

## Characterization of benzophenanthridine alkaloids production in *Eschscholtzia californica* cells by a manipulation of medium sucrose

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Liquid cultures of *Eschscholtzia californica* accumulate the benzophenanthridine alkaloids sanguinarine, chelirubine, macarpine, and chelerythrine, all of which are known to be constituents of the *Eschscholtzia* plant. The production rates of alkaloids depends on the medium conditions. In this study, the effect of initial sucrose concentration (i.e. 10, 20, 30, 50 and 100g l<sup>-1</sup>) was investigated in suspension cultures of *E. californica* for production of sanguinarine, chelerythrine and dihydrosanguinarine. The final dry cell weight was increased from 5.2 to 19.1g l<sup>-1</sup> with an increase of initial sucrose concentration from 10 to 50 g l<sup>-1</sup>. The maximum cell mass based on dry cell weight was obtained at 10 to 25 day with an increase of initial sucrose concentration from 20 to 50 g l<sup>-1</sup>. And it was found that a high sugar level was favorable to the synthesis of dihydrosanguinarine, which may be due to the high osmotic pressure. The maximum production of sanguinarine(19.1mg g-DCW<sup>-1</sup>) and dihydrosanguinarine(24.7mg g-DCW<sup>-1</sup>) was achieved at an initial sucrose concentration of 50g l<sup>-1</sup> on the day 32 and 21. Compared with the initial low sucrose concentration (20g l<sup>-1</sup>), the maximum sanguinarine and dihydrosanguinarine content was increased by 2.2- and 25.4-fold. In our present research, we showed that sanguinarine production was influenced by initial sugar concentration. The obtained results are discussed in regard to the current knowledge on sugar effects on plant cell culture system for producing secondary metabolites.

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