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**Resource partitioning between two competitive species, the hihi
(*Notiomystis cincta*) and bellbird (*Anthornis melanura*), during
the non-breeding season on Tiritiri Matangi Island**

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Michelle Roper

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Abstract

Understanding the level of competition and resource partitioning between New Zealand's ecological honeyeaters is important for hihi (*Notiomystis cincta*) conservation management. Hihi management on Tiritiri Matangi Island has been thought to be hindered by competition with bellbirds (*Anthornis melanura*), particularly at the supplementary sugar water feeders. With some inconsistent results in differences between their foraging ecology at different locations and seasons, I collected data on the foraging ecology of both hihi and bellbirds on Tiritiri Matangi Island to compare with previous studies at other locations. Nectar was the main constituent of both species diet with fruit only being consumed in the autumn-winter months for both species. The main difference between the species was that hihi consumed more fruit than bellbirds and bellbirds consumed honeydew. Bellbirds foraged more in the higher vegetation layers and on higher nectar value flowers than hihi which corresponded with previous studies. This suggested that resource partitioning is likely to be in the form of bellbirds defending the best resources of higher nectar value in the higher vegetation layers with interference competition and hihi obtain resources with exploitation competition by utilising flowers which are often smaller, less abundant or produce less nectar in the lower vegetation layers. Male bellbirds and hihi were the most frequent visitors to the supplementary feeders. With few interspecific interactions it suggests that male bellbirds are unable to defend the feeders due to the feeders being overwhelmed with hihi and also showing how dependent hihi are on supplementary feeding. Female bellbirds were the least frequent visitors suggesting that intraspecific competition is greater at the feeders but only for bellbirds as there was little evidence of high competition between the hihi sexes. There may be some resource partitioning between habitat types as hihi were consistently found at higher densities in the mature forest habitat likely due to their dependence on the feeders and artificial nest boxes, whereas bellbird densities changed with resource availability and breeding season territoriality. The densities of both species were affected by the presence of feeders and nectar availability with positive correlation between the species in the non-breeding season, suggesting that hihi habitat preference was not affected by competitive exclusion from bellbirds. The removal of 100 bellbirds for a translocation had no evident impact on hihi and bellbird densities at capture sites.

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In dedication and loving memory of Gladys Esme Bedingfield, October 1923 –
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PERMITTING

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