

Intisari

Bioremediasi limbah mengandung kromium di perairan menggunakan tanaman air dengan laju pertumbuhan tinggi sangat diperlukan. *Lemna perpusilla* memiliki kemampuan mengakumulasi logam kromium. Kemampuan tersebut didukung oleh adanya bakteri endofit yang berasosiasi di dalam jaringan tanaman. Penelitian ini bertujuan untuk mendapatkan dan mengidentifikasi bakteri endofit tanaman *Lemna perpusilla* yang resisten terhadap kromium heksavalen (Cr⁶⁺). Bakteri endofit tanaman *Lemna perpusilla* diisolasi dengan metode cawan sebar dalam medium *Tryptic Soy Agar* (TSA). Isolat-isolat diseleksi pada medium minimal agar, kemudian keragaman bakteri dianalisis dengan metode *Amplified Ribosomal DNA Restriction Analysis* (ARDRA) menggunakan enzim restriksi *HaeIII* dan *AluI*. Isolat bakteri kemudian diuji resistensi terhadap Cr⁶⁺ dalam medium minimal yang ditambah K₂Cr₂O₇ konsentrasi 0, 20, 40, 60, dan 80 ppm. Isolat bakteri endofit terpilih diidentifikasi molekuler berdasarkan urutan basa gen penyandi 16S rRNA dan dikarakterisasi secara fisiologis dengan pengujian biokimia. Dari hasil penelitian ini, diperoleh 33 isolat bakteri dan 16 diantaranya mampu tumbuh di medium minimal. Berdasarkan pola pemotongan ARDRA diperoleh 3 pola pemotongan. Sebanyak 4 isolat bakteri yang resisten terhadap Cr⁶⁺ diidentifikasi molekuler dan uji biokimia. Melalui identifikasi molekuler LP 2 dan LP 3 teridentifikasi sebagai *Acinetobacter baumannii* dan LP 4 dan LP 12 sebagai *Peribacillus simplex*.

Kata kunci: bakteri endofit, identifikasi, kromium, *Lemna perpusilla*

Abstract

Bioremediation of waste containing chromium in waters using aquatic plants with high growth rates is needed. *Lemna perpusilla* can accumulate chromium metal. This ability is supported by the presence of associated endophytic bacteria in plant tissues. This study aimed to obtain and identify endophytic bacteria of *Lemna perpusilla* plant that were resistant to hexavalent chromium (Cr⁶⁺). The endophytic bacteria of *Lemna perpusilla* plant were isolated by spread plate method in Tryptic Soy Agar (TSA) medium. The isolates were selected on a minimal agar medium, then bacterial diversity was analyzed using the Amplified Ribosomal DNA Restriction Analysis (ARDRA) method using restriction enzymes *Hae*III and *Alu*I. The bacterial isolates were then tested for resistance to Cr⁶⁺ in minimal medium added with K₂Cr₂O₇ concentrations of 0, 20, 40, 60, and 80 ppm. Selected endophytic bacterial isolates were identified molecularly based on the base sequence of the 16S rRNA gene and physiologically characterized by biochemical testing. From the results of this study, 33 bacterial isolates were obtained and 16 of them were able to grow in minimal medium. Based on the ARDRA cutting pattern, 3 cutting patterns were obtained. A total of 4 bacterial isolates that were resistant to Cr⁶⁺ were identified by molecular and biochemical tests. Through molecular identification, isolates LP 2 and LP .3 were identified as *Acinetobacter baumannii* and isolates LP 4 and LP 12 as *Peribacillus simplex*.

Keywords: chromium, endophytic bacteria, identification, *Lemna perpusilla*