Preliminary Studies to Increase the Ethanol Content in Wine from Grapes Available in Jaffna Peninsula

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This study was aimed to increase the ethanol production from grape must (juice) with *Saccharomyces cerevisiae*. The formulated Yeast extract, Peptone and Sugar (YPS) medium contained yeast extract, 2.5gL^{-1}; bacteriological peptone, 1.15 gL^{-1}; $(NH_4)_2HPO_4$, 0.25 gL^{-1}; $MgSO_4.7H_2O$, 0.025 gL^{-1} and Glucose, 10 gL^{-1} at pH 5.0. When the YPS medium was inoculated with *S. cerevisiae,* 3.75(±0.025) gL^{-1} ethanol was produced at 30°C and pH 5.0. When glucose was replaced with the same amount of sucrose (Table sugar), ethanol production increased to 4.25(±0.15) gL^{-1}. When sucrose concentration in the YPS medium was changed from 50, 80 and 100gL^{-1} respectively, 26.45(±0.5) gL^{-1}, 45.4 (±0.25) gL^{-1} and 43.7 (±0.25) gL^{-1} ethanol were obtained at 22h. To find the effect of mixing on ethanol production, the experiment was preceded with media consisting of different concentrations of sucrose (50, 80 and 100gL^{-1}) and the fermentation was carried out under stationary condition as the control. The highest ethanol production [47.15(±0.25) gL^{-1}] was obtained in the medium with 80 gL^{-1} sucrose under stationary condition. The non peeled grapes and peeled grapes were homogenized and the extracts were prepared. The composition of Non Peeled Grapes Extract (NPGE) and Peeled Grapes Extract (PGE) were analyzed. NPGE contained higher content of total sugar, protein, acid as Tartaric acid and ash [86(±0.1) gL^{-1}, 6.587(±0.2) gL^{-1}, 11.7(±0.2) gL^{-1} and 0.65(±0.23) gL^{-1} respectively] than PGE [80(±0.14) gL^{-1}, 5.687(±0.2) gL^{-1}, 11.25(±0.2) gL^{-1} and 0.51(±0.21) gL^{-1} respectively]. The NPGE and PGE were supplemented with the nutrients of YPS medium except sucrose. Ethanol production from NPGE and PGE was compared with 80gL^{-1} sucrose with YPS medium. The highest ethanol [51.075 (±0.2) gL^{-1}] was produced in NPGE medium than that in PGE medium (41.8(±0.25) gL^{-1}) and 80 gL^{-1} sucrose medium (47.75(±0.2) gL^{-1}). Hence NPGE was selected as the carbon source for further study.

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