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Process optimization for enhanced biogas production from Bagasse

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Lignocelluloses are often a major or sometimes the sole components of different waste streams from various industries, forestry, agriculture and municipalities. Hydrolysis of these materials is the first step for either digestion to biogas (methane). However, enzymatic hydrolysis of lignocelluloses with no pretreatment is usually not so effective because of high stability of the materials to enzymatic or bacterial attacks. Effective parameters in pretreatment of lignocelluloses, such as crystallinity, accessible surface area, and protection by lignin and hemicellulose are the most important ones. Although several pretreatment methods are available, their effects on improvement in biogas production are not optimised. They include milling, irradiation, microwave, steam explosion, ammonia fiber explosion (AFEX), supercritical CO(2) and its explosion, alkaline hydrolysis, liquid hot-water pretreatment, , wet oxidation, ozonolysis, dilute-and concentrated-acid hydrolysis, and biological pretreatments.

Sugar cane Bagasse is available in huge quantities, especially in tropical countries, which are at present not properly utilized.

Pretreatment of Bagasse exposes the cellulose making it accessible to cellulase enzyme. Both chemical and biological pretreatments are possible.

Exposing bagasse to 1 % alkali (sodium hydroxide) and mixing with urea enhances biogas production.

Similarly growing pleurotus florida fungi in the presence of urea, lactose and cupric chloride improves biogas production from bagasse. Urea is used to optimize the carbon: nitrogen ratio of the substrate. Lactose and cupric chloride enhances secretion of laccase enzyme, which delignifies bagasse, without sodium hydroxide.

Biography

Gopinathan C has several years of research experience in the area of fermentation technology, especially in the area of Bioenergy. He has got 15 years of teaching and research experience and filed three patents. He has also presented his inventions in several national and international conferences. Presently he is working as the head of department of Biotechnology, University of Calicut.

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Optimization of multiple shoot induction and regeneration of Indian barley cultivars

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Multiple shoot induction and direct organogenesis without callus formation reduces the time period needed for regeneration in plants especially in case of barley which is very recalcitrant to regenerate and is considered as the forth most important crop in the world. So the in vitro potential of mature embryos from six Indian originated barley cultivars provided by Leibniz Institute of Plant Genetics and Cultivated Plant Research (IPK) - Germany was investigated for direct multiple shoot induction and production of regenerated plants. Mature embryos were dissected from seeds after surface sterilization and inoculated on MS basal media containing 30mg/L maltose, 8gr/L agar supplemented with different concentrations of 2, 4-D and BAP. Adventitious shoots per explants, regenerated plants and regeneration efficiency were analyzed and multiple comparison of mean was conducted using LSD (0.5%). The result shows that there are significant differences between varieties and media composition for induction and number of adventitious shoots. The most responsive variety was HOR 4952 with average of 13.67 shoots per explants in media containing 3mg/L BAP +0.5mg/L 2,4-D, and the least responsive variety was belong to accession number HOR 8093 with 2.33 shoots per explants in 1BAP+0.3 2,4-D media.

Biography

Hassan Rostami is PhD student of biotechnology at CBT, IST, JNTUH. He is studying on barley regeneration and transformation for improving its feed quality.

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