PENGOLAHAN AIR LIMBAH PENYAMAKAN KULIT DENGAN METODE FITOREMEDIASI

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INTISARI

Penelitian pengelolaan limbah penyamakan kulit dengan tanaman eceng gondok (*Eichhornia crassipes*), kayu apu (*Pistia stratiotes*) dan kangkung air (*Ipomoea aquatica*) menggunakan sistem polikultur dan monokultur telah dilakukan. Tujuan penelitian ini adalah mengetahui penurunan kadar polutan pada limbah penyamakan kulit yang dilakukan proses fitoremediasi dengan tanaman eceng gondok, kayu apu dan kangkung air, mengetahui orde kinetika penurunan COD, BOD, dan krom total dengan metode fitoremediasi monokultur dan polikultur, dan menentukan efektivitas antara tanaman eceng gondok, kayu apu dan kangkung air sebagai agen fitoremediasi limbah penyamakan kulit. Metode penelitian yang dilakukan terbagi menjadi dua bagian utama, yaitu fitoremediasi dan analisis. Fitoremediasi dilakukan dengan beberapa variasi antara tanaman eceng gondok, kayu apu dan kangkung air, yaitu sistem monokultur, sistem polikultur dua tanaman dan sistem polikultur tiga tanaman dengan massa total tanaman adalah 150 gram. Analisis didasarkan pada prinsip volumetri dan spektrofotometri. Hasil analisis yang didapatkan diuji signifikasinya dengan uji ANOVA.

Hasil yang didapatkan pada penelitian ini adalah sistem polikultur dan monokultur tanaman eceng gondok, kayu apu dan kangkung airdapat menurunkan kadar COD, BOD, dan krom total. Orde kinetika yang didapatkan bahwa sistem polikultur sebagian besar mengikuti model reaksi orde 2, sedangkan beberapa sistem monokultur cenderung mengikuti orde 0 atau orde 1. Hasil dari uji ANOVA adalah sistem polikultur ketiga tanaman tersebut menjadi sistem kultur paling efektif diikuti dengan sistem polikultur dua tanaman lalu sistem monokultur. Namun, sistem monokultur memiliki efektivitas melebihi sistem polikultur dua tanaman pada parameter COD.

Kata kunci : ANOVA, BOD, COD, fitoremediasi, krom total

TANNING WASTEWATER TREATMENT BY PHYTOREMEDIATION METHOD

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ABSTRACT

Research on the management of tanning waste with water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*) and water spinach (*Ipomoea aquatica*) using polyculture and monoculture systems has been conducted. The purpose of this study is to determine the reduction of pollutant levels in tanning waste carried out by the phytoremediation process with water hyacinth, water lettuc and water spinach, to determine the kinetic order of reduction of COD, BOD, and total chromium by monoculture and polyculture phytoremediation methods, and to determine the effectiveness between water hyacinth, water lettuce and water spinach as a phytoremediation agent of tanning waste. The research methods carried out are divided into two main parts, namely phytoremediation and analysis. Phytoremediation was carried out with several variations between water hyacinth, water lettuce and water spinach, namely a monoculture system, a two-plant polyculture system and a three-plant polyculture system with a total plant mass of 150 grams. The analysis is based on the principles of volumetric and spectrophotometry. The results of the analysis obtained were tested for significance with the ANOVA test.

The results obtained in this study are that the polyculture and monoculture system of water hyacinth, water lettuce and water spinach can reduce COD, BOD, and total chromium levels. The order of kinetics obtained is that polyculture systems mostly follow order 2 reaction models, while some monoculture systems tend to follow order 0 or order 1. The result of the ANOVA test is that the polyculture system of the three plants becomes the most effective culture system followed by the two-plant polyculture system and then the monoculture system. However, the monoculture system has an effectiveness that exceeds the two-plant polyculture system on COD parameters.

Keyword : ANOVA, BOD, COD, phytoremediation, total chromium