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New Insights on Cistus salviifolius L. Micropropagation

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Research Article

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ABSTRACT

One of the major concerns in the establishment of any mycorrhization program is ensuring the mass production of sterile, consistent and standardized plant material. In the present study, a successful protocol for micropropagation of *Cistus salviifolius L.* was developed. The process was initiated from nodal segments excised from mature *C. salviifolius* plant selected due to its mycorrhizal capacities. Murashige and Skoog basal medium supplement with gibberellic acid (0.5 mg/L) and of 6-Benzylaminopurine (0.5 mg/L) was the best medium for proliferation purposes and successful rooting was achieved with the same basal medium supplemented with Indole-3-butyric acid (0.5 mg/L). The proposed methodology represent a novelty because it allowed the rapid multiplication of *C. salviifolius* starting from mature explants, here reported for the first time, using lower plant growth regulators concentrations than the previously reported for this particular *Cistus* species

INTRODUCTION

The genus *Cistus* L. (*Cistaceae*) is one of the most characteristic genera of the Mediterranean flora ^[1]. It encompasses a group of about 20 perennial shrub species, distributed throughout the Mediterranean region and Canary Islands, all sharing the same distinctive feature, a combination of diverse hair types on the leaf, stem, and calyx ^[2,3]. *Cistus* species exhibit a range of specific adaptations as well to Mediterranean environments, such as, fire-dependent seed germination, insect-dependent pollination, flower-dependent reproduction and spring-dependent phenology ^[4].

Cistus species are involved in many ecological processes taking place in Mediterranean ecosystems ^{[5].} Furthermore, they support a vast and rich mycobiota, constituting reservoirs for mycorrhizal fungal inoculum in the absence of host trees ^{[6].} In total, more than 200 fungal species, belonging to 40 genera, have been reported to be associated with Cistus. Among which, several edible hypogeous Ascomycota, mainly included in Tuber and Terfezia genera, and commonly known as truffles are highly sought-after and some species command extraordinary prices in local markets, however, due to their ectomycorrhizal nature, truffles must be cultivated in orchards with their plant hosts ^{[8].} As proposed by Giovannetti and Fontana, the wide variety of Cistus (and other Cistaceae) environmental and ecological requirements makes them ideal candidates to increase the range of habitats where truffles can be grown ^{[9].} Thereby, inoculating these Cistaceae with truffle inoculum and planting them in a primary stage of truffle forest repopulation, has become an extremely interesting new use for Cistus plants and one with great economic importance and potential for forestry purposes ^{[10].}

Cistus salviifolius L. a low subshrub up to 1 m tall, with ovate to rounded leaves and white flowers is the most widely spread species of the *genus* around the Mediterranean basin [3]. It can occur in sandy soils over a wide range of habitats and has been regularly reported as a plant host for various *Terfezia* species, which makes it one of the best choices for planned *Terfezia* cultivation over a wide range of habitats [7,11,12].