

ABSTRAK

Makroinvertebrata merupakan organisme dasar perairan yang berperan penting sebagai bioindikator untuk menilai kondisi ekologis sungai. Menurunnya kualitas air Sungai Logawa akibat aktivitas antropogenik berpotensi mencemari perairan serta memengaruhi komunitas makroinvertebrata sebagai indikator biologis kualitas air. Penelitian ini bertujuan untuk mengkaji kondisi kualitas air Sungai Logawa berdasarkan indikator biologis makroinvertebrata dan menjelaskan korelasi antara parameter fisik-kimiawi perairan dengan tingkat pencemaran berdasarkan *Family Biotic Index* (FBI). Penelitian dilaksanakan di Sungai Logawa, Banyumas Jawa Tengah pada delapan stasiun yang mewakili bagian hulu dan tengah pada bulan Juli hingga September 2024. Metode yang digunakan pada penentuan nilai FBI pada penelitian ini yaitu pendekatan deskriptif kuantitatif dan kualitatif. Parameter fisik-kimiawi kualitas air yang diukur yaitu suhu dan oksigen terlarut (DO) secara *in-situ*, serta *Biological Oxygen Demand* (BOD) dan *Chemical Oxygen Demand* (COD) secara *ex-situ*. Nilai FBI dan parameter fisik-kimiawi perairan dianalisis menggunakan Uji Korelasi Pearson. Hasil penelitian menunjukkan terdapat 22 famili makroinvertebrata dari tujuh ordo, didominasi oleh Ephemeroptera, Trichoptera, dan Plecoptera. Nilai FBI di bagian hulu sebesar 3,1 dan di tengah 3,5 yang menandakan kualitas air sangat baik dengan tingkat pencemaran organik rendah. Parameter suhu, oksigen terlarut, dan BOD masih sesuai baku mutu PP No. 22 Tahun 2021 kelas II, sedangkan COD tergolong tinggi mendekati batas kelas III. Analisis korelasi menunjukkan hubungan lemah antara FBI dengan suhu, oksigen terlarut, dan BOD, serta hubungan sedang dengan COD. Berdasarkan parameter fisik-kimia dan FBI, Sungai Logawa dikategorikan masih dalam kondisi ekologis baik.

Kata kunci: Ephemeroptera; *Family Biotic Index*; kualitas air; Sungai Logawa

ABSTRACT

Macroinvertebrates are benthic aquatic organisms that play an important role as bioindicators for assessing the ecological condition of rivers. The decline in water quality of the Logawa River due to anthropogenic activities has the potential to cause pollution and affect the macroinvertebrate community as a biological indicator of water quality. This study aimed to assess the water quality condition of the Logawa River based on macroinvertebrate biological indicators and to explain the correlation between physicochemical parameters and the level of pollution using the Family Biotic Index (FBI). The research was conducted at eight sampling stations representing the upstream and middle sections of the Logawa River, Banyumas, Central Java, from July to September 2024. The determination of FBI values employed a descriptive quantitative and qualitative approach. Physicochemical parameters measured included temperature and dissolved oxygen (DO) in situ, as well as Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) ex situ. The FBI values and physicochemical parameters were analyzed using Pearson's Correlation Test. The results showed 22 macroinvertebrate families from seven orders, dominated by Ephemeroptera, Trichoptera, and Plecoptera. The FBI values in the upstream and middle sections were 3.1 and 3.5, respectively, indicating very good water quality with low levels of organic pollution. Temperature, DO, and BOD parameters were within the water quality standards of Government Regulation No. 22 of 2021 for Class II, while COD values were relatively high, approaching the Class III limit. Correlation analysis revealed a weak relationship between FBI and temperature, DO, and BOD, and a moderate relationship with COD. Based on physicochemical and biological parameters, the Logawa River is categorized as being in good ecological condition.

Keyword: *Ephemeroptera; Family Biotic Index; Logawa River; water quality*