

## INTISARI

Lindi hitam adalah limbah cair pulp yang berasal dari tahapan delignifikasi, dengan karakteristik warna coklat gelap dan mengandung bahan organik yang tinggi terutama lignin. Warna coklat gelap disebabkan oleh degradasi lignin yang tidak sempurna. Degradasi lebih lanjut oleh mikroorganisme dapat menyebabkan dekolorisasi pada lindi hitam. Penelitian ini bertujuan untuk mendapatkan isolat bakteri lignolitik dari lingkungan alami yang akan digunakan sebagai inokulum dalam dekolorisasi dan degradasi lignin dalam lindi hitam.

Isolasi bakteri lignolitik menggunakan Nutrien Agar-modifikasi yakni ditambah asam tanat. Seleksi isolat dilakukan secara kualitatif dan kuantitatif. Medium uji dekolorisasi dan degradasi lignin adalah Mineral Salt ditambah lindi hitam. Parameter yang diamati selama dekolorisasi dan degradasi lignin yaitu penurunan intensitas warna (465 nm), lignin sisa, pertumbuhan (cfu/ml) dan perubahan pH.

Dua puluh satu isolat diperoleh dari sampah dan kayu lapuk. Berdasar atas kemampuan merombak lignin secara kualitatif dan kuantitatif, dipilih dua isolat yaitu SPH9 dan SPH10. Hasil penelitian menunjukkan konsentrasi terbaik untuk dekolorisasi dan degradasi lignin adalah 10%. Isolat SPH9 dan SPH10 mampu mendekolorisasi lindi hitam masing-masing sebesar 82,97% dan 86,34%, sedangkan degradasi lignin masing-masing sebesar 82,97% dan 86,34%. Penelitian juga menunjukkan peningkatan jumlah sel dan kenaikan pH selama dekolorisasi dan degradasi lignin. Hasil identifikasi menunjukkan bahwa isolat SPH9 termasuk genus *Micrococcus* dan isolat SPH10 termasuk genus *Bacillus*.

**Kata Kunci : Dekolorisasi, degradasi lignin, lindi hitam, bakteri lignolitik.**

## ABSTRACT

### **Decolorization and Degradation of Lignin of Black Liquor by Lignolytic Bacteria**

Black liquor that derivat from pulp mill effluent contained high organic matter, especially lignin. An uncomplete delignified, causing dark brown color to black liquor. The degradation of lignin that cause decolorization of black liquor can be done by microorganism. This research was conducted to obtain lignolytic bacteria from nature, as degrader and decolorizer agents.

The lignolytic bacteria were isolated from several environments by using modified Nutrient Agar (NA) and added with tanic acid. Examination of decolorization and degradation of lignin were done in Mineral Salt medium, added with black liquor. The parameters measured were decrease of optical density (465 nm), concentration of lignin, growth (cfu/ml) and pH alteration.

Twenty one isolates if lignolytic bacteria were successfully obtained from garbage and decayed wood. Based on the qualitative and quantitative measured, two isolated were chosen among thase 21, they were SPH9 and SPH10. The optimum concentration of black liquor used for decolorization and degradation of lignin was 10%. The result showed that SPH9 and SPH10 were able to decolorize 36,75% and 37,18%, respectively and degradation of lignin ability of these isolates 82,97% and 86,34%, within 24 days. The growth of bacteria tend to increase during the incubation time, and the pH fluctuation. The result of characterization showed that the isolate SPH9 was identified the genera *Micrococcus* and SPH10 was grouped on the genera *Micrococcus* and SPH10 was the grouped *Bacillus*.

**Keywords:** *Decolorization, degradation of lignin, black liquor, lignolytic bacteria.*