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INCREASING LIGNAN PRODUCTION IN *LINUM ALBUM* CELL CULTURE BY NITROGEN SOURCE

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The natural lignin podophyllotoxin (PTOX), a dimerized product of two phenylpropanoid moieties which occurs in a few plant species, is a pharmacologically important compound for its anticancer activities. It is used as a precursor for the chemical synthesis of the anticancer drugs etoposide, teniposide and etopophos. Since the chemical synthesis of PTOX is an expensive process and its availability from natural sources is an important issue for pharmaceutical companies, the biotechnological production of PTOX using plant cell and tissue cultures assumes great significance. Manipulation of nutritional factors is very effective in enhancing the yield and productivity of plant cell suspension culture. Among nutrients, nitrogen source in the medium was demonstrated not only significantly affects the growth and development of plants, but it also changes secondary metabolism. In this study, we investigated the different concentrations effect of total nitrogen on cell growth, PTOX and lariciresinol production in *L. album* cell culture. Treatment of *L. album* cell cultures with the 60mM total nitrogen increased the production of PTOX and lariciresinol about 2-fold higher than control.

References

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SALICYLIC ACID-INDUCED PHYSIOLOGICAL EFFECTS AND TAXOL PRODUCTION IN CELL CULTURES OF *TAXUS BACCATA* L.

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Numerous strategies have been proposed for improving plant cell productivity and secondary metabolite production in suspension-cultured cells. Elicitation is one of them, which efficiently activates the expression of defense-related genes and also the pathways of defense-related secondary metabolites (Zhao et al., 2005). Salicylic acid (SA) is considered one of the key endogenous signals involved in regulating a number of processes in plants and vigorously stimulates secondary metabolism. The present study was undertaken in order to investigate the effect of different concentrations of SA (25, 50 and 50 mg/L) on some physiological parameters and taxol production in cell culture of *Taxus baccata*. Calli were induced from longitudinally-halved stem sections of *T. baccata* on solidified B5 medium, supplemented with α -naphthalene acetic acid (2 mg/l), 2,4-dichlorophenoxyacetic acid (0.2 mg/l), benzyladenine (0.2 mg/l), sucrose (20 g/l) ascorbic acid (50 mg/l) and pH 5.5 for about 20-30 days. Cell suspensions were established from the friable calli in the same media without agar. The results showed that growth, viability and protein content of cells were decreased when SA concentration increased. The lipid peroxidation rate, phenolics content and activity of phenylalanine ammonia-lyase, polyphenol oxidase and peroxidase enzymes gradually increased with increase of SA concentration up to 50 mg/L, but at higher concentration decreased significantly. Increase in SA concentration resulted in more taxol biosynthesis and production and most yield of taxol (3.2 mg/g DW) was obtained at 50 mg/L of SA which enhanced about 6.6-fold compared to that of the control. The induction of cell defense responses by SA elicitor is probably one of reasons for improving biosynthesis and production of taxol.

References

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