Sequential isolation of saturated, aromatic, resinic, and asphaltic fractions degrading bacteria from oil contaminated soil in South Sumatera = Isolasi bertahap bakteri pendegradasi fraksi jenuh, aromatik, resin, dan aspal dari tanah terkontaminasi minyak di Sumatera Selatan

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Abstrak

Penelitian isolasi bertahap telah dilakukan untuk mendapatkan bakteri pendegradasi fraksi jenuh, aromatik, resin, dan aspal. Isolasi dilakukan terhadap lima sampel tanah terkontaminasi minyak dari Sumatera Selatan. Medium isolasi menggunakan soil extract diperkaya oil recovery atau oil recovery sisa degradasi (OSD) sebagai satu-satunya sumber karbon dan energi sesuai tahapan isolasi. OSD setiap akhir tahap isolasi difraksinasi menggunakan analisis SARA untuk mengetahui fraksi jenuh, aromatik, resin dan aspal. Hasil penelitian mendapatkan enam isolat bakteri terpilih berdasarkan kecepatan degradasi tertinggi pada setiap tahap, satu isolat bakteri pendegradasi fraksi jenuh yaitu Mycobacterium sp. T1H2D4-7 dengan laju degradasi 0,0199 mg/jam dan kepadatan 8,4x10 6cfu/g dari tahap I. Isolat T2H1D2-4 teridentifikasi sebagai Pseudomonas sp. merupakan bakteri pendegradasi fraksi aromatik dengan laju degradasi 0,0141 mg/jam dan kepadatan 5,1x10 6cfu/g diperoleh pada tahap II. Dua isolat yaitu Micrococcus sp. T3H2D4-2 dan Pseudomonas sp. T1H1D5-5 merupakan bakteri pendegradasi fraksi resin yang masing-masing mempunyai laju degradasi 0,0088 mg/jam dengan kepadatan 5,6x10 6cfu/g, dan 0,0089 mg/jam dengan kepadatan 5,7x10 6cfu/g diperoleh dari tahap III. Isolasi tahap IV diperoleh dua isolat yaitu Pseudomonas sp. T4H1D3-1 dan Pseudomonas sp. T4H3D5-4 yang merupakan bakteri pendegradasi fraksi aspal, masing-masing mempunyai kecepatan degradasi 0,0057 mg /jam dengan kerapatan 5,6x10 6cfu/g, dan 0,0058 mg/jam dengan kerapatan 5,7x10 6cfu/g.

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Sequential isolation has been conducted to obtain isolates of saturated, aromatic, resin, and asphaltene fractions degrading bacteria from oil contaminated sites. Five soil samples were collected from South Sumatera. These bacterial isolates were obtained using soil extract medium enriched with oil recovery or remaining-oil recovery degradated (ROD) as sole carbon and energy sources according to the isolation stage as the isolation medium. ROD at the end of every isolation stage analyzed oil fractions by use of the SARA analysis method. Six isolates of bacteria have been selected, one isolate was fraction satu rates degrading bacteria that are Mycobacterium sp. T1H2D4-7 at degradation rate 0.0199 mgs/h with density 8.4x10 6cfu/g from stage I. The isolate T2H1D2-4, identified as Pseudomonas sp. was fraction aromatics degrading bacteria at accelerate 0.0141 mgs/h with density 5.1x10 6cfu/g are obtained at stage II. Two isolates namely Micrococcus sp. T3H2D4-2 and Pseudomonas sp. T1H1D5-5 were fraction resins degrading bacteria by accelerate 0.00 88 mgs/h at density 5.6x10 6cfu/g and 0.0089 mgs/h at density 5.7x10 6 cfu/g are obtained at stage III. Isolation of stage IV has been obtained two isolates Pseudomonas sp. T4H1D3-1 and Pseudomonas sp. T4H3D5-4 were fraction asphaltenes degrading bacteria by accelerate 0.0057 mgs/h at density 5.6x10 6cfu/g and accelerate 0.0058 mgs/h at density 5.7x10 6cfu/g.