Hybrid identification in Nothofagus subgenus using high resolution melting with ITS and trnL approach

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The genus Nothofagus is the main component of southern South American temperate forests. The 40 Nothofagus species, evergreen and deciduous, and some natural hybrids are spread among Central and Southern Chile, Argentina, New Zealand, Australia, New Guinea and New Caledonia. Nothofagus nervosa, Nothofagus obliqua and Nothofagus dombeyi are potentially very important timber producers due to their high wood quality and relative fast growth; however, indiscriminate logging has degraded vast areas the Chilean forest causing a serious state of deterioration of their genetic resource. The South of Chile has a large area covered by secondary forests of Nothofagus dombeyi. These forests have a high diversity of species, large amount of biomass and high silvicultural potential. This work shows a case of hybrid identification in Nothofagus subgenus in different secondary forests of Chile, using high resolution melting. Unknown samples of Nothofagus subgenus are genetically distinguishable with the ITS region of Nothofagus antarctica, Nothofagus nitida and N. obliqua species. It was not possible to distinguish between unknown samples of Andean versus coastal origin. Melting curves with ITS approach of unknown material are genetically similar, positioned between N. dombeyi and N. antarctica and distant from N. nitida. The unknown samples are genetically very close to Nothofagus dombeyi. This suggests the presence of hybrid individuality between species (N. dombeyi × N. antarctica) with the possibility of introgression towards the gene pool of N. antarctica, producing the deciduous foliage that is both present. The trnL locus has no distinction between the N. dombeyi and N. antarctica species, since a similar melting curve is present and equal Tm (80.00 ?C). The trnL locus cannot be genetically

distinguished from one unknown sample of Nothofagus to another, as highlighted in this study.

HRM

ITS region

Nothofagus

Nothofagus subgenus

TrnL locus

Antarctica

article

biomass

Chile

foliage

forest

gene pool

high resolution melting analysis

individuality

introgression