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Effects of Argentine ant (*Linepithema humile*) on arthropod fauna in New Zealand native forest

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A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Biological Sciences, The University of Auckland, 2006
Argentine ant (*Linepithema humile*)
Abstract

Although Argentine ant (*Linepithema humile*), a highly invasive ant species, has been in New Zealand for at least 14 years, little is known about their ecology and potential for invasion. Increasing spread and establishment of populations throughout New Zealand is disturbing because of the devastating impacts documented on native invertebrate biodiversity overseas. The primary aim of this study was to determine the impacts of Argentine ants on arthropods in native forest habitats in west Auckland. Pitfall traps at invaded and uninvaded sites were used to quantify ant and non-ant arthropod faunas. Argentine ants did not adversely affect native host ant communities. Moreover, two ant species appeared to be resistant to invasion. Argentine ant invasion reduced the abundance of a few orders of invertebrates while several taxa were more abundant in the presence of Argentine ants. Distribution and foraging activity of Argentine ant populations were monitored in this study from 2000-2003. Also, rate of spread was investigated to evaluate whether native forest habitats would be at risk from invasion. Measurements of foraging ant trails on monitored tree trunks revealed seasonal distribution patterns involving high activity in summer/autumn and low activity in winter/early spring. Argentine ants were found to be established primarily along the edge of the forest and did not invade into the interior of the forest during the study period. An Argentine ant poisoning operation on Tiritiri Matangi Island in January 2001 provided the opportunity to document the results of the eradication trial. In addition, pitfall traps placed at two treated sites and one untreated site were used to compare pre-poison and post-poison effects on ant and non-ant invertebrate communities. Fipronil baiting at 0.01% effectively reduced Argentine ants at the study sites and very few ants were
observed in both tree count and pitfall trap recordings two months after poisoning. The invasion of Argentine ants on Tiritiri Matangi Island decimated native host ants and no recovery was detected throughout the study. Several groups of invertebrates appeared to benefit from the removal of Argentine ants while a few showed no detectable changes. Conservation implications resulting from the findings of this study are discussed. Also, potential future research involving Argentine ants are outlined.
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# Table of contents

Frontispiece
Abstract
Acknowledgements
Table of contents
List of Tables
List of Figures
List of Plates

**Chapter One: Literature review**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 General Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Biology</td>
<td>2</td>
</tr>
<tr>
<td>1.2.1 Human association</td>
<td>2</td>
</tr>
<tr>
<td>1.2.2 Dispersal</td>
<td>2</td>
</tr>
<tr>
<td>1.2.3 Unicoloniality</td>
<td>3</td>
</tr>
<tr>
<td>1.2.4 Interspecific aggression</td>
<td>5</td>
</tr>
<tr>
<td>1.2.5 Polygyny</td>
<td>6</td>
</tr>
<tr>
<td>1.2.6 Mating and Budding</td>
<td>7</td>
</tr>
<tr>
<td>1.2.7 Nests</td>
<td>7</td>
</tr>
<tr>
<td>1.2.8 Feeding</td>
<td>8</td>
</tr>
<tr>
<td>1.2.9 Small size</td>
<td>10</td>
</tr>
<tr>
<td>1.3 Worldwide distribution</td>
<td>11</td>
</tr>
<tr>
<td>1.4 Habitat</td>
<td>11</td>
</tr>
<tr>
<td>1.5 Impacts</td>
<td>13</td>
</tr>
<tr>
<td>1.5.1 Ant impacts</td>
<td>13</td>
</tr>
<tr>
<td>1.5.2 Non-ant invertebrate impacts</td>
<td>15</td>
</tr>
</tbody>
</table>
### Vertebrate Impacts

1.5.3 Vertebrate impacts

1.6 New Zealand ants

1.7 Argentine ant history in New Zealand

1.8 Other recent invasive ants in New Zealand

1.9 Thesis outline

1.9.1 Chapter content

1.9.2 Aims

Chapter Two: The invasive Argentine ant, *Linepithema humile*, disrupts ant and non-ant arthropod faunas in New Zealand native forest

2.1 Abstract

2.2 Introduction

2.3 Methods

2.3.1 Study sites

2.3.2 Pitfall trapping

2.3.3 Statistical methods

2.3.3.1 Multivariate analyses

2.3.3.2 Univariate analyses

2.4 Results

2.4.1 Effects on ants

2.4.2 Effects on other invertebrates

2.5 Discussion

2.5.1 Remarks on sampling methodology

2.5.2 Effects on ants

2.5.3 Effects on other invertebrates

### Chapter Three: Seasonal patterns and invasion rates of Argentine ant, *Linepithema humile*, in New Zealand native forest

3.1 Abstract
3.2 Introduction

3.3 Methods
3.3.1 Study sites
3.3.2 Sampling
  3.3.2.1 Distribution
  3.3.2.2 Seasonal effects
  3.3.2.3 Rate of spread
  3.3.2.4 Pitfall traps
3.3.3 Statistical analyses

3.4 Results
3.4.1 Seasonal and annual effects
3.4.2 Invasion rate
3.4.3 Pitfall traps and distance from edge
3.4.4 Ant activity and correlations

3.5 Discussion
3.5.1 Comments on sampling methodology
3.5.2 Argentine ant activity and spread

Chapter Four: Control of Argentine ant, Linepithema humile, by fipronil poison baiting and changes in the invertebrate fauna of Tiritiri Matangi Island, New Zealand

4.1 Abstract

4.2 Introduction

4.3 Methods
4.3.1 Study area
4.3.2 Bait treatment
4.3.3 Monitoring ant activity
4.3.4 Pitfall traps
4.3.5 Statistical analyses
  4.3.5.1 Treatment of Argentine ants
  4.3.5.2 Post-poison effects on ant and non-ant invertebrate faunas
4.4 Results

4.4.1 Ant tree counts

4.4.2 Pitfall traps

4.4.3 Impacts on ants

4.4.4 Impacts on other invertebrates
  4.4.4.1 Amphipoda
  4.4.4.2 Non-ant Hymenoptera
  4.4.4.3 Carabidae
  4.4.4.4 Others

4.5 Discussion

4.5.1 Eradication trial

4.5.2 Impacts on ants

4.5.3 Impacts on other invertebrates

Chapter Five: Thesis summary. Conservation implications and future research recommendations

5.1 Thesis summary

5.2 Conservation implications

5.3 Future research and recommendations

References

Appendices

Appendix 1. Examples of tests for ANOVA assumptions for Auckland sites A and B pitfall trap data.

Appendix 2. Number of pitfall trapped invertebrates recorded at Auckland site A from Jul 00 - Mar 03.

Appendix 3. Number of pitfall trapped invertebrates recorded at Auckland site B from Feb 01 - Mar 03.

Appendix 4. Number of pitfall trapped invertebrates recorded at Auckland site C from Dec 00 - Mar 03.

Appendix 5. Number of pitfall trapped invertebrates recorded at Auckland site D from Dec 00 - Mar 03.
Appendix 6. Number of pitfall trapped invertebrates recorded at Auckland site E from Jul 00 - Mar 03.

Appendix 7. Annual climatological data from the Henderson station. (A) Mean temperature, (B) total monthly rainfall, and (C) mean relative humidity. Climate data were obtained from the climatological database of the National Institute of Water and Atmospheric Research (NIWA). Daily climatological recordings are from station A64865 located at Henderson (Grid Reference: R11 559 810).

Appendix 8. Annual climatological data from the Owairaka station. (A) Mean temperature and (B) total monthly rainfall. Climate data were obtained from the climatological database of the National Institute of Water and Atmospheric Research (NIWA). Daily climatological recordings are from station A64971 located at Owairaka (Grid Reference: R11 642 775). Relative humidity data were not recorded for station A64971.

Appendix 9. Examples of tests for ANOVA assumptions for Auckland sites A and B ant tree trunk counts.


Appendix 14. Number of pitfall trapped invertebrates recorded at Tiritiri Matangi Island site A from Dec 00 – Mar 03.

Appendix 15. Number of pitfall trapped invertebrates recorded at Tiritiri Matangi Island site B from Dec 00 – Mar 03.

Appendix 16. Number of pitfall trapped invertebrates recorded at Tiritiri Matangi Island site C from Dec 00 – Mar 03.
Appendix 17. Abundance of Isopoda collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 18. Abundance of Archaeognatha collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 19. Abundance of Chilopoda collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 20. Abundance of Diplopoda collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 21. Abundance of Opiliones collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 22. Abundance of Acarina collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 23. Abundance of Araneae collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 24. Family composition and abundance (%) in pitfall traps of (a) Araneae, (b) Hymenoptera (non-ant), and (c) Diptera at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. Values were calculated by summing over all pitfall traps at each site.
Appendix 25. Abundance of Diptera collected in monthly pitfall traps \( (n = 10) \) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 26. Abundance of Coleoptera collected in monthly pitfall traps \( (n = 10) \) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Appendix 27. Annual climatological data. (A) Mean temperature, (B) total monthly rainfall, and (C) mean relative humidity. Climate data were obtained from the climatological database of the National Institute of Water and Atmospheric Research (NIWA). Daily climatological recordings are from stations A64683-Whangaparaoa (Grid Reference: R10 746 092) and A64691-Tiritiri Matangi Island (Grid Reference: R10 802 088). For (A) and (C), data are from Whangaparaoa weather station. For (B), the data are from the Tiritiri Matangi Island weather station.
List of Tables

Table 1.1 Summary of ant species replaced as a result of Argentine ant invasions. 14

Table 1.2 Summary of impacts of Argentine ants on non-ant invertebrate communities. Effects are based on reported impacts and do not necessarily recognize statistically significant effects concerning consequences of Argentine ant invasion. 17

Table 2.1 Study site characteristics. 32

Table 2.2 Trap layout and sample sizes at sites A-E. 33

Table 2.3 Ant species recorded in pitfall traps at invaded and uninvaded sites. 37

Table 2.4 SIMPER results of ant species that contributed most to the differences in ant composition between Argentine ant invaded and uninvaded sites. 39

Table 2.5 Mean seasonal abundance of ant species as found by pitfall traps at all sites. Each table entry is the mean abundance of each species in each season averaged from the total number of months in the sampling period at each site. 40

Table 2.6 Mean monthly abundance of ant species as found by pitfall traps at all sites as a function of distance in metres to the nearest reserve edge. Each table entry is the mean abundance of each species at each distance averaged from the total number of months in the sampling period at each site. Numbers refer to distance groups: 1 = 0 - 4.99m; 2 = 5.0 - 9.99m; 3 = 10.0 - 14.99m. 41

Table 2.7 SIMPER results of major taxa that contributed most to the differences in invertebrate composition between Argentine ant invaded and uninvaded sites. 45

Table 2.8 Analysis of similarities of family composition of arthropods between invaded and uninvaded sites. 48

Table 3.1 Tree species and sample size. 80

Table 4.1 Concentration of fipronil used in baiting operations during 2000-2001. 120

Table 4.2 Tree species and sample size at study sites. 121
Table 4.3 Ant species recorded in pitfall traps from all three sites.

Table 4.4 Results of BACI tests (two-way factorial ANOVA) for ant species. P values that are in bold are significant ($P < 0.05$). The interaction (site x time) is the interest of the model.

Table 4.5 Results of BACI tests (two-way factorial ANOVA) for taxa. P values that are in bold are significant ($P < 0.05$). The interaction (site x time) is the interest of the model.

Table 4.6 Mean number of invertebrate taxa per treatment period as found by pitfall traps at site A.

Table 4.7 Mean number of invertebrate taxa per treatment period as found by pitfall traps at site B.

Table 4.8 Mean number of invertebrate taxa per period as found by pitfall traps at site C.
List of Figures

Figure 1.1 Current distribution of the Argentine ant in New Zealand (Follows that of Harris 2002).

Figure 2.1 Location of study sites in Auckland.

Figure 2.2 nMDS ordination of ant species composition at five sites either invaded (triangle) or uninvaded (square) by the Argentine ant. Stress value = 0.

Figure 2.3 Ant species richness from pitfall traps at each site from Jul 00 – Mar 03. Shaded bars represent invaded sites while unfilled bars represent uninvaded sites. Numbers above columns represent sample sizes.

Figure 2.4 nMDS ordination of ant species composition at five sites across distances sampled from the edge. Sites A-B are invaded; sites C-E are uninvaded. Numbers refer to distances from the edge: 1, 0 - 4.99m; 2, 5.0 - 9.99m; 3, 10.0-14.99m. Stress value = 0.01.

Figure 2.5 nMDS ordination of ant species composition at five sites across seasons. Sites A-B are invaded; sites C-E are uninvaded. Numbers refer to seasons: 1, winter; 2, spring; 3, summer; 4, autumn. Stress value = 0.05.

Figure 2.6 nMDS ordination of invertebrate composition at five sites either invaded (triangle) or uninvaded (square) by the Argentine ant. Stress value = 0.

Figure 2.7 Mean (+ SE) abundance per pitfall trap for major taxa (a - f) at each study site. Hatched bars indicate Argentine ant invaded sites; white bars indicate uninvaded sites. Values were calculated by averaging over all pitfall traps throughout the sampling period for each site. Sample sizes are as follows: sites (A, n = 660; B, n = 260; C, n = 560; D, n = 560; E, n = 660). Letters above columns are Tukey HSD groups.

Figure 2.8 Mean (+ SE) abundance per pitfall trap for major taxa (a - f) at each study site. Hatched bars indicate Argentine ant invaded sites; white bars indicate uninvaded sites. Values were calculated by averaging over all pitfall traps throughout the sampling period for each site. Sample sizes are as follows: sites (A, n = 660; B, n = 260; C, n = 560; D, n = 560; E, n = 660). Letters above columns are Tukey HSD groups.
Figure 2.9  Mean (± SE) abundance per pitfall trap for major taxa (a, b) at each study site. Hatched bars indicate Argentine ant invaded sites; white bars indicate uninvaded sites. Values were calculated by averaging over all pitfall traps throughout the sampling period for each site. Sample sizes are as follows: sites (A, n = 660; B, n = 260; C, n = 560; D, n = 560; E, n = 660). Letters above columns are Tukey HSD groups.

Figure 2.10  Relative abundance of family composition of (a) Hemiptera, (b) Hymenoptera (non-ant), and (c) Acarina captured in pitfall traps throughout the sampling period for each site. Sites A-B are invaded; sites C-E are uninvaded. Values were calculated as a percentage of the total number of individuals captured within each site. Numbers above columns are total abundance at each site.

Figure 2.11  Relative abundance of family composition of (a) Araneae, (b) Collembola, and (c) Diptera captured in pitfall traps throughout the sampling period for each site. Sites A-B are invaded; sites C-E are uninvaded. Values were calculated as a percentage of the total number of individuals captured within each site. Numbers above columns are total abundance at each site.

Figure 2.12  Relative abundance of family composition of (a) Coleoptera and (b) Carabidae captured in pitfall traps throughout the sampling period for each site. Sites A-B are invaded; sites C-E are uninvaded. Values were calculated as a percentage of the total number of individuals captured within each site. Numbers above columns are total abundance at each site.

Figure 2.13  nMDS ordination of invertebrate composition at five sites across seasons. Sites A-B are invaded; sites C-E are uninvaded. Numbers refer to seasons: 1, winter; 2, spring; 3, summer; 4, autumn. Stress value = 0.08.

Figure 2.14  nMDS ordination of invertebrate composition at five sites across distances sampled from the edge. Sites A-B are invaded; sites C-E are uninvaded. Numbers refer to distances from the edge: 1, 0 - 4.99m; 2, 5.0 - 9.99m; 3, 10.0-14.99m. Stress value = 0.05.

Figure 3.1  Site A seasonal patterns of Argentine ant foragers (Mean ± SE) on kanuka (A) 2000-2001, (B) 2001-2002, and (C) 2002-2003. All values are means of weekly tree trunk (n = 10) observations. Flowering and fruiting periods follow that of Salmon (1999).
Figure 3.2  Site A seasonal patterns of Argentine ant foragers (Mean ± SE) on pate (A) 2000-2001, (B) 2001-2002, and (C) 2002-2003. All values are means of weekly tree trunk \((n = 10)\) observations. Flowering and fruiting periods follow that of Salmon (1999).

Figure 3.3  Site A seasonal patterns of Argentine ant foragers (Mean ± SE) on mahoe (A) 2000-2001, (B) 2001-2002, and (C) 2002-2003. All values are means of weekly tree trunk \((n = 10)\) observations. Flowering and fruiting periods follow that of Salmon (1999).

Figure 3.4  Site B seasonal patterns of Argentine ant foragers (Mean ± SE) on mahoe (A) 2001-2002 and (B) 2002-2003. All values are means of weekly tree trunk \((n = 15)\) observations. Flowering and fruiting periods follow that of Salmon (1999).

Figure 3.5  Site B seasonal patterns of Argentine ant foragers (Mean ± SE) on mapou (A) 2001-2002 and (B) 2002-2003. All values are means of weekly tree trunk \((n = 15)\) observations. Flowering and fruiting periods follow that of Salmon (1999).

Figure 3.6  Mean numbers (± SE) of Argentine ants in each distance strata as a function from the forest edge at site A. Data are from tree trunk \((n = 50)\) observations sampled weekly from May 2000 to April 2001.

Figure 3.7  Mean numbers (± SE) of Argentine ants in each distance strata as a function from the forest edge at site A. Data are from tree trunk \((n = 50)\) observations sampled weekly from May 2001 to April 2002.

Figure 3.8  Mean numbers (± SE) of Argentine ants in each distance strata as a function from the forest edge at site A. Data are from tree trunk \((n = 50)\) observations sampled weekly from May 2002 to April 2003.

Figure 3.9  Mean numbers (± SE) of Argentine ants caught in monthly pitfall traps as a function of distance in metres to the nearest forest edge at site A. Numbers above columns represent sample sizes.

Figure 4.1  Location of Tiritiri Matangi Island, off the coast of Whangaparaoa Peninsula.

Figure 4.2  Location of Argentine ant infestations on Tiritiri Matangi Island. The black rectangle represents the study area (see Figure 4.3) (Map modified from map from Harris 2002).
Figure 4.3 Location of study sites within (A, B) and outside (C) the main infestation on Tiritiri Matangi Island. The solid black line represents the poisoning boundary (photo: Chris Green).

Figure 4.4 Mean (± SE) numbers of Argentine ants per observation on monitored tree trunks \((n = 15)\) over time in infested sites (A and B) treated with fipronil (0.01%) baits. Data were averaged among all tree trunks for each observation at each site. See methods for details about baiting.

Figure 4.5 Monthly Argentine ant total pitfall trap \((n = 10)\) abundance at all sites from Dec 00 – Nov 01. Site C was a control site outside of the infestation zone with no Argentine ants. The vertical arrow represents the poisoning period. Data were calculated by summing over all pitfall traps for each month at each site. For statistical analysis, a log \((x + 1)\) transformation of the data was used.

Figure 4.6 nMDS ordination of ant species composition at three sites either infested (triangle) or uninfested (square) by the Argentine ant. Numbers refer to treatment times: 1, pre-poison; 2, post-poison. Site C was the control site. Stress value = 0.

Figure 4.7 Total number of ants caught in pitfall traps \((n = 20)\) at each site during (A) pre-poison and (B) post-poison. Sites A-B are treated sites in the infestation area. Site C is a control site outside of the infestation area. Data are from pitfall traps summed across date. For statistical analysis, a log \((x + 1)\) transformation of the data was used.

Figure 4.8 Total number of ants caught in pitfall traps \((n = 120)\) at each site during (A) first year post-poison and (B) second year post-poison. Sites A-B are treated sites in the infestation area. Site C is a control site outside of the infestation area. Data are from pitfall traps summed across date. For statistical analysis, a log \((x + 1)\) transformation of the data was used.

Figure 4.9 Ant species richness at treated (A, B) and untreated (C) site/s from monthly pitfall trap collections \((n = 10)\) between Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Figure 4.10 nMDS ordination of invertebrate composition at three sites either infested (triangle) or uninfested (square) by the Argentine ant. Numbers refer to treatment times: 1, pre-poison; 2, post-poison. Site C was the control site. Stress value = 0.
Figure 4.11 Abundance of Amphipoda collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Figure 4.12 Abundance of non-ant Hymenoptera collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.

Figure 4.13 Family composition and abundance (%) in pitfall traps of (a) Hymenoptera (non-ant) and (b) Coleoptera at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. Species composition and abundance (%) in pitfall traps of (c) Carabidae at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. Values were calculated by summing over all pitfall traps at each site. Total abundance is reported above columns at each site.

Figure 4.14 Abundance of Carabidae collected in monthly pitfall traps ($n = 10$) at treated (A, B) and untreated (C) site/s from Dec 00 – Mar 03. For (A) and (B), black bars indicate pre-poison while white bars post-poison. Shaded bar for (B) indicates the intermediate period.
List of Plates

Plate 1. Argentine ant foraging trail on kanuka. 77

Plate 2. Argentine ant foraging trail on mapou. Ants descending with engorged gasters. 77