

PEMANFAATAN PERIFITON DALAM PENILAIAN KUALITAS PERAIRAN SUNGAI CISARANTEN YANG TERDAMPAK LIMBAH DOMESTIK

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ABSTRAK

Sungai Cisaranten diduga menerima masukan limbah domestik yang berasal dari aktivitas masyarakat di sepanjang aliran sungai. Masukan limbah tersebut berpotensi menurunkan kualitas perairan melalui perubahan parameter fisika dan kimia, serta memengaruhi struktur komunitas organisme akuatik. Penelitian ini bertujuan untuk mengetahui kondisi kualitas air, menganalisis struktur komunitas perifiton, serta mengkaji peran perifiton sebagai bioindikator pencemaran limbah domestik di Sungai Cisaranten. Penelitian ini dilakukan pada bulan Maret–Mei 2026 dengan menggunakan metode *purposive sampling* pada tiga stasiun pengamatan. Pengambilan sampel dilakukan tiga kali pada setiap stasiun dengan interval satu minggu. Parameter yang diamati meliputi parameter fisik (suhu, kecepatan arus, dan TDS), kimia (pH, DO, BOD, COD, nitrat, dan fosfat), serta biologi berupa komunitas perifiton. Pengujian parameter penelitian dilakukan di Laboratorium Dinas Lingkungan Hidup Kota Bandung dan Laboratorium Terpadu UIN Sunan Gunung Djati Bandung. Sampel perifiton diambil melalui metode pengikisan substrat, diawetkan menggunakan Lugol 1%, dan diidentifikasi secara mikroskopis. Data dianalisis menggunakan IBM SPSS versi 25.0.0 melalui perhitungan indeks saprobitas (SI), tropik saprobik indeks (TSI), serta uji korelasi antara parameter fisika dan kimia dengan struktur komunitas perifiton. Hasil penelitian menunjukkan 45 genus perifiton yang tergolong ke dalam 10 kelas dengan dominansi Bacillariophyceae. Nilai indeks keanekaragaman tertinggi terdapat pada Stasiun 3 sebesar 3,129, indeks keseragaman tertinggi pada Stasiun 2 sebesar 0,884, dan indeks dominansi tertinggi pada Stasiun 2 sebesar 0,12. Hasil uji korelasi menunjukkan bahwa Suhu, memiliki hubungan paling kuat dengan struktur komunitas perifiton di Sungai Cisaranten. Rerata nilai SI dan TSI sebesar 1,42 dan 2,86 menunjukkan bahwa Sungai Cisaranten termasuk kelompok perairan β -mesosaprobik dengan tingkat pencemaran ringan hingga sedang

Kata Kunci: Bioindikator, kualitas air, limbah domestik, perifiton, Sungai Cisaranten

UTILIZATION OF PERPHYTON IN ASSESSING THE QUALITY OF CISARANTEN RIVER WATERS AFFECTED BY DOMESTIC WASTE

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ABSTRACT

The Cisaranten River is suspected of receiving domestic waste inputs resulting from human activities along its course. Such waste inputs have the potential to degrade water quality by altering physical and chemical parameters and influencing the community structure of aquatic organisms. This study aimed to assess water quality conditions, analyze periphyton community structure, and evaluate the role of periphyton as a bioindicator of domestic waste pollution in the Cisaranten River. The research was conducted from March to May 2026 using purposive sampling at three observation stations. Sampling was performed three times at each station at one-week intervals. Observed parameters included physical factors (temperature, current velocity, and TDS), chemical factors (pH, DO, BOD, COD, nitrate, and phosphate), and biological factors (periphyton community). Parameter analysis was carried out at the Bandung City Environmental Agency Laboratory and the Integrated Laboratory of UIN Sunan Gunung Djati Bandung. Periphyton samples were collected via substrate scraping, preserved with 1% Lugol's solution, and identified microscopically. Data were analyzed using IBM SPSS version 25.0.0, involving the calculation of the Saprobity Index (SI) and Trophic Saprobic Index (TSI), as well as correlation tests between physical-chemical parameters and periphyton community structure. The results identified 45 periphyton genera belonging to 10 classes, with Bacillariophyceae being the dominant group. The highest diversity index (3.129) was recorded at Station 3, while the highest evenness index (0.884) and dominance index (0.12) were found at Station 2. Correlation analysis revealed that Temperature, exhibited the strongest relationships with the periphyton community structure in the Cisaranten River. Mean SI and TSI values of 1.42 and 2.86, respectively, indicate that the Cisaranten River falls into the β -mesosaprobic category, characterized by light to moderate pollution levels.

Keywords: Bioindicator, domestic wastewater, periphyton, water quality, Cisaranten River.