

Investigation of Taxol and 10-Diacetylbaccatin III Production under Chitosan and Jasmonic Acid Elicitors in Yew (*Taxus baccata* L.) Cell Suspension Culture

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Abstract

Taxol is the most important taxane used in the treatment of many cancers. Due to its very low amount in the yew plant, alternative methods such as cell suspension culture, as well as various elicitors are used to increase the production of taxanes. In this study, after callus induction and yew cell suspension culture, the production of taxanes was investigated under the influence of jasmonic acid (10, 20, 40 Mμ) and chitosan (10, 30, 50 mg/l). After induction of callus in the stem in B5 medium containing 4 mg/L 2-4-D, 1 mg/L kinetin, 0.5 mg/L gibberellin, 30 g/L sucrose, and 7 g/L agar with 10 cc/L antioxidants, cell suspension culture was performed in B5 medium containing 2 mg/L picloram, 0.1 mg/L kinetin, 0.5 mg/L gibberellin, 5 g/L sucrose, 5 g/L fructose, and 10 ml/L antioxidants. 8 days after cultivation, elicitors were applied, and on day 17 after cultivation, the levels of phenol, flavonoid, PAL enzyme, 10-diacetylbaccatinIII, and taxol were measured. The results showed that in 30 mg/L chitosan, taxol was 21% and the amount of phenol, flavonoid and PAL enzyme in chitosan increased compared to the control. The amount of 10-diacetylbaccatin III in 10 mg/L chitosan increased by 62% compared to the control. Therefore, chitosan has a better effect than jasmonic acid and can be used to optimize the commercial production of taxol in bioreactor systems.

Keywords: Anticancer, elicitor, cell suspension culture, taxanes, *Taxus baccata*.