EFEKTIVITAS PENGOLAHAN LIMBAH CAIR TEMPE DENGAN SEDIMENTASI DAN FITOREMEDIASI KAYU APU (*PISTIA STRATIOTES* L.) DALAM MENURUNKAN BOD COD DAN TSS

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INTISARI

Latar Belakang : Limbah cair tempe memiliki karakteristik mengandung bahan organik tinggi, sehingga jika dibuang langsung ke perairan akan menimbulkan pencemaran lingkungan. Berdasarkan survei pendahuluan industri tempe di Karang Nongko, Panggungharjo, Sewon, Bantul limbah cair tempe yang dibuang langsung ke sungai mengandung BOD 686,8 mg/L, COD 15.760 mg/L, dan TSS 438 mg/L. Parameter tersebut belum memenuhi standar Perda DIY No. 7 Tahun 2016 tentang Baku Mutu Air Limbah. Berdasarkan permasalahan di atas, peneliti tertarik untuk mengolah limbah cair tempe dengan sedimentasi dan fitoremediasi tanaman kayu apu.
Tujuan : Mengetahui efektivitas sedimentasi dan fitoremediasi tanaman kayu apu dalam memperbaiki kualitas limbah cair industri tempe di Karang Nongko, Panggungharjo, Sewon, Bantul.
Metode : Jenis penelitian ini adalah *true experiment* dengan desain penelitian "*Pretest Posttest with Control Group*". Penelitian ini terdiri dari kelompok kontrol dan perlakuan. Data hasil penelitian akan dianalisis secara deskriptif dan analitik. Objek penelitian ini adalah limbah cair industri tempe di Karang Nongko, Panggungharjo, Sewon, Bantul, dengan teknik pengambilan limbah secara *grab sampling*. Pengolahan limbah cair tempe dengan debit 300 ml/menit, dialirkan ke bak sedimentasi dengan waktu kontak 2,5 jam dan bak fitoremediasi kayu apu (2.200 gram) dengan waktu kontak 24 jam.
Hasil : Rata-rata penurunan hasil uji pada kelompok kontrol adalah BOD 2,48%, COD 8,29%, dan TSS -10,46 %. Rata-rata penurunan hasil uji pada kelompok perlakuan adalah BOD 37,81%, COD 50,23%, dan TSS 69,75%. Menurut hasil uji statistik *T-Test* Bebas *p-value* BOD 0,137 > 0,05, COD 0,015 < 0,05, dan TSS 0,119 > 0,05.
Kesimpulan : Pengolahan sedimentasi dan fitoremediasi tanaman kayu apu belum efektif dalam memperbaiki kualitas limbah cair tempe dengan penurunan kadar BOD sebesar 35,33%, COD sebesar 41,94%, dan TSS sebesar 80,21%.

Kata Kunci : Sedimentasi, Fitoremediasi, BOD, COD, TSS

EFFECTIVENESS OF TEMPE WASTEWATER TREATMENT WITH SEDIMENTATION AND PHYTOREMEDIATION OF KAYU APU (*PISTIA STRATIOTES* L.) IN REDUCING BOD COD AND TSS

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ABSTRACT

Background : Tempe wastewater has the characteristic of containing high organic materials so that if it is discharged directly into the waters will cause environmental pollution. Based on the preliminary survey to the tempe industry in Karang Nongko, Panggungharjo, Sewon, Bantul, tempe wastewater discharged directly into the river contains BOD 686,8 mg/L, COD 15.760 mg/L, dan TSS 438 mg/L. These parameters has not fulfilled standard of Regional Regulation of Yogyakarta Special Region Number 7 in the year 2016 about Wastewater Quality Standard. Based on the problems above, researchers are interested in treating tempe wastewater by sedimentation and phytoremediation kayu apu.
Purpose : Knowing the effectiveness of sedimentation and phytoremediation kayu apu in improving the quality wastewater of the tempe industry in Karang Nongko, Panggungharjo, Sewon, Bantul.
Methode : : This type of research is a true experiment with the research design "Pretest Posttest with Control Group". This research consisted of control and treatment groups. The research data will be analyzed descriptively and analytically. The object of this research is the wastewater of the tempe industry in Karang Nongko, Panggungharjo, Sewon, Bantul, with a grab sampling as the technique for taking the waste. Tempe wastewater treatment with the flow is 300 ml/minute, flowed into a sedimentation tank with the detention time of 2,5 hours dan a phytoremediation tank of kayu apu (2.200 grams) with the detention time of 24 hours.
Result : The average decrease test results in the control group are BOD 2.48%, COD 8.29%, and TSS -10.46 %. The average decrease test results in the treatment group are BOD 37.81%, COD 50.23%, and TSS 69.75%. According to the result of the Independent Sample Test statistical test the p-value of BOD 0.137 > 0.05, COD 0.015 < 0,05, dan TSS 0.119 > 0.05.
Conclusion : Sedimentation and phytoremediation of kayu apu treatment have not been effective in improving the quality of tempe wastewater with a decrease in BOD level of 35.33%, COD by 41.94%, and TSS by 80.21%.

Keywords : Sedimentation, Phytoremediation, BOD, COD, TSS