

Genetic and morphological differentiation in rakali, the Australo-Papuan water rat (*Hydromys chrysogaster*) with implications for its taxonomic and conservation status.

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Rakali or the Australo-Papuan water rat (*Hydromys chrysogaster* Geoffroy 1804), is a large, carnivorous, semi-aquatic rodent distributed in Australia and New Guinea. Despite being the first native rodent described it remains relatively poorly researched. This study aims to clarify the species' taxonomy and conservation status through examining: 1) spatial patterns of polymorphism 2) phylogenetic relationships by partial sequencing of the cytochrome *b* gene of mitochondrial DNA) and 3) genetic structure using six microsatellite markers. There was male-bias body size sexual dimorphism, correlation between body weight and latitude, colour phenotypes and differences in tail tip albinism. Phylograms revealed presence of a separate Australian/New Guinean and New Guinean clade and reciprocal monophyly between distribution extremes, with support for subspecies differentiation in Australia. Two potential new species within New Guinea were paraphyletic with the waterside rat (*Parahydromys asper*). Nuclear DNA results indicated six major genetic clusters aligning with geographic region and isolation by distance (IBD) effect. Southwest WA and Barrow Island populations were insular and highly differentiated; remaining groups demonstrated contemporaneity of gene flow. These results reflect divergence arising from dispersal, radiations and temporal and geographic history of separation and warrant taxonomic revision of the species whilst providing guidance for conservation and management efforts.



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ABSTRACT BOOK