Isolasi dan identifikasi bakteri aktinomisetes dengan kemampuan selulolitik tinggi berdasarkan data sekuen parsial gen 16s rRNA = Isolation and identification of actinomycetes with high cellulolytic ability based on partial sequence data of 16s rRNA gene

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Abstrak

Penelitian bertujuan untuk memperoleh isolat dan identitas aktinomisetes yang memiliki kemampuan selulolitik. Isolat-isolat aktinomisetes diperoleh dari lima sampel tanah di Sulawesi Selatan. Isolasi aktinomisetes dilakukan dengan metode Dry Heat (DH), Rehydration-Centrifugation (RC), dan Sodium Dodecyl Sulphate-Yeast Extract (SDS-YE) menggunakan medium Humic Acid-Vitamins Agar (HVA). Pengujian kemampuan aktinomisetes dalam mendegradasi selulosa dilakukan dengan penapisan menggunakan medium Carboxy Methyl Cellulose (CMC), dan pengukuran aktivitas enzim selulase dilakukan dengan metode Dinitrosalicylic Acid (DNS). Lima isolat dengan kemampuan selulolitik tinggi diidentifikasi berdasarkan data sekuen parsial gen 16S rRNA. Pada penelitian ini diperoleh sebanyak 41 isolat aktinomisetes, yang terdiri dari 21 isolat (metode DH), 11 isolat (metode RC), dan 9 isolat (metode SDS-YE). Sembilan belas dari 41 isolat menunjukkan kemampuan selulolitik. Hasil identifikasi menunjukkan kelima isolat aktinomisetes berasal dari genus Streptomyces. Kemiripan sekuen masing-masing isolat terhadap spesies terdekatnya adalah 99%. Isolat DH-BRT06-1 memiliki kemiripan sekuen terhadap Streptomyces chartreusis, DH-BRT06-3 dan DH-BRT06-6 terhadap Streptomyces parvulus, RC-BR03-2 terhadap Streptomyces sp., dan SDSYE-BT01-1 terhadap Streptomyces mutabilis.
.....The aims of this research were to obtain and identify actinomycetes with cellulolytic ability. Actinomycetes isolates were obtained from five soil samples of South Sulawesi by Dry Heat (DH), Rehydration-Centrifugation (RC), and Sodium Dodecyl Sulphate-Yeast Extract (SDS-YE) methods with Humic Acid-Vitamins Agar (HVA) as medium isolation. Carboxy Methyl Cellulose (CMC) medium was used for screening the cellulose degrading ability, and cellulase activity was measured by Dinitrosalicylic Acid (DNS) method. A total of 41 isolates were obtained from soil samples, they were consisted of 21 isolates (DH method), 11 isolates (RC method), and 9 isolates (SDS-YE method). Nineteen of 41 isolates showed cellulolytic ability. Five isolates with high celluloytic activity were identified based on 16S rRNA gene partial sequence data. Identification result showed five isolates were belong to genus Streptomyces. Homology similarities sequence from each isolate to their closest species were 99%. Isolate DH-BRT06-1 showed sequence similarities to Streptomyces chartreusis, DH-BRT06-3 and DH-BRT06-6 to Streptomyces parvulus, RC-BR03-2 to Streptomyces sp., dan SDSYE-BT01-1 to Streptomyces mutabilis.