

## ABSTRACT

The present study is concerned with the isolation and screening of *Aspergillus niger* for citric acid production. Twelve strains of *A. niger* were isolated and screened for citric acid production by submerged fermentation. Of all the strains, *A. niger* GCBT-7 gave the maximum citric acid production ( $8.7 \pm 0.37$  g/l). The *A. niger* GCBT-7 produced  $11.91 \pm 0.71$  g/l citric acid after optimization of cultural conditions. This strain was improved through ultraviolet (UV) radiations and chemical treatment (EMS and nitrous acid). Among all the mutants developed *A. niger* NA-16 was found to be the hyper producer of citric acid. The mutant gave 4.6 fold higher citric acid production than the wild culture GCBT-7.

Five fermentation media were investigated, M2 was found to be optimal for the citric acid production ( $40.1 \pm 0.90$  g/l) by the mutant strain *A. niger* NA-16. The cultural conditions such as sugar conc. (15 %, w/v), incubation period (168 h), initial pH (5.5) and ferrocyanide conc. (150 ppm) were also optimized. The product formation rates i.e.,  $Y_{p/x}$  ( $1.7054 \pm 0.0200$  g/g cells),  $Q_p$  ( $0.2720 \pm 0.0028$  g/l/h) and  $q_p$  ( $0.01023 \pm 0.000070$  g/g/h) were higher for mutant NA-16 than the parental strain when the medium was supplemented with 2.0 % (v/v) methanol. The maximum citric acid production ( $47.21 \pm 0.56$  g/) was obtained when  $\text{NH}_4\text{Cl}$  (0.25 % N, w/v) and  $\text{ZnSO}_4$  (0.022 g/l, w/v) were added.