Isolation of ligninolytic microbial regime from mangrove ecosystem for the bioremediation of lignocellulosic waste generated from jute plant

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ABSTRACT

Lignocellulosic biomass is widely available plant waste material that is being generated million of tons every year throughout the globe. Lignocellulosic structure is highly recalcitrant due to the presence of phenolic lignin that surrounds polysaccharides like cellulose, hemicellulose adhered by pectin. Although LCB have multi-dimensional application as a source of value added product generation like bio-ethanol, still some negative impact has been observed on the agriculture due to the unplanned dumping of the LCB waste that causes serial bioleaching and contaminates the agricultural field and water resources through increasing chemical oxygen demand. Jute plant is one of the most important lignocellulosic cash crops of India. West Bengal is the highest jute producing state in India. But the environmental pollution that is being generated through the jute root cut off stocks is observable and its remediation is highly needed by the industry. Different physico-chemical methods are used for the production of high quality fibre from the jute root section but all processes are costly and cause low grade fibre generation. Thus in all respect, staring from the waste treatment to the production of value added product and high quality jute fibre, biological regime are the best option. To this end, current study focuses on bioremediation of jute root cut off segment using novel microbial isolates from mangrove ecosystem to accelerate jute root recycling and reduce environmental pollution.

Keywords: Lignocellulosic biomass, ligninolytic microbial regime, bioremediation, environmental pollution, waste recycling, mangrove ecosystem.

