

INTISARI

Ekstraksi Senyawa Antibakteri *Arthrospira platensis* dan Aplikasinya Dalam Pengendalian Mutu Udang Vaname (*Litopenaeus vannamei*) Segar selama Penyimpanan Dingin

Arthrospira platensis diketahui memiliki potensi tinggi dalam menghasilkan senyawa antimikroba, sehingga dinilai sesuai untuk dieksploitasi sebagai agen biokontrol terhadap bakteri. Penelitian dilakukan dengan dua tahapan, yang pertama yaitu proses ekstraksi dan pengujian antibakteri dari ekstrak *Arthrospira platensis* dan tahap kedua yaitu pengaplikasian ekstrak *Arthrospira platensis* sebagai bahan antibakteri dalam pengendalian mutu udang vaname segar dievaluasi dengan mengamati nilai pH, TPC, TVB-N, histamin, dan organoleptik. Hasil penelitian menunjukkan bahwa etanol merupakan pelarut yang paling efektif untuk proses ekstraksi, yaitu ekstrak etanol menunjukkan aktivitas antibakteri dengan nilai MIC terhadap *Escherichia coli* sebesar 2,5 mg/ml dan terhadap *Staphylococcus aureus* sebesar 1,25 mg/ml. Uji zona hambat memperlihatkan bahwa pada konsentrasi ekstrak 5 dan 10 mg/ml, diameter zona hambat terhadap *E. coli* masing-masing sebesar $10,33 \pm 0,15$ mm dan $11,35 \pm 0,20$ mm, sedangkan terhadap *S. aureus* masing-masing sebesar $10,90 \pm 0,20$ mm dan $11,76 \pm 0,35$ mm. Aplikasi ekstrak *A. platensis* mampu memperpanjang masa simpan udang vaname, dimana sampel kontrol layak dikonsumsi hingga hari ke-8 berdasarkan nilai TPC sebesar $4,06 \pm 0,1$ CFU/ml, sedangkan sampel dengan penambahan ekstrak *Arthrospira platensis* 5% dan 10% mampu memperpanjang masa simpan hingga hari ke-12 dengan nilai $5,11 \pm 0,07$ CFU/ml dan $5,41 \pm 0,32$ CFU/ml, serta pada konsentrasi 15% mampu memperpanjang masa simpan hingga hari ke-16 dengan nilai $5,31 \pm 0,20$ CFU/ml. Nilai TVB-N pada sampel 5%, 10% dan 15% masing-masing mampu mempertahankan mutu udang hingga hari ke-4, ke-8, dan ke-12 dengan nilai $17,00 \pm 0,15$ mg N/100g dan $27,45 \pm 0,01$ mg N/100g, $27,36 \pm 1,14$ mg N/100g. Nilai organoleptik dengan penambahan ekstrak 15% memiliki nilai kenampakan $7 \pm 1,22$; nilai bau $6 \pm 1,83$; nilai tekstur $7 \pm 0,98$ hingga hari ke-12 dan tidak terdeteksi kandungan histamin hingga akhir penyimpanan.

Kata kunci: *Arthrospira platensis* , antibakteri, *Litopenaeus vannamei*, pH, TPC, TVB-N

ABSTRACT

Extraction of Antibacterial Compounds from *Arthrospira platensis* and Their Application in Quality Control of Fresh Vannamei Shrimp (*Litopenaeus vannamei*) During Cold Storage

Arthrospira platensis is known to have high potential in producing antimicrobial compounds, making it suitable for exploitation as a biocontrol agent against bacteria. The research was conducted in two stages, the first being the extraction process and antibacterial testing of *Arthrospira platensis* extracts, and the second being the application of *Arthrospira platensis* extracts as an antibacterial agent in controlling the quality of fresh vaname shrimp, evaluated by observing pH, TPC, TVB-N, histamine, and organoleptic values. The results of the study showed that ethanol was the most effective solvent for the extraction process, with ethanol extracts exhibiting antibacterial activity with an MIC value against *Escherichia coli* of 2.5 mg/ml and against *Staphylococcus aureus* of 1.25 mg/ml. The inhibition zone test showed that at extract concentrations of 5 and 10 mg/ml, the inhibition zone diameters against *E. coli* were 10.33 ± 0.15 mm and 11.35 ± 0.20 mm, meanwhile against *S. aureus*, the values were 10.90 ± 0.20 mm and 11.76 ± 0.35 mm, respectively. The application of *A. platensis* extract was able to extend the shelf life of vannamei shrimp, where the control sample was still safe for consumption until day 8 based on a TPC value of 4.06 ± 0.1 CFU/ml, while samples with the addition of 5% and 10% *Arthrospira platensis* extract were able to extend the shelf life until day 12 with values of 5.11 ± 0.07 CFU/ml and 5.41 ± 0.32 CFU/ml, respectively, and at a concentration of 15%, it was able to extend the shelf life until day 16 with a value of 5.31 ± 0.20 CFU/ml. The TVB-N values in 5%, 10%, and 15% samples were able to maintain shrimp quality until day 4, day 8, and day 12 with values of 17.00 ± 0.15 mg N/100g, 27.45 ± 0.01 mg N/100g, and 27.36 ± 1.14 mg N/100g, respectively. The organoleptic values with the addition of 15% extract had appearance scores of 7 ± 1.22 ; odor scores of 6 ± 1.83 ; texture scores of 7 ± 0.98 until day 12, and no histamine content was detected until the end of storage.

Keywords: *Arthrospira platensis* , antibacterial, *Litopenaeus vannamei*, pH, TPC, TVB-N