

ABSTRAK

Penggunaan pupuk dan pestisida sintetik berkontribusi terhadap cemaran residu logam berat kadmium. Bakteri tertentu resisten cekaman kadmium dan berpotensi untuk remediasi lahan tercemar. Penelitian ini bertujuan untuk (1) mengisolasi bakteri area rizosfer tanaman bawang merah kabupaten Brebes yang resisten cemaran kadmium, (2) mengetahui karakteristik morfologi dan biokimia isolat bakteri, dan (3) mengidentifikasi genus isolat bakteri. Penelitian dilaksanakan pada bulan November 2019 sampai dengan Mei 2020 di Laboratorium Agroekologi dan Laboratorium Agronomi dan Hortikultura Fakultas Pertanian, Universitas Jenderal Soedirman. Tahapan penelitian yang dilakukan meliputi isolasi, karakterisasi morfologi, uji biokimia, dan identifikasi bakteri. Isolasi bakteri dilakukan pada 5 sampel tanah yang berasal dari Desa Buara, Desa Cikeuseul Kidul, Desa Cikeuseul Lor, Desa Ciseureuh, dan Desa Sindangjaya Kecamatan Ketanggungan, Kabupaten Brebes. Karakterisasi morfologi meliputi identifikasi morfologi koloni bakteri, pewarnaan Gram, dan pewarnaan spora. Uji biokimia meliputi uji oksidase, katalase, motilitas, fermentasi karbohidrat, fermentasi manitol, sitrat, MR-VP, O/F, hidrolisis pati, dan fiksasi N. Identifikasi bakteri dilakukan berdasarkan buku *Bergey's Manual of Determinative Bacteriology*. Isolat yang resisten cemaran kadmium meliputi BR₂, CK₂, CL₃, SJ₃, dan CR₁. Seluruh isolat memiliki warna koloni putih, bentuk bulat, dan tidak menghasilkan pigmen, Gram positif, memiliki spora, dan berbentuk batang. Uji biokimia menunjukkan bahwa seluruh isolat bereaksi positif terhadap uji oksidase, katalase, motilitas, fermentasi karbohidrat, fermentasi manitol, sitrat, dan O/F, dan hanya isolat SJ₃ bereaksi positif terhadap uji hidrolisis pati. Hasil identifikasi bakteri menunjukkan bahwa isolat BR₂, CK₂, CL₃, dan CR₁ adalah *Bacillus marinus*, sedangkan isolat SJ₃ adalah *Bacillus megaterium*.

Kata kunci: isolasi, identifikasi bakteri, resisten, kadmium

ABSTRACT

The use of synthetic fertilizers and pesticides has been contributing to cadmium pollutant in soil. Several bacteria are resistances to cadmium and potentially helping to remediated polluted soil. This study aims to (1) isolate bacteria of rhizosfer area from Brebes Regency which resistance to cadmium contamination, (2) determine the morphological and biochemical characteristics of isolates, and (3) identify the genus of isolate bacteria. The research was conducted in November 2019 until May 2020 in the Agroecology Laboratory and the Agronomy and Horticulture Laboratory of Faculty of Agriculture, Jenderal Soedirman University. The research conducted including isolation, morphological characterization, biochemical tests, and bacterial identification. Bacterial isolation was carried out on 5 soil samples taken from Buara Village, Cikeuseul Kidul Village, Cikeuseul Lor Village, Ciseureuh Village, and Sindangjaya Village Ketanggungan District, Brebes Regency. Morphological characterization including bacterial colony morphology, Gram staining, and spore staining. Biochemical test including oxidase, catalase, motility, carbohydrate fermentation, mannitol fermentation, citrate, MR-VP, O / F, starch hydrolysis, and N. fixation. Identification of bacteria is carried out using Bergey's Manual of Determinative Bacteriology. Isolates found from samples including BR₂, CK₂, CL₃, SJ₃, and CR₁. All isolates were white, round, and did not produce pigments, were Gram positive, had spores, and were rod-shaped. Biochemical tests showed all isolates are positive for oxidase, catalase, motility, carbohydrate fermentation, mannitol, citrate, and O / F and only SJ₃ isolates were positive for starch hydrolysis tests. The results obtained by bacteria showed that isolates BR₂, CK₂, CL₃, and CR₁ were *Bacillus marinus*, while isolates SJ₃ were *Bacillus megaterium*.

Keyword: isolation, bacteria identification, resistance, cadmium