

Investigating the role of endophytes in enhancing grapevine resilience to drought

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Abstract

Grapevine is a crop of great economic importance for several countries. The intensification of grapevine production has mostly been sustained by the increasing use of water resources at the expense of the environmental water balance. Moreover, in the last decades, climate change and the consequent expansion of drought have further compromised water availability, making current agricultural systems even more fragile both ecologically and economically. Recently, many research groups have highlighted the important role of endophytes in facilitating plant growth under optimal or stressful conditions. Within the framework of the PRIMA project, we aim to investigate the possible exploitation of the natural endophyte biodiversity as a sustainable tool to make grapevine plants more resilient to water deficit environmental conditions. Cultivable bacterial communities of field grapevine plants growing in the arid regions of Italy and Algeria have been isolated from leaf tissues. Endophytes were characterised and screened for their plant growth-promoting traits and used to generate endophyte consortia to inoculate endophyte-free grapevine plants. In a parallel approach we tested the possibility of using the grafting procedure to transfer endophytes between plants. Preliminary data are presented showing the efficiency of this procedure and the dynamics of the endophyte community in the destination plant.

Keywords: grapevine, endophyte, climate change, drought, sustainability.