

## ESTABLISHMENT OF ROOT CULTURES OF *HYOSCYAMUS NIGER* L. FOR THE PRODUCTION OF TROPINE ALKALOIDS

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Root cultures of *Hyoscyamus niger* were established for the production of the tropane alkaloids - hyoscyamine and scopolamine. A successful root culture was established in shake flasks containing liquid MS medium supplemented with 0.5 mg/L IBA and this root culture was able to increase its root mass until its maximum point at the fourth subculture with four weeks interval for each subculture. The amount of roots produced at the fourth subculture was 294 times the biomass increased from its initial weight. Normal *H. niger* roots could be mass produced in aerated liquid medium using enlarged aeration tubes or fabricated fermentors. The roots proliferated well in the aerated system and the roots produced consisted of primary and secondary rootlets. The root pieces multiplied to an average of  $3.38 \pm 0.63$  g from an initial weight of 0.01 g within four weeks in each of the 150 ml aeration tube. However, the root biomass increased to an average of  $27.52 \pm 6.77$  g from the initial weight of 0.1 g within the same period using one litre aeration tube. The presence of both hyoscyamine and scopolamine were detected in all the established root cultures.

**Key words:** Root cultures; *Hyoscyamus niger*; tropane alkaloids; hyoscyamine

### Introduction

*Hyoscyamus niger* (black henbane) has been used as a medicine from ancient times. The use of fresh or dried leaves, flowering tops and seeds of commercial henbane are officially used for their alkaloids (British Pharmacopoeia 1999). Tropane alkaloids including hyoscyamine, hyoscine (scopolamine) and atropine are some of the most commonly used phytochemicals in modern medicine mainly because of their anti-cholinergic and antispasmodic properties. These are commonly used in the treatment of a number of diseases affecting respiratory and intestinal