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**Vertical Distribution, Resource and Space Use in a  
Tropical Rainforest Small Mammal Community**

**Thesis submitted by**

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**2005**

**for the research Degree of Master of Science  
in Zoology and Tropical Ecology  
within the School of Tropical Biology and  
Cooperative Research Centre for Tropical Rainforest Ecology and Management  
James Cook University  
Australia**

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## ABSTRACT

Mammal assemblages of rainforest communities are commonly vertically stratified. This can be driven by competition for or access to resources in the upper canopy layers of the forest. Arboreal mammals comprise a substantial proportion of tropical mammal communities and yet are difficult to census due to their inaccessibility and often, cryptic and nocturnal behaviour. Nonetheless they require attention to ensure they are appropriately managed. This study found the rodent community of Cape Tribulation to be vertically stratified with *Pogonomys mollipilosus* found only in the upper canopy layers and *Rattus leucopus* on the ground. *Melomys cervinipes* and *Uromys caudimaculatus* were found at all four height layers. Fruit and flower resource abundance were not significantly correlated with total rodent captures, however arboreal captures of *M. cervinipes* and *P. mollipilosus* were correlated with the number of individual flowering canopy trees.

The consumption of fruits by vertebrates and invertebrates may be both advantageous and detrimental to seeds. The consumption of *Acmena graveolens* fruit pulp by rodents and beetle presence, increases the germination success of *A. graveolens* seeds. Germination success is also higher as seed size increases and seed size influences the amount of pulp remaining on seeds. In this study, both vertebrate and invertebrate interaction with the fruit appears advantageous.

Nesting and resource availability were identified as two mechanisms driving arboreal activity of *M. cervinipes*, a scansorial rainforest rodent. Home range size does not significantly differ between the sexes. The number of canopy trees increased linearly with area size for the 95% harmonic mean area but the average number of canopy trees remained the same regardless of area for core home range areas.

The salient points of this study are as follows:

1. Arboreal trapping is an important part of biodiversity assessment of forest-dwelling small mammal communities
2. Removal of pulp by rodents and beetle presence enhances germination success of *A. graveolens* seeds
3. The number of canopy trees influences core home range size of *M. cervinipes*

Understanding the full extent of rodent resource use, including fruit consumption, is important to increase our knowledge and understanding of community dynamics, the associated impacts upon seed survival and in the long term, the structuring of plant communities and maintenance of diversity in tropical rainforests.

# Table of Contents

STATEMENT OF ACCESS.....	ii
DECLARATION.....	iii
ABSTRACT.....	iv
TABLE OF CONTENTS.....	vi
LIST OF FIGURES.....	ix
ACKNOWLEDGEMENTS.....	x
<b>CHAPTER 1: GENERAL INTRODUCTION.....</b>	<b>1</b>
Objectives of this study.....	1
Background: a review of the literature.....	4
Home range size.....	5
Canopy mammal frugivory and its impacts upon seed germination success and dispersal.....	7
<b>CHAPTER 2: BIODIVERSITY ASSESSMENT: THE IMPLICATIONS OF FOREGOING CANOPY CENSUS.....</b>	<b>10</b>
Abstract.....	10
The importance of comprehensive fauna surveys.....	11
Different traps and heights yield different results.....	13
Management implications.....	14
<b>CHAPTER 3: DOES RESOURCE AVAILABILITY GOVERN VERTICAL STRATIFICATION OF RODENTS IN AUSTRALIAN LOWLAND TROPICAL RAINFOREST? .....</b>	<b>16</b>
Abstract.....	16
Introduction.....	17
Methods.....	19
Study site.....	19
Vertical stratification of small mammals.....	19
Arboreal behaviour and local resource abundance.....	20
Canopy tree flowering phenology and arboreal rodent captures.....	21
Results.....	21
Vertical stratification of small mammals.....	21
Arboreal behaviour and local resource abundance.....	24
Discussion.....	25
Vertical stratification of small mammals.....	25
Competition?.....	28
<b>CHAPTER 4: A PLANT- ANIMAL INTERACTION INVOLVING RODENTS, BEETLES AND AN AUSTRALIAN RAINFOREST FRUIT (<i>Acmena graveolens</i>).....</b>	<b>31</b>
Abstract.....	31
Introduction.....	32
Methods.....	35
Study site and species characteristics.....	35
Pulp removal by rodents and beetles and its effect on germination success.....	36
The effect of seed size on germination success.....	37
The identification of fruit pulp consumers.....	37



<i>Pulp removal and seed size under natural conditions</i> .....	38
<i>Statistical analysis</i> .....	38
<b>Results</b> .....	<b>39</b>
<i>Pulp removal by rodents, the presence of beetle holes and their combined effect on germination success</i> .....	39
<i>The effect of seed size on germination success, pulp remaining and the proportion of seeds with beetle holes</i> .....	42
<i>The identification of pulp consumers</i> .....	44
<i>Pulp remaining and seed size under natural conditions</i> .....	45
<b>Discussion</b> .....	<b>46</b>
<i>The interaction between pulp remaining, presence of beetle holes and germination success of <i>A. graveolens</i> seeds</i> .....	46
<i>The effect of seed size</i> .....	48
<i>The identification of pulp consumers</i> .....	50
<i>Pulp removal under natural conditions</i> .....	50
<b>CHAPTER 5: HOME RANGE, RESOURCE AND SPACE USE BY A TROPICAL RAINFOREST RODENT, <i>Melomys cervinipes</i></b> .....	<b>52</b>
<b>Abstract</b> .....	<b>52</b>
<b>Introduction</b> .....	<b>53</b>
<b>Methods</b> .....	<b>55</b>
<i>Extent and purpose of arboreal behaviour</i> .....	55
<i>The influence of sex, body weight and resource availability on home range size</i> .....	57
<i>Canopy tree species diversity index</i> .....	57
<b>Results</b> .....	<b>57</b>
<i>The extent of arboreal activity</i> .....	57
<i>The purpose of arboreal activity</i> .....	57
<i>Estimation of home range size and the influence of sex, body weight and resource availability</i> .....	59
<i>Sex and body weight</i> .....	60
<i>Canopy tree species diversity</i> .....	62
<i>Resource availability</i> .....	62
<b>Discussion</b> .....	<b>64</b>
<i>Arboreal activity</i> .....	64
<i>Home range size</i> .....	64
<b>CHAPTER 6: SUMMARY AND CONCLUSIONS</b> .....	<b>68</b>
<b>1. Vertical distribution of arboreal/scansorial mammals</b> .....	<b>68</b>
1.1 <i>Biodiversity estimates are inaccurate if arboreal species are overlooked</i> .....	68
1.2 <i>A tropical rodent assemblage is vertically stratified</i> .....	68
1.3 <i>The relationship between rodents, resources and flowering canopy trees</i> .....	69
<b>2. The influence of consumption by rodents, presence of beetles and seed size on the germination success of <i>A. graveolens</i> seeds</b> .....	<b>70</b>
2.1 <i>Relationship between <i>A. graveolens</i>, beetles and rodents</i> .....	70
2.2 <i>Seed size and its effects on beetle presence, pulp remaining and germination success</i> .....	70
2.3 <i>Pulp consumers under natural conditions</i> .....	71
<b>3. Space use and arboreal behaviour of canopy-dwelling mammals</b> .....	<b>71</b>
3.1 <i>Arboreal behaviour and resource use</i> .....	71
<b>4. Conclusions and ecological implications of this study</b> .....	<b>72</b>

REFERENCES.....

## LIST OF FIGURES

### Chapter 3:

Figure 1: Captures (%) for each species across four height strata at the Australian Canopy Crane Site, Cape Tribulation.....	23
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### Chapter 4:

Figure 1: The influence of pulp remaining and beetle hole presence on germination success of <i>A. graveolens</i> seeds .....	41
Figure 2: The effect of seed size on germination success of <i>A. graveolens</i> seeds.....	41
Figure 3: The influence of seed size on the presence of beetle holes.....	43
Figure 4: The influence of seed size on the amount of pulp remaining.....	43

### Chapter 5:

Figure 1: Core home range area defined as the 65% Harmonic Mean area.....	56
Figure 2: The proportion of time <i>M. cervinipes</i> spent on the ground and in the canopy.....	58
Figure 3: Spatial representation of core home ranges of the eight collared <i>M. cervinipes</i> individuals.....	60
Figure 4: Relationship between the average number of canopy trees (95% HM) and home range area .....	63
Figure 5: Relationship between the average number of canopy trees (65% HM) and home range area.....	63

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