

عنوان مقاله:

Response surface modeling of natural alizarin production in hairy root cultures of *Rubia tinctorum* L. upon elicitation with fungal mycelia

محل انتشار:

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خلاصه مقاله:

The roots of *Rubia tinctorum* L., the common madder contain natural red dye known as alizarin. In the current study, central composite design of response surface methodology was employed for modeling of fungal elicitor treatment on natural alizarin production in uniform hairy root cultures of common madder in liquid 1/2 B5 medium. Upon fungal elicitation assay, using two fungal mycelia elicitors (*Aspergillus niger* and *Bipolaris maydis*) at three different times (0, 12 and 24h), the production of alizarin was determined. According to the results, after 24h; modeling and optimization conditions, including combination of 2 % of both elicitors for alizarin production equal to 10.0 mg.g<sup>-1</sup> DW was evaluated. Optimal process parameters have been determined by using a high desirability value of 1.00 in Design-Expert® software. Our results, altogether, offer a promising method regarding to the improvement of the alizarin production, as a pivotal natural dye in industrial applications. The roots of *Rubia tinctorum* L., the common madder contain natural red dye known as alizarin. In the current study, central composite design of response surface methodology was employed for modeling of fungal elicitor treatment on natural alizarin production in uniform hairy root cultures of common madder in liquid 1/2 B5 medium. Upon fungal elicitation assay, using two fungal mycelia elicitors (*Aspergillus niger* and *Bipolaris maydis*) at three different times (0, 12 and 24h), the production of alizarin was determined. According to the results, after 24h; modeling and optimization conditions, including combination of 2 % of both elicitors for alizarin production equal to 10.0 mg.g<sup>-1</sup> DW was evaluated. Optimal process parameters have been determined by using a high desirability value of 1.00 in Design-Expert® software. Our results, altogether, offer a promising method regarding to the improvement of the alizarin production, as a pivotal natural dye in industrial applications.

کلمات کلیدی:

*Agrobacterium rhizogenes*, Alizarin, Hairy roots, Madder, *Rubia tinctorum* L., Fungal elicitor

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