ABSTRACT FOR PARALLEL SESSIONS

S2-C02

Bioremediation Of Industrial Dyes: Black Reactive 5 And Methylene Blue By White Rot Fungus

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Abstract

The aim of the presence research work is to discover the degree of dye decolourization by novel white rot fungi isolated from soil at three different sites; agriculture, virgin forest soil and composting in Johore. Initial experiment was performed with 29 white rot fungus isolates and 3 standard strains, namely *Phanerochaete chrysosporium* (DSM 6909), *Bkerjandera adusta* (DSM 4710) and *Phlebia radiata* (DSM 2111). Soil characteristics; pH, moisture, total viable count, total fungi as well as fungal cell morphology were performed during analysis. White rot fungi were isolated and cultivated on solid medium containing indicator compounds that enabled the detection of enzymes peroxidase as specific colour reactions using guaicol. Selected isolates then were performed in solid medium containing 0.2% dyes (Methylene blue and Reactive Black 5) and incubated up to 10 days at 30 ˚C before the decolourization rate was observed. The screening work resulted in isolation of 26 positive fungal strains. Liquid cultivations of positive strains confirmed that 24 out of 26 dye degrader were found in the screening. Methylene blue was found to be the most decolorized by white rot fungi with 68.52±3.88% compared to Reactive Black 5, 59.91±3.42 %, respectively. There was significance difference in decolorizing for both dyes responded by soil isolates from different locations. But, in comparison among standard strains, non-significance was observed. *P. chrysosporium* present the best degrader among the other standard strains for both dyes. Analysis of variance for different locations showed that isolates from virgin forest soil was found to be the most significance in decolourization of methylene blue while composting site for decolourization of Reactive Black 5 dye. This study also suggests that plate-test screening based on polymeric dye compound; guaiacol is an efficient way to screening novel white rot fungus. Further identification and ability to degrade various biological products such as lignin and halo-cellulose should be done as essential to find local and efficient white rot fungus to further develop these industrial applications.

Keywords: Decolorization, textile dye, *Phanerochaete chrysosporium, Bkerjandera adusta, Phlebia radiate*, white rot fungus, guaicol.

ABSTRACT FOR PARALLEL SESSIONS

S2-A01

Fructooligosaccharide Prebiotics: Optimization Of Different Cultivation Parameters On Their Microbial Production

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Abstract

Recently, a great attention has been paid to the use of dietary carbohydrates as prebiotic functional foods. Among the new commercially available products, fructooligosaccharides (FOS), which are microbially produced from sucrose, have attracted special interest due to their valuable properties and, thus, have a great economic potential for the sugar industrial branch. They are non-cariogenic sweeteners of low caloric value, as they are not hydrolyzed by the gastro-intestinal enzymes, promoting selectively the growth of the *bifidobacteria* in the colon, helping to eliminate the harmful microbial species to human and animal health and preventing colon cancer. FOSs have been also found to reduce cholesterol, phospholipids and triglyceride levels in blood. FOS have been mainly produced by microbial fructosyltransferase (FTase) enzymes. The present work outlines bioprocess optimization for different cultivation parameters affecting the production of FTase by *Penicilliumaurantiogriseum* AUMC 5605. The optimization involves both traditional as well as fractional factorial design approaches. Additionally, the production process will be compared under batch and fed-batch conditions. Finally, the optimized process conditions will be applied to 5-L stirred tank bioreactor cultivations.

Keywords: Prebiotics, fructooligosaccharides, optimization, cultivation.