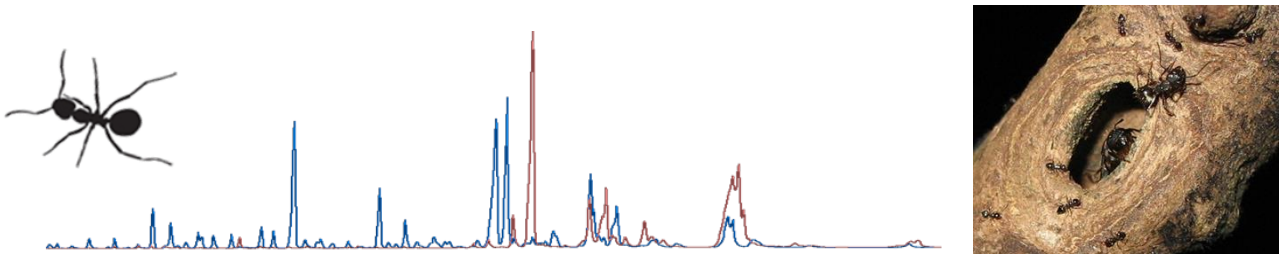
MSc/BSc Project – Desiccation resistance in tropical ants

Every terrestrial organism has to maintain its water balance and cope with the risk of desiccation. This risk is especially high in tropical habitats (due to higher temperatures), and increases with climate change due to rising temperatures and less frequent rainfall.
Insects protect themselves from water loss via a thin layer of lipids on their body surface, the so-called cuticular hydrocarbons (CHCs). Composition and quantity of these CHCs is likely to determine how well an insect can maintain its water balance during dry periods. It seems likely that species differ in drought resistance depending on the microhabitat of a tropical habitat. For example, canopy-dwelling species may be more exposed to dry conditions than understory species, and thus be more drought-resistant.
In this project, we want to investigate drought resistance in ants from different microhabitats in a tropical rainforest. We are looking for a highly motivated Master or Bachelor student to participate in our research on desiccation resistance in different ant communities. We will study ant communities in different microhabitats in the tropical lowland rainforest of Perú (leaf litter, understorey, canopy), analyse their CHC profiles and measure their drought resistance.



Left: Cuticular hydrocarbon profiles of two tropical ant species. Right: The ant species *Camponotus femoratus* and *Crematogaster levior* at their nest entrance

The project will combine field work in the Panguana station (near Pucallpa, Perú) with ant identification and chemical analyses using GC-MS (gas chromatography-mass spectrometry). The candidate(s) will travel to Perú with us in March 2024, and stay there for 3-5 weeks. Field work will include collecting ants, producing chemical extracts, identifying the ant species and conducting desiccation assays. Back in Mainz, the CHC extracts will be analysed by the candidate(s) using GC-MS. Experience in working under field conditions, insect identification and/or statistical analyses are advantageous. Travel expenses (flights and accomodation) must be covered by the candidate(s), although there might be partial financial support.

If you are interested or have further questions, please contact PD Dr. Florian Menzel (menzelf@uni-mainz.de).

Left: View of the Panguana research station. Right: The rainforest around the station.