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RESEARCH DIRECTIONS

Hungry Insects

Dr Markus Riegler and Professor David Ellsworth, from the Centre for Plants and the Environment, have been awarded an Australian Research Council Discovery Project Grant to test the predicted responses of individual insect species and communities in eucalypt forests against realistic climate change scenarios.

'Insect populations are controlled by a combination of available food sources and antagonists (predators, parasitoids, pathogens)' says Dr Riegler. 'Understanding the drivers for insect populations and their vulnerabilities to environmental change is the first step to predicting insect adaptation and devising strategies to minimise the impacts of climate change on forest biodiversity. Both outbreaks and extinctions of insect species in eucalypt forests can have a negative impact on the forest, for example, increasing the accumulation of leaf litter and, therefore, the risk of bushfire activity.'

Using the Hawkesbury Forest Experiment, the pre-eminent climate change experiment facility located at UWS, the researchers will be able to predict the effects of changes in tree productivity and plant biochemistry under different combinations of water and nutrient availability and elevated atmospheric conditions. They will then investigate if these changes are likely to affect insect community composition in different treatments, and insect feeding rates of representative eucalypt insect species. The insects will be treated under standardised conditions and offered leaf material from the eucalypt treatments in field and glass houses. Growth rates of larval stages, pupal weight, physiological parameters and reproductive fitness will be measured in relation to changes in the leaf chemistry to determine their adaptability.

This project will contribute to an understanding of how eucalypt associated insect communities are regulated. Results from this project will deliver important information for future forest protection, reforestation programs and enhance our ability to protect plantations from insect attack, manage biodiversity and mitigate the severity of bushfires.

Project Title: Insect herbivore and plant responses in eucalypt forests under climate change at physiological, species and community scales
Funding has been set at: $305,000
Contact Details: m.riegler@uws.edu.au
http://www.uws.edu.au/cpe
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