

Isolation of citric acid-producing *Aspergillus niger* from soil and organic wastes

ABSTRACT

Introduction of new *Aspergillus niger* strains that are more productive than those currently in use is one of the important steps in promoting more effective commercial citric acid production. The present study was conducted to isolate and characterise indigenous *A. niger* from selected soil and organic wastes such as soil with buried bamboo, soil with bamboo on the surface, soil under cattle grazing, mango orchard soil, rotting plum fruit and rotting bread. Morphological identification of *A. niger* was based on the length and width of the conidiophores, vesicles, phialides, and spores. Citric acid-producing *Aspergillus* isolates were screened based on the citric acid production index. The present study found that the highest fungal spore counts ($3.35 \pm 0.15 \times 10^7$ spores/g sample) were obtained from soil under cattle grazing, as were the highest *A. niger* counts ($7.25 \pm 0.05 \times 10^6$ spores/g sample). The lowest total fungal counts came from rotting plum fruit ($4.70 \pm 0.10 \times 10^5$ spores/g sample). A total of 14 isolates were collected, with five (NSA03, NSA06, NSA09, NSA12, and NSA14) showing morphological similarities with the reference isolate, *A. niger* Tiegh. All isolates were able to produce citric acid, but with varying efficiencies according to their citric acid production indices. The soil under cattle grazing area found to be the best site for sampling and isolation for citric acid-producing *A. niger* by using Czapek-Dox as a medium of isolation.

Keyword: *Aspergillus niger*; Citric acid; Fungal morphology; Organic waste; Soil fungi