

Optimization of Production Medium for Monacolin-K Production by *Monascus pilosus*

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Abstract

Monacolin-K(also known as lovastatin) is a secondary metabolite of polyketide structure produced by the filamentous fungus *Monascus*, and lowers the concentration of cholesterol in the plasma of human and animals. Batch fermentation in shake flasks was undertaken to learn how different compounds in the fermentation medium affect cell growth and monacolin-K production. Monacolin-K production and cell growth by basic production medium in shake flasks were 50 mg/L and 25 g/L, respectively. It was found that monacolin-K production and cell growth by *Monascus pilosus* are influenced by several factors such as chemical compounds and concentration of substrate, organic and inorganic nitrogen sources and amino acids. As a result, glucose was a superior substrate for monacolin-K production by *Monascus pilosus*. The excellent organic nitrogen sources were peptone and yeast extract which were able to increase the monacolin-K and biomass production. Among the inorganic sources, ammonium phosphate monobasic was found to be the best. It was also confirmed that the presence of L-histidine enhance the monacolin-K production.

The medium composition was optimized in shake flasks for monacolin-K production by *Monascus pilosus* using the Graeco-Latin square design. Applying this design technique, the optimum concentration of the four variables was obtained and with this optimized medium, monacolin-K production was increased by 300% with respect to the basic medium.