



Methyl Jasmonate Enhances the Accumulation of Phenolic Acids in *Salvia virgata* Jacq. Hairy Root Cultures.

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Salvia virgata Jacq., a medicinally important plant belonging to the Lamiaceae family, is commonly used for the treatment of skin diseases, wound and blood cancer [1]. Phenolic acids, especially rosmarinic acid (RA), are the most important and valuable compounds in this species. The present study was aimed to investigate the effect of methyl jasmonate (MeJA) on the production of rosmarinic acid, salvianolic acid A (sal-A) and caffeic acid (CA) in *S. virgata* hairy root cultures. Leaf explants were inoculated with *Agrobacterium rhizogenes* strain ATCC 15834. The infected explants cultured on solid hormone-free MS medium in the dark for 48h at 25 °C. To prove the transformed nature of hairy root lines, PCR-analysis was performed with the use of primers designed for *rolC* gene. The hairy root line C was selected for further studies based on its growth performance and RA accumulation. In order to increase phenolic acids production, two concentrations (50 and 100 µM) of MeJA were added to 55-day-old hairy root cultures. The hairy roots were harvested 1, 3 and 5 days after elicitor treatment. The optimum exposure time of roots to elicitor for enhancing phenolic acids biosynthesis was achieved 3 days after elicitation with MeJA. The maximum contents of RA (18.45 mg/g DW), sal-A (2.11 mg/g DW) and CA (2.61 mg/g DW) were obtained in hairy roots treated with 100 µM of MeJA on 3th day of elicitation. In conclusion, hairy root culture could be considered as a beneficial tool for producing the valuable phytochemicals, like phenolic acids, in *S. virgata*.

Keywords: *Agrobacterium rhizogenes*, Caffeic acid, Rosmarinic acid, *Salvia virgata*

References

- [1] Akkol, E.K.; Goger, F.; Kosar, M.; Baser, K. H. C. *Food Chem.* **2008**, *108*, 942-949.
- [2] Kosar, M.; Goger, F.; Baser, K. H. C. *J. Agric. Food Chem.* **2008**, *56*, 2369–2374.