Production and derivate composition of trisporoids in extended fermentation of Blakeslea trispora.

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Abstract

Trisporic acid, its precursors and derivatives are used within zygomycete fungi as communication signals and sexual regulators, and also influence the production rate of the parent compound, beta-carotene. Cultivation parameters during growth and the trisporoid production phase of Blakeslea trispora were studied in two-step shake flask cultures and up-scaled fermentations. Comparison of various fermentation protocols allowed the definition of parameters governing trisporoid production. Highest yields were obtained when the initial growth phase allowed for both rapid growth and fast exhaustion of nitrogen and phosporous sources. Onset of trisporoid production is accompanied by a pH drop in the medium and triggered by nutrient limitation, nitrogen depletion being the most important factor. Supplementation of cultures with carbon at low concentration after onset of trisporoid production led to prolonged growth and higher final product accumulation. B. trispora produces trisporoids in two major series, B and C. During a first peak in trisporic acid accumulation, production of trisporic acid B exceeds that of trisporic acid C, which later accumulates at the expense of the trisporic acid B, indicating a variable regulation of the ratio

between these metabolites. These data are valuable for tailoring production systems for enrichment of specific intermediates of this complex signal family.

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