

ABSTRAK

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PERBEDAAN LAMA AERASI MENGGUNAKAN AQUARIUM AIR PUMP TERHADAP PENURUNAN KADAR BOD PADA LIMBAH CAIR DI INDUSTRI BATIK

xv + 92 halaman + 12 tabel + 8 lampiran

Limbah cair industri batik menjadi permasalahan lingkungan akibat tingginya kadar BOD (*Biochemical Oxygen Demand*) dalam limbah cair di industri batik. Peningkatan kadar BOD menyebabkan *algaebloom*, yaitu peningkatan kadar nutrisi yang memicu pertumbuhan alga secara berlebihan. Aerasi adalah salah satu metode yang bisa menurunkan kadar BOD. Penelitian bertujuan mengetahui perbedaan lama aerasi menggunakan aquarium air pump terhadap penurunan BOD pada limbah cair di industri batik.

Jenis penelitian ini adalah pra-eksperimen yang menggunakan desain *pretest* dan *posttest*. Dalam penelitian kali ini melakukan penurunan BOD menggunakan aquarium air pump dengan lama waktu yang berbeda, yaitu 0 jam (sebelum perlakuan), 16 jam, 20 jam dan 24 jam. Sampel diambil secara grab sampling dan diperiksa kadar BOD-nya di laboratorium. Analisis data memakai uji *friedman* dan *pairwise comparisons*.

Hasil menyebutkan bahwa setelah aerasi 24 jam didapatkan nilai BOD sebesar 46,22 mg/l yang memenuhi baku mutu, dan penurunan sebesar 77,08%. Hasil uji *friedman* didapatkan nilai *p-value* 0,000 yang artinya ada beda. Hasil uji *pairwise comparisons* yang menunjukkan bahwa setelah perlakuan aerasi 16 jam dan 20 jam memiliki nilai *p-value* lebih besar dari 0,05 sehingga tidak ada beda, untuk perlakuan yang lainnya mempunyai nilai *p-value* di bawah 0,05 yang artinya ada beda. Perlu penelitian lanjutan tentang penurunan kadar COD.

Kata kunci : BOD, limbah cair, industri batik, aerasi, air pump

Daftar bacaan : 28 referensi (2020–2024)

ABSTRACT

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THE DIFFERENCE IN AERATION TIME USING AN AQUARIUM AIR PUMP ON THE REDUCTION OF BOD LEVELS IN LIQUID WASTE IN THE BATIK INDUSTRY

xv + 92 pages + 12 tables + 8 attachments

Batik industry wastewater poses an environmental problem due to its high Biochemical Oxygen Demand (BOD) levels. Elevated BOD levels can lead to algal blooms, which occur when increased nutrient concentrations trigger excessive algal growth. Aeration is one method that can reduce BOD levels. This study aimed to determine the effect of different aeration durations using an aquarium air pump on the reduction of BOD in batik industry wastewater.

This research was a pre-experimental study with a pretest–posttest design. BOD reduction was carried out using an aquarium air pump with varying durations: 0 hours (before treatment), 16 hours, 20 hours, and 24 hours. Samples were collected using grab sampling and analyzed for BOD concentration in the laboratory. Data were analyzed using the Friedman test and pairwise comparisons.

The results showed that after 24 hours of aeration, the BOD value was 46.22 mg/L, meeting the quality standard, with a 77.08% reduction. The Friedman test yielded a p-value of 0.000, indicating a significant difference. Pairwise comparison results showed that 16-hour and 20-hour aeration treatments had p-values greater than 0.05, indicating no significant difference, whereas other treatment comparisons had p-values below 0.05, indicating a significant difference. Further research is needed to investigate the reduction of Chemical Oxygen Demand (COD) levels.

Keywords : aeration, BOD, wastewater, batik industry

References : 28 sources (2020–2024)