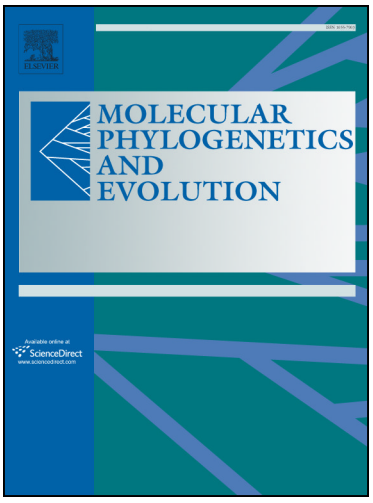

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Evolution in Australia's mesic biome under past and future climates: insights from a phylogenetic study of the Australian Rock orchids (*Dendrobium speciosum* complex, Orchidaceae)

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Abstract

The Australian mesic biome spans c. 33 degrees of latitude along Australia's east coast and ranges but is dissected by historical and contemporary biogeographical barriers. To investigate the impact of these barriers on evolutionary diversification and to predict the impact of future climate change on the distribution of species and genetic diversity within this biome, we inferred phylogenetic relationships within the *Dendrobium speciosum* complex (Orchidaceae) across its distribution and undertook environmental niche modelling (ENM) under past, contemporary and projected future climates.

Neighbor Joining tree inference, Neighbor Net and STRUCTURE analyses of Amplified Fragment Length Polymorphism (AFLP) profiles for *D. speciosum* sampled from across its distribution showed that the complex consists of two highly supported main groups, which are geographically separated by the St. Lawrence gap, an area of dry sclerophyll forest and woodland. The presence of several highly admixed individuals identified by the STRUCTURE analysis provides evidence of genetic exchange between