

## Intisari

### **Daya Serap *Ulva lactuca* Linnaeus 1753 terhadap Nitrogen dan Fosfor pada Air Budidaya Udang Vaname**

Pertumbuhan perikanan budidaya yang pesat diiringi dengan peningkatan produksi air limbah kaya nutrisi yang mengakibatkan terjadinya eutrofikasi dan penurunan kualitas air. Rumput laut dapat dimanfaatkan sebagai biofilter yang dapat mengurangi kelebihan nutrisi pada air budidaya udang sehingga dapat mewujudkan kegiatan budidaya yang berkelanjutan. Penelitian ini bertujuan untuk mengetahui pengaruh perbedaan kepadatan *Ulva lactuca* terhadap efektivitas biofilter pada air budidaya udang vaname, penyerapan *U.lactuca* dengan kepadatan berbeda terhadap nutrisi nitrogen dan fosfat dalam air budidaya udang vaname, dan mengetahui pertumbuhan *U.lactuca* dengan kepadatan berbeda pada air budidaya udang vaname. Penelitian dilaksanakan di Unit Kerja Budidaya Air Laut Sundak, Gunungkidul pada bulan November-Desember 2020. Penelitian dilakukan menggunakan Rancangan Acak Lengkap dengan 3 perlakuan dan 3 ulangan, yaitu kepadatan *U.lactuca* 1; 2; dan 3 gL<sup>-1</sup>. Hasil penelitian menunjukkan penurunan terbesar konsentrasi nitrat dan fosfat air terjadi pada hari ke-15, yaitu sebesar 22,22% dan 37,25%. Penyerapan nitrogen dan fosfor ke dalam thallus terbaik pada kepadatan 1 gL<sup>-1</sup>, yaitu 3,67% dan 23,36%. Pertumbuhan *U.lactuca* dipengaruhi oleh keterbatasan nitrogen, kondisi lingkungan, dan perbedaan kepadatan tebar. Kualitas air yang terukur selama penelitian yaitu suhu 26,6-30,4°C, salinitas 28,9-34,2 ppt, O<sub>2</sub> terlarut 3,9-6,5 mgL<sup>-1</sup>, pH 7,4-8,1, TDS 31,7-38,4 mgL<sup>-1</sup>, dan TSS 3013-6818 mgL<sup>-1</sup>. Perbedaan kepadatan *U.lactuca* mempengaruhi efektivitas biofilter pada air budidaya udang vaname. Kepadatan terendah (1 gL<sup>-1</sup>) merupakan perlakuan terbaik, ditunjukkan dengan penyerapan nitrat dan fosfat yang lebih tinggi dibandingkan kepadatan 2 gL<sup>-1</sup> dan 3 gL<sup>-1</sup>. Pertumbuhan *U.lactuca* paling baik pada kepadatan 1 gL<sup>-1</sup> karena terjadi penambahan nitrogen dan fosfor dalam thallus sebesar 3,67% dan 23,36%.

Kata kunci: biofilter, fosfat, nitrogen, udang, *Ulva*

### *Abstract*

#### **The Absorption of *Ulva lactuca* Linnaeus 1753 against Nitrogen and Phosphorus in Whiteleg Shrimp Wastewater**

The rapid growth of aquaculture is accompanied by an increase in the production of nutrient-rich wastewater which results in eutrophication and a decrease in water quality. Macroalgae can be used as a biofilter which can reduce excess nutrients in shrimp culture water so that it can achieve sustainable aquaculture activities. This study aims to determine the effect of differences in *Ulva lactuca* densities on biofilter effectiveness in whiteleg shrimp wastewater, adsorption capacity of *U.lactuca* with difference densities against total nitrogen and phosphorus, and the growth of *U.lactuca* with different densities in whiteleg shrimp wastewater. The study was conducted at Unit Kerja Balai Budidaya Air Laut Sundak Gunungkidul in November-December 2020. The study was conducted using a Completely Randomized Design with 3 treatments and 3 replications, which were 1, 2, and 3 gL<sup>-1</sup>. The results showed that the largest decrease in water nitrate and phosphate concentrations occurred on the 15th day, namely 22.22% and 37.25%. The best absorption of nitrogen and phosphorus into the thallus was in density 1 gL<sup>-1</sup>, namely 3.67% and 23.36%. *Ulva* biomass has decreased due to several factors, such as low nitrogen availability, environmental conditions, predators, and differences in stocking density. Water quality measured during the study was temperature 26.6-30.4 °C, salinity 28.9-34.2 ppt, dissolved oxygen 3.9-6.5 mgL<sup>-1</sup>, pH 7.4-8.1, TDS 31.7-38.4 mgL<sup>-1</sup>, and TSS 3013-6818 mgL<sup>-1</sup>. The difference in *U.lactuca* density affects the effectiveness of the biofilter in the white shrimp culture. The lowest density (1 gL<sup>-1</sup>) is the best treatment, indicated by the adsorption of nitrate and phosphate which is higher than the density of 2 gL<sup>-1</sup> and 3 gL<sup>-1</sup>. The best growth of *U.lactuca* at a density of 1 gL<sup>-1</sup> due to the addition of nitrogen and phosphorus in the thallus of 3.67% and 23.36%.

Key words: biofilter, nitrogen, phosphate, shrimp, *Ulva*