P 32 Enhanced Production of Tropane Alkaloid in *Scopolia paviflora*Hairy Root Cultures by Optimization of Micro and Macro Components

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Objectives

The tropane alkaloids (TA) hyoscyamine and scopolamine, widely used as antichornergic agents that act on the parasympathetic nevous system, come exclusively from solanaceous plants such as *Atropa*, *Datura*, *Duboisia*, *Hyoscyamus* and *Scopolia*. This study was carried out for establishment of medium condition to improve production of tropane alkaloids.

Meterial and Methods

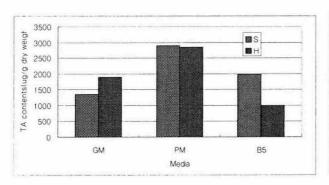
The hairy roots of *Scopolia paviflora* were induced from the rhizome of mature plant, and maintained in B5 medium containing 3% sucrose and 0.1 mg/l IBA. For individual component optimization, stocks of each components were prepared at concentrations of 1/4, 1/2, 1, 2 and 4 folds on base of B5 medium. Other components were controlled except for one component which is varied in concentration from 1/4 to 4 folds. All the culture flasks were inoculated with 0.5g fresh weigh. After 4 week, the cultures were havested, weighted, and analysed by HPLC (MeCN:50 mM K₂HPO₄=22:78, 4.6×25 mm TSK gel ODS column and UV 215 nm). From these results, a growth

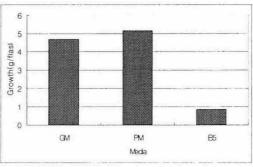
medium (GM) and production medium (PM) were formulated for two stage cultures.

Results and Discussion

The effect of micro and macro elements on cell growth and production was investigated. Growth of hairy root was the best in inorganic compounds such as KNO3 (×2), MgSO47H₂O (×2), MnSO₄H₂O (×2), ZnSO₄7 H₂O (×2), CuSO₄5H₂O (×4), CaCl₂2H₂O (×1/4), KI (×1/2), CoCl₂6H₂O (×4), NH₄H₂PO₄ (×2), H₃BO₃ (×2), Na₂MoO₄2H₂O (×1/4), (NH4)₂SO₄ (×1), NaH₂PO₄ (×4), KCl (×1) and NaFeEDTA(×2). Production of TA was increased in inorganic components such as KNO₃ (×2), MgSO₄7H₂O (×4), MnSO₄H₂O (×2), ZnSO₄7 H₂O (×1/4), CuSO₄5H₂O (×1/2), CaCl₂2H₂O (×1), KI (×1/4), CoCl₂6H₂O (×1/2), NH₄H₂PO₄ (×1/2), H₃BO₃ (×2), Na₂MoO₄2H₂O (×4), (NH4) ₂SO₄ (×1/4), NaH₂PO₄ (×2), KCl (×4) and NaFeEDTA (×1)

Two stage culture was increased on TA production and hairy root growth compared to that of B5 medium. This results will be served mass production of tropane alkaloid by large scale cultivation.





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