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Expression of genes involved in Taxol biosynthetic pathway in *Taxus baccata* L. and application of Magnetic- and carbon-based nano-adsorbents for pre-purification of Taxol

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This work was undertaken to elucidate the consequences of some environmental cues (i.e. day length, temperature, hours of sunlight and relative humidity) on the expression patterns of TXS, DBAT, BAPT and DBTNBT genes contributed to the taxol biosynthetic pathway. Our results indicated that environmental cues have synergistic or antagonistic regulatory roles of on transcription activity and taxanes accumulation in yew, though DBAT activity is less influenced, could be accordingly a rate-limiting enzyme. Furthermore, a modified analytic hierarchy process (AHP) approach based on refinement assay of non-dominated alternatives was employed to monitor the most reliable callus maintenance media of *T. baccata* callus cultures in terms of five criteria. Our results connoted that L-glutamine-based feeding appears to generate more significant results either for calli growth continuously or taxanes production, while, for stems, both amino acid supplies had fairly equal worth. Meanwhile, considering decolorization efficiency, purity of taxol, recovery and reusability of adsorbents, Fe₃O₄NPs@GO (50 g/L) in dichloromethane was selected as the best medium for pre-purification of paclitaxel. Finally, based on RSM data, the optimum conditions to simultaneously acquire the maximum EPPR (94.0%) and ETP (11.4%) were recorded as adsorbent dosage of 37.7 g L⁻¹, sorption temperature of 30.7°C and agitation power of 153.1 rpm; and the predictive results were confirmed using experimental rechecking survey.

Biography

Mohammad Reza Naghavi is an academic member at the University of Tehran, Iran. He has published more than 140 research articles in the field of plant biotechnology. He has been serving as an editorial board member of four International and National Journals.

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