

**ISOLASI, SKRINING, DAN KARAKTERISASI PARSIAL BAKTERI
TERMOFILIK PENGHASIL PROTEASE ALKALI DARI SUMBER AIR
PANAS SAPAN AMBAYAN SOLOK SELATAN, SUMATERA BARAT**

SKRIPSI SARJANA BIOLOGI



OLEH :

NAIYA RIMA KOMALA

NIM. 2210422015

Pembimbing:

- 1. Prof. Dr. Anthoni Agustien**
- 2. Prof. Dr. Yetti Marlida**

DEPARTEMEN BIOLOGI

FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

UNIVERSITAS ANDALAS

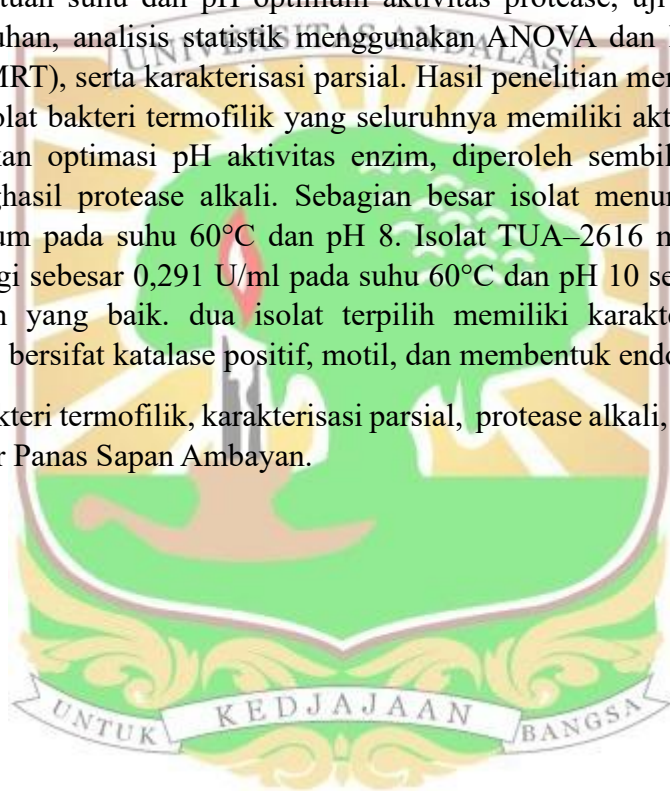
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ABSTRAK

Protease alkali merupakan enzim yang banyak dimanfaatkan dalam berbagai bidang industri dan umumnya diproduksi oleh bakteri termofilik. Sumber Air Panas Sapan Ambayan, Solok Selatan, Sumatera Barat berpotensi menjadi habitat bakteri termofilik penghasil protease alkali. Penelitian ini bertujuan memperoleh isolat bakteri termofilik penghasil protease alkali serta mengkaji aktivitas, stabilitas, dan karakterisasi parsial isolat terpilih. Penelitian menggunakan metode survei dengan teknik *purposive sampling* pada tiga titik pengambilan sampel. Tahapan penelitian meliputi isolasi, skrining, penentuan suhu dan pH optimum aktivitas protease, uji stabilitas enzim, kurva pertumbuhan, analisis statistik menggunakan ANOVA dan Duncan Multiple Range Test (DMRT), serta karakterisasi parsial. Hasil penelitian menunjukkan bahwa diperoleh 11 isolat bakteri termofilik yang seluruhnya memiliki aktivitas proteolitik. Setelah dilakukan optimasi pH aktivitas enzim, diperoleh sembilan isolat bakteri termofilik penghasil protease alkali. Sebagian besar isolat menunjukkan aktivitas protease optimum pada suhu 60°C dan pH 8. Isolat TUA-2616 memiliki aktivitas protease tertinggi sebesar 0,291 U/ml pada suhu 60°C dan pH 10 serta menunjukkan stabilitas enzim yang baik. dua isolat terpilih memiliki karakter Gram positif, berbentuk basil, bersifat katalase positif, motil, dan membentuk endospora.

Kata kunci: bakteri termofilik, karakterisasi parsial, protease alkali, skrining, Sumber Air Panas Sapan Ambayan.



ABSTRACT

Alkaline proteases are industrial enzymes widely produced by thermophilic bacteria. Sapan Ambayan Hot Springs, South Solok, West Sumatra, have the potential to serve as a habitat for alkaline protease-producing thermophilic bacteria. This study aimed to obtain thermophilic bacterial isolates producing alkaline proteases and to evaluate their enzyme activity, stability, and partial characterization. A survey method with purposive sampling was conducted at three sampling sites. The research stages included isolation, screening, determination of the optimum temperature and pH for protease activity, enzyme stability testing, growth curve analysis, statistical analysis using Analysis of Variance (ANOVA) followed by Duncan's Multiple Range Test (DMRT), and partial characterization. The results showed that 11 thermophilic bacterial isolates were obtained, all of which exhibited proteolytic activity. After optimization of enzyme activity at different pH values, nine isolates were confirmed as alkaline protease producers. Most isolates showed optimum protease activity at 60°C and pH 8. Isolate TUA-2616 exhibited the highest protease activity (0.291 U/ml) at 60°C and pH 10 and showed good enzyme stability. The two selected isolates were Gram-positive, rod-shaped, catalase-positive, motile, and endospore-forming.

Keywords: alkaline protease, partial characterization, screening, Sapan Ambayan Hot Spring, thermophilic bacteria.

