

IDENTIFICATION OF MICROPLASTIC CONTENT IN GONGGONG SNAILS (*Laevistrombus Turturella*) ON PENYENGAT ISLAND TANJUNGPINANG CITY

Identifikasi Kandungan Mikroplastik pada Siput Gonggong (*Laevistrombus turturella*) di
Pulau Penyengat Kota Tanjungpinang

Ayu Zalfitri^{1*}, Zahidah Hasan², Atikah Nurhayati³, Raden Mochammad Candra
Wirawan Arief⁴

Fisheries Study Program, Faculty of Fisheries and Marine Sciences, Padjadjaran University

Bandung-Sumedang Highway KM 21, Hegarmanah, Jatinangor District, Sumedang Regency, West
Java 45363

*Corresponding Author: ayu20007@mail.unpad.ac.id

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ABSTRACT

Penyengat Island is a tourist attraction located in the Penyengat Village of Tanjungpinang City, Riau Islands Province. As a tourist destination and a point along maritime transport routes, it is susceptible to the influx of waste such as plastic waste into its waters. This study aims to determine the abundance and characteristics of microplastics found in gonggong snails and aquatic sediments on Penyengat Island. The method used was purposive sampling for sample collection and site selection. The data obtained were analyzed using *one-way* ANOVA with a significance level of 5%. The highest microplastic abundance was found at Station 1, located along the coastal area of Jalan Pelabuhan (gonggong snails $3,80 \pm 0,86$ particles/g, sediment $1,03 \pm 0,23$ particles/g). The lowest microplastic concentration was found at Station 3, located along the coastline of Jalan Sumur (gonggong snails: $1,60 \pm 0,29$, sediment $0,44 \pm 0,10$). The most commonly found microplastic forms were fragments (gonggong snails 61,29%, sediment 58,93%) and film (gonggong snails 23,04%, sediment 30,98%). Meanwhile, the dominant colors at each station were black (gonggong snails 37,79%, sediment 45,60%) and transparent (gonggong snails 22,58%, sediment 22,66%). The high consumption of gonggong as a food source necessitates research on the microplastic content in gonggong and in the aquatic sediments where these sessile organisms live and forage.

Keywords: Microplastic, Gonggong Snails, Sediment

ABSTRAK

Pulau Penyengat merupakan salah satu objek wisata yang terletak di Kelurahan Penyengat Kota Tanjungpinang, Provinsi Kepulauan Riau. Sebagai salah satu destinasi wisata dan dilewati oleh jalur transportasi laut, menjadikan adanya potensi masukan limbah pada perairan seperti limbah plastik. Penelitian ini bertujuan untuk menentukan kelimpahan dan karakteristik

mikroplastik yang terkandung pada siput gonggong dan sedimen perairan di Pulau Penyengat. Metode yang digunakan adalah teknik *purposive sampling* dalam pengumpulan sampel dan penentuan titik lokasi. Data yang telah diperoleh diuji menggunakan *one way ANOVA* dengan taraf signifikansi 5%. Kelimpahan mikroplastik tertinggi berada pada stasiun 1 yaitu pada bagian pesisir Jalan Pelabuhan dengan konsentrasi (siput gonggong $3,80 \pm 0,86$ partikel/g, sedimen $1,03 \pm 0,23$ partikel/g. Konsentrasi mikroplastik terendah berada pada stasiun 3 yaitu pada pesisir Jalan Sumur (siput gonggong $1,60 \pm 0,29$, sedimen $0,44 \pm 0,0$). Bentuk mikroplastik yang paling sering ditemukan fragmen (siput gonggong 61,29%, sedimen 58,93%) dan film (siput gonggong 23,04%, sedimen 30,98%). Sedangkan, rata-rata warna yang dominan tiap stasiun adalah hitam (siput gonggong 37,79%, sedimen 45,60%) dan transparan (siput gonggong 22,58 %, sedimen 22,66%). Tingginya pemanfaatan siput gonggong sebagai bahan pangan menjadikan diperlukan adanya penelitian mengenai kandungan mikroplastik yang ada pada siput gonggong dan sedimen perairan yang merupakan tempat hidup dan mencari makan biota *sessil* tersebut.

Kata Kunci: Mikroplastik, Siput Gonggong, Sedimen

INTRODUCTION

According to data from the Ministry of Environment and Forestry (KLHK), plastic waste production in Indonesia reached 31,3 million tons in 2023, with plastic waste accounting for 19,2% of the total. Jambeck *et al.* (2015) identified Indonesia as the second-largest contributor of plastic waste, ranking just behind China. Plastic packaging is convenient but tends to be used only once before becoming waste (Fachrul *et al.* 2021). The large scale daily use of plastic significantly increases plastic waste production much of this waste ends up in aquatic ecosystems, where it undergoes degradation into microplastics.

Microplastics are small plastic particles generally less than 5 mm in size distributed across the sea surface, coastlines and the seabed (Lusher *et al.* 2013). They are classified into two categories primary and secondary microplastics. Primary microplastics are particles that are already microscopic in size and are found in products made from plastic particles such as cleansers and cosmetics. In contrast, secondary microplastics originate from existing plastic in the environment that breaks down into smaller fragments through fragmentation processes (Friadi *et al.* 2023).

Microplastics exhibit diverse shapes, types, sizes, compositions, colors and densities (Bergmann *et al.* 2015). They are composed of various polymers with differing densities, including polyethylene, polystyrene, polypropylene, polyester and polyvinyl chloride. Meanwhile, classification based on texture and shape includes categories such as fibers, fragments, films and pellets (Hastuti *et al.* 2014).

Microplastic particles entering aquatic environments accumulate in substrates or sediments (Violando *et al.* 2023). Microplastics trapped in sediment are ingested by various marine organisms, particularly sessile biota such as benthos. Thus, sediment serves as a pathway for microplastics to enter the food chain of benthic organisms such as snails or gastropods.

The distribution of microplastics in sediments is influenced by sediment grain size. Finer sediments increase microplastic retention (Jiang *et al.* 2023). According to a study by Ningrum *et al.* (2022), filaments are the type of microplastic most commonly found in sandy and slightly stony sediments. According to Watters *et al.* (2010) soft sediments can trap microplastics more effectively compared to gravelly and stony sediments. Based on these two studies, the deposition patterns of microplastics are influenced by sediment grain size.

Penyengat Island is a tourist destination located in the Penyengat Village of Tanjungpinang City, Riau Islands Province. The high volume of tourism and residential

activities on Penyengat Island has led to plastic waste pollution. This aligns with the findings Dewi *et al.* (2015) who state that plastic in the ocean originates from tourism activities, household waste, fishing waste and waste from ports. In addition to tourism, Penyengat Island is also a fishing ground for various marine products, including fish and gonggong snails (Nezaputri *et al.* 2021).

Beyond its role as a tourist destination, Penyengat Island is frequently used for harvesting marine resources particularly fish and gonggong snails (Nezaputri *et al.* 2021). According to Syukri *et al.* (2020) gonggong snails are a popular snack with high consumption rates on Penyengat Island. Gonggong snails are a type of benthic animal belonging to the *Strombidae* family they are sedentary, living, and rely on the sediment for their food (Supratman & Syamsudin 2018).

According to Susiana *et al.* (2019) the presence of gonggong snails in the Riau Islands represents a significant target for resource utilization. Gonggong snails are widely consumed by both the local population and tourists, ranging from domestic to international visitors. This makes gonggong snails a popular food item with commercial value (Soeharmoko 2020). The high level of utilization of gonggong snails as a food product necessitates research on the abundance and characteristics of microplastics accumulated in gonggong snails and their sediments, which serve as the habitat and foraging grounds for these *sessile* organisms.

RESEARCH METHODS

Time and Location

This research will be conducted from July to August 2024. The study sites are located in the Pulau Penyengat Urban Village, Tanjungpinang City, Riau Islands Province, comprising three stations characterized by distinct human activities. Station 1 is situated on Pelabuhan street, an area dominated by tourism and shipping activities. Station 2 located on Istana Laut street is a residential area, while Station 3 is on Sumur street, an area with minimal human or tourist activity. The samples used in this study consist of gonggong snail (*Laevistrombus turturella*) and sediment. Microplastic processing and analysis were conducted at the Biogeochemistry Laboratory of the Faculty of Fisheries and Marine Sciences Padjadjaran University, while sediment sample processing to measure grain size was carried out at the ITK Laboratory of the Faculty of Fisheries and Marine Sciences, Padjadjaran University.

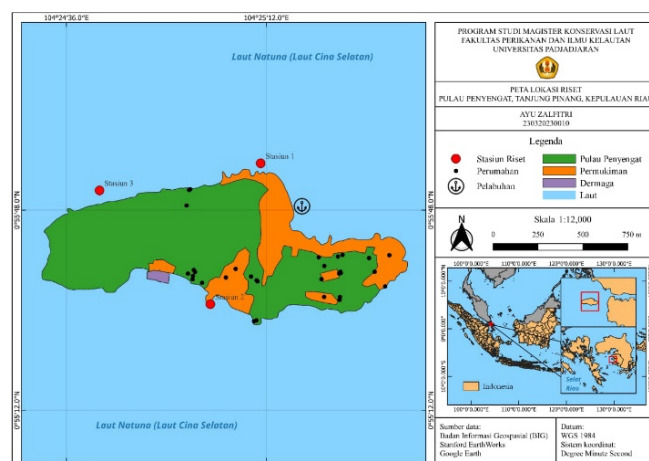


Figure 1. Research Location Map (Primary Data, 2024)

Tools and Materials

The equipment used in this study included GPS (*Global Positioning System*), quadrat transects, roll meter, ekman grab, soil meter, pH meter, refractometer, DO meter, Ziploc bags,

cool box, drying oven, sieve shaker, analytical balance, beakers, measuring cups, petri dishes, erlenmeyer flasks, Buchner funnel, mortar, hot plate stirrer, metal spatula, metal tweezers, dropper pipette, stirring rod, thermometer, Whatman No. 42 filter paper, camera, writing utensils, Zeiss microscope and computer. The materials used were samples of the gonggong snail (*Laevistrombus turturella*) and sediment sample, aluminum foil, distilled water, NaCl, H₂O₂ 30% and Fe(II).

Research Procedure

This study used primary data and secondary data from the literature as references. Sampling of gonggong snails and sediment was conducted during the lowest tide using the quadrat transect method, transects were laid out perpendicular to the shoreline extending toward the sea with plots spaced 1 meter apart and three replicates performed. Sediment samples were collected to a depth of 7 cm to assess the spatial distribution of microplastics (Ayuningtyas *et al.* 2019). The collected snail and sediment samples were placed in resealable plastic bags and stored in a cooler box. The water quality parameters measured in this study included temperature, salinity, current and pH.

Sediment grain size analysis was conducted using the method described by Rachman *et al.* (2023) in which 200 g of the collected sediment sample was weighed. The samples were dried by exposing them to direct sunlight and then oven dried to ensure thorough drying. Subsequently, the samples were sieved using a *sieve shaker* with mesh sizes of 4,75 mm, 2,00 mm, 0,85 mm, 0,425 mm, 0,250 mm, 0,180 mm, 0,150 mm, 0,106 mm, 0,090 mm, 0,075 mm, and 0,060 mm for 10 minutes. Next, the dried sediment samples were separated by each sieve diameter and weighed (Oktaviana *et al.* 2016). Sediment samples retained on the sieves were collected, weighed using an analytical balance and entered into the Gradistat software (Oktaviana *et al.* 2016). Next, sediment types were classified based on the Wentworth scale by Uden Wentworth (1922). Sediment sample preparation involved drying the samples in an oven for 24 hours at 60°C. The dried sediment samples were then ground and sieved; 100 g of the sample was weighed, 300 mL of NaCl solution was added and the mixture was homogenized using a magnetic stirrer for 3 minutes. Once the sample was homogeneous, it was incubated for 48 hours, covered with aluminum foil. The resulting supernatant was filtered through a *stainless steel* sieve into an Erlenmeyer flask and dissolved in 20 mL of a solution containing H₂O₂ 30% and 0.05 M Fe(II). The mixture was then heated on a hot plate stirrer for 30 minutes until it reached 75°C, after which the sample was allowed to stand for 48 hours. The supernatant obtained was filtered using Whatman No. 42 filter paper in a Buchner funnel, then the filter paper was transferred to a Petri dish.

Preparation of the gonggong snail samples was carried out by adding 20 mL of a solution containing H₂O₂ 30% and 0.05 M Fe(II). The 10 grams of the gonggong snail sample, which had been ground using a mortar, was homogenized and heated using a hot plate stirrer for 30 minutes until it reached a temperature of 75°C. The homogenized sample was incubated for 48 hours to obtain a clear supernatant. The resulting supernatant was filtered using a stainless steel sieve (5 mm mesh). If organic matter was still present, 20 mL of H₂O₂ 30% solution was added. If no organic matter remained, the sample was filtered using Whatman No. 42 filter paper in a buchner funnel, and the filter paper was transferred to a Petri dish.

The prepared samples of gonggong snails and sediment will be identified using a Zeiss microscope. Microplastic data analysis will be entered into Microsoft Excel, including abundance and characteristics. The abundance of microplastics in gonggong snails can be calculated using the formula:

$$\text{Microplastic abundance} = \frac{\text{Number of microplastic particles}}{\text{Sample weight}}$$

The analysis of microplastic abundance in sediment was conducted by dividing the number of microplastics found by the dry weight of the sediment (g). According to Widianarko and Hantoro (2019), the abundance of microplastics in sediment is calculated using the formula:

$$C = n/v$$

Description:

C = The abundance of microplastics obtained (particles)

n = Number of microplastic particles

v = Dry sediment sample weight (g)

Data Analysis

Differences in microplastic abundance at each station were analyzed using statistical tests. The statistical test performed was a *one-way ANOVA* (5% significance level), preceded by preliminary tests for normality using the *Shapiro-Wilk* test and for homogeneity using Bartlett's test. Once it was confirmed that the data were homogeneous and normally distributed, a follow up *one-way ANOVA* was conducted to determine whether there were differences in the mean microplastic shapes at each station. Interpretation of the output from the one-way ANOVA test if the value is ($F > F_{crit}$) then there is a difference in the data, if the value is ($P \text{ value} < 0,05$) then the data is significantly different (Lestari *et al.* 2021).

RESULT

Water Quality

Based on the research results, water quality data including temperature, current, pH and salinity as well as seawater quality standards based on Government Regulation No. 22 of 2021 are presented in Table 1.

Table 1. Water Quality

Parameter	Unit	Station			Quality standard
		1	2	3	
Water Temperature	(°C)	32,2*	31,6	28,7	28 - 32
Current	(m/s)	0,09	0,11	0,20	-
pH	-	7,99	7,96	7,93	7,0 - 8,5
Salinity	(‰)	32	31,6	31	0 - 34

* Exceeding quality standards (Primary Data, 2024)

Sediment Types

Based on the study, different sediment types were identified on Penyengat Island as shown in Figure 2.

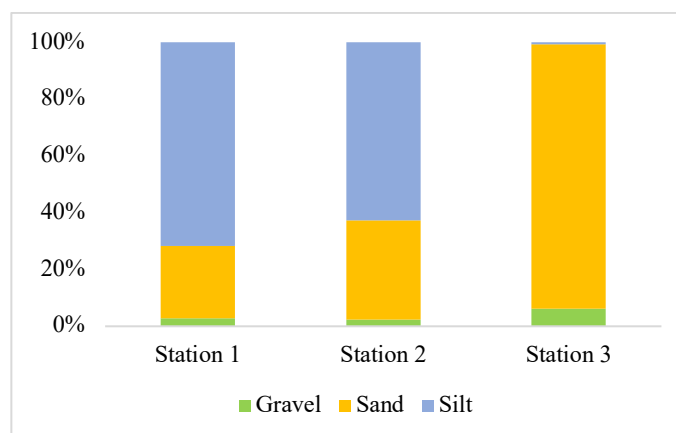


Figure 2. Percentage of Sediment Fractions

Microplastic Abundance

The highest microplastic abundance was found at Station 1, with concentrations of $3,80 \pm 0,86$ particles/g in gonggong snails and $1,03 \pm 0,23$ particles/g in sediment. Station 2 showed microplastic concentrations of $1,83 \pm 0,31$ particles/g in gonggong snails and $0,83 \pm 0,17$ particles/g in sediment. Meanwhile, the lowest microplastic abundance was recorded at Station 3 with concentrations of $1,60 \pm 0,29$ particles/g in gonggong snails and $0,44 \pm 0,10$ particles/g in sediment. Based on the research results, data on microplastic abundance in gonggong snail samples are presented in Figure 3.

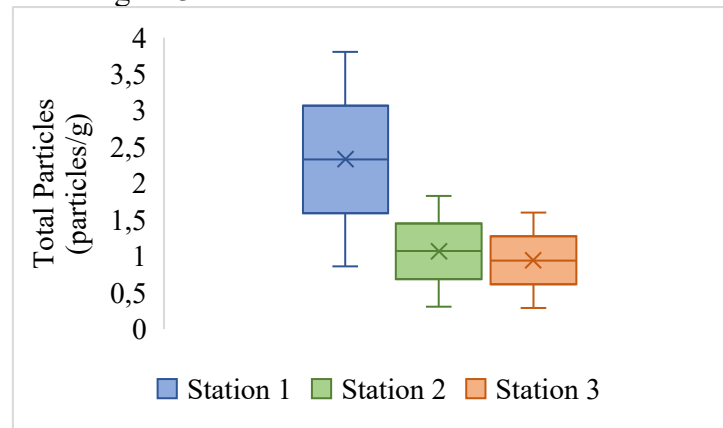


Figure 3. Microplastic abundance in Gonggong snails

In addition, based on the data the microplastic abundance in the sediment samples is presented in Figure 4.

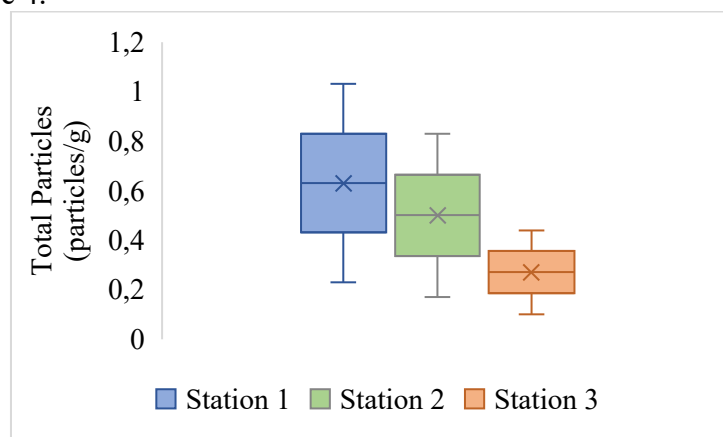


Figure 4. Microplastic abundance in sediments.

Microplastic Characteristics

The shapes of microplastics in the gonggong snails and sediment were dominated by fragments (gonggong snails 61,29%, sediment 58,93%) and films (gonggong snails 23,04%, sediment 30,98%). A graph showing the composition of microplastic shapes in gonggong snails at each station is shown in Figure 5.

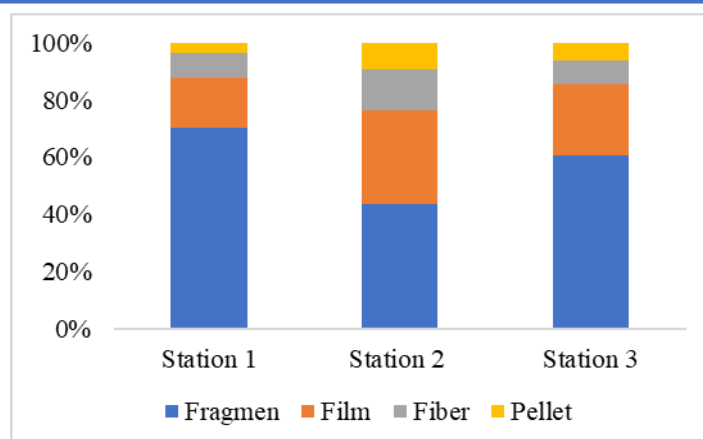


Figure 5. Composition of microplastic shapes in Gonggong snails.

Meanwhile, the graph showing the composition of microplastic shapes in the sediment at each station can be observed in Figure 6.

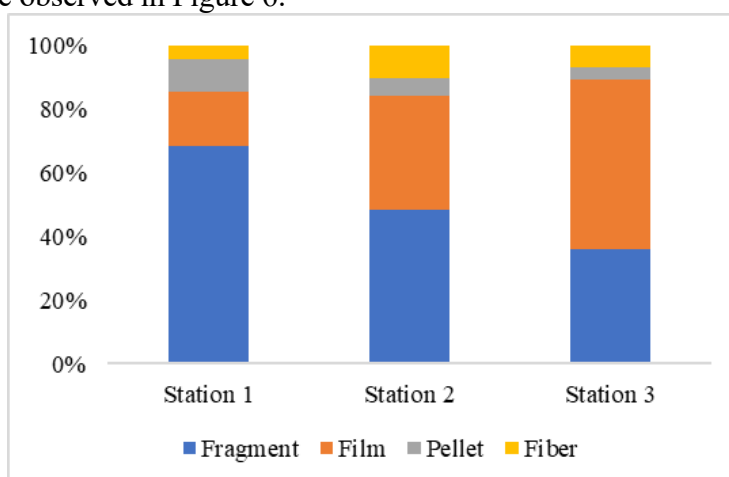


Figure 6. Composition of microplastic shapes in the sediment

Microplastics in the gonggong snails and sediment were predominantly black (gonggong snails 37,79%, sediment 45,60%) and transparent (gonggong snails 22,58%, sediment 22,66%). A graph showing the color composition of the gonggong snails at each station is presented in Figure 7.

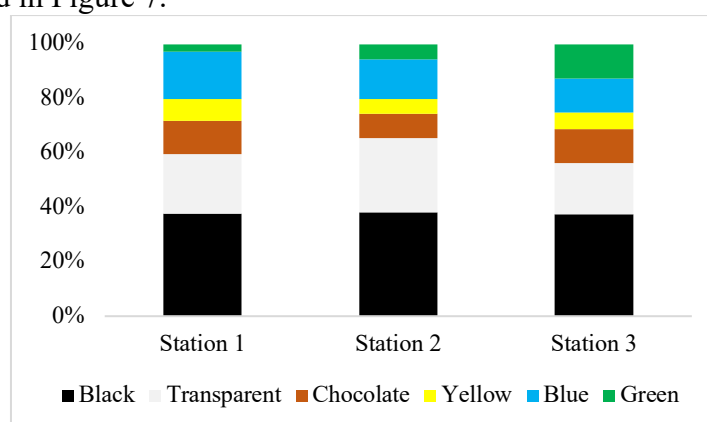


Figure 7. Color composition of microplastics in Gonggong snails

Meanwhile, the graph showing the color composition of the sediment at each station can be seen in Figure 8.

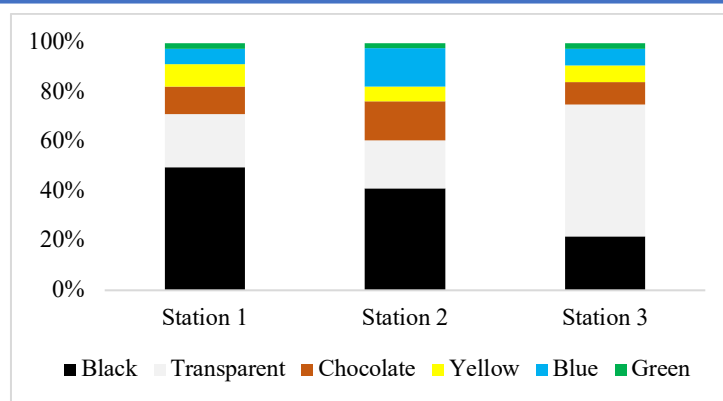


Figure 8. Color composition of microplastics in sediments

DISCUSSION

Water Quality

Based on the results of water quality measurements, the average temperature at Station 1 was $32,2 \pm 1,30$ °C, Station 2 was $31,6 \pm 0,75$ °C and Station 3 was $28,7 \pm 3,23$ °C. The average temperature at Station 1 remains within the temperature quality standard established by Government Regulation No. 22 of 2021, which is 28–32 °C. Temperature can influence the degradation of plastic into smaller particles—commonly known as microplastics a process aided by sunlight. According to Layn *et al.* (2020) as water temperatures rise, the abundance of microplastics will increase. The high temperature at Station 1 was due to the sampling process being conducted during the daytime.

Current measurements at Penyengat Island yielded average speeds of $0,09 \pm 0,01$ m/s at Station 1, $0,11 \pm 0,04$ m/s at Station 2, and $0,20 \pm 0,18$ m/s at Station 3. According to Coppock *et al.* (2017) average water currents are known to reflect microplastic abundance in a body of water; if the current speed is low, the movement of microplastic particles slows down, leading to accumulation and a tendency for fragmentation to occur only in that specific area. Syaputra *et al.* (2025) classify current speeds into three categories: weak (0,01–0,19 m/s), moderate (0,20–0,39 m/s), and strong ($\geq 0,40$ m/s). Marine current patterns can be influenced by tidal phenomena (Islami *et al.* 2020). Measurements of the pH parameter yielded average values of $7,99 \pm 0,28$ at Station 1, $7,96 \pm 0,23$ at Station 2, and $7,93 \pm 0,07$ at Station 3. These values meet the quality standards set by Government Regulation No. 22 of 2021, namely 7.0–8.5. The pH value influences the degradation of microplastics by bacteria, a process commonly known as biodegradation. Bacteria tend to degrade microplastics within a pH range of 7–8; some bacteria capable of degrading microplastics include *Acinetobacter* sp., *Rhodococcus* sp., and *Pseudomonas* sp. (Ningrum *et al.* 2022). The slightly higher pH value at Station 1 compared to the other stations is likely due to sampling being conducted during the day. Sampling during the day can cause CO_2 concentrations to decrease due to photosynthesis (Supriatna *et al.* 2020)..

Salinity measurements yielded average values of 32 ppt at Station 1, $31,6 \pm 0,58$ ppt at Station 2, and 31 ppt at Station 3. According to Government Regulation No. 22 of 2021, these salinity values meet the specified water quality standards which range from 0 to 34 ppt. Salinity levels can influence the fragmentation of plastic into microplastics; high salinity increases the density of the water, causing plastic to float more easily on the water's surface and be directly exposed to sunlight (Teuten *et al.* 2009). The salinity value at Station 1 was significantly higher than at the other stations because sampling was conducted during the day, which is believed to have been influenced by evaporation.

Types of Sediment

The dominant sediment fraction at Station 1 was *silt*, accounting for 71.80%; Station 2 was dominated by *silt*, accounting for 62.78%. Meanwhile, Station 3 was dominated by *sand*, accounting for 93.20%. The deposition and distribution of sediment fractions are influenced by various factors, one of which is the oceanographic conditions of the water body, such as waves and currents (Nugroho & Basit 2014). Silt or mud fractions are less likely to settle in sediments where water currents are relatively strong (Kinasih *et al.* 2015).

Microplastic Abundance

Observations of gonggong snail samples from Penyengat Island in Tanjungpinang City showed that the microplastic particles found in a 10 gram sample of gonggong snails consisted of fragments, films, fibers, and pellets (Figure 9). Results from a *one-way* ANOVA test showed that microplastic concentrations at each station differed significantly ($F > F\text{-critical}$; $P\text{-value} < 0,05$). The highest microplastic abundance concentration was found in the gonggong snail sample from Station 1 ($3,80 \pm 0,86$ particles/g), likely due to the high level of human activity at this location (port, tourism, and trade), suggesting that microplastic input from land is relatively high. According to Dewi *et al.* (2015), microplastics originate from plastic waste resulting from various land-based activities such as tourism, household waste, port waste and waste from fishing activities.

The accumulation of microplastics in the gonggong snail is likely due to the high concentration of microplastics present in the sediment. As a *deposit-feeder* organism, the gonggong snail feeds by scraping the sediment layer causing sand or sediment to be ingested and accumulate in its digestive system. According to Supratman and Tati (2018), *deposit-feeding* organisms tend to be susceptible to microplastic accumulation, as the ingestion of sediment results in the simultaneous ingestion of microplastics. The diameter and weight of the gonggong snail are shown in Figure 9.



Figure 9. Diameter and weight of Gonggong snails
(Personal Documentation 2024)

The average weight of the gonggong snail at Station 1 was 20,55 g, at Station 2 was 14,75 g, and at Station 3 was 17,97 g. Meanwhile, the average diameter of the gonggong snail at Station 1 was 57,5 mm, at Station 2 was 50 mm, and at Station 3 was 55,75 mm. Differences in microplastic concentrations in gonggong snails may also be influenced by differences in size (diameter), though the correlation tends to be low. Differences in gastropod shell size from large to small or vice versa may be caused by environmental pressures such as tourism, industrial activities, or human settlements. According to Ningsih *et al.* (2024) differences in gastropod shell size at each station are influenced by substrate conditions, physical and chemical factors of the water and human activities.

Microplastic particles were identified at three research stations and exhibited significant variation and differences based on the results of a *one-way* ANOVA test ($F > F\text{-critical}$; $P\text{-value} < 0,05$). The highest microplastic abundance in sediment samples was found, in descending order, at Station 1 ($1,03 \pm 0,23$ particles/g), Station 2 ($0,83 \pm 0,17$ particles/g), and Station 3 ($0,44 \pm 0,10$ particles/g). The low microplastic concentration in the sediment at Station 3 is due to differences in current velocity; at this station, the current tends to be stronger than at other stations, so it is presumed that microplastics have difficulty settling into the sediment. Chakraborty *et al.* (2015) stated that sediment grain size can influence the deposition of microplastics in sediment. According to Dewi (2015) soft sediments such as *clay* tend to trap microplastic particles more easily than sandy or stony sediments.

Characteristics of Microplastics

The results of the *one-way* ANOVA test on gonggong snails and sediment on Penyengat Island showed significant differences in microplastic form ($F > F\text{-critical}$; $P\text{-value} < 0.05$). The microplastic shapes most frequently found in gonggong snails and sediment were fragments (gonggong snails 61,29%, sediment 58,93%) and films (gonggong snails 23,04%, sediment 30,98%). The microplastics found in gonggong snails and sediments on Penyengat Island exhibit relatively distinct shapes, indicating that they may originate from different sources or be exposed to relatively different environmental factors. This aligns with the findings of Suteja *et al.* (2021), who noted that differences in microplastic shapes across all samples can be influenced by environmental factors (sources) and water hydrodynamics.

The shapes of microplastics in the gonggong snails and sediments were dominated by fragments, which were the most abundant at each station. According to Azizah *et al.* (2020), fragments are the most commonly found type of microplastic compared to other types. The high prevalence of fragment type microplastics is attributed to the fact that this type originates from varied sources, disperses easily and can persist in sediments for a long time (Hasteti *et al.* 2023). The dominance of microplastic fragments at this location is believed to stem from domestic and tourism activities that generate waste. According to Andrady (2011) fragments result from the fragmentation of beverage and food bottles, water jugs, jar shards, small pieces of PVC pipe and jars. Station 1 located on Jalan Pelabuhan, is a ship berthing area and thus a potential source of microplastic fragments. This is because paint on ship hulls can undergo corrosion over time, leading to its accumulation in sediments and aquatic biota. In addition, *ballast water* is another potential source of microplastics originating from this location. Zendehboudi *et al.* (2024) found an average microplastic abundance in ballast water samples of 12.53 items/L.

Film is the most common form of microplastic after fragments; the high abundance of film-form microplastics at the three stations is due to this type's thin and small size, making it easily carried by currents (Hidalgo-Ruz *et al.* 2013). Furthermore, according to Ayuningtyas *et al.* (2019) film type microplastics tend to have low density, making them prone to floating and moving from one location to another. Film type microplastics have flexible and thin physical characteristics and typically originate from pieces of single use plastic bags that have degraded and settled in the sediment (Ningrum *et al.* 2022). The forms of microplastics found in gonggong snails and sediment are shown in Figure 10.

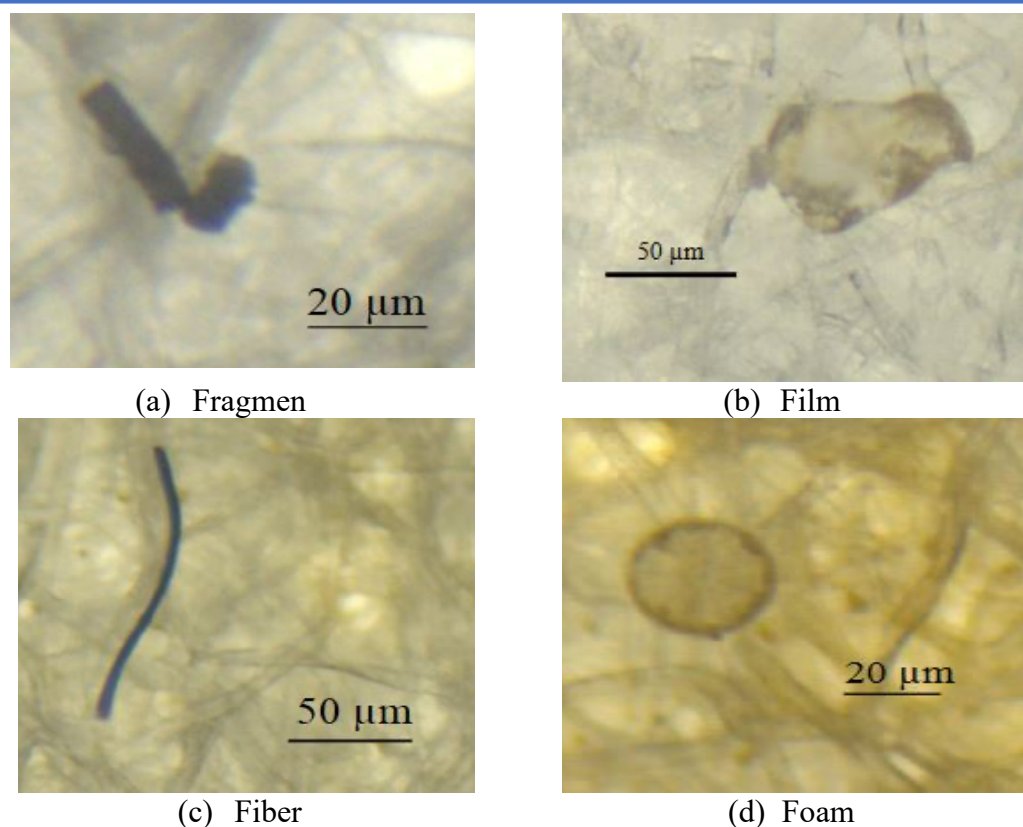


Figure 10. Forms of microplastics

The results of the *one-way* ANOVA test on microplastics in gonggong snails and sediments on Penyengat Island showed a significant effect of microplastic color ($F > F_{\text{critical}}$; $P\text{-value} < 0,05$). The most commonly found microplastic colors in gonggong snails and sediment were black (gonggong snails 37,79%, sediment 45,60%) and transparent (gonggong snails 22,58%, sediment 22,66%). Black color often indicates that the plastic has undergone significant absorption of various pollutants (Duis and Coors 2016). Black fragments in microplastics are also thought to originate from various terrestrial sources such as black plastic bags resulting from commercial, tourism, and domestic activities. Additionally, the black color may result from the wear and tear of ship paint that has undergone a corrosive process and accumulated in the water (Lima *et al.* 2014). Meanwhile, the transparent color of microplastics is believed to result from a relatively recent plastic fragmentation process caused by sunlight (Laksono *et al.* 2021). According to Pedrotti *et al.* (2014), transparent microplastics originate from *polypropylene* (PP), a polymer known for its low density, which is why it is commonly found in water bodies. Transparent microplastics tend to be *filamentous* in form and originate from single use plastic bags (Kapo *et al.* 2020).

CONCLUSION

Microplastics were detected in all samples from all study locations. The highest microplastic abundance was found at Station 1, specifically along the coastal area of Jalan Pelabuhan (gonggong snails $3,80 \pm 0,86$ particles/g, sediment $1,03 \pm 0,23$ particles/g). The lowest microplastic concentrations were found at Station 3, located along the coastline of Jalan Sumur (gonggong snails $1,60 \pm 0,29$ particles/g, sediment $0,44 \pm 0,10$ particles/g).

The most commonly found microplastic forms were fragments (gonggong snails 61,29%, sediment 58,93%) and films (gonggong snails 23,04%, sediment 30,98%). Meanwhile, the dominant colors at each station were black (gonggong snails 37,79%, sediment 45,60%) and transparent (gonggong snails 22,58%, sediment 22,66%). A *one-way* ANOVA parametric test on the abundance, shape and color of microplastics in gonggong snails and

aquatic sediments at each station revealed significant differences ($F > F\text{-critical}$; $P\text{-value} < 0,05$) indicating that differences between stations influence the abundance and characteristics of microplastics.

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