INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: PROFILING OF SELECTED GRASS SPECIES FOR BIOETHANOL PRODUCTION

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SHORT ABSTRACT

Biomass derived alcohol or bioethanol have been considered as next generation sustainable attractive fuel for IC engine. Bioethanol is a clean fuel produced from renewable biomass such as corn, sugar, grasses, agro-residues etc.

The present thesis has focused on screening of waste biomass such as grasses produced in the North-Eastern states of India to use as potential feed stock for second generation bioethanol production.

For the analysis 29 grass species found in Kamrup district of Assam and Thoubal district of Manipur for screening were collected. Theses grasses were characterized to determine cellulose, hemicellulose, lignin and ash/inorganic materials. Based on the physico-chemical characterization, two grasses i.e. Eragrostis airoides and Imperta cylindrical were selected on the basis of high percentage of cellulose to investigate the feasibility of bioethanol production.

The highest cellulose content was found in the Eragrostis airoides biomass. This substrate was used for conversion of bioethanol by microbial fermentation process. In the thesis different pretreatment methods such as physical, acid, and alkali treatments were used to increase the yield of bioethanol and indicated that highest yield of 17.56-18.66 g/L of ethanol can be produced in acid treatment of biomass and enzymatic hydrolysis process followed by fermentation using S. cereviceae and local Hamei.