

Biogeographic anomalies in the species richness of Chilean forests:

Incorporating evolution into a climatic - historic scenario

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Broad-scale richness gradients are closely associated with temperature and water availability. However, historical and evolutionary processes have also contributed to shape current diversity patterns. In this paper we focus on the potential influences of Pleistocene glaciation and phylogenetic niche conservatism (the tendency for traits to be maintained during diversification) on the tree diversity gradient in Chile, and we quantify its primary climatic correlates. Tree species richness is greatest at mid latitudes, particularly in the Andes and Coastal ranges, and decreases abruptly to the south and north. Regression tree analysis identified annual precipitation and annual temperature as the primary probable drivers of this gradient. Ice cover during the Last Glacial Maximum was also identified as an 'important' variable, but the contemporary and historical predictors are strongly collinear. Geographically weighted regression indicated that the relationships between richness and enviro