

Systematics and diversity of native pest beetles, *Eucolaspis*, in New Zealand

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Eucolaspis Sharp 1886 is native to New Zealand comprising many endemic species. Although 15 species have been described, taxonomy remains unresolved with poor descriptions and inconsistency among treatments. These beetles feed on various introduced and native plants. Economic damage in orchards is usually attributed to the species *E. brunnea* (Fabricius 1792), but several taxa might be involved. We undertook an integrated taxonomic study of the genus, with special interest on the populations infesting organic apple orchards in Hawke's Bay, New Zealand. Beetles from several locations and host plants in New Zealand were used for our study. We also examined extensive museum collections including type specimens, which afforded valuable information about morphological variation, host plant use and spatial distribution. Morphometric analysis of museum samples suggested just two morphotype groups, but most of the named species were spread across both. DNA was extracted from representative individuals of all the fresh samples, and a short mitochondrial DNA Cytochrome c oxidase 1 region was sequenced. This revealed three distinct genetic lineages, which were found consistent with morphometric analysis. Two of the genetic lineages occur in beetles living in sympatry, but these are separated by greater genetic distances than each is from a third lineage. Our data provide the opportunity to decipher the extent of morphological variation within species and thus the actual number of extant species which has been variously interpreted as 5 and 15. Furthermore these data allow us to determine how many species and populations are implicated in infestation of exotic crops.

