

RINGKASAN

Limbah cair dari kantin mahasiswa Fakultas Sains dan Teknologi Universitas Jambi merupakan salah satu jenis limbah cair domestik yang dapat menyebabkan pencemaran. Zat pencemar yang biasanya terdapat dalam air limbah kantin mencakup minyak dan lemak, deterjen, bakteri patogen, serta bahan padatan organik dan anorganik (Ni'am, 2020). Tujuan penelitian ini adalah yang pertama mengetahui nilai konsentrasi parameter COD serta minyak dan lemak limbah cair kantin Fakultas Sains dan Teknologi Universitas Jambi sebelum dan sesudah pengolahan limbah cair kantin. Kedua untuk menganalisis efektivitas zeolit dan tanaman eceng gondok (*Eichhornia crassipes*) terhadap penurunan konsentrasi parameter COD serta minyak dan lemak limbah cair kantin Fakultas Sains dan Teknologi Universitas Jambi.

Sebelum memulai penelitian, persiapan alat dan bahan serta merancang alat penelitian. Selanjutnya, eceng gondok (*Eichhornia crassipes*) diaklimatisasi selama 7 hari. Setelah itu, dilakukan pengolahan limbah cair dari kantin Fakultas Sains dan Teknologi Universitas Jambi. Limbah cair kantin dimasukkan ke dalam *styrofoam box*. Pada *styrofoam box* pertama, limbah cair 5 liter dicampur dengan 2 kg zeolit sebagai media filter. Limbah cair ini didiamkan selama 45 menit sebelum disaring dan dipindahkan ke botol plastik. Pengolahan yang sama diterapkan pada *styrofoam box* kedua. Kemudian, limbah cair melalui tahap proses biologi selama 15 hari dengan variasi waktu 5, 10, dan 15 hari. Tahap akhir, analisis sampel di laboratorium PT. Jambi Lestari Internasional (JLI).

Setelah dilakukan pengolahan limbah cair Fakultas Sains dan Teknologi Universitas Jambi. Penelitian ini menunjukkan bahwa sebelum pengolahan, limbah cair kantin memiliki nilai COD sebesar 22.357,28 mg/L dan kadar minyak sebesar 5.576,12 mg/L. Setelah diolah menggunakan zeolit nilai COD menurun menjadi 2.831,325 mg/L serta minyak dan lemak sebesar 17,92 mg/L. Pengolahan dengan kombinasi zeolit dan eceng gondok (*Eichhornia crassipes*) selama 5 hari, 10 hari dan 15 hari berturut-turut menghasilkan nilai COD sebesar 792,25 mg/L, 307,9 mg/L, dan 666,67 mg/L serta minyak dan lemak sebesar 3,22 mg/L, 6,76 mg/L dan 13,61 mg/L. Efektivitas penggunaan dengan zeolit saja menghasilkan nilai efektivitas COD sebesar 87,34% serta minyak dan lemak sebesar 99,68%. Sementara itu, pengolahan kombinasi zeolit dan eceng gondok (*Eichhornia crassipes*) pada waktu 5 hari, 10 hari dan 15 hari berturut-turut menghasilkan nilai efektivitas penurunan kadar COD sebesar 96,46%, 98,62% dan 97,02% serta minyak dan lemak sebesar 99,94%, 99,88% dan 99,76%.

Kata kunci : Eceng Gondok (*Eichhornia crassipes*), Limbah Cair Kantin, Zeolit

SUMMARY

*Wastewater from the canteen of the Faculty of Science and Technology at Universitas Jambi is a type of domestic wastewater that can cause pollution. Pollutants commonly found in canteen wastewater include oils and fats, detergents, pathogenic bacteria, as well as organic and inorganic solid materials (Ni'am, 2020). The objectives of this research are, firstly, to determine the concentration values of COD parameters, as well as oil and fat, in the canteen wastewater of the Faculty of Science and Technology, Universitas Jambi, before and after treatment. Secondly, to analyze the effectiveness of zeolite and the water hyacinth plant (*Eichhornia crassipes*) in reducing the concentration of COD parameters, as well as oil and fat, in the canteen wastewater of the Faculty of Science and Technology, Universitas Jambi.*

*Before starting the research, the equipment and materials are prepared, and the research apparatus is designed. Next, the water hyacinth (*Eichhornia crassipes*) is acclimatized for 7 days. After that, the wastewater from the canteen of the Faculty of Science and Technology at Universitas Jambi is treated. The canteen wastewater is placed in a styrofoam box. In the first styrofoam box, 5 liters of wastewater is mixed with 2 kg of zeolite as the filter medium. This wastewater is left to stand for 45 minutes before being filtered and transferred to a plastic bottle. The same treatment is applied to the second styrofoam box. Then, the wastewater undergoes a biological process for 15 days with time variations of 5, 10, and 15 days. The final stage is the sample analysis in the laboratory of PT. Jambi Lestari Internasional (JLI).*

*After treating the wastewater from the Faculty of Science and Technology at Universitas Jambi, this study shows that before treatment, the canteen wastewater had a COD value of 22,357.28 mg/L and an oil content of 5,576.12 mg/L. After treatment using zeolite, the COD value decreased to 2,831.325 mg/L, and the oil and fat content to 17.92 mg/L. Treatment with a combination of zeolite and water hyacinth (*Eichhornia crassipes*) for 5 days, 10 days, and 15 days respectively resulted in COD values of 792.25 mg/L, 307.9 mg/L, and 666.67 mg/L, and oil and fat contents of 3.22 mg/L, 6.76 mg/L, and 13.61 mg/L. The effectiveness of using only zeolite resulted in a COD reduction effectiveness of 87.34% and oil and fat reduction of 99.68%. Meanwhile, the combined treatment of zeolite and water hyacinth (*Eichhornia crassipes*) over 5 days, 10 days, and 15 days resulted in COD reduction effectiveness of 96.46%, 98.62%, and 97.02%, and oil and fat reduction effectiveness of 99.94%, 99.88%, and 99.76%, respectively.*

Keyword : *Canteen wastewater, Water Hyacinth (*Eichhornia crassipes*), Zeolite*