ABSTRAK

ANALISIS PENGOLAHAN AIR LIMBAH KEGIATAN DAPUR DI SATUAN PELAYANAN PEMENUHAN GIZI MENGGUNAKAN HIDROGEN PEROKSIDA (H_2O_2) DAN MEMBRAN MIKROFILTRASI BERDASARKAN VARIASI WAKTU KONTAK

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Abstrak

Air limbah yang dihasilkan dari kegiatan dapur Satuan Pelayanan Pemenuhan Gizi (SPPG) mengandung berbagai bahan pencemar, seperti bahan organik, deterjen, minyak, dan lemak yang dapat menimbulkan dampak terhadap lingkungan apabila tidak dilakukan pengolahan. Penelitian ini bertujuan untuk mengetahui karakteristik awal air limbah SPPG serta mengkaji efektivitas kombinasi hidrogen peroksida (H_2O_2), sinar matahari, dan membran mikrofiltrasi dalam menurunkan konsentrasi pencemar berdasarkan variasi waktu kontak 30 menit, 60 menit, dan 90 menit. Penelitian menggunakan metode eksperimen laboratorium dengan parameter pengujian meliputi pH, *Biological Oxygen Demand* (BOD), deterjen total, serta minyak dan lemak. Hasil pengujian menunjukkan bahwa air limbah sebelum pengolahan memiliki nilai pH sebesar 5,66, BOD sebesar 5792,15 mg/L, deterjen total sebesar 69,51 mg/L, serta minyak dan lemak sebesar 11,17 mg/L. Hasil pengolahan terbaik diperoleh pada waktu kontak 90 menit dengan nilai pH 5,02, BOD 1433,95 mg/L, deterjen total 13,10 mg/L, serta minyak dan lemak 7,72 mg/L. Efisiensi penyisihan tertinggi pada waktu kontak tersebut mencapai 75,2% untuk BOD, 81,1% untuk deterjen total, dan 30,88% untuk minyak dan lemak. Berdasarkan hasil tersebut, gabungan metode pengolahan mampu menurunkan konsentrasi pencemar, tetapi belum seluruh parameter memenuhi baku mutu yang ditetapkan, terutama pH, BOD, dan deterjen total.

Kata kunci: air limbah SPPG, hidrogen peroksida, sinar matahari, membran mikrofiltrasi, waktu kontak.

ABSTRACT

ANALYSIS OF KITCHEN WASTEWATER TREATMENT AT THE NUTRITION FULFILLMENT SERVICE UNIT USING HYDROGEN PEROXIDE (H_2O_2) AND MICROFILTRATION MEMBRANES BASED ON CONTACT TIME VARIATIONS

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Abstract

Kitchen wastewater generated from activities at the Nutrition Fulfillment Service Unit (SPPG) contains various pollutants, such as organic matter, detergents, oil, and grease, which may have adverse environmental impacts if left untreated. This study aimed to determine the initial characteristics of SPPG wastewater and evaluate the effectiveness of a combination of hydrogen peroxide (H_2O_2), sunlight, and microfiltration membrane treatment in reducing pollutant concentrations based on contact time variations of 30, 60, and 90 minutes. The study employed a laboratory experimental method, with the tested parameters including pH, Biochemical Oxygen Demand (BOD), total detergent, and oil and grease. The test results showed that the untreated wastewater had a pH value of 5.66, BOD of 5,792.15 mg/L, total detergent of 69.51 mg/L, and oil and grease of 11.17 mg/L. The optimal treatment results were obtained at a contact time of 90 minutes, with a pH value of 5.02, BOD of 1,433.95 mg/L, total detergent of 13.10 mg/L, and oil and grease of 7.72 mg/L. The highest removal efficiencies at this contact time reached 75.2% for BOD, 81.1% for total detergent, and 30.88% for oil and grease. Based on these results, the combined treatment method was able to reduce pollutant concentrations; however, not all parameters met the applicable wastewater quality standards, particularly pH, BOD, and total detergent.

Keywords: SPPG wastewater, hydrogen peroxide, sunlight, microfiltration membrane, contact time.