

Optimization of fermentation medium using the dietary soybean flour for production of monacolin-K by *Monascus pilosus*

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Abstract

The production medium composition and components were optimized on a shake flask scale for monacolin-K production by *Monascus pilosus*(KCCM 60160). The effect of three different soybean flours on the monacolin-K production were studied in order to replace the nitrogen sources of basic production medium(yeast extract, malt extract and beef extract). Among the several experiments, the production medium with dietary soybean flour to replace a half of yeast extract was very good for monacolin-K production. Plackett-Burman experimental design was used to determine the key factors which are critical to produce the biological products in the fermentation. According to the result of Plackett-Burman experimental design, a second order response surface design was applied using yeast extract, beef extract and $(\text{NH}_4)_2\text{SO}_4$ as factors. Applying this model, the optimum concentration of the three variables was obtained. The maximum monacolin-K production(369.6 mg/L) predicted by model agrees well with the experimental value(418 mg/L) obtained from the experimental verification at the optimal medium. The yield of monacolin-K was increased by 67% as compared to that obtained with basic production medium in shake flasks.