

DEVA KURNANING NPM 180351100072. Kemampuan *Effective Microorganism-4* (EM4) Dalam Penurunan Kadar BOD dan COD Limbah Cair Industri Tahu dibawah Bimbingan Dr. Haryo Triajie, S.Pi., M.Si

ABSTRAK

Limbah industri tahu terbagi menjadi dua bentuk, yaitu limbah padat dan limbah cair yang memiliki potensi untuk mencemari lingkungan perairan. Karakteristik limbah cair tahu memiliki kandungan zat organik sehingga kadar *Biological Oxygen Demand* (BOD) dan *Chemical Oxygen Demand* (COD) tinggi. Salah satu cara untuk menurunkan kadar bahan pencemar yaitu dengan menggunakan *Effective Microorganism-4* (EM4). Metode dalam penelitian ini menggunakan Rancangan Acak Lengkap (RAL) dengan 4 perlakuan dan 3 pengulangan. Lokasi pengambilan sampel berada di Industri Tahu X Kecamatan Kamal, Kabupaten Bangkalan, Madura dan tempat penelitian dilaksanakan di Laboratorium Universitas Trunojoyo Madura. Penelitian diawali dengan melakukan fermentasi selama 7 hari kemudian uji bioremediasi selama 15 hari serta melakukan pengukuran pada hari ke-0 (kontrol), hari ke-5, hari ke-10, dan hari ke-15 hari setelah masa fermentasi. Hasil penelitian menunjukkan bahwa penurunan kadar BOD tertinggi pada perlakuan EM4 (10%) yaitu 346,67 mg/L dengan persentase penurunan sebesar 86,67% dan penurunan kadar COD tertinggi pada perlakuan EM4 (10%) sebesar 673,83 mg/L dengan persentase penurunan sebesar 74,69%. Pengolahan limbah cair industri tahu dengan penambahan konsentrasi EM4 yang berbeda-beda belum mampu menurunkan kadar BOD dan COD hingga memenuhi baku mutu yang telah ditetapkan oleh Peraturan Menteri Lingkungan Hidup Nomor 5 Tahun 2014 Tentang Baku Mutu Bagi Usaha dan/atau Kegiatan Pengolahan Kedelai.

Kata Kunci: Limbah cair industri tahu, *Biological Oxygen Demand* (BOD), *Chemical Oxygen Demand* (COD), *Effective Microorganism-4* (EM4)

DEVA KURNANING NPM 180351100072. Ability of *Effective Microorganism-4* (EM4) in Reducing BOD and COD Levels of Tofu Industrial Liquid Waste Under the Guidance Dr. Haryo Triajie, S.Pi., M.Si

ABSTRACT

Waste industry is divided into two forms, namely solid waste and liquid waste which have potential for the aquatic environment. The characteristics of tofu liquid waste contain organic substances to increase the *Biological Oxygen Demand* (BOD) and *Chemical Oxygen Demand* (COD). One way to reduce pollutant levels is to use *Effective Microorganism-4* (EM4). The method in this study used a completely randomized design (CRD) with 4 treatments and 3 treatments. The sampling location was in the Tofu Industry X, Kamal District, Bangkalan Regency, Madura, and where the research was carried out at the Trunojoyo University Laboratory, Madura. The study was started by doing fermentation for 7 days then bioremediation test for 15 days and taking measurements on day 0 (control), day 5, day 10, and day 15 after then fermentation period. The result showed that the highest decrease in BOD levels in EM4 treatment (10%) was 346,67 mg/L with percentage decrease of 86,67% and the highest decrease in COD levels in EM4 treatment (10%) was 673,83 mg/L with percentage decrease of 74,69%. Tofu industrial wastewater treatment with different concentrations of EM4 has not been able to reduce the levels of BOD and COD to meet the standards set by the Regulation of the Minister of the Environment Number 5 of 2014 concerning Quality Standards for Soybean Processing Businesses and/or Activities.

Keywords: Tofu industrial wastewater, *Biological Oxygen Demand* (BOD), *Chemical Oxygen Demand* (COD), *Effective Microorganism-4* (EM4)