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The Expression Level of PMT and H6H and the Accumulation of Tropane Alkaloids by Signalling Compounds in *Scopolia parviflora* Adventitious Hairy Root Cultures

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Objectives

Methyl jasmonate has been confirmed as an effective elicitor for induction of secondary metabolites in plant cell culture. Salicylic acid is also one of the most widely studied stress-signalling molecules. Thus, we studied effect of methyl jasmonate and salicylic acid as signalling compounds on production of tropane alkaloids in adventitious hairy root culture of *Scopolia parviflora*.

Materials and Methods

1. Plant material: Adventitious hairy roots of *S. parviflora* was cultured at B5 liquid medium(containing 0.1 mg/L IBA and 5% sucrose).
2. Elicitation: Each methyl jasmonate and salicylic acid (final concentration 0.01, 0.1, 1.0, and 2.0 mM) were inoculated in adventitious hairy root cultured for 2 weeks.
3. Analysis of tropane alkaloid: Sample were harvested at 0, 12, 24, 48 and 72 hour and quantified by HPLC. Expression level of PMT and H6H were performed by western blot.

Results and Discussion

Treatment of methyl jasmonate and salicylic acid as signalling compounds inhibited root growth but resulted in the accumulation of higher tropane alkaloids. 0.01 mM of methyl jasmonate gave the maximum yield of hyoscyamine on 24 hour of exposure time and enhanced hyoscyamine production up to 1.5 times compare with control. Figure. 1 shows the tropane alkaloids accumulation for 72 hour after adding various concentration of methyl jasmonate. In case of salicylic acid, both 0.01 and 1.0 mM increased the production of scopolamine, but not hyoscyamine. Roots treated methyl jasmonate showed an overexpression of PMT and H6H at 12 hour of exposure time. Roots treated salicylic acid increased expression level of PMT and H6H until 24 hour and decreased after 24 hour of exposure time.

Acknowledgment

This research was supported by a grant (codePF003103-00) from Plant Diversity Research Center of 21st Frontier Research Program funded by Ministry of Science and Technology of Korean Government.

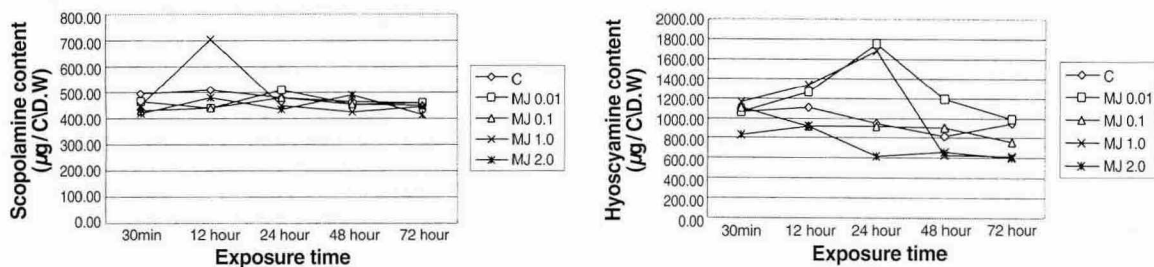


Figure 1. The effects of methyl jasmonate on scopolamine and hyoscyamine production.