

CHARACTERIZATION OF CALABRIA AND SARDINIA MYRTLE USING GENETIC, CHEMICAL AND BIOLOGICAL MARKERS

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Myrtus communis is a shrub that belongs to the Myrtaceae family, it is widespread in the Mediterranean basin primarily near the coastal regions and on the islands. It is known for its essential oil extracted from leaves and mature fruits, rich in linear, cyclic, and bicyclic monoterpenes. In Calabria and Sardinia *M. communis* historically represents an important natural source, and possesses an interesting potential, mainly in food and flavor industries. However, the intra-specific variability could dramatically affect the chemical composition of a plant species, therefore great attention has been recently devoted by manufacturers toward to the characterization of wild-type plants, with the aim of detecting ecotypes commercially exploitable.

In this work ecotypes of myrtle were collected in several localities of Calabria and Sardinia, and analysed for *i*) genetic relationships by means of AFLP markers; *ii*) chemical diversity, assessing the content in myrtenol, linalool, and eucalyptol, the compounds that better represent the apolar portions of the leaves extracts; *iii*) the biological activity activities (antioxidant, antibacterial, and antifungal) of the extracts.

The genetic analysis evidenced that Calabria and Sardinia ecotypes are genetically distinct.

Calabrian samples evidenced an average total monoterpene content almost 47% lower than that detectable in Sardinian samples. The qualitative and quantitative determination of the single compounds in all the myrtle samples led to conclude that three chemotypes are present: eucalyptol, linalool and myrtenol. Eucalyptol chemotype revealed to be slightly prevalent in Sardinia, while in Calabria it showed a presence equal to linalool chemotype. In both the regions, myrtenol chemotypes were less abundant. In some cases a relationship between the antioxidant and antibacterial activity and the myrtenol, linalool, and eucalyptol quali-quantitative assessment, was established. Antifungal activity was always very weak and far to prospect possible myrtle applications taking advantage of this biological capacity. However, it is evident that a more consisting correlation could be done only with a deeper phytochemical investigation, targeting other secondary metabolites (i.e. polyphenols).

Anyway, this work represents the first researching step on Sardinian and Calabrian myrtle biodiversity and suggests continuity in the investigation, in particular for those samples which

already evidenced a possible strong relation between biological activity and phytochemical characterization.