

Comparison of bioethanol production from cultivated versus wild *Gracilaria verrucosa* and *Gracilaria gigas*

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<b>Abstract</b>	<p>The seaweed genus <i>Gracilaria</i> is a potential candidate for the production of bioethanol due to its high carbohydrate content. <i>Gracilaria</i> is abundant throughout the world and can be found in both wild and cultivated forms. Differences in the ecological factors such as temperature, salinity, and light intensity affecting wild and cultivated specimens may influence the biochemical content of seaweeds, including the carbohydrate content. This study aimed to investigate the proximate composition and potential bioethanol production of wild and cultivated <i>G. gigas</i> and <i>G. verrucosa</i>. Bioethanol was produced using separate hydrolysis fermentation (SHF), employing a combination of enzymatic and acid hydrolysis, followed by fermentation with <i>Saccharomyces cerevisiae</i> ATCC 200062. The highest carbohydrate content was found in wild <i>G. gigas</i>. The highest galactose and glucose contents (20.21 <math>\pm</math> 0.32 and 9.70 <math>\pm</math> 0.49 g L<sup>-1</sup>, respectively), as well as the highest production of bioethanol (3.56 <math>\pm</math> 0.02 g L<sup>-1</sup>), were also found in wild <i>G. gigas</i>. Thus, we conclude that wild <i>G. gigas</i> is the most promising candidate for bioethanol production. Further research is needed to optimize bioethanol production from wild <i>G. gigas</i>. Domestication of wild <i>G. gigas</i> is a promising challenge for aquaculture to avoid overexploitation of this wild seaweed resource.</p>
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