Multigene phylogeny of Australian darkling beetles (Coleoptera: Tenebrionidae)

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Darkling beetles (Coleoptera: Tenebrionidae) are species rich and show a great diversity of morphology. Adaption to scavenging primarily on dead plant and fungal material has allowed them to better survive in arid habitats and it is thought this adaptation has lead to their successful diversification. There are currently over 1600 known species of Australian tenebrionids in 216 genera in eight sub families. Relationships between almost 100 genera of darkling beetles were investigated using two mitochondrial (cytochrome oxidase 1 and partial large subunit, 16S) and nuclear (partial large subunit, 28S) genes. Separate and combined data analyses were performed under parsimony, maximum-likelihood and Bayesian methods. The utility of each of these genes for examining relationships differed for each gene and is discussed. We also assess the traditional morphology-based classification of tenebrionid families, sub families and tribes based on the results of the phylogenetic analyses.