

OPTIMASI METABOLIT SEKUNDER BAKTERI SIMBION SPONS YANG BERPOTENSI SEBAGAI ANTIBAKTERI

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ABSTRAK

Penelitian ini bertujuan untuk optimasi produk metabolit sekunder bakteri simbion spons yang diperoleh dari perairan Pandan Sibolga. Sampel yang digunakan ialah bakteri simbion spons yang diperoleh dari 3 spesies spons. Bakteri simbion spons didapatkan dengan mengisolasi bakteri keatas permukaan media *Zobell Marine Agar*. Bakteri yang telah tumbuh di karakterisasi berdasarkan karakteristik morfologi koloni (warna, bentuk, elevasi, dan tepian) serta dilakukan identifikasi gram bakteri. Dari hasil karakterisasi diperoleh 13 isolat bakteri simbion spons dengan 5 isolat berasal dari Spons 1 (S1I1,S1I2,S1I3,S1I4, dan S1I5), 4 isolat dari Spons 2 (S2I1,S2I2,S2I3, dan S2I4), dan 4 isolat dari Spons 3 (S3I1, S3I2, S3I3, S3I4). Isolat bakteri simbion spons dilakukan uji aktivitas antibakteri untuk mengetahui isolat yang berpotensi sebagai antibakteri dengan menguji pada 3 spesies bakteri uji yaitu *Staphylococcus aureus*, *Eschericia coli*, dan *Salmonella typhii*. Dari uji yang dilakukan didapatkan 9 isolat yang berpotensi sebagai antibakteri dengan 6 isolat berspektrum luas (S1I1, S1I3, S1I4, S2I1, S2I2, dan S3I2) dan 3 isolat berspektrum sempit (S1I5,S3I1, dan S3I3). Adapun zona hambat terluas terhadap bakteri *S.auerus*, *E.coli*, dan *S.typhii* didapatkan pada isolat S3I2,S2I2, dan S3I3 dengan luas zona hambat 11mm, 9mm, dan 11mm. Berdasarkan luas zona hambat dan spektrumnya, maka diperoleh 3 isolat terbaik untuk dilakukan optimasi metabolit sekunder yaitu isolat S1I3, S2I2, dan S3I2. Optimasi waktu didapatkan waktu terbaik untuk produksi metabolit sekunder masing masing isolat adalah S1I3 pada jam inkubasi ke-72 hingga ke-76, isolat S2I2 pada jam inkubasi ke-36 hingga ke-75 jam, dan isolat S3I2 pada jam inkubasi ke-73 hingga ke-76. Adapun pada optimasi media, didapatkan media NB dapat mengoptimasi pertumbuhan isolat S1I3 dan S3I2 serta media M13 mengoptimalkan produksi isolat S2I2.

Kata Kunci : Bakteri Simbion Spons, Aktivitas Antibakteri, Optimasi Metabolit Sekunder

OPTIMIZATION OF SECONDARY METABOLISM OF POTENTIAL SYMBIONTS SPONGE BACTERIA AS AN ANTIBACTERIAL

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ABSTRACT

This study aims to optimize the secondary metabolism products of symbionts sponge bacteria obtained from the Pandan Sibolga waters. The sample used was symbionts sponge bacteria obtained from 3 species of sponges. The symbionts sponge bacteria are obtained by isolating bacteria on the media surface of Zobell Marine Agar. Bacteria that have been grown are characterized based on the morphological characteristics of the colonies (color, shape, elevation, and edges) and gram identification of bacteria is carried out. From the characterization results, 13 isolates of sponge symbionts bacteria were obtained with 5 isolates from Sponge 1 (S1I1, S1I2, S1I3, S1I4, and S1I5), 4 isolates from Sponge 2 (S2I1, S2I2, S2I3, and S2I4), and 4 isolates from Sponge 3 (S3I1, S3I2, S3I3, S3I4). The antibacterial activity of sponge symbionts bacteria was tested to determine the isolates that have the potential to be antibacterial by testing the 3 species of test bacteria, namely *Staphylococcus aureus*, *Eschericia coli*, and *Salmonella typhi*. From the tests conducted, 9 isolates were potentially antibacterial with 6 broad spectrum isolates (S1I1, S1I3, S1I4, S2I1, S2I2, and S3I2) and 3 narrow spectrum isolates (S1I5, S3I1, and S3I3). The widest inhibition zones against *S.auerus*, *E. coli*, and *S. typhi* bacteria were found in S3I2, S2I2, and S3I3 isolates with an area of 11mm, 9mm and 11mm inhibitory zones. Based on the extent of the inhibitory zone and its spectrum, 3 of the best isolates were obtained to optimize secondary metabolites, namely S1I3, S2I2, and S3I2 isolates. Optimization of time obtained for the best time for secondary metabolite production of each isolate was S1I3 at the 72nd to 76th incubation hour, S2I2 isolate at 36th to 75th hour incubation hour, and S3I2 isolate at 73rd incubation hour to -76. As for media optimization, NB media can be obtained to optimize the growth of S1I3 and S3I2 isolates and M13 media to optimize the production of S2I2 isolates.

Keywords : *Symbionts Sponge Bacteria, Antibacteria Activity, Optimization of Secondary Metabolism*