

An Oligocene microthermal forest dominated by *Nothofagus* in Sierra Baguales, Chilean Patagonia: Response to global cooling and tectonic events

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A large fossil leaf assemblage (>3700 specimens) is reported from the Oligocene Río Leona Formation in the Sierra Baguales of Chilean Patagonia. The association comprises 29 species but is dominated by *Nothofagus* genera, which constitutes 65% of specimens. The collection can be classified as a Mixed Palaeoflora of the Austral-Antarctic association. Stratigraphic analysis of the assemblage indicates a decrease in species diversity and richness over time, which was accompanied by species turnover. Quantitative studies of foliar morphology (CLAMP, Leaf Margin Analysis) indicates cool-to-cold and dry climatic conditions, with a Mean Annual Temperature of 9.2 °C, a relatively high seasonality in temperature and precipitation, and a Mean Annual Precipitation of 931 mm. *Nothofagus* only became dominant in southeastern Patagonia during the Rupelian, coinciding with a marked global cooling period linked to the initiation of glaciation in Antarctica about 34 Ma. The decrease in precipitation following this event is attributed to the development of a rain shadow to the east of the rising Southern Patagonian Andes, which must have been of the order of 1000 m or more for topographic climate forcing to take effect. This contrasts with the rain shadow development east of the Andes at lower latitudes, which was mainly manifested after the middle Miocene.