

Biotechnology process to study the influence of carbon and nitrogen concentration in the production of red colorants by an alternative microorganism

Santos-Ebinuma, V.C.¹; Roberto, I.C.²; Teixeira, M.F.S.³; Pessoa, A. Jr⁴

¹Dep. of Bioprocess and Biotechnology, School of Pharmaceutical Sciences, UNESP, São Paulo, Brazil; ²University of São Paulo, Lorena School of Engineering, USP, São Paulo, Brazil; ³ Dep.Parasitology, UFAM, Amazonas, Brazil; ⁴Dep of Biochemical and Pharmaceutical Technology, USP, São Paulo, Brazil.

INTRODUÇÃO. Safety concerns about synthetic coloring agents have increased not only the popularity but also the demand for natural colorants. Thus, fungal biodiversity has been employed as alternative microorganisms to produce novel and safer colorants. **OBJETIVO:** In this work, an experimental design was used in order to study the influence of carbon and nitrogen concentration in the red colorants production by *Penicillium purpurogenum* DPUA 1275; the aim was to increase the yield of production and to reduce the manufacturing costs. **MATERIAL E METODOS:** To this purpose, a 22 central composite design was selected using sucrose (48-62 g/L) and yeast extract (7.6-10.4 g/L) as carbon and nitrogen source, respectively; they represented the two independent variables. The experiments were performed in shaker at 150 rev min⁻¹ at 30°C for 336 hours. The production of the red colorants was evaluated through the measurement of the absorbance at 490nm (maximum absorption for this color). **DISCUSSÃO E RESULTADOS:** Run 2 (50 g/L of sucrose and 10 g/L of yeast extract) and run 8 (55g/L of sucrose and 10.4 g/L of yeast extract) promoted similar results: 2.040UA490nm and 2.034UA490nm. These results pointed out that the sucrose concentration did not have a significant influence on the production process. Moreover, the surface response obtained from statistical analysis indicates that higher concentrations of yeast extract could increase the production. **CONCLUSÃO:** The results obtained suggested that the yeast extract concentration is more significant than the carbon one in the production of red colorants by *P. purpurogenum* DPUA 1275, which is a new producer of natural colorants with high yield and capacity to replace the synthetic ones evaluable in the market. Furthermore, these results suggest that the statistical design adopted in this study is a powerful tool for the quick and low-cost optimization of red colorant production.

Palavra chave: Biotechnology, Natural Colorants, Bioprocess, *Penicillium purpurogenum*

Patrocínio: FAPESP, CNPq and CAPES