



**EFFECT OF METHYL JASMONATE TREATMENT ON EXPRESSION
PROFILE OF SOME GENES INVOLVE IN ALKALOID BIOSYNTHESIS
PATHWAY AND AMOUNT OF NICOTINE FROM *NICOTIANA
BENTHAMIANA* IN HAIRY ROOT CULTURE**

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Nicotiana benthamiana is one of the important species of solanaceae family. The Solanaceae produce a variety of interesting biologically active products including the steroid alkaloids solanidine, nicotine and tropane alkaloids [1]. Putrescine N-methyltransferase (PMT) is an enzyme that catalyses S-adenosylmethionine-dependent methylation of putrescine in one of the primary steps of nicotine and tropane alkaloids biosynthesis pathway [2]. Two tobacco members of the AP2/ERF-domain transcription factors family called *NiORC1* and *NiJAP1* were shown to up regulate the activity of the *NiPMT* promoter in *N. benthamiana* under environmental stresses [3]. The AP2/ERF-like protein *NbERF1* shows 82% amino acid identity with tobacco *NiORC1* [4]. Several members of the APETALA2/Ethylene Response Factor (AP2/ERF)-domain transcription factor family have emerged as important players in JA-responsive gene expression [3]. In this work, hairy root of *N. benthamiana* were cultured on hormone-free half-strength MS medium at 28 °C in darkness. Samples were then affected by 20 and 100 µg/ml methyl jasmonate. Plants were harvested at 0.5, 4, 24, 72 and 144 hours after each treatment. Concentrations of nicotine were determined with HPLC analysis. Results showed that amount of nicotine significantly increased in 100 µg/ml of methyl jasmonate treatment for 72 hours. Finally, the expression patterns of *NiPMT*, *NiORC1* and *NiJAP1* were studied.

References

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