

Bachelor of Science (B.Sc.) project

You are what you eat: Investigating a potential means by which stingless bees imbibe resin chemicals



Pollen pots in *Austroplebeia australis* nest, Brisbane, Australia (photo credit: S. X. Chui).

Resin is an important tropical forest resource for the majority of stingless bees, which use resin for nest construction, physical and chemical defence, and inter-/intra-specific communication. Moreover, chemicals derived tree resin collected by stingless bees were found to be associated with their cuticular chemical profiles and in nest material, underscoring the close association between stingless bees and resin. However, the mechanism by which stingless bees integrate chemicals derived from externally collected resin onto their cuticles is unknown. Solvent-washed bees were found to continue retaining resin chemicals in their cuticles, i.e. these chemicals are integrated in the cuticle and would have had to been consumed by stingless bees, which suggests an oral route for the transference of chemicals from resin to bee. Stingless bees incorporate resin with wax to form cerumen, which is used to construct the majority of nest structures, including that of food storage pots. It would be of interest to investigate if chemicals from resin used in food storage pots (i.e. pollen, honey pots) leech into stored food, as a possible route by which stingless bee larvae ingest these chemicals in food provisions stored in brood cells.

Requirements:

- Design and carry out experiment(s) which demonstrate if resin chemicals from pollen and honey pots of two stingless bee species can leech out into surrounding material
- Analysis of GC-MS chromatograms
- Data analysis, visualisation, and interpretation
- Writing as part of a publishable manuscript to be submitted to an internationally peer-reviewed journal

For further questions and application please contact us [Chair of Plant-Insect Interactions: **Prof. Dr. Sara Leonhardt** (Hans Carl-von-Carlowitz-Platz 2. **Room 1.2.1.3**, Email: sara.leonhardt@tum.de) or **PhD student Shao Xiong Chui** (**Room 1.2.1.8**, Email: sx.chui@tum.de)].