

KARAKTERISASI MORFOLOGIS DAN FISIOLOGIS *Azolla microphylla* Kaulf. PADA CEKAMAN SALINITAS SERTA AKTIVITASNYA SEBAGAI ANTIBAKTERI

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Intisari

Potensi metabolit sekunder pada *Azolla microphylla* Kaulf. cukup menjanjikan. Kandungan senyawa metabolit sekunder pada *Azolla microphylla* Kaulf. dapat digunakan sebagai alternatif antibakteri. Melalui manipulasi tanaman dengan cekaman salinitas, diharapkan produksi metabolit sekunder mampu meningkat secara signifikan dengan korelasi pada karakteristik morfologis dan fisiologisnya. Penelitian ini merupakan eksperimen rancangan penelitian acak lengkap (RAL) dengan 6 perlakuan konsentrasi NaCl 0 mM (kontrol negatif), 5 mM, 10 mM, 15 mM, 20 mM, dan 25 mM dengan 5 ulangan untuk setiap perlakuan. Parameter penelitian yang diamati meliputi jumlah akar, panjang akar, pertambahan jumlah akar, diameter akar, lebar daun, biomassa, klorofil, prolin, flavonoid dan aktivitas antibakteri. Data penelitian dianalisis dengan uji ANOVA dan uji lanjut DMRT pada taraf signifikansi 5%. Hasil penelitian menunjukkan variasi konsentrasi NaCl berpengaruh pada kondisi morfologis dan fisiologis azolla. Semakin tinggi konsentrasi NaCl mengakibatkan: 1) Secara morfologis warna azolla menjadi lebih gelap dan ujung akar menggulung, 2) Secara fisiologis diamati penurunan pertambahan jumlah akar, panjang akar, diameter akar, lebar daun, klorofil dan biomassa, Kadar prolin dan flavonoid meningkat sesuai peningkatan konsentrasi NaCl yang dipaparkan. Pengujian antibakteri terhadap *B. subtilis* menghasilkan zona hambat sebesar berkisar antara 17,630 mm hingga 24,860 mm, menghambat pertumbuhan *E. coli* dengan zona hambat berkisar dari 22,102 mm hingga 25,422 mm.

Kata kunci: *azolla*, *salinitas*, *metabolit sekunder*, *antibakteri*.

**MORPHOLOGICAL AND PHYSIOLOGICAL CHARACTERIZATION of
Azolla microphylla Kaulf. ON THE CHECK OF SALINITY AND ITS
ACTIVITY AS AN ANTIBACTERIAL**

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Abstract

The potency of *Azolla microphylla* Kaulf., secondary metabolites is quite promising. Secondary metabolites content in *Azolla microphylla* Kaulf., can be used as an antibacterial alternative. Through manipulation of plants with salinity stress, it is expected that secondary metabolite production can increase significantly in correlation with their morphological and physiological characteristics. This study was conducted using completely randomized research design (CRD) with 6 treatments of NaCl concentration, 0 mM NaCl (negative control), 5 mM, 10 mM, 15 mM, 20 mM, and 25 mM with 5 replications for each treatment. The research parameters observed included the increased number of roots, root length, root diameter, leaf width, biomass, chlorophyll, proline, flavonoids and antibacterial activity. The research data were analyzed by ANOVA test and DMRT at a significance level of 5%. The results showed that variations of NaCl concentration had an effect on the morphological and physiological conditions in azolla. The higher concentration of NaCl results in: 1) morphologically, the color of azolla becomes darker and curl observed in root tips, 2) physiologically, the increase number of roots, root length, root diameter, leaf width, chlorophyll and biomass are decline, but levels of proline and flavonoids incline with increased NaCl concentration exposure. Antibacterial testing against *Bacillus subtilis* produced an inhibition zone range from 17,630 mm to 24,860 mm, inhibiting the growth of *Escherichia coli* with an inhibition zone range from 22,102 mm to 25,422 mm.

Key words: *azolla*, *salinity*, *secondary metabolites*, *antibacterial*.