Optimization of Remazol Brilliant Blue R dye removal by novel biosorbent 
P. eryngii immobilized on Amberlite XAD-4 using response surface 
methodology

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ABSTRACT

This study investigates preparation of biosorbent Pleurotus eryngii immobilized on Amberlite 
XAD-4 and the optimal conditions for removal of Remazol Brilliant Blue R (RBBR) reactive 
dye from synthetic aqueous solutions. The process was optimized using the response 
surface methodology (RSM) developed by the application of the quadratic model associated 
with the central composite design. For this purpose, RSM was employed to determine the 
effects of operational parameters on this material as effective and available adsorbent. The 
investigated variables were dye initial concentration (10–60 mg L−1), solution pH (2–9), 
adsorbent dosage (0.1–0.5 g), and temperature (20–45˚C). The significant factors on each 
experimental design response were identified from the analysis of variance (ANOVA). The 
RSM indicated that optimum conditions of initial dye concentration, pH, adsorbent dosage, 
and temperature for maximum RBBR removal (98%) were achieved as 36.3 mg L−1, 2.0, 
0.304 g, and 38.7˚C, respectively. The results showed that this biosorbent was an appropriate 
adsorbent for the removal of RBBR from aqueous solutions.

Keywords: Amberlite XAD-4; Pleurotus eryngii; RSM; Remazol Brilliant Blue R