

RINGKASAN

SHERLI SEPTIA WANTIS. Kepadatan dan Keanekaragaman Gastropoda pada Ekosistem Mangrove di Perairan Tanjung Piayu, Kota Batam. Dibimbing oleh SUSIANA dan AHMAD ZAHID.

Ekosistem mangrove memiliki peran penting sebagai habitat berbagai organisme pesisir, termasuk gastropoda yang berfungsi sebagai pengurai bahan organik dan bioindikator kualitas lingkungan. Aktivitas antropogenik di kawasan Tanjung Piayu, Kota Batam, seperti penangkapan biota, pembuangan limbah domestik, serta pemanfaatan mangrove berpotensi memengaruhi kondisi habitat gastropoda. Penelitian ini bertujuan mengidentifikasi jenis gastropoda, menganalisis kepadatan dan keanekaragaman gastropoda, serta menganalisis hubungan kepadatan gastropoda dengan parameter lingkungan di ekosistem mangrove Perairan Tanjung Piayu, Kota Batam. Penelitian dilaksanakan pada Februari–April 2026 di ekosistem mangrove Perairan Tanjung Piayu, Kota Batam menggunakan metode survei dengan teknik *systematic random sampling*. Pengambilan sampel dilakukan pada 25 titik pengamatan menggunakan transek berukuran 10×10 m dengan plot 1×1 m. Data primer berupa jenis, jumlah individu gastropoda, suhu, salinitas, pH, oksigen terlarut (DO), dan substrat, sedangkan data sekunder diperoleh dari berbagai literatur. Analisis data meliputi perhitungan kepadatan, indeks keanekaragaman Shannon-Wiener, indeks dominansi Simpson, analisis *cluster* menggunakan Indeks Canberra, uji *One Way ANOVA*, dan *Principal Component Analysis* (PCA). Hasil penelitian menunjukkan bahwa ditemukan empat spesies gastropoda, yaitu *Nerita costata*, *Chicoreus capucinus*, *Terebralia sulcata*, dan *Cerithidea anticipata* dengan total 500 individu. *Cluster 1* memiliki kepadatan gastropoda tertinggi pada seluruh spesies dibandingkan *Cluster 2* dan *Cluster 3*, dengan kepadatan *Nerita costata* sebesar 1,10 ind/m², *Terebralia sulcata* 0,34 ind/m², *Cerithidea anticipata* 0,30 ind/m², dan *Chicoreus capucinus* 0,18 ind/m². Nilai indeks keanekaragaman berkisar antara 0,746–1,543, sedangkan indeks dominansi berkisar antara 0,009–0,020. Parameter lingkungan pada seluruh lokasi penelitian relatif seragam dengan suhu 26,4–26,6°C, salinitas 27,9–28,2 ppt, pH 6,7–6,8, DO 4,7–4,9 mg/L, dan tipe substrat berupa pasir berlumpur. Hasil uji *One-Way ANOVA* menunjukkan bahwa kepadatan setiap spesies serta indeks keanekaragaman dan dominansi tidak berbeda secara signifikan antar *cluster* ($p > 0,05$). Analisis PCA menunjukkan bahwa *Nerita costata* berasosiasi dengan salinitas dan pH, *Chicoreus capucinus* berasosiasi dengan pH, sedangkan *Terebralia sulcata* dan *Cerithidea anticipata* lebih berasosiasi dengan suhu dan oksigen terlarut (DO). Secara keseluruhan, kondisi lingkungan yang relatif homogen menyebabkan tidak adanya perbedaan yang signifikan pada struktur komunitas gastropoda antar *cluster*.

Kata kunci: Gastropoda, Keanekaragaman, Kepadatan, Mangrove, Tanjung Piayu.

SUMMARY

SHERLI SEPTIA WANTIS. *Density and Diversity of Gastropods in the Mangrove Ecosystem of Tanjung Piayu Waters, Batam City*. Supervised by SUSIANA and AHMAD ZAHID.

Mangrove ecosystems play an important role in supporting coastal biodiversity by providing habitat, feeding grounds, nursery areas, and spawning sites for various aquatic organisms, including gastropods. Gastropods also function as decomposers and biological indicators of environmental quality because they are sensitive to changes in their habitat. However, increasing human activities in the mangrove ecosystem of Tanjung Piayu, Batam City, may affect environmental conditions and consequently influence the density and diversity of gastropods. This study aimed to identify gastropod species, analyze their density and diversity, and examine the relationship between gastropod density and environmental parameters in the mangrove ecosystem of Tanjung Piayu Waters, Batam City. The research was conducted from February to April 2026 in the mangrove ecosystem of Tanjung Piayu Waters, Batam City. A survey method with a systematic random sampling technique was applied at 25 sampling points using 10×10 m transects with 1×1 m plots. Primary data consisted of gastropod species, abundance, water temperature, salinity, pH, dissolved oxygen (DO), and substrate characteristics, while secondary data were collected from scientific literature. Data were analyzed using density calculations, the Shannon-Wiener diversity index, Simpson dominance index, cluster analysis based on the Canberra Index, One-Way Analysis of Variance (ANOVA), and Principal Component Analysis (PCA). The results showed that four gastropod species were identified, namely *Nerita costata*, *Chicoreus capucinus*, *Terebralia sulcata*, and *Cerithidea anticipata*, with a total of 500 individuals. Cluster 1 exhibited the highest gastropod density for all species compared to Clusters 2 and 3, with densities of 1.10 ind/m² for *Nerita costata*, 0.34 ind/m² for *Terebralia sulcata*, 0.30 ind/m² for *Cerithidea anticipata*, and 0.18 ind/m² for *Chicoreus capucinus*. The diversity index ranged from 0.746 to 1.543, while the dominance index ranged from 0.009 to 0.020. Environmental parameters were relatively similar across all sampling sites, with temperatures ranging from 26.4 to 26.6°C, salinity from 27.9 to 28.2 ppt, pH from 6.7 to 6.8, dissolved oxygen (DO) from 4.7 to 4.9 mg/L, and a muddy sand substrate. The One-Way ANOVA results indicated that the density of each gastropod species, as well as the diversity and dominance indices, did not differ significantly among clusters ($p > 0.05$). Principal Component Analysis (PCA) showed that *Nerita costata* was associated with salinity and pH, *Chicoreus capucinus* was associated with pH, whereas *Terebralia sulcata* and *Cerithidea anticipata* were more closely associated with temperature and dissolved oxygen (DO). Overall, the relatively homogeneous environmental conditions resulted in no significant differences in the gastropod community structure among the clusters.

Keywords: Density, Diversity, Gastropods, Mangrove Ecosystem, Tanjung Piayu.