



UNIVERSITÀ DEGLI STUDI DI SALERNO



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Studio della biodiversità mediante marcatori molecolari di popolazioni naturali e di ecotipi orticoli della regione Campania

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Abstract

My PhD research project: “Studio della biodiversità mediante marcatori molecolari di popolazioni naturali e di ecotipi orticoli della regione Campania” is focused on genetic biodiversity. In particular the aims are: i) genetic and epigenetic biodiversity study of white (*Populus alba* L.) widespread in Sardinia (Italy) through whole genome analysis; ii) analysis of the DNA methylation status in response to different environmental conditions (meteorological, pedological, latitude, longitude, altitude, pollution, etc.); iii) DNA isolation from typical Campania (South of Italy) horticultural products (unique ecotypes), and genetic biodiversity study through codominant molecular markers (Simple Sequence Repeat) aimed to establish a DNA gene bank with the Campania horticultural ecotype. The last aim of my research project is part of the Campania Regional project AGRIGENET. During the study year 108 leaf samples, harvested from white poplar specimens, were collected in Sardinia region, and for each single tree, the geographic coordinates, dendrometric characteristics and leaf morphological features were noted (a leaf picture of each poplar collected tree was taken). The DNA from all harvested samples was extracted and evaluated throughout gel electrophoresis and/or spectrophotometric analysis. AFLP (Amplified Fragment Length Polymorphism) and MSAP (Methylation Sensitive Amplification Polymorphism) protocols were conducted on all samples. The study confirmed that the genetic biodiversity is quite limited but it is counterbalanced by epigenetic inter-population molecular variability. The comparison between *MspI* and *HpaII* profiles revealed that environmental conditions strongly influence the hemi-methylation status of the inner cytosine. The variable epigenetic status of Sardinian white poplars revealed a decreased number of the population clusters. The landscape genetics analyses clearly demonstrated that the ramets of the same clone showed different methylation status in relation to their geographic positions. Therefore, our data further confirmed that the studies on plant biodiversity should no longer be restricted solely to genetic aspects, especially in the case of vegetatively propagated plant species.

The second aspect concerned Campania typical horticultures, in particular: mays (6 ecotype); escarole (1 ecotype); courgette (2 ecotype); garlic (2 ecotype); onion (4 ecotype). We cultivated about 10 plants for each ecotype, and, at the same time, we conducted a bibliography research to obtain specific SSR (Simple Sequence Repeat) primers. The results suggested a case of synonymy for garlic "Schiacciato" and "Tondo di Torella", while for the other ecotypes it was highlighted a huge genetic biodiversity due to uncontrolled reproduction by seed operated by farmers. This result did not allow the association between molecular profile and ecotype.