

## SSR AND EST-SSR MARKERS TO ASSESS GENETIC DIVERSITY IN EUROPEAN CHESTNUT POPULATIONS

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The genetic diversity is the basis for the adaptability of organisms against environmental changes through natural selection. Populations with low genetic variation are more vulnerable to pollution, changes in climate and habitat alteration due to the human activities. In recent years microsatellites have become the most used markers for population genetics analysis. These markers measure neutral DNA variation, but they are not useful for measuring the adaptive genetic diversity. Recently the increased availability of the DNA sequences has given the possibility to develop EST-derived SSR markers, a new type of functional genomic markers. EST-derived SSR were found to be more than three times as transferable across species as compared with anonymous SSRs.

*Castanea sativa* is one of the most widespread tree species in Europe. It belongs to the *Fagaceae* family together with *Quercus* and *Fagus* sp. Previous studies, aimed to evaluate the genetic and adaptive variation, have been carried out in a large number of populations spanning the whole distribution area of the species. Genetic variation was estimated by ISSR and isozyme markers (Mattioni et al.2007). Adaptive variation was estimated at traits related to climate change (i.e. drought tolerance, bud burst, bud set ). The results showed a high degree of variation within and among chestnut populations both at genetic as well as phenotypic level (Lauteri et al.2004).

The aim of the present work is to compare the genetic differentiation, based on neutral SSR markers and EST-SSR markers, of chestnut European populations collected through a climate gradient. EST-SSR were developed from oak EST data base and the transferability was tested in chestnut. Six SSR markers were used to assess genetic diversity in natural chestnut populations from Italy, Greece and Turkey. Some of these EST-SSR have been used to estimate functional diversity in the same populations analysed by neutral SSR. The results obtained are compared and discussed.