

## ABSTRAK

(Siti Mashfufah. 26010119120024. Hubungan Bahan Organik Total dan Tekstur Sedimen dengan Struktur Komunitas Makrozoobentos di Sungai Banger, Pekalongan. Haeruddin dan Diani Estining Tyas).

Makrozoobentos merupakan salah satu organisme yang hidupnya berada di substrat dasar perairan yang bergerak dengan cara menggali, merayap, maupun melekatkan diri pada substrat dasar perairan. Kelimpahan makrozoobentos disuatu perairan dipengaruhi oleh tingkat sensitifitas, sifat kimia, fisika dan biologi perairan. Kelimpahan makrozoobentos juga dipengaruhi oleh tekstur sedimen dan konsentrasi bahan organik. Tujuan dari penelitian ini adalah untuk melihat hubungan bahan organik total (BOT) dan tekstur sedimen dengan struktur komunitas makrozoobentos. Penelitian ini dilakukan pada bulan Desember 2025 di Sungai Banger, Pekalongan, Jawa Tengah sebanyak 3 stasiun dengan 3 kali pengulangan. Metode penelitian yang digunakan dalam penelitian ini yaitu metode survei yang dianalisis secara kuantitatif. Pengambilan sampel dilakukan dengan menggunakan metode *purposive* sampling. Analisis data menggunakan *software Microsoft Excel* dan SPSS Statistik versi 27 dengan menggunakan uji regresi linier. Parameter kualitas air di Sungai Banger pada ketiga stasiun diperoleh hasil rata-rata suhu 28,06 – 36,36 °C, pH 7,8 – 8,2, kecepatan arus 0,06 – 0,13 m/s, DO 5,9 – 6,56 mg/l, dan kedalaman perairan 188 – 264,6 cm. Bobot BOT pada ketiga stasiun rata-rata berkisar antara 4,7 – 5,08 gram dan rata-rata persentase BOT berkisar antara 19 – 20%. Jenis makrozoobentos yang ditemukan yaitu dari genus Pila, Pilsbryoconcha, dan Filopaludina. Hasil hubungan antara kelimpahan dengan BOT dengan persamaan regresi  $y = -7.08 \times 10^3 + 1.54 \times 10^2 x$  dengan nilai  $R^2$  sebesar 0,927 dan hubungan antara tekstur sedimen dengan kelimpahan makrozoobentos yaitu;  $y = -4.07 \times 10^3 + 20.72 x$ , dengan nilai koefisien determinasi ( $R^2$ ) sebesar 0,221. Tingkat keanekaragaman ( $H'$ ) pada stasiun I sebesar 0,34, indeks keseragaman ( $e$ ) tidak terdefinisi, dan Indeks Dominansi ( $C$ ) sebesar 0,11, pada stasiun II  $H'$  sebesar 0,34 indeks keseragaman  $e$  tidak terdefinisi, dan Indeks Dominansi  $C$  sebesar 0,11, dan pada stasiun III diperoleh  $H'$  sebesar 0,34,  $e$  sebesar 0,31, dan Indeks Dominansi  $C$  sebesar 0,11. Hasil penelitian didapatkan bahwa hubungan bahan organik total dan tekstur sedimen berpengaruh terhadap kelimpahan makrozoobentos.

**Kata kunci:** Bahan Organik Total, Makrozoobentos, Pila, Tekstur Sedimen.

## ABSTRACT

**(Siti Mashfufah. 26010119120024. *The Relationship Between Total Organic Matter and Sediment Texture on the Community Structure of Macrozoobenthos in the Banger River, Pekalongan.* Haeruddin and Diani Estining Tyas).**

*Macrozoobenthos are organisms that live on the bottom substrate of aquatic environments and move by burrowing, crawling, or attaching themselves to the substrate. The abundance of macrozoobenthos in aquatic ecosystems is influenced by sensitivity levels as well as the chemical, physical, and biological properties of the waters. Macrozoobenthos abundance is also affected by sediment texture and organic matter concentration. The purpose of this study was to determine the relationship between total organic matter (TOM) and sediment texture on the community structure of macrozoobenthos. This research was conducted in December 2025 in the Banger River, Pekalongan, Central Java, at 3 stations, with each station consisting of 3 sampling points. The research method used was a survey method analyzed quantitatively. Samples were collected using a purposive sampling method. Data were analyzed using Microsoft Excel and SPSS Statistics version 27 through linear regression analysis. The results showed a relationship between macrozoobenthos abundance and TOM. The water quality parameters measured in the Banger River showed average values across the three stations ranging from 28.06–36.36°C for temperature, 7.8–8.2 for pH, 0.06–0.13 m/s for current velocity, 5.9–6.56 mg/L for dissolved oxygen (DO), and 188–264.6 cm for water depth. The average TOM weight ranged from 4.7–5.08 g, while the average TOM percentage ranged from 19–20%. The macrozoobenthic taxa identified belonged to the genera Pila, Pilsbryoconcha, and Filopaludina. The relationship between macrozoobenthic abundance and TOM was described by the regression equation  $y = -7.08 \times 10^3 + 1.54 \times 10^2x$ , with a coefficient of determination ( $R^2$ ) of 0.927, indicating a strong relationship. Meanwhile, the relationship between sediment texture and macrozoobenthic abundance was expressed by the equation  $y = -4.07 \times 10^3 + 20.72x$ , with an  $R^2$  value of 0.221, indicating a weaker relationship. The diversity index ( $H'$ ) at Stations I, II, and III was 0.34. The evenness index ( $e$ ) was undefined at Stations I and II, while Station III had an  $e$  value of 0.31. The dominance index ( $C$ ) was 0.11 at all stations. The results indicate that both Total Organic Matter and sediment texture influence the abundance of macrozoobenthos in the Banger River.*

**Keywords:** Total Organic Matter, Macrozoobenthos, Pila, Sediment Texture.