

Detoxification of acidic catalyzed hydrolysate of *Kappaphycus alvarezii* (cottonii)

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Abstract	<p>Red seaweed, <i>Kappaphycus alvarezii</i>, holds great promise for use in biofuel production due to its high carbohydrate content. In this study, we investigated the effect of fermentation inhibitors to the <i>K. alvarezii</i> hydrolysate on cell growth and ethanol fermentation. In addition, detoxification of fermentation inhibitors was performed to decrease the fermentation inhibitory effect. 5-Hydroxymethylfurfural and levulinic acid, which are liberated from acidic hydrolysis, was also observed in the hydrolysate of <i>K. alvarezii</i>. These compounds inhibited ethanol fermentation. In order to remove these inhibitors, activated charcoal and calcium hydroxide were introduced. The efficiency of activated charcoals was examined and over-liming was used to remove the inhibitors. Activated charcoal was found to be more effective than calcium hydroxide to remove the inhibitors. Detoxification by activated charcoal strongly improved the fermentability of dilute acid hydrolysate in the production of bioethanol from <i>K. alvarezii</i> with <i>Saccharomyces cerevisiae</i>. The optimal detoxifying conditions were found to be below an activated charcoal concentration of 5%.</p>
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