The batch ethanol production from Jerusalem artichoke juice by thermotolerant yeast *Kluyveromyces marxianus* DBKKU Y-102

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In this study, selection and characterization of thermotolerant yeasts *Kluyveromyces marxianus* capable of producing ethanol from Jerusalem artichoke juice (ARJ) (*Helianthus tuberosus* L.) were investigated. Batch ethanol fermentation of six isolated *K. marxianus* strains, that is, DBKKU Y-102, DBKKU Y-103, DBKKU Y-104, DBKKU Y-105, DBKKU Y-106 and DBKKU Y-107, were compared at different temperatures. Among the strains tested, DBKKU Y-102 gave the relatively high ethanol concentration at 37°C and 40°C, as compared to the others. The effect of initial pH, sugar concentration, cell concentration, nitrogen source and concentration of magnesium sulfate on ethanol production by *K. marxianus* DBKKU Y-102 was determined. The results showed that the highest ethanol productivity (4.24±0.02 g/l.h), ethanol concentration (101.74±0.47 g/l), and theoretical ethanol yield (90.24%) were obtained at 37°C under the following optimal conditions: pH 5.5, 250 g/l initial sugar concentration, 1×10⁸ cells/ml initial yeast cell, 0.5 g/l diammonium phosphate as nitrogen source. The batch ethanol fermentation was conducted in a 2-L jar fermenter under the optimal conditions with an agitation speed of 100 rpm. *K. marxianus* DBKKU Y-102 yielded the final ethanol concentration of 94.62±0.86 g/l, a productivity of 2.63±0.02 g/l.h, and 90.26% of the theoretical ethanol yield. These results suggested that the thermotolerant yeast, *K. marxianus* DBKKU Y-102, has high potential for ethanol production at high temperature from ARJ.

**Keywords** : Ethanol, Jerusalem artichoke, *Kluyveromyces marxianus*, Thermotolerant yeast