

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 anticholinergic agents that act on the parasympathetic nervous 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.

Material 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 harvested, 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), MgSO₄·7H₂O (×2), MnSO₄·H₂O (×2), ZnSO₄·7H₂O (×2), CuSO₄·5H₂O (×4), CaCl₂·2H₂O (×1/4), KI (×1/2), CoCl₂·6H₂O (×4), NH₄H₂PO₄ (×2), H₃BO₃ (×2), Na₂MoO₄·2H₂O (×1/4), (NH₄)₂SO₄ (×1), NaH₂PO₄ (×4), KCl (×1) and NaFeEDTA (×2). Production of TA was increased in inorganic components such as KNO₃ (×2), MgSO₄·7H₂O (×4), MnSO₄·H₂O (×2), ZnSO₄·7H₂O (×1/4), CuSO₄·5H₂O (×1/2), CaCl₂·2H₂O (×1), KI (×1/4), CoCl₂·6H₂O (×1/2), NH₄H₂PO₄ (×1/2), H₃BO₃ (×2), Na₂MoO₄·2H₂O (×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.

