

Molecular determinants of risk-taking in the invasive Argentine ant and behavioural variation along an introduction pathway

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Eligible for student prize

Are we driving the evolution of invasive species to our own detriment? Humans routinely transport invasive species around the globe. It has been suggested that this process leads to selection for traits that promote invasiveness. We tested this hypothesis by investigating a risk-taking behavioural syndrome in the Argentine ant, which has successively colonised most temperate regions around the world, including New Zealand. We studied variation in foraging behaviour and aggression in native as well as introduced Argentine ant populations from California, Australia and New Zealand in order to determine if data was consistent with selection of risk-taking along the introduction pathway. We combined behavioural assays, neurochemical and transcriptomic analysis to investigate the risk-taking behavioural syndrome as well as its molecular basis. Our first results show that octopamine - a major biogenic amine - mediates foraging behaviour in the Argentine ant. Behavioural variation within regions was high, but we found no phenotypic evidence for increased risk-taking along the studied introduction pathway. The next step of this study is to perform a global comparative analysis of the Argentine ant transcriptome in the different regions along its introduction pathway. This will help to investigate underlying mechanisms of how evolution and invasion processes may interact, as well as to understand better the molecular basis of variation in a key behavioural trait in the invasive Argentine ant.

