ABSTRAK

Nahdya Ashiva Syam
EFEKTIVITAS PEMANFAATAN SAMPAH ORGANIK (*ECO ENZYME*) UNTUK MENURUNKAN PARAMETER pH, BOD, DAN NH_3 PADA AIR LIMBAH RSUD JOMBANG TAHUN 2025
xv + 74 halaman + 15 tabel + 13 lampiran

Pengolahan air limbah RSUD Jombang masih mengalami ketidaksesuaian baku mutu parameter air limbah seperti pH, BOD, dan NH_3. Selain itu, RSUD Jombang juga belum menerapkan teknologi tambahan yang efektif dan ramah lingkungan seperti *eco enzyme*. Penelitian ini bertujuan untuk menganalisis efektivitas *eco enzyme* untuk menurunkan kadar pH, BOD, dan NH_3 pada air limbah RSUD Jombang.

Penelitian menggunakan metode eksperimen laboratorium dengan desain *Posttest Only Control Group*. Sampel air limbah diambil dari IPAL RSUD Jombang dan diberi perlakuan *eco enzyme* dengan konsentrasi 5%, 10%, dan 15% selama 5 hari. Parameter yang diuji meliputi pH, BOD, dan NH_3. Sedangkan uji fitokimia dilakukan untuk menguji kandungan bioaktif didalamnya. Analisis data menggunakan uji *One-way ANOVA* untuk mengetahui perbedaan yang signifikan antar kelompok perlakuan *eco enzyme.*

Hasil uji fitokimia menunjukkan bahwa hasil karakterisasi secara kuantitatif menunjukkan bahwa *eco enzyme* mengandung lima kelompok senyawa bioaktif utama, yaitu flavonoid, (14,246 mg/mL), polifenol (3,648 mg/mL), asam sistrat (0,6954 g/L), asam laktat (0,05 mg/mL), dan bromelain (0,714 U/mL. Hasil menunjukkan bahwa *eco enzyme* mampu menurunkan seluruh parameter secara signifikan dengan rerata pH menurun dari 8,18 menjadi 6,00 (26,59%), BOD dari 73,63 mg/L menjadi 38,57 mg/L (47,62%), dan NH_3 dari 9,45 mg/L menjadi 2,78 mg/L (70,52%) pada konsentrasi 15%. Uji statistik menunjukkan perbedaan signifikan antar perlakuan ($p < 0,05$) dengan penurunan tertinggi pada konsentrasi 15%.

Eco enzyme terbukti efektif pada konsentrasi 15% dalam menurunkan pH, BOD, dan NH_3 air limbah rumah sakit. Disarankan dilakukan pemanfaatan *eco enzyme* dalam skala besar di rumah sakit sebagai teknologi alternatif yang ekonomis dan berkelanjutan.

Kata Kunci : *Eco enzyme*, air limbah, pH, BOD, NH_3
Daftar Pustaka : 42 (41 jurnal, 1 peraturan)

ABSTRACT

Nahdya Ashiva Syam
EFFECTIVENESS OF THE USE OF ORGANIC WASTE (ECO ENZYME) TO REDUCE THE PARAMETERS OF PH, BOD, AND NH_3 *IN WASTEWATER OF JOMBANG HOSPITAL IN 2025*
xv + 74 pages + 15 tables + 13 appendices

Wastewater treatment at RSUD Jombang still faced non-compliance with wastewater quality standards for parameters such as pH, BOD, and NH_3*. In addition, RSUD Jombang had not yet implemented additional technologies that were effective and environmentally friendly, such as eco enzymes. This study aimed to analyze the effectiveness of eco enzyme in reducing pH, BOD, and* NH_3 *levels in wastewater at RSUD Jombang.*

The research used a laboratory experiment method with a Posttest Only Control Group design. Wastewater samples were taken from the Jombang Hospital WWTP and given eco enzyme treatment with concentrations of 5%, 10%, and 15% for 5 days. The parameters tested include pH, BOD, and NH_3*. Meanwhile, phytochemical tests are carried out to test the bioactive content in it. Data analysis used the One-way ANOVA test to determine the significant differences between the eco enzyme treatment groups.*

*The results of the phytochemical test showed that the characterization results were quantitatively shown that eco enzymes contained five main groups of bioactive compounds, namely flavonoids, (14.246 mg/*mL*), polyphenols (3.648 mg/*mL*), cisstral acid (0.6954 g/L), lactic acid (0.05 mg/*mL*), and bromelain (0.714 U/*mL*). The results showed that eco enzyme was able to significantly lower all parameters with the average pH decreasing from 8.18 to 6.00 (26.59%), BOD from 73.63 mg/L to 38.57 mg/L (47.62%), and* NH_3 *from 9.45 mg/L to 2.78 mg/L (70.52%) at a concentration of 15%. Statistical tests showed significant differences between treatments (*$p < 0.05$*) with the highest decrease at 15% concentration.*

Eco enzymes have been shown to be effective at a 15% concentration in lowering the pH, BOD, and NH_3 *of hospital wastewater. It is recommended to use eco enzymes on a large scale in hospitals as an alternative technology that is economical and sustainable.*

***Keywords** : Eco enzyme, wastewater, pH, BOD,* NH_3
***Bibliography** : 42 (41 journals, 1 rule)*