Nucleotidic variability of the *Eucalyptus urophylla* CAD2 gene in population along altitudinal gradient in Timor Island

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Single nucleotide polymorphism (SNP) in candidate genes offers new perspectives to analyse the impact of natural selection on gene variation along environmental gradient and to understand the molecular basis of adaptation.
The aim of our study was to describe the nucleotidic variability within the Cinnamyl Alcohol Dehydrogenase (CAD) gene, a structural gene of the lignin biosynthesis pathway, within a representative sample of *Eucalyptus urophylla* distributed at various altitudes in the Timor island. Previous studies have shown that the altitudinal gradient affect strongly the growth of this species, the origin from lower altitude exhibiting a better growth. In order to have a better understanding of this phenotype, we have studied 89 *E. urophylla* genotypes from 45 open pollinated families. They have been selected in the region of Remexio and Maubisse (Timor East), from 500 m to 1760 m. The gene has been firstly sequenced, from 10 individuals, by direct sequencing of the PCR product. Then the SNPs and INDELs were identified by sequence alignment. An average of 1 SNP every 34 pb and 1 INDEL every 338 pb were detected, with differences related to the intronic or exonic localization. Then a large scale genotyping was performed by fluorescence polarization detection. A preliminary analysis of the nucleotidic variability was carried out in the first exon and intron of the CAD gene. A statistical method (PHASE software) was used to infer phase and to reconstruct haplotypes, using genotype datas.
This study was compared with an analysis based on microsatellite markers which shows that the natural population of *E.urophylla* was poorly structured (Fst=0.04 with a sample covering all the natural range and Fst=0.02 on Timor island).