

INTISARI

HUBUNGAN NITRAT DAN FOSFAT DENGAN KELIMPAHAN FITOPLANKTON DI SUNGAI SEMPOR, KALURAHAN DONOKERTO, KABUPATEN SLEMAN

Sungai Sempor merupakan salah satu sungai yang berada di Kabupaten Sleman. Penelitian ini bertujuan untuk mengetahui struktur komunitas fitoplankton serta hubungan nitrat dan fosfat dengan kelimpahan fitoplankton di Sungai Sempor. Parameter kualitas air yang diukur meliputi suhu, oksigen (O_2) terlarut, pH, nitrat dan fosfat merupakan salah satu cara untuk mengetahui kondisi ekologi Sungai Sempor. Penelitian dilaksanakan pada bulan Oktober – Desember 2022. Pengambilan sampel dilakukan pada 4 stasiun setiap dua minggu sekali. Struktur komunitas fitoplankton yang ada di Sungai Sempor didominasi oleh kelas Bacillariophyceae (9 genus), Cyanophyceae (7 genus), Zygnematomyceae (5 genus), Chlorophyceae (3 genus), Dinophyceae (1 genus), dan Coscinodiscophyceae (1 genus). Kelimpahan fitoplankton berkisar antara 18 – 93 ind/L. Indeks keanekaragaman menunjukkan keanekaragaman fitoplankton ekologis, tekanan ekologis sedang, dan kondisi ekosistem cukup seimbang. Indeks dominansi menunjukkan tidak terjadi dominansi genus fitoplankton. Indeks kemerataan menunjukkan komunitas fitoplankton dalam kondisi yang baik atau stabil. Hasil analisis regresi linier berganda diperoleh persamaan $Y = 119,883 - 16,125X_1 - 121,418X_2$ dan koefisien korelasi (R) sebesar 0,6283 yang menunjukkan hubungan kuat antara kandungan nitrat dan fosfat dengan kelimpahan fitoplankton. Sedangkan untuk nilai koefisien determinasi (R^2) sebesar 0,3948 yang artinya 39,5% kelimpahan fitoplankton di Sungai Sempor dipengaruhi oleh kandungan nitrat dan fosfat. Berdasarkan hasil pengukuran, suhu yang diperoleh berkisar 23,5°C - 25,1 °C, nilai oksigen (O_2) terlarut 2,32 - 9,40 mg/L, nilai pH 6,8 - 7,5. Berdasarkan parameter kualitas air fisika dan kimia perairan di Sungai Sempor tergolong dalam perairan mesotrofik hingga eutrofik yang mendukung kehidupan organisme akuatik terutama fitoplankton, sedangkan fitoplankton didapatkan kelimpahan yang rendah.

Kata kunci : nitrat, fosfat, fitoplankton, Sungai Sempor

ABSTRACT

RELATIONSHIP OF NITRATE AND PHOSPHATE ON PHYTOPLANKTON ABUNDANCE IN THE SEMPOR STREAM, DONOKERTO VILLAGE, SLEMAN REGENCY

Sempor River is one of the rivers located in Sleman Regency. This study aims to determine the structure of phytoplankton community as well as the relationship between nitrate and phosphate with phytoplankton abundance in Sempor River. Water quality parameters measured include temperature, dissolved oxygen (O₂), pH, nitrate, and phosphate as a way to determine the ecological condition of Sempor River. The research was conducted from October to December 2022. Sampling was conducted at 4 stations every two weeks. The phytoplankton community structure in Sempor River was dominated by Bacillariophyceae (9 genus), Cyanophyceae (7 genus), Zygnematophyceae (5 genus), Chlorophyceae (3 genus), Dinophyceae (1 genus), and Coscinodiscophyceae (1 genus). Phytoplankton abundance ranged from 18 - 93 ind/L. The diversity index showed ecological phytoplankton diversity, moderate ecological pressure, and fairly balanced ecosystem conditions. The dominance index showed no dominance of the phytoplankton genus. The evenness index shows that the phytoplankton community is in good or stable condition. The results of multiple linear regression analysis obtained the equation $Y = 119.883 - 16.125X_1 - 121.418X_2$ and the correlation coefficient (R) of 0.6283 which shows a strong relationship between nitrate and phosphate content with phytoplankton abundance. Meanwhile, the coefficient of determination (R²) is 0.3948, which means that 39.5% of phytoplankton abundance in Sempor River is influenced by nitrate and phosphate content. Based on the measurement results, the temperature obtained ranged from 23.5 °C - 25.1 °C, dissolved oxygen (O₂) value 2.32 - 9.40 mg/L, pH value 6.8 - 7.5. Based on the physical and chemical water quality parameters, the waters in Sempor River are classified as mesotrophic to eutrophic waters that support the life of aquatic organisms, especially phytoplankton, whereas the phytoplankton abundance was low.

Keywords: nitrate, phosphate, phytoplankton, Sempor River.