Velvet worm diversity in New Zealand

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Eligible for student prize

Peripatus, of the phylum Onychophora, are soft bodied, velvety textured invertebrates that commonly inhabit decaying logs and leaf litter on the forest floor. In New Zealand there are two genera (*Peripatoides* and *Ooperipatellus*), currently comprising nine species. The larger, livebearing, genus, *Peripatoides*, is the main subject of this study. Sympatry has been documented among five of the seven species in this genus. All in the North Island, with the habitat of *Peripatoides sympatrica* overlapping with *P. aurorbis, P. suteri* and *P. morgani* separately, and *P. morgani* overlapping with *P. kawakaensis*. Such sympatry accompanied by multilocus genetic data showing no interbreeding provide compelling evidence of the species status of these taxa. However, given no known ecological difference among these taxa, prompts the the question of how such relationships might occur and be maintained. Modern models of sympatric speciation (the process through which new species evolve from an ancestral species occupying the same geographic region) predict that some traits/genes of the insipient taxa are under intense selection. This might invovle niche differentiation, which could also arise when ecologically similar species that evolved in allopatry come into contact through range expansion. We are exploring these and other possible explanations for how these species are able to occupy the same habitats, whilst simultaneously testing their population genetic structure and reproductive isolation.