

RINGKASAN

DWITA. Fitoplankton sebagai Bioindikator Kualitas Perairan Pesisir Teluk Sasah Pulau Bintan. Dibimbing oleh TRI APRIADI dan WINNY RETNA MELANI.

Fitoplankton yang berperan sebagai produsen primer di perairan memiliki sensitivitas terhadap perubahan kondisi lingkungan. Kehadiran bahan pencemar organik dan anorganik yang berasal dari permukiman dan industri yang ada di sekitar pesisir dapat memengaruhi struktur komunitas fitoplankton. Penelitian ini bertujuan untuk menganalisis kualitas perairan Teluk Sasah Pulau Bintan berdasarkan struktur komunitas fitoplankton melalui indeks saprobik. Penelitian dilakukan pada Januari-Februari 2025 dengan metode *systematic random sampling* di 30 titik pengamatan. Parameter fisika dan kimia air yang dianalisis yaitu suhu, kecerahan, kedalaman, kekeruhan, pH, DO, salinitas, BOD, nitrat, fosfat, dan amonia. Analisis struktur komunitas fitoplankton meliputi kelimpahan, indeks keanekaragaman (H'), keseragaman (E), dominansi (C), dan indeks saprobik. Berdasarkan hasil penelitian diperoleh informasi bahwa parameter kecerahan, konsentrasi fosfat, dan nitrat tidak memenuhi standar baku mutu PP RI No. 22 Tahun 2021. Hasil identifikasi fitoplankton terdiri dari 4 divisi dan 34 genera dengan total kelimpahan rata-rata fitoplankton berkisar $1.401.566 \text{ sel/m}^3$. Kelimpahan tertinggi pada genus *Chaetoceros* sp. sebesar 358.767 sel/m^3 dan terendah genus *Climacodmium* sp. 109 sel/m^3 . Berdasarkan hasil indeks ekologi, perairan Teluk Sasah menunjukkan keanekaragaman (H') tergolong rendah (2,20), keseragaman (E) sedang (0,71), dan dominansi (C) rendah (0,16). Nilai-nilai ini mengindikasikan bahwa perairan Teluk Sasah mengalami tekanan ekologis ringan. Berdasarkan indeks saprobik, perairan Teluk Sasah mengalami pencemaran bahan organik dan anorganik kategori rendah atau β -Mesosaprobik. Berdasarkan hasil analisis korelasi, suhu, kecerahan, pH, dan fosfat merupakan parameter fisika-kimia yang menunjukkan hubungan signifikan terhadap kelimpahan fitoplankton di perairan Teluk Sasah.

Kata kunci: Bioindikator, Fitoplankton, Indeks ekologi, Indeks saprobik, Teluk Sasah

SUMMARY

DWITA. Phytoplankton as Bioindicators of Coastal Water Quality in Teluk Sasah Bintan Island. Supervised by TRI APRIADI and WINNY RETNA MELANI.

Phytoplankton, as primary producers in aquatic ecosystems, are sensitive to changes in environmental conditions. The presence of organic and inorganic pollutants originating from residential and industrial activities around the coastal area can affect the structure of phytoplankton communities. This study aims to analyze the water quality of Teluk Sasah, Bintan Island, based on the phytoplankton community structure using the saprobic index. The research was conducted from January to February 2025 using a systematic random sampling method at 30 observation points. The physical and chemical water parameters analyzed included temperature, transparency, depth, turbidity, pH, dissolved oxygen (DO), salinity, biological oxygen demand (BOD), nitrate, phosphate, and ammonia. Phytoplankton community structure analysis consisted of abundance, diversity index (H'), evenness index (E), dominance index (C), and saprobic index. The results showed that transparency, phosphate, and nitrate concentrations did not meet the water quality standards based on Government Regulation of the Republic of Indonesia No. 22 of 2021. The results of phytoplankton identification consisted of 4 divisions and 34 genera, with a total average phytoplankton abundance of approximately 1,401,566 cells/m³. The highest abundance was recorded for the genus *Chaetoceros* sp. (358,767 cells/m³), while the lowest was *Climacodium* sp. (109 cells/m³). Ecological index analysis indicated that Teluk Sasah waters have low diversity ($H' = 2,20$), moderate evenness ($E = 0,71$), and low dominance ($C = 0,16$). These values suggest that the waters of Teluk Sasah are experiencing mild ecological stress. Based on the saprobic index, Teluk Sasah is categorized as experiencing low levels of organic and inorganic pollution or β -Mesosaprobic. Based on the correlation analysis, temperature, transparency, pH, and phosphate are physico-chemical parameters that show a significant relationship with phytoplankton abundance in the waters of Teluk Sasah.

Keywords: Bioindicator, Ecological index, Phytoplankton, Saprobic index, Teluk Sasah