

Changes in mandible shapes of invading house mouse populations on New Zealand off-shore islands.

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The house mouse (*Mus musculus*) is a common pest species in New Zealand, and have invaded most of our off shore insular communities. Many of these mouse populations represent singular colonization events of separate genetic strains, and thus present a unique opportunity to study the adaptive response of each lineage in an insular setting. Major phenotypic changes are regularly documented on islands, and often proceed at an accelerated rate compared to mainland populations. These changes can be reflected in cranio-dental morphology as the invading population adapt to local food resources. Geometric morphometric analysis of house mouse mandibles was used to assess phenotypic change in this study. This technique is a powerful multivariate tool that allows size and shape to be analysed separately by scaling coordinate configurations using a Generalised Procrustes analysis. Re-ordination of the Procrustes coordinates allows exploration of the most important shape variates on a principle components plot. Principle component analysis shows significant changes in mandible shapes between island populations when controlling for allometry (significant chi² value >5.99, p<0.01). These changes reflect adaptations to each unique insular environment, and differences in dietary components between populations. The significance of mandible shape changes observed in the house mouse pertain to the success of such invasive species, which relies on their ability to adapt to new, challenging environments.