

Production of Vinegar from Palmyrah (*Borassus flabellifer* L.) Toddy

Keerthiga^{1, 2}, S., *Mahilrajan², S. and Sajiwanie¹, J.W.A.

¹Department of Food Science & Technology, Sabaragamuwa University of Sri Lanka

²Palmyrah Research Institute, Kandy Road, Jaffna, Sri Lanka

*Corresponding E-mail: jsubajini@gmail.com

Vinegar is a condiment prepared from different sugary and starchy materials by alcoholic and subsequent acetic fermentation. This can be utilized as flavoring agent, preservative, a medicine, cleaning agent and as a herbicide. The aim of this research was to produce palmyrah vinegar from fermented sap called as toddy, which contains around 4-6 % of alcohol. Three different processes such as Orlean, generator and submerged were used to produce vinegar. Orlean process was carried out with corn cob which produced 3.27 % of acetic acid at 6th day of fermentation. Acetic acid producing bacteria besides gel like structure were selected based on the highest acid production from Orlean process. Fermentation medium having both corn cob and activated inoculums was significantly ($p < 0.05$) reduced the time required to produced maximum acid (4.01 %). During generator process over oxidation of ethanol was observed due to the high rate of aeration with pump. Submerged fermentation was carried out in the 250ml of conical flask with 100ml of toddy as fermentation medium. Which was inoculated with 10ml of activated medium containing Glucose (10 g/100ml), yeast extracts (1.2 g/100ml) and peptone (0.5 g/100ml) and incubated in shaking water bath at 30 °C. Optimization of fermentation process was carried out with different inoculums size (5, 10, 20 and 30 %), temperature (room temperature (28 °C), 30 °C and 32 °C), shaking and without shaking. Shaking (3.96 %) temperature 30 °C (4.23 %) and activated inoculum 10 % (4.53 %) was selected as optimum condition for the best production of acid at 8th, 7th and 5th day of fermentation period respectively. Efficiency of acetic acid production by using optimized submerged fermentation process was showed 92.4 %. Therefore, toddy could be used for the production of natural vinegar production under optimum fermentation conditions.

Key words: Acetic acid, Orlean process, Palmyrah toddy, Fermentation, Vinegar