crickets influence their genetic structures. In addition, a preliminary phylogenetic tree of the crickets was conducted in order to see how different strategies of symbiosis evolve in *Myrmecophilus* species.



Fig. A specialist ant cricket *Myrmecophilus americanus* grooms its host *Paratrechina longicornis* worker in order to acquire CHCs.