Mette Hedegaard Thomsen, J Biotechnol Biomater 2015, 5:7
http://dx.doi.org/10.4172/2155-952X.C1.046

OMICS International
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412th OMICS International Conference

World Bio Summit & Expo

November 02-04, 2015 Dubai, UAE

The halophyte *Salicornia bigelovii*, a promising feedstock for biofuels and biochemicals production in arid areas

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Halophytes are a group of plant species that have managed to adapt to extremely difficult environments including salinized arid lands of the Middle East, South America, and Africa. The main advantage of these plants is their ability to tolerate high salt concentrations and lack of nutrients in the soil. Finding such biofuels/biochemicals feedstock is especially important for arid regions of the world, where food production is already limited by the scarcity of freshwater resources. In this study, *Salicornia bigelovii* straw was characterized and evaluated as a potential lignocellulosic bioethanol feedstock. *Salicornia bigelovii* was cultivated and irrigated with high salinity water (40 ppt). Characterization of the plant straw grown at different conditions (soil salinity varying between 10 and 50 ppt and fertilizer grade varying between 1 and 2 gN/m^2) was performed by analysis of extractives, carbohydrates, lignin and ash content in the dry *S. bigelovii* samples. Extractives free biomass was comparable to traditional lignocellulosic biomasses (such as wheat straw and corn stover), with relatively high glucan and xylan content (26 and 22 g/100 gTS, respectively) but with lower lignin content (7 g/100 gTS). The washed feedstock was subjected to hydrothermal pretreatment, producing highly digestible (up to 92% glucan-to-glucose conversion) and fermentable (up to 100% glucose-to-ethanol conversion) fiber fractions, regardless of the severity of the process. Liquid fractions obtained in the pretreatment did not show any significant inhibition when used as fermentation medium for *Saccharomyces cerevisiae*. In conclusion *Salicornia bigelovii* showed great potential as low in-put biofuels and biochemicals feedstock.

Biography

Mette Hedegaard Thomsen has worked with utilization of waste products for bio-fuels and green chemicals for 15 years. Following her PhD, she was employed with Risø National Laboratory for Sustainable Energy, Technical University of Denmark (2004-2010). Her research focuses on development and design of low temperature chemical and biotechnological processes for production of liquid biofuels and biochemicals using biorefinery concepts. In June 2010, she joined Masdar Institute as Assistant Professor, Department of Chemical and Environmental Engineering. She is Author and Co-author of 45 scientific papers including 24 ISI journal papers, three book chapters, and several conference contributions.

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