Predominant regeneration strategy results in species-specific genetic patterns in sympatric *Nothofagus s.s.* congeners (Nothofagaceae)

M. Cristina Acosta [A], Paula Mathiasen [B] and Andrea C. Premoli [B C]

[A] Instituto Multidisciplinario de Biología Vegetal (IMBIV), CONICET-Universidad Nacional de Córdoba, Casilla de Correo 495, 5000 Córdoba, Argentina.

[B] Laboratorio Ecotono, Instituto de Investigaciones en Biodiversidad y Medioambiente (INIBIOMA), CONICET – Universidad Nacional del Comahue, Quintral 1250, 8400 Bariloche, Argentina.

[C] Corresponding author. Email: andrea.premoli@gmail.com

Australian Journal of Botany - http://dx.doi.org/10.1071/BT11277
Submitted: 3 November 2011 Accepted: 4 March 2012 Published online: 4 May 2012

Abstract

Life-history traits affect plant performance. Predominant regeneration modes, sprouting *v.* non-sprouting, will result in contrasting evolutionary and ecological responses that may be traced by nuclear markers. Sympatric *Nothofagus* Blume species provide the natural setting to test whether sprouters have a greater ability to maintain genetic diversity. In total, 28 populations along the entire distribution range of *N. antarctica* (G. Forst.) Oerst. were screened by eight polymorphic isozyme loci. We compared pairwise genetic patterns of the predominant sprouter *N. antarctica* with the mainly non-sprouter *N. pumilio* (Poepp. & Endl.) Krasser at 20 sympatric locations along their geographically concordant widespread range. Overall, the sprouter *N. antarctica* showed higher genetic variation throughout its range than did the non-sprouter *N. pumilio*. Mid-latitude populations of *N. antarctica* have maintained isozyme diversity, as inferred using genetic-landscape analysis. Despite the potential for inter-specific gene flow and past hybridisations, species identity was preserved by divergent selective forces acting on sympatric populations with distinct autoecological traits. Predominantly sprouting, as compared with mainly non-sprouting, has favoured long-term persistence of genet diversity in relatively large populations that were probably less affected by drift through time, thereby preserving molecular variants along its range. These variants, in combination with plasticity in diverse habitats, have resulted in greater resilience of *N. antarctica* under changing scenarios.

Additional keywords: isozyme markers, non-sprouter, Patagonia, regeneration mode, sprouter.

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