Polyphenolic profiles of *Rosmarinus officinalis* and *Lavandula angustifolia* inoculated with arbuscular mycorrhizal fungi

Pasquini D.[1,2], Balestrini R.[3], Lumini E.[3], Ferrini F.[1,2,4], Brunetti C.[1,2]
dalila.pasquini@unifi.it
[1]*University of Florence, Department of Agriculture, Food, Environment and Forestry (DAGRI), Sesto Fiorentino (Florence), 50019, Italy*
[2]*National Research Council of Italy, Institute for Sustainable Plant Protection (IPSP), Sesto Fiorentino (Florence), 50019, Italy*
[3]*CNR-IPSP, Viale Mattioli 25, Torino*
[4]*VALUE Laboratory on Green, Health & Wellbeing, University of Florence*

Lavender (*Lavandula angustifolia*) and rosemary (*Rosmarinus officinalis*) are small fragrant shrubs native to the Mediterranean regions, and they are cultivated worldwide for their therapeutic and cosmetic uses as well as in the food industry. The main aim of this work was to evaluate the potential impact of Arbuscular Mycorrhizal Fungi (AMF) on plant polyphenolic profiles. In this experiment, lavender and rosemary plants, provided by the "Istituto Tecnico Geometri e Agrari Vaglio Rubens" (Biella, Italy), were grown in 1L pots in a randomized block design, which included 4 treatments for each species: (i) non-inoculated control (Ø Myc-); ii) AMF mono species inoculum (Myc+_MO) with (*Rhizophagus irregularis* BEG140; Symbiom, Lanškroun, Czech Republic); (iii) AMF multiple species inoculum 1 (Myc+_MI) (*Funneliformis geosporum* BEG199*; Funneliformis caledonium* BEG97*; Claroidoglomus claroideum* BEG96; Symbiom, Lanškroun, Czech Republic) and (vi) AMF double species inoculum 2 (Myc+) (*Rhizophagus intraradices* and *Funneliformis mosseae*, MycAgro, France). The polyphenolic compounds were analysed through HPLC-DAD, carrying out a qualitative and quantitative comparison to highlight possible differences in polyphenolic profile induced by AMF treatment with respect to non-inoculated plants. No qualitative differences were found between non-inoculated (Ø) and AMF inoculated lavender plants. A higher concentration of hydroxycinnamic acid derivative compounds was observed in the non-inoculated plants of this species. On the contrary, rosemary plants showed differences at qualitative level. Indeed, three additional rosmarinic acid derivatives were identified in the non-inoculated plants compared to the inoculated ones, whereas the total polyphenolic compounds were in the same amount in all the treatments. In conclusion, this study raises questions regarding the real impact that inoculation with AMF can have on secondary metabolites production in lavender and rosemary as well as other important Mediterranean fragrant shrubs.

Keywords: arbuscular mycorrhizal fungi, HPLC-DAD, lavender, polyphenol profile, rosemary.