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Abstract

Isolation And Characterization Of Ligninolytic Bacterial Strains Present In Tropical Forest Soils

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Abstract: Lignin is a complex heteropolymer consisting of methoxylated and nonmethoxylated phenylpropanoid subunits linked to cellulose and hemicellulose. Due to the fact that lignin is a recalcitrant biomolecule to degradation, crop plant waste with high lignin content is difficult to process and convert to carbohydrates suitable for fermentation. In this work, we present isolated ligninolytic bacterial strains from tropical soils. An amount of 10 isolates were identified as lignin degraders coming from soils found in a Mexican tropical region. Biochemical and molecular techniques were employed to characterize these ligninolytic bacterial strains. Dyes with similar chemical structure to lignin (e.g. malachite green [MG]) were employed as substrates for these lignin degrading isolates using both liquid and solid-phase assays. Isolates showed a dye degradation spectrum: some of them proved to be total MG degrading strains; others, just partial degraders that generally just absorbed the dye. Bacterial DNA from selected isolates was extracted, and PCR products for the 16S rRNA gene were generated. These amplicons were partially sequenced and nucleotide blasted against the whole NCBI nucleotide collection. Isolate 1 reported a 100% homology to the environmental bacterium NCK210a04CL while isolate 2 reported the same level of homology to proteobacterium clone MS074A1_G09.

Keywords: lignin degradation, tropical bacteria

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