

## **BIOREMEDIASI LOGAM BERAT KADMIUM (Cd) OLEH BAKTERI DARI PESISIR PANTAI SELATAN KULON PROGO**

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### **INTISARI**

Ekosistem mangrove rentan mengalami pencemaran karena lokasinya yang berada di perbatasan sungai dengan laut. Kadmium salah satu logam berat yang bersifat toksik. Bioremediasi merupakan proses mengurangi atau menghilangkan toksik logam berat dengan memanfaatkan organisme seperti bakteri. Oleh karena itu, penelitian ini bertujuan untuk isolasi dan skrining bakteri resisten logam berat kadmium, mengetahui pertumbuhan dan kemampuan mengurangi kadar logam kadmium, serta mengidentifikasi bakteri resisten kadmium terpilih berdasarkan karakter fenotipik. Sampel diambil dari sedimen sekitar perakaran mangrove di Kulon Progo. Pengujian sampel dilaksanakan di Laboratorium Mikrobiologi, Fakultas Biologi Universitas Gadjah Mada. Bakteri diisolasi menggunakan media *marine broth* (MB). Isolat bakteri diukur pertumbuhannya, kemampuan menurunkan logam serta diidentifikasi berdasarkan karakter fenotip. Terdapat tiga isolat bakteri dimana dua diantaranya isolate A dan B merupakan anggota *Pseudomonas*, sedangkan isolate C termasuk *Staphylococcus*. Laju peretumbuhan tertinggi dimiliki isolat C, yaitu 0.1298 generasi/jam, isolat B 0.0726 generasi/jam, dan isolat A 0.0091 generasi/jam. Efisiensi pengurangan konsentrasi kadmium 30 ppm oleh isolat A dan C sebesar 47.73% serta 47.17% untuk isolat B. Resistensi terhadap kadmium diatur oleh gen *czcA* dan kemampuan adsorbs oleh bakteri.

Kata kunci: *bakteri, bioremediasi, kadmium (Cd), mangrove*

## **BIOREMEDIATION OF HEAVY METAL CADMIUM (Cd) BY BACTERIA FROM THE SOUTH COAST OF KULON PROGO**

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### **ABSTRACT**

The mangrove ecosystem is vulnerable to pollution because of its location on the border of the river and the sea. Cadmium is a toxic heavy metal. Bioremediation is process of reducing or eliminating toxic heavy metals by utilizing organisms such as bacteria. Therefore, this study aims to isolate and screen bacteria resistant to the heavy metal cadmium, determine their growth and ability to reduce cadmium metal levels, and identify selected cadmium resistant bacteria based on phenotypic characters. Samples were taken from sediment around mangrove roots in Kulon Progo. Sample testing was carried out at the Microbiology Laboratory, Faculty of Biology, Gadjah Mada University. Bacteria were isolated using marine broth (MB) media. Bacterial isolates were measured for growth, ability to degrade metals and identified based on phenotypic characteristics. There were three bacterial isolates, two of which isolates A and B were members of *Pseudomonas*, while isolate C belonged to *Staphylococcus*. The highest growth rate was owned by isolate C, namely 0.1298 generations/hour, isolate B 0.0726 generations/hour, and isolate A 0.0091 generations/hour. The efficiency of reducing cadmium concentrations of 30 ppm by isolates A and C ppm was 47.73% and 47.17% for isolate B. Resistance to cadmium is regulated by the *czcA* gene and the ability to adsorb by bacteria.

Key words: *bacteria, bioremediation, cadmium (Cd), mangrove*