Induction of Pyridine Alkaloid Formation in Transformed Root Cultures of *Nicotiana tabacum*

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Hairy root cultures of *Nicotiana tabacum* were set up by excised root tips with *Agrobacterium rhizogenes*. The successful transformation was confirmed by analyzing *rolC* and *virC* genes using polymerase chain reaction (PCR). Hairy root cultures were employed to study the formation of pyridine alkaloids, mainly nicotine. The transformed cultures were incubated with potential elicitors, such as methyljasmonate, quercetin and salicylic acid, in order to stimulate the biosynthesis of pyridine alkaloids. Profile and amounts of pyridine alkaloids were analyzed using capillary GLC-MS. Treatment of the cultures with methyljasmonate (50 εM) increased the alkaloid accumulation ca. 7-fold up to a level of 0.58 mg/g fresh weight as compared to untreated controls. Quercetin (200 εM) enhanced the alkaloid production ca. 4-fold (0.34 mg/g fresh weight) within 24 h. In contrast salicylic acid in all tested concentrations decreased the alkaloid level to 1 εg/g fresh weight. Also the inhibitory effect of salicylic acid on the elicitation effect of methyljasmonate and quercetin was investigated.

Key words: Nicotiana tabacum, Pyridine Alkaloids, Hairy Root Culture