

## ABSTRAK

Aktivitas industri yang melibatkan silika di kawasan PIER menghasilkan limbah berbahaya, termasuk logam berat Pb yang beracun, yang dapat berdampak buruk terhadap lingkungan dan organisme hidup. Organisme yang mampu menahan dan menyimpan Pb adalah mikroba. Tujuan dari penelitian ini adalah untuk mengetahui spesies bakteri (X) yang diperoleh dari limbah pabrik PIER yang berpotensi menjadi agen bioremediasi kadar Pb air limbah. Untuk mencapai hal ini, desain penelitian deskriptif kualitatif dievaluasi menggunakan metode eksperimental yang sah. Dari kawasan PIER di kabupaten Pasuruan diperoleh sampel dari limbah pabrik silika. Sampel diambil hanya pada satu titik yaitu saluran pembuangan pabrik silika. Mengamati karakteristik bakteri secara makroskopis dan mikroskopis, serta menguji kemampuannya dalam melawan dan menurunkan kadar Pb merupakan parameter yang diukur. Kawasan PIER Kabupaten Pasuruan menjadi lokasi penelitian. Dua isolat bakteri dikumpulkan dari limbah pabrik silika, dan menunjukkan resistensi terhadap kadar Pb yang berbeda. Untuk uji ketahanan digunakan konsentrasi 0, 15, 30, dan 45 ppm. Uji reduksi Pb menggunakan konsentrasi 30 ppm dan diulang sebanyak tiga kali. Spektrofotometri Serapan Atom (AAS) digunakan untuk analisis kadar Pb, dan data disajikan secara deskriptif. Hasil penelitian menunjukkan bahwa kedua isolat bakteri tersebut mempunyai kemampuan dalam menurunkan kadar Pb. P1T1 (*Bacillus Subtilis*) dan P2T2 (*Bacillus Subtilis*) terbukti menurunkan kadar Pb sebesar 22,7%.

**Kata kunci : Bakteri X, Timbal (Pb), PIER.**

## **ABSTRACT**

Industrial activities involving silica in the PIER area produce hazardous waste, including the toxic heavy metal Pb, which can have a negative impact on the environment and living organisms. Organisms that are able to hold and store Pb are microbes. The purpose of this study was to determine the bacterial species (X) obtained from PIER factory waste which has the potential to be a bioremediation agent in wastewater Pb levels. To achieve this, a qualitative descriptive research design is evaluated using valid experimental methods. From the PIER area in Pasuruan district, samples were obtained from silica factory waste. Samples were taken only at one point, namely the silica factory sewer. Observing the characteristics of bacteria macroscopically and microscopically, as well as testing their ability to fight and reduce Pb levels were the parameters that were measured. The PIER area of Pasuruan Regency is the research location. Two bacterial isolates were collected from silica factory waste, and showed resistance to different levels of Pb. For the resistance test used concentrations of 0, 15, 30, and 45 ppm. The Pb reduction test used a concentration of 30 ppm and was repeated three times. Atomic Absorption Spectrophotometry (AAS) was used to analyze Pb content, and the data was presented descriptively. The results showed that the two bacterial isolates had the ability to reduce Pb levels. P1T1 (*Bacillus Subtilis*) and P2T2 (*Bacillus Subtilis*) were shown to reduce Pb levels by 22.7%.

**Keyword : Bacteria X, Lead (Pb), PIER**

