

Supplementation of Nitrogen Sources to Grapes Extract to Improve Ethanol Production

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Grapes produced in Jaffna could be used for wine production since there are no facilities available to preserve them. Mainly Istralian blue variety is produced in Jaffna and it contained (gL^{-1}) 86 (± 0.1) total sugar, 6.587 (± 0.2) protein, 11.7 (± 0.2) acid as Tartaric acid and 0.65 (± 0.23) ash. This study was aimed to increase the ethanol production by optimizing the nitrogen sources. *Saccharomyces cerevisiae* was grown, in a medium containing, Non Peeled Grapes Extract (NPGE) with (gL^{-1}) the total sugar of 86, yeast extract, 2.5; bacteriological peptone, 1.15; $(\text{NH}_4)_2\text{HPO}_4$, 0.25 and $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 0.025 at 30°C and pH 5.0 under stationary condition. Increase in the concentration of $(\text{NH}_4)_2\text{HPO}_4$ from 0.25 to 1.0 gL^{-1} increased the ethanol production from 40.8 to 49.9 gL^{-1} . To the above medium 1.0 gL^{-1} of $(\text{NH}_4)_2\text{HPO}_4$ was added and supplemented with sucrose to bring the total sugar concentration to 80, 120, 160, 200 and 240 gL^{-1} , highest ethanol production [$82.8 (\pm 0.125) \text{ gL}^{-1}$] was obtained with the total sugar concentration of 240 gL^{-1} . NPGE supplemented with sucrose (total sugar 240 gL^{-1}), yeast extract (2.5 gL^{-1}), bacteriological peptone (1.15 gL^{-1}) and $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ (0.025 gL^{-1}), various concentrations of $(\text{NH}_4)_2\text{HPO}_4$ (1.0 to 2.0 gL^{-1}) was added and the ethanol production was increased from 82.8 to 86.3 gL^{-1} . Addition of yeast extract (1.25 to 10 gL^{-1}) and bacteriological peptone (0.575 to 2.30 gL^{-1}) did not improve the ethanol production. This study showed that ethanol production could be improved from 40.8 to 86.3 gL^{-1} by supplementing (gL^{-1}) 154 sucrose, 2.0 $(\text{NH}_4)_2\text{HPO}_4$, 2.5 yeast extract, 1.15 bacteriological peptone and $0.025 \text{ MgSO}_4 \cdot 7\text{H}_2\text{O}$ to NPGE.

Key words: Grapes Extract, Yeast extract Peptone (YP) medium, *Saccharomyces cerevisiae*, Wine, Sucrose.