

## Acceleration of anthraquinone-type dye removal by white-rot fungus under optimized environmental conditions

### Abstract

The decolorization of the recalcitrant dye Remazol Brilliant Blue R (RBBR) by the culture filtrate of *Polyporus* sp. S133 and the effect of various environmental factors were investigated. Both biodegradation and biosorption were playing an important role in bioremoval mechanisms. The highest biosorption of RBBR in *Polyporus* sp. S133 was shown by all carbon sources such as sucrose, glucose, fructose, and starch. No biosorption was shown by the addition of aromatic compounds and metal ions; 97.1 % RBBR decolorization was achieved in 120-rpm culture for 96 h, as compared to 49.5 % decolorization in stationary culture. Increasing the shaking rotation of the culture to more than 120 rpm was proven to give a negative effect on decolorization. The highest production of laccase was shown at pH 4 and constantly decreases when the pH level increases. The addition of glucose, ammonium tartrate,  $\text{Cu}^{2+}$ , and protocatechuic acid was the suitable environmental condition for RBBR decolorization. There was a positive relationship between all environmental conditions and laccase production in the decolorization of RBBR.