Isolasi Bakteri Penghasil Enzim Protease Pada Oncom Merah Pasca Fermentasi 72 Jam dan Identifikasi Molekuler Bakteri Berbasis Gen 16S rRNA

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ABSTRAK

Enzim protease berfungsi menghidrolisis ikatan peptida pada protein menjadi molekul lebih sederhana untuk dicerna oleh tubuh sangat dibutuhkan dalam industri pangan. Salah satu upaya untuk meningkatkan produksi enzim protease adalah dengan mencari sumber-sumber baru penghasil enzim protease, khususnya dari kelompok bakteri. Tujuan penelitian ini untuk mendapatkan isolat bakteri penghasil protease yang terdapat pada oncom pasca fermentasi 72 jam, serta untuk mengidentifikasi bakteri penghasil protease yang diperoleh berdasarkan analisis gen 16S rRNA. Proses isolasi dan purifikasi koloni bakteri dilakukan pada media *Nutrient Agar* dengan metode *spread* dan diuji produksi enzim protease menggunakan media selektif *Skim Milk Agar*. Proses identifikasi molekuler dilakukan melalui analisis sekuen fragmen gen 16S rRNA bakteri yang diamplifikasi dengan metode *Polymerase Chain Reaction* (PCR), kemudian dilanjutkan dengan sekuensing. Pada proses isolasi diperoleh satu isolat bakteri yang memiliki aktivitas proteolitik ditunjukkan adanya zona bening dengan diameter 78,00 mm. Analisis similaritas dari hasil pensejajaran sekuen dengan BLAST diketahui fragmen gen 16S rRNA strain IROD3 (*Indonesian Red Oncom Day-3*) menunjukkan kemiripan 99% dengan fragmen gen 16S rRNA isolat bakteri *Bacillus megaterium* strain CS17 (kode akses Genbank MG430224.1).

Kata kunci : Identifikasi molekuler, bakteri proteolitik, gen 16S rRNA, *Bacillus megaterium*

Isolation of Protease Enzyme Producing Bacteria on 72-H Post-Fermented Red Oncom and Bacterial Molecular Identification Based on Analysis of 16S rRNA Gene

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ABSTRACT

Protease enzyme has function to hydrolyze peptide bonds in proteins into simpler molecules to digest by the body which important to food industry. One of effort to increase the production of protease enzymes is looking for new sources of protease particularly from bacterial groups. The purpose of this study was to obtain an isolate of protease-producing bacteria found on post-fermentation oncom 72 hours, and to identify the protease-producing bacteria based on the analysis of 16S rRNA gene. Isolation and purification process of bacterial colony was carried out on Nutrient Agar medium with spread technique, production test of protease enzyme was performed using Selective Skim Milk Agar. The process of Molecular identification process was carried out through analysis of 16S rRNA gene fragment sequences which were amplified using Polymerase Chain Reaction (PCR) method, and continued by sequencing. The result of bacteria isolation was found one isolate which has proteolytic activity in Skim Milk Agar medium which has clear zone diameter of 78.00 mm. A similarity analysis based on the 16S rRNA gene sequence showed that IROD3 (*Indonesian Red Oncom Day-3*) has 99% similarity level with the 16S rRNA gene fragment of *Bacillus megaterium* strain CS17 (access code Genbank: MG430224.1).

Keywords: Molecular identification, proteolytic bacteria, 16S rRNA gene, *Bacillus megaterium*