

Cavernicolous Combat and Sexual Selection in the New Zealand Weta *Pachyrhamma waitomoensis*.

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Eligible for student prize

The Orthoptera comprise many classic study species in the fields of mating system evolution and inter-male fighting behaviour, but the raphidophoridae have received relatively little of this research attention despite being a basal family and displaying many fascinating traits. Here, we investigate the mating system of the cave weta *Pachyrhamma waitomoensis*, a subterranean native of New Zealand's Waitomo district, with a focus on the factors that have led to the species' remarkable, sexually dimorphic hind leg exaggeration; those of the male weta have developed to extraordinary lengths, being more than 1.5 times longer than those of females. These elongated structures appear to be used in two areas of mating behaviour - aggressive competition between males and guarding of females during pairships. To investigate these behaviours I quantify the reproductive benefit to males in defending females, and test the following hypotheses: that males with longer hind legs are more likely to be victorious in aggressive encounters, that escalation of aggression is greater in contests between males of similar leg-length, and that guarding females results in less disturbance to her and this translates into more enduring pairships. Results so far indicate that there are significant advantages to long-legged males in contests, and that guarding females does result in a reproductive benefit. Interestingly, the benefit of guarding females appears not to stem from preventing access by rival males to the mate, but in fending off nuisance organisms that cohabit in the weta's aggregations.

