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Population-level differentiation between Yellow Crazy Ant supercolonies in South-East Asia

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The Yellow Crazy Ant (YCA) *Anoplolepis gracilipes* ranks among the most destructive social insect invaders in South-East Asia and the Indopacific. It is believed that their ability to form vast polydomous, polygynous supercolonies is the key to their ecological success. This is particularly true in Arnhem Land, NE-Australia, where a single supercolony spans up to 80km across, covering more than 15.000km² in total (Gruber et al. 2011). In Sabah, North-East Borneo, however, YCA population structure is very different. Here, YCA supercolonies are no larger than 300m across and many supercolonies of varying sizes compete for resources within the same population. Using data from two independent populations of supercolonies, we will demonstrate that YCA supercolonies in NE-Borneo are genetically and chemically (Cuticular Hydrocarbons) differentiated to such an extent that it suggests lack of gene flow between them. We argue that positive feedback between behavioral, genetic and chemical differentiation will further intensify intercolonial segregation, possibly leading to reproductive isolation between different YCA supercolonies and thus, speciation. Preliminary experiments using a limited set of laboratory colonies suggest a reproductive barrier between distantly related YCA supercolonies. It is currently unclear whether this is due to worker-policing or the inability of queens mated with males from foreign supercolonies to produce vital offspring. We aim at further studying the potential reproductive barrier between YCA supercolonies along a gradient of genetic similarity by cross-breeding males and queens from variably related supercolonies. To identify suitable supercolonies, we performed a population genetic analysis of YCA populations in Jambi, Central Sumatra, sampling from over 30 supercolonies that are as far as 100km apart. We thus present first genetic data on that population and discuss the experimental design with which we intend to identify the degree of genetic distance at which males and queens from different YCA supercolonies are reproductively isolated.

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Sugar preference and the importance of viscosity in Apis cerana*, the Asian honeybee*

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The Asian honeybee, *Apis cerana java* (AHB) is a tropical bee species that recently breached quarantine in northern Australia. It is classed as an invasive pest with the potential to detrimentally impact upon Australian beekeeping and other agricultural industries. New research is investigating the behaviour and ecotoxicology of AHB with the aim of developing and optimising trapping stations to impede colony spread. Whilst sugar feeding preferences in the temperate species *Apis mellifera* have been extensively investigated, preferences in AHB are much less known. This information is crucial to the design of an efficient AHB trapping station. Here, we investigate the sugar solution preferences of AHB using the sugars most common found in nectar. We tested glucose and fructose (hexose sugars), sucrose (a disaccharide sugar) and various mixtures. We also used manipulated solution viscosity through the addition of tylose. We found that, as for *Apis mellifera*, AHB displayed a strong preference for equicaloric solutions of sucrose over hexose solutions, with both hexoses equally attractive. However, whilst *Apis mellifera* displayed a strong preference for glucose-fructose-sucrose over an equicaloric sucrose solution, AHB displayed no preference between equicaloric solutions of sucrose, glucose-fructose and glucose-fructose-sucrose. In addition, when sucrose concentrations were fixed and viscosity was manipulated using tylose, AHB showed a preference for more viscous solutions than was predicted by a recently published model of nectar-feeding. We discuss these results in light of this model and the ecology of AHB.