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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.