ABSTRACT

DESSY MAULIDYA MAHARANI. F351080101. Adaptation of Saccharomyces cerevisiae to Cassava Acid Hydrolisates for Bioethanol Production. Under direction of DWI SETYANINGSIH and GAYUH RAHAYU.

Acid hydrolisates of cassava contain toxic substances i.e. 3.55 g/l HMF and 0.72 g/l furfural to ethanol producing yeast, Saccharomyces cerevisiae. This study is aiming at screening four strains of S. cerevisiae for their tolerance capacity to that acid hydrolisates. Out of four strains, S. cerevisiae IPBCC 05.548 showed the highest tolerance on the bases of ethanol production. It produced 4.1% (b/v) ethanol. Prior to adaptation, optimum sugar concentration and starter dosage were determined in sequence. Out of 15%, 18%, 20% and 24% concentration, S. cerevisiae IPBCC 05.548 showed the highest ethanol production (4.10% b/v) at 15% of total sugar. Among starter dosage (1, 2 and 3 times of 0.23% of sugar concentration), that were tested on optimal sugar concentration indicated that the twice of dosage was the best for ethanol production. Adaptation was then performed for 72 hours for each cycle. Of the cycles, the 9th cycle (648 hours) showed the highest specific growth rate (0.14g.h⁻¹) as well as ethanol yield (4.13% b/v). Comparison of the adapted strain to unadapted strain proved that the adapted strain produced 30.78% higher ethanol yield than those of unadapted strain.

Keywords: cassava, S. cerevisiae, acid hydrolisate, HMF, furfural, ethanol, selection, adaptation