

URC RESEARCH REPORT

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Date: March 2010

Project Title: Biosecurity and weed management: taking into account the biodiversity value of woody invasive alien plant species (Invertebrate Identification)

RMOL#: RIO9011

1. What is (are) the research question(s)?

- Does the diversity of invertebrates differ between privet forest and native forest?
- Does the diversity of invertebrates differ over a year of data collection at two sites in Auckland

2. Rationale

Tree privet (*Ligustrum lucidum*) is a common woody invasive alien plant species in New Zealand, forming large monocultural stands that suppress native plants. Privet is also considered to be a respiratory allergen. It is controlled by local and regional councils with a range of methods, usually resulting in complete removal. A range of native and exotic bird species (particularly tui) are known to feed on privet fruits, which appear to provide an important winter food source. Initial investigations have shown high levels of invertebrates under privet and native reptiles are also present. It is not known how privet forest compares with native forest as a habitat and source of food for native animals. It is also not known what the effects of the removal of privet might be on urban wildlife. This project aims to estimate what biodiversity value privet forest may have and provides baseline data for a study that will measure changes after the removal of the privet. The results of this study will indicate to managers what changes (if any) there may be in the populations of native fauna if privet is removed. Invertebrates are critical parts of ecosystems, particularly as decomposers, yet are often not included in ecological surveys due to the frequency of collections required, identification complexities and costs.

The invertebrate collection part of this project, as well as providing data for the comparison of the biodiversity at two sites, will also provide data for seasonal fluctuations in diversity and abundance in urban and non-urban parts of Auckland. This project will complete the ecological study begun as the science part of the "Art and Biology" project funded for 2007 and 2008 by URC. We were not able to complete the project in 2008 due to the disruptions caused by restructuring and the lack of available invertebrate taxonomy expertise.

3. Methodology

We have 15 months of invertebrate collections from 12 pit fall traps at each of two sites stored in alcohol. Curation in 2008 resulted in 585 vials of invertebrates that need to be identified. Each vial represents a subsample of invertebrates from a

single pitfall trap, at one of the two sites, collected on a particular date. We will identify every invertebrate in each vial as far as possible (family/genus/species). Our team would be able to do “triage” – identifying invertebrates to their main taxonomic groups, but require expert assistance to identify some of the collections to genus or species level. We envisage that we will learn how to do this ourselves over the rest of the year from observing the expert. The equipment required (microscopes etc.) is available in the Department of Natural Sciences. Numbers of species and abundance will be compared between the two sites and over time. This will necessitate some form of statistical analysis. Overall species lists at each site will also be created as a resource for other researchers.

4. Outcomes / findings

Stephen Thorpe from the University of Auckland was hired to identify the invertebrates. I received nine reports on his progress. We now have a massive dataset that we will analyse and use in a paper when we have time (I am writing 4 papers currently, this work would go into the 5th paper).

Interesting findings/notes so far:

- An unusual female specimen of *Embolemus zealandicus* was donated to the Lincoln University Entomology Research Museum (http://species.wikimedia.org/wiki/File:Embolemus_zealandicus_female_dorsal.jpg)
- The mites have been sent to a researcher in New York who is describing a new family.
- We collected an unusual slater: (<http://species.wikimedia.org/wiki/File:Coronadillo.jpg>)
- We collected a specimen of a new species of the spider genus *Pahoroides*, which is being revised by Fitzgerald & Sirvid: (http://species.wikimedia.org/wiki/File:Pahoroides_courti_female_lateral.jpg)

All of the above were from the native forest at Laingholm

Initial scans of the data suggests that there is a much higher diversity of species in the native forest than the exotic.

Please note that the above information should not be disseminated until we have published our paper.

5. Publications and dissemination

Nothing yet – we will crunch the data once we have the mites back from New York and work on the paper then.