

ABSTRAK

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**EFEKTIVITAS EKOENZIM SEBAGAI BIOKATALISATOR PROSES
DEGRADASI SURFAKTAN PADA AIR LIMBAH DETERJEN DI
KECAMATAN SUKAJADI KOTA BANDUNG**

Limbah domestik memberikan kontribusi sebesar 87% terhadap pencemaran air, jauh lebih besar dibandingkan dengan kontribusi limbah cair industri. Meningkatnya limbah cair domestik yang mengandung deterjen akibat aktivitas industri *laundry* di badan air akan menimbulkan tumpukan surfaktan yang menyebabkan pendangkalan air dan menghambat transfer oksigen ke dalam air. Penelitian ini bertujuan untuk menganalisis efektivitas inovasi ekoenzim dalam menurunkan kadar surfaktan di dalam air limbah deterjen pada berbagai konsentrasi. Penelitian ini merupakan penelitian eksperimen kuasi dengan rancangan penelitian *Posttest Only Control Group Design with Nonequivalent Group*. Variabel bebas yaitu ekoenzim dengan konsentrasi 0% (kontrol), 10%, 12%, dan 14%, serta variabel terikat yaitu penurunan kadar surfaktan. Berdasarkan perhitungan Federer, sampel pada penelitian ini adalah 24 liter air limbah deterjen dari *laundry* S-59 di Kecamatan Sukajadi, Kota Bandung. Pemilihan sampel menggunakan metode *purposive sampling*. Ekoenzim dibuat dengan memfermentasikan kulit buah, air, dan molase selama 90 hari. Analisis data secara univariat dan bivariat menggunakan uji *Kruskall-wallis* dan dilanjutkan dengan uji *Dunn*. Hasil penelitian menunjukkan bahwa ekoenzim berpengaruh terhadap penurunan kadar surfaktan dalam air limbah *laundry*. Konsentrasi ekoenzim 10% dapat menurunkan kadar surfaktan sebanyak 97,6%, konsentrasi ekoenzim 12% dapat menurunkan kadar surfaktan sebanyak 98,6%, dan konsentrasi ekoenzim 14% dapat menurunkan kadar surfakatan sebanyak 99,2%. Konsentrasi yang paling efektif untuk menurunkan kadar surfaktan adalah 14%. Penelitian lanjutan diperlukan untuk mengevaluasi pengaruh waktu kontak ekoenzim dengan air limbah terhadap tingkat kekeruhan air media uji.

Kata kunci: ekoenzim, surfakatan, air limbah *laundry*

ABSTRACT

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EFFECTIVENESS OF ECOENZYMES AS BIOCATALYZERS FOR SURFACTANT DEGRADATION PROCESSES IN DETERGENT WASTEWATER IN SUKAJADI DISTRICT, BANDUNG.

Domestic effluent contributes 87% to water pollution, far greater than the contribution of industrial wastewater. The increase in domestic wastewater containing detergents due to laundry industry activities in water bodies will cause a pile of surfactants that cause siltation of water and inhibit the transfer of oxygen into the water. This study aims to analyze the effectiveness of ecoenzyme innovation in reducing surfactant levels in detergent wastewater at various concentrations. This research is a quasi-experimental research with Posttest Only Control Group Design with Nonequivalent Group. The independent variable is ecoenzyme with concentrations of 0% (control), 10%, 12%, and 14%, and the dependent variable is the decrease in surfactant levels. Based on Federer's calculation, the sample in this study was 24 liters of detergent wastewater from laundry S-59 in Sukajadi District, Bandung City. The sample selection used purposive sampling method. The ecoenzyme was prepared by fractionating fruit peels, water, and molasses for 90 days. Data were analyzed univariately and bivariately using Kruskal-wallis test and continued with Dunn's test. The results showed that ecoenzyme had an effect on reducing surfactant levels in laundry wastewater. 10% concentration of ecoenzyme can reduce surfactant levels by 97.6%, 12% concentration of ecoenzyme can reduce surfactant levels by 98.6%, and 14% ecoenzyme concentration can reduce surfactant levels by 99.2%. The most effective concentration to reduce surfactant levels is 14%. Further research is needed to evaluate the effect of ecoenzyme contact time with wastewater on the turbidity level of the test media water.

Keywords: *ecoenzymes, surfactant, laundry waste water*