

## Intisari

Tembaga termasuk logam berat yang mudah ditemukan di lingkungan akibat berbagai aktivitas alami maupun antropogenik seperti pertambangan bahkan industri yang berpotensi mencemari lingkungan dan menjadi ancaman serius terhadap kelangsungan makhluk hidup. Pencemaran tembaga diatasi dengan memanfaatkan mikroorganisme dalam bioremediasi logam berat di lingkungan. *Bacillus cereus* dan *Pseudomonas aeruginosa* diketahui mampu menurunkan konsentrasi tembaga dengan pembentukan biofilm. *B. cereus* dan *P. aeruginosa* digunakan untuk menurunkan konsentrasi tembaga dengan menumbuhkan bakteri dalam medium cair Luria-Bertani (LB) ditambah dengan zat besi ( $\text{FeCl}_3$  100  $\mu\text{M}$ ) dan  $\text{CuSO}_4$  pada konsentrasi 300 mg/L dan 1000 mg/L. Penelitian ini menunjukkan bahwa penambahan zat besi mampu meningkatkan pembentukan biofilm dibandingkan dengan perlakuan tanpa penambahan zat besi. Analisis penurunan konsentrasi tembaga tertinggi setelah 24 jam diperoleh pada *P. aeruginosa* sebesar 24,9% sedangkan *B. cereus* sebesar 23,8%.

**Kata kunci:** *Bacillus cereus*, biofilm, bioremediasi, biosorpsi, *Pseudomonas aeruginosa*, tembaga, zat besi

### *Abstract*

Copper is a heavy metal widely found in the environment as a result of natural as well as anthropogenic activities, such as mining industry. The environmental contamination with copper has become a serious health concern and environmental damage. It has been widely known that environmental contamination may be alleviated by employing microorganisms, such as bacteria, that have the ability to remediate the environmental damage. *Bacillus cereus* and *Pseudomonas aeruginosa* are known to have the capability in lowering copper concentration by the formation of biofilm. In this work, *Bacillus cereus* and *Pseudomonas aeruginosa* were employed to lower copper concentration in liquid medium by cultivating the bacteria in Luria-Bertani broth medium supplemented with FeCl<sub>3</sub> at 100μM, and CuSO<sub>4</sub> at 300mg/L or 1000mg/L. The results of this study demonstrated that the addition of FeCl<sub>3</sub> increased biofilm formation followed by lowering concentration of copper, as compared to the absence of FeCl<sub>3</sub> in the medium. After 24 hours of incubation, it was found that *Pseudomonas aeruginosa* and *Bacillus cereus* were capable of lowering copper concentration by 24.9%, and 23.8%, respectively.

**Key words:** *Bacillus cereus*, biofilm, bioremediation, copper, iron, *Pseudomonas aeruginosa*