Matching invasive species to invaded environments using climate, habitat and phylogeny

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Eligible for student prize

To be better prepared and to assist with the prevention of new species establishing in new regions, some means of predicting those that have highest risk is required. The overall aim of this research is to develop new methods that will help improve the risk assessment of invasive herbivorous insects that threaten New Zealand's native flora. The naturalisation or the establishment success of new species is determined by how it responds to the new abiotic and biotic constraints or opportunities in a new environment. Previous research has indicated that when well-known climatic and biotic constraints are accounted for, there may be other signals in metadata about potential invaders that can indicate risk of alien species to native flora in particular. Following that research, the importance of biogeography for risk assessment of the potential impact of non-indigenous herbivorous insects and plant pathogens in natural ecosystems, will be investigated. Second, the potential for phylogenetic affinities analysis of insect species and plant pathogens to give useful predictions to evaluate the relative impacts on individual hosts and ecological systems, will be determined. Third, the potential for the existence of predictive patterns among generalist and specialist invasive herbivorous insects will be evaluated. Finally, a synthesis of the new knowledge gained from biogeographic matching, phylogenetic affinities analysis and generalist-specialist analysis will be carried out to improve the risk analysis for invasive species.