

HUBUNGAN KEMELIMPAHAN KOMUNITAS FITOPLANKTON DENGAN PRODUKTIVITAS PRIMER DI KOLAM BUDIDAYA AIR TAWAR CANGKRINGAN, YOGYAKARTA

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INTISARI

Ekosistem akuatik merupakan suatu ekosistem terbuka yang membutuhkan input aliran energi secara kontinu. Fitoplankton sebagai organisme autotrof menghasilkan materi organik melalui proses fotosintesis menjadi sumber produktivitas primer bagi ekosistem perairan. Penelitian ini, bertujuan untuk mempelajari kemelimpahan fitoplankton serta faktor yang mempengaruhinya, mempelajari produktivitas primer serta faktor yang mempengaruhinya, dan mempelajari hubungan kemelimpahan komunitas fitoplankton dengan produktivitas primer di kolam budidaya air tawar Cangkringan. Penelitian ini dilakukan di 5 stasiun pengamatan: inlet, kolam induk, kolam pembesaran, kolam juvenile, dan outlet. Perhitungan kemelimpahan plankton dilakukan dengan cara menyaring sampel air sebanyak 20 L menggunakan plankton net, selanjutnya diidentifikasi menggunakan mikroskop cahaya dengan perbesaran 10 x 10. Produktivitas primer dihitung menggunakan metode botol gelap-botol terang serta analisis konsentrasi klorofil dihitung menggunakan spektrofotometer pada λ 630nm, λ 647nm, dan λ 750nm. Parameter fisiko kimia yang diukur meliputi alkalinitas, pH, CO₂, suhu udara, suhu air, turbiditas, jeluk, penetrasi cahaya, dan intensitas cahaya. Data dianalisa menggunakan regresi korelasi dan regresi sederhana secara one way ANOVA. Hasil penelitian ini menunjukkan bahwa, terdapat 30 spesies fitoplankton di 5 stasiun yang diteliti. Kemelimpahan fitoplankton tertinggi di kolam budidaya air tawar (BAT) Cangkringan adalah kolam induk dengan nilai 46.265 individu/L dan faktor yang meregulasinya adalah nutrien, intensitas cahaya, penetrasi cahaya, suhu air, dan pH. Nilai produktivitas primer bersih tertinggi berada di kolam induk dengan nilai 277,4 mgC/m³/h dan faktor yang meregulasinya adalah kemelimpahan fitoplankton, kelompok fungsional fitoplankton, dan konsentrasi klorofil. Ada hubungan positif, kemelimpahan fitoplankton dengan produktivitas primer, dengan nilai r 0,857.

Kata Kunci: kemelimpahan fitoplankton, produktivitas primer, kolam budidaya air tawar.

Correlation between Phytoplankton Abundance and Its Primary Productivity in The Freshwater Culture Pond, Cangkringan, Yogyakarta

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ABSTRACT

An aquatic ecosystem is an open ecosystem which needs input energy from organic material continuously. Thus, phytoplankton as autotroph organisms produce organic material through photosynthesis processes this called primary productivity for an aquatic ecosystem. The research objectives were to study phytoplankton abundance and its regulated factor, to study net primary productivity and its regulated factor, and to study the correlation of phytoplankton abundance related to its primary productivity in Cangkringan freshwater culture ponds. The samples were taken from 5 stations: inlet, main pond, mature pond, juvenile pond and outlet. The plankton was concentrated from 20 L water sample using plankton net then samples were observed using light microscope 10 x 10 magnification. Primary productivity was measured by dark-light bottle method, and chlorophyll concentration was analyzed by spectrophotometry on λ 630nm, λ 647nm, and λ 750nm. Physic-chemyc parameters measured were including alkalinity, pH, CO₂, air temperature, water temperature, turbidity, depth, light penetration, and light intensity. Data were analyzed using regression-correlation and simple regression by one way ANOVA. The result showed that there were 30 phytoplankton species in 5 research station. The highest phytoplankton abundance in Cangkringan freshwater culture ponds was in mature pond with density of 46,265 individual/L and the regulated factors for this abundance were light intensity, light penetration, water temperature, and pH. The highest net primary productivity was in mature pond with amount of 277.4 mgC/m³/h and the regulated factors were phytoplankton abundance, phytoplankton functional grup, and chlorophyll concentration. In addition, there was positive correlation between phytoplankton abundance and primary productivity with r value of 0.86.

Key Word: Phytoplankton abundance, primary productivity, freshwater culter pond.