

RINGKASAN

Hutan mangrove merupakan suatu ekosistem yang memiliki keunikan dengan keragaman makhluk hidup baik makroorganisme maupun mikroorganisme. Bakteri mengurai serasah mangrove dengan menghasilkan enzim ekstraseluler pemecah makromolekul seperti selulosa, amilum, lignin, dan protein. Enzim amilase adalah enzim ekstraseluler yang menghidrolisis amilum pada daun dan kulit batang tanaman mangrove menjadi molekul glukosa sederhana. Bakteri yang mampu menghasilkan enzim amilase disebut bakteri amilolitik. Bakteri asal sedimen mangrove pantai Logending belum diketahui kemampuan amilolitiknya, sehingga penelitian ini bertujuan untuk mengetahui kemampuan isolat bakteri sedimen mangrove dalam menghasilkan enzim amilase, mengetahui pH dan suhu optimum aktivitas amilase yang dihasilkan, dan mengetahui identitas bakteri penghasil amilase.

Penelitian dilakukan dengan metode survei. Tahap penelitian meliputi, skrining bakteri amilolitik, pembuatan kurva tumbuh, produksi amilase, optimasi aktivitas amilolitik pada variasi suhu (35°C; 36°C; 37 °C; 38°C) dan pH (4,5; 5; 5,5; 6) serta karakterisasi isolat amilolitik. Parameter yang diukur yaitu indeks amilolitik, unit aktivitas enzim amilase, total unit bakteri (CFU/mL), dan identitas bakteri amilolitik asal sedimen mangrove. Analisis data dilakukan secara deskriptif.

Hasil pengukuran indeks amilolitik tertinggi ditunjukkan oleh isolat LG113 dengan nilai indeks amilolitik 9,86 mm dari 10 isolat amilolitik asal sedimen mangrove. Suhu optimum aktivitas amilase isolat LG113 asal sedimen mangrove pantai Logending adalah 37°C yaitu sebesar 2,13 U/mL dan pH optimumnya adalah 6 yaitu sebesar 2,14 U/mL. Jumlah total sel bakteri amilolitik pada akhir masa produksi adalah $1,94 \times 10^{13}$ CFU/mL. Identitas isolat bakteri amilolitik asal sedimen mangrove pantai Logending termasuk anggota genus *Bacillus*.

Kata kunci : *Amilase, Bakteri Amilolitik, pH, Sedimen Mangrove, Suhu*

SUMMARY

Mangrove forest is an ecosystem that is unique with a diversity of living organisms, both macroorganisms and microorganisms. Bacteria decompose the mangrove litter by producing extracellular enzymes that break down macromolecules such as cellulose, starch, lignin, and protein. Amylase enzyme is an extracellular enzyme that hydrolyzes starch in the leaves and bark of mangrove plants into simple glucose molecules. Bacteria that are able to produce the enzyme amylase are called amylolytic bacteria. The amylolytic ability of bacteria from the mangrove sediments of the Logending beach is not known, so this study aimed to determine the ability of isolates of mangrove sediment bacteria to produce amylase, to determine the optimum pH and temperature conditions for the amylase activity produced, and to identify the amylase-producing bacteria.

The research was conducted by survey method. The research stages included screening of amylolytic bacteria, growth curves preparation, amylase production, optimizing amylolytic activity at varies in temperature (35°C; 36°C; 37°C; 38°C) and pH (4,5; 5; 5,5; 6) and characterization of amylolytic isolates. Parameters measured were the amylolytic index, amylase enzyme activity unit, total bacterial unit (CFU/mL), and identity of amylolytic bacteria from mangrove sediments. Data analysis was done descriptively.

The results showed that the highest amylolytic index were shown by isolate LG113 with an amylolytic index value of 9,86 mm from 10 amylolytic isolates from mangrove sediments. The optimum temperature of amylase activity was 37°C which was 2,13 U/mL and the optimum pH was 6 which was 2,14 U/mL. The total number of amylolytic bacterial cells at the end of production time was $1,94 \times 10^{13}$ CFU/mL. The identity of amylolytic bacteria from mangrove sediments at the Logending coast was belong to *Bacillus* genus.

Key words : *Amylase, Amylolytic Bacteria, Mangrove Sediment, pH, Temperature*