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**Morphology, Phylogeography and Drumming  
Behaviour of a New Zealand Ground Weta,  
*Hemiandrus pallitarsis*.**

A thesis presented in partial fulfillment of the requirements for the degree of

**Master of Science**

in Conservation Biology

at

Massey University, Palmerston North, New Zealand



**Massey University**

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**2008**

# Abstract

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Species are one of the fundamental components of biology and the accurate delimitation of species is important in evolutionary, systematic and ecological studies, yet there is still confusion over how species can be recognised. Examining different characters allows multiple lines of evidence for successful and accurate species delimitation and identification. In this thesis, morphological, genetic and behavioural variation is investigated within an endemic species of ground weta, *Hemiandrus pallitarsis*, in the North Island, New Zealand. Twelve morphological characters were measured, and mitochondrial cytochrome oxidase I DNA sequences were analysed from populations across the distributional range of *H. pallitarsis*. Both methods provide no evidence of a species complex within *H. pallitarsis*. Instead, the morphometric results suggest females are significantly larger than males, and ground weta in Palmerston North are significantly smaller than weta further north. Additionally, genetic analyses found substantial population structuring, large genetic distances, and an historical south to north pattern of movement in the North Island. The pattern of vibratory drumming behaviour followed that predicted by morphology and geographic proximity – drumming signals were more similar between geographically close populations and did not match the patterns of genetic isolation. Overall, this thesis was able to show that *H. pallitarsis* is morphologically, genetically and behaviourally variable across the North Island.

# Acknowledgements

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I would like thank my supervisors Dr Steve Trewick and Dr Mary Morgan-Richards for their constant enthusiasm and effortless and endless support throughout this project. Thank you also for funding the genetic sequencing, without which my life would have been that much more difficult. Thank you to my co-supervisor, Dr Isabel Castro, for comments and advice on the weta drumming behaviour. I would like to acknowledge Dr Ian Stringer for giving me the original idea to study ground weta and also for taking me on many Middle Island tusked weta trips. Thank you to Dr Darryl Gwynne for his encouragement and exuberant enthusiasm for weta and their sexual behaviour. To all those people who help me in the field: the “Kelso Lane weta hunters”, Rob Chappell, Lorraine Cook, Kaye Rabarts, Susan Cunningham, Jonathan Tonkin, and Louisa Robertson, thank you all so much. For help in the lab, thank you to everyone in the Allan Wilson Centre, especially to Renae Pratt, Simon Hills, Gillian Gibb and Carlos Lehnebach. I would like to acknowledge John Early at the Auckland Museum for providing weta specimens, and the Entomological Society of New Zealand and the Orthopterist’s Society for their financial contributions to this project. A big thank you goes to everyone in the Ecology building and the B.E.E.R.S group. Finally and most importantly, thank you to all my family and friends for your love and support. In particular, thanks to Dad for taking me out to some wonderful and exiting islands and helping me whenever I needed it, I hope this thesis makes you proud, and thanks to Mum and Pete for providing a fantastic weta population in their back garden and for the many hours of encouragement, love and support, couldn’t have done it without you.

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