Bioethanol production from sodium hydroxide/hydrogen peroxide-pretreated water hyacinth via simultaneous saccharification and fermentation with a newly isolated thermotolerant *Kluyveromyces marxianu* strain

Jinping Yan, Zhilei Wei, Qiaoping Wang, Manman He, Shumei Li, Chagan Irbis

PII: S0960-8524(15)00860-3
DOI: http://dx.doi.org/10.1016/j.biortech.2015.06.069
Reference: BITE 15149

To appear in: *Bioresource Technology*

Received Date: 20 April 2015
Revised Date: 13 June 2015
Accepted Date: 15 June 2015

Please cite this article as: Yan, J., Wei, Z., Wang, Q., He, M., Li, S., Irbis, C., Bioethanol production from sodium hydroxide/hydrogen peroxide-pretreated water hyacinth via simultaneous saccharification and fermentation with a newly isolated thermotolerant *Kluyveromyces marxianu* strain, *Bioresource Technology* (2015), doi: http://dx.doi.org/10.1016/j.biortech.2015.06.069

Title: Bioethanol production from sodium hydroxide/hydrogen peroxide-pretreated water hyacinth via simultaneous saccharification and fermentation with a newly isolated thermotolerant *Kluyveromyces marxianu* strain

Author: Jinping Yan[a, §], Zhilei Wei [a, b, §], Qiaoping Wang [a], Manman He [a], Shumei Li [a], Chagan Irbis [a, *]

Affiliations:

[a] Laboratory of Bioconversion, Life Science and Technology College, Kunming University of Science and Technology, Kunming, 650500, PR China;

[b] Changdu Institute of Agriculture Science, Changdu, 854000, PR China.

Abstract

In this study, bioethanol production from NaOH/H_2O_2–pretreated water hyacinth was investigated. Pretreatment of water hyacinth with 1.5% (v/v) H_2O_2 and 3% (w/v) NaOH at 25 °C increased the production of reducing sugars (223.53 mg/g dry) and decreased the cellulose crystallinity (12.18%), compared with 48.67 mg/g dry and 22.80% in the untreated sample, respectively. The newly isolated *Kluyveromyces marxianu* K213 showed greater ethanol production from glucose (0.43 g/g glucose) at 45 °C than did the control *Saccharomyces cerevisiae* angel yeast. The maximum ethanol concentration (7.34 g/L) achieved with *K. marxianu* K213 by simultaneous saccharification and fermentation (SSF) from pretreated water hyacinth at 42 °C was 1.78-fold greater than that produced by angel yeast *S. cerevisiae* at 30 °C. The present work demonstrates that bioethanol production achieved via SSF of NaOH/H_2O_2–pretreated water hyacinth with *K. marxianu* K213 is a promising