COBALT INDUCED TAXOL PRODUCTION AND RELEASE BY CELL CULTURE OF HAZEL (*CORYLUS AVELLANA* L.)

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Meanwhile cobalt is an essential micronutrient and is required for normal growth and takes part in redox reactions, electron transfers and other important metabolic processes in plants, a few studies have been documented on the effects of Co on the secondary metabolite production in plant cell cultures [1, 2]. Recently a few studies have been showed that elicitors/stimulators such as, chitosan, salicylic acid, methyl jasmonate, and ultrasound improved taxol and related taxanes production in suspension cultures of hazel [3,4]. Since any study has been done on the effects of cobalt on cell culture of hazel, the experiment was designed and carried out. For this the cells were treated with cobalt chloride at concentration of 25, 50 and 100 □M. The treatments were applied on day 8 of subculture and cultures harvested on day 14. Cell growth, biomass production, electrolyte leakage, total dissolved solute, protein content, taxol production, specific yield and its release to the medium were evaluated. The results showed that cell growth as fresh weight decreased significantly by all Co concentrations compared to control but whole biomass production (dry matter) in treated cultures wasn't significantly affected. Electrolyte leakage and total dissolved solute in treated cultures media enhanced by Co concentrations compared to those of the control. Both extracellular and cell-associated taxol improved by Co and total taxol accumulation increased along with increasing Co concentrations. Most total taxol achieved at 100 □M concentration of Co, which was 13 fold of the control culture. Taxol release also affected significantly by treatments and the highest amount (83%) measured at 50 □M of Co concentration. Specific yield of taxol also increased with increasing Co concentration and the maximum value (48 □g/g dry weights) achieved under effect of 100 □M concentration of Co. The results suggest that the stimulated taxol accumulation was a stress response of the cells.

References

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TROPANE ALKALOID PRODUCTION IN ATROPA HAIRY ROOTS OVEREXPRESSING *PMT* AND *H6H* GENES

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Atropa belladonna is the most important commercial source for obtaining pharmaceutical tropane alkaloids such as scopolamine and hyoscyamine [1]. In many cases, overexpression of exogenous genes can improve final products [1]. In this study, we integrated putrescine N-methyl transferase and hyoscyamine β-6hydroxylase genes in to DNA of *Atropa belladonna* by an *Agrobacterium rhizogenes* construct that contains *pmt* and *h6h* genes. Leaf discs were inoculated by *Agrobacterium rhizogenes* and hairy roots appeared after 2 weeks. Induced hairy roots were cultured on phytohormone free Murashige and Skoog medium. Medium contains Cefotoxim antibiotic to eliminate the bacteria. After harvesting the hairy roots, they established in liquid medium. Transgenic DNA was confirmed by genomic polymerase chain reaction (PCR) and finally the scopolamine and hyosciamine production were examined by HPLC.

Reference

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