

## Improvement of *Aspergillus flavus* Link S44-1 using random mutational method for kojic acid production

### ABSTRACT

**AIM:** The aim of this study was to improve the kojic acid producing strain, *A. flavus* Link S44-1, by random mutation methods. **METHODS:** Random induced mutation method was applied to *A. flavus* Link S44-1 with N-Methyl-N' nitro-N nitrosoguanidine (NTG), ultraviolet (UV), and  $\gamma$  irradiation for improvement of its ability in producing kojic acid. The changes in the activity of cell bound enzyme responsible for kojic acid synthesis after the mutation were evaluated. **RESULTS:** The improved mutants (*A. flavus* NTG-MTDC-22, *A. flavus* UV-MTDC-12, and *A. flavus* G-MTDC-8) were capable of producing kojic acid up to final concentrations of 46, 42, and 49 g/L in fed-batch fermentation respectively. These which were 2.3 to 2.7 fold higher than the parent strain. In the mutated strains, the activities of enzymes related to kojic acid pathway such as glucose dehydrogenase and gluconate dehydrogenase detected during the fermentation were significantly higher than the parent strain. Spores of the mutants were stable and have consistent ability in producing kojic acid after prolonged storage in glycerol at -20 °C. **CONCLUSION:** The mutant *A. flavus* and the simple method used to improve the strains have potential applications in the development of fermentation process for industrial production of kojic acid, where the demand for this organic acid has increased enormously with its increasing applications in various industries.

**Keyword:** *Aspergillus flavus*; Glucose dehydrogenase; Methylnitronitrosoguanidine; Ultraviolet rays