Thesis Title	Optimization on Adenosine Production from *Cordyceps militaris* Using Submerged Fermentation
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ABSTRACT

Cordyceps militaris, a medicinal mushroom, is widely used in traditional herbal medicine in East Asia. Adenosine is the main compound found in *C. militaris* which has many biological and pharmacological properties including anti–aging, skin regeneration, anti–wrinkle as well as and anti–hair fall. In this study, the production of adenosine from *C. militaris* was influenced by various factors including (1) fungal strains, (2) carbon source, (3) nitrogen source and (4) initial pH. To optimize the adenosine production, an experimental design based on the Taguchi method (Qualitek–4 software) was operated in this study. The experimental factors considered include (1) fungal strains (SH01, ATCC 34165 and a hybrid strain), (2) glucose concentration (20–60 g/L), (3) yeast extract concentration (5–20 g/L) and (4) initial pH (4.0–7.0). Nine treatments obtained from Taguchi–base experimental design were performed under 250–mL shaking flask containing 50 mL culture medium for 30 days in triplicate. It was found that the cultivation of *C. militaris* SH01 strain under optimal condition (40 g/L glucose, 20 g/L yeast extract and initial pH 4.0) showed the maximum adenosine production and productivity which were 8.662±0.269 mg/g and 2.495±0.077 mg/g.d, respectively, which was higher than expected result for 1.44 times. However, the

scalability in 5–L shaking flask shown the productivity of adenosine at 1.849±0.094 mg/g.d which was lower than in 250–mL shaking flask. Thus, these findings provide an effective strategy for enhancing adenosine production, and have potential to apply in large scale for healthcare, food and cosmetic purposes.

Keywords: Adenosine, *Cordyceps militaris*, Process Optimization, Submerged Fermentation, Taguchi Method