JURNAL PERIKANAN DAN KELAUTAN
Volume 30 No. 3, October 2025: 319-323

e-issn : 2721-8902
p-issn : 0853-7607

Habitat and Density of Crab (*Parathelpusha pardus*) in the Tanduk River, Rumbio Village, Kampar District, Riau

Habitat dan Kepadatan Kepiting (Parathelphusa pardus) di Sungai Tanduk Desa Rumbio Kecamatan Kampar Provinsi Riau

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Received
21 August 2025

Accepted
20 September 2025

Abstract

Freshwater crabs have a life cycle entirely in freshwater and play an essential role in the food chain as both omnivores and detritivores. Some freshwater crabs can only be found in clean water, so they can also be used as bioindicators of water quality. This study aims to determine the habitat and density of crabs in the Tanduk River in Rumbio Village and to investigate the relationship between environmental parameters and the density of *P. pardus* crabs in this area, Kampar District. The study was conducted from March to April 2024 in Rumbio Village, Kampar District, Kampar Regency, Riau Province. The methods used were surveys and literature reviews. The survey method involved direct field visits to the study site. Sampling was conducted three times over a three-week period. The literature review involved collecting secondary data from previous studies and data obtained from local government offices. Primary data consisted of field data, including crab samples that were collected and identified, as well as water quality data. The study found that the density of P. pardus crabs in the Tanduk River in Rumbio Village was 10 individuals at Station 1, 16 individuals at Station 2, and 29 individuals at Station 3. Various factors, including environmental conditions like vegetation and food availability, influenced this. The habitat characteristics supporting the survival of *P. pardus* crabs based on water quality measurements in Rumbio Village during the study were temperature 27–28°C, turbidity 12–50 cm, pH 7.5–8.5, dissolved oxygen 5.7–7.2 mg/L, free CO_2 5–17 mg/L, and phosphate 0.0730–0.1327 mg/L.

Keywords: Habitat, Density, Crabs, Rumbio Village

Abstrak

Kepiting Air Tawar memiliki siklus hidup yang seluruhnya berada di perairan tawar berperan penting dalam rantai makanan yaitu sebagai omnivora dan detrivor serta beberapa kepiting air tawar hanya dapat ditemukan pada perairan dengan kondisi yang bersih, sehingga dapat juga dijadikan sebagai bioindikator suatu perairan. Penelitian ini bertujuan untuk mengetahui habitat dan kepadatan kepiting di sungai Tanduk Desa Rumbio serta mengetahui hubungan parameter lingkungan terhadap kepadatan kepiting *P. pardus* di Sungai Tanduk Desa Rumbio Kecamatan Kampar. Penelitian ini dilaksanakan pada Maret-April 2024 di Desa Rumbio Kecamatan Kampar, Kabupaten Kampar Provinsi Riau. Metode yang digunakan survei dan studi literatur, metode survei yaitu melakukan tinjauan secara langsung kelapangan yang menjadi lokasi penelitian. Pengambiilan sampel dilakukan 3 kali pengambilan dengan jangka waktu 3 minggu. Sedangkan studi literatur merupakan pengumpulan data sekunder berupa hasil penelitian terdahulu dan data yang didapatkan dari kantor

pemerintah setempat lalu data primer merupakan data lapangan berupa data sampel kepiting yang diperoleh dan diidentifikasi serta data kualitas air. Hasil dari penelitian ini ditemukan kepadatan kepiting *P. pardus* di Sungai Tanduk Desa Rumbio di Stasiun 1 berkisar 10 individu, pada Stasiun 2 berkisar 16 individu, dan pada Stasiun 3 berkisar 29 individu. Hal ini dipengaruhi oleh berbagai faktor seperti kondisi lingkungan seperti vegetasi tumbuhan dan ketersediaan makanan. Karakteristik habitat yang mendukung keberlangsungan hidup kepiting *P. pardus* berdasarkan pengukuran kualitas air di Desa Rumbio selama penelitian yaitu suhu 27-28°C, kecerahan 12-50 cm, pH 7,5-8,5, oksigen terlarut 5,7-7,2 mg/L, CO_2 bebas 5-17 mg/l dan fosfat 0,0730 – 0,1327 mg/L.

Kata kunci: Habitat, Kepadatan, Kepiting, Desa Rumbio

1. Introduction

Crabs are ten-legged crustaceans with very short tails (Greek: brachy = short, ura = tail). This animal is classified under the phylum Arthropoda, subphylum Crustacea, order Decapoda, and infraorder Brachyura (Ruppert et al., 2003). The crab's body is covered by a carapace, which is a hard outer shell or exoskeleton and serves to protect the crab's internal organs. The *P. pardus* crab is similar to other crabs in that its growth is always marked by the occurrence of molting phases. The strength of the chelae in capturing food during molting differs from that of crabs not in the molting phase, thereby influencing the feeding habits and types of food typically consumed by the *P. pardus* crab. According to Febriani (2017), debris is suspected to be the primary food source for *P. pardus* crabs, with the debris consumed by these crabs originating from dead or decaying *Barclaya* sp. *P. pardus* crabs have ecological potential as bioindicators of environmental pollution, as freshwater crabs are only found in clean water bodies.

Crabs play an essential role in aquatic ecosystems by converting nutrients, enhancing mineralization, increasing oxygen distribution in the soil, aiding carbon cycling, and serving as a natural food source for various aquatic organisms (Prianto, 2007). *P. pardus* crabs have benefits as natural livestock feed and as a remedy for liver disease in broiler chickens. *P. pardus* crabs are found in the freshwater of Rumbio Village, which is not too far from residential areas. Various activities, including the disposal of household waste into water bodies and agricultural and livestock activities, negatively impact the declining population of P. pardus crabs and may affect the river's ecological balance.

Given the need to preserve and ensure the survival of *P. pardus* crabs, appropriate management strategies are required to safeguard their natural habitats. In a previous study, Ramona (2021) investigated the habitat characteristics of *P. pardus* crabs. However, further research on the habitat and population of *P. pardus* crabs is needed because they play an essential role in the aquatic ecosystem. Therefore, the author is interested in conducting research on the habitat and population of *P. pardus* crabs in the Tanduk River in Rumbio Village, North Kampar District, Kampar Regency. This study also aims to determine the habitat characteristics and crab density in the Tanduk River in Rumbio Village, as well as to determine the relationship between environmental parameters and the density of *P. pardus* crabs in the Tanduk River in Rumbio Village, Kampar District, Kampar Regency, Riau Province.

2. Material and Method

2.1. Time and Place

This research was conducted in March-April 2024 in Rumbio Village, Kampar District, Kampar Regency, Riau Province.

2.2. Methods

The methods used in this study were surveys and literature studies. The survey method involves conducting a direct field review of the research location. Sampling was carried out three times over a period of three weeks. Meanwhile, the literature study involved collecting secondary data, including previous research results and data obtained from local government offices. In contrast, primary data consisted of field data in the form of crab samples that were received, and identified, as well as water quality data.

2.3. Procedures

Crab samples were captured using traps. Three traps were placed at each station, and traps baited with palm fruit were placed in waters with abundant vegetation. The traps were then left in place until the crabs entered the traps. Once the samples were obtained, they were placed in 2 kg plastic bags, and the time of collection was

recorded. The crabs were then placed in a cool box filled with crushed ice. The density of *P. pardus* crabs was calculated using the Hayne method (regression method). Animals were sampled at different times, and those caught were not released. The formula is as follows:

$$Yi = a - bXi$$

Description: Yi is the number of animals caught in period i
Xi is the cumulative number of animals in period i
B is the slope of the regression line with a negative value
A is the intercept of the regression line on the Y-axis.

Substrate sampling was carried out using PVC pipes. Data collection was performed by inserting the PVC pipe into the substrate at a 45° angle and then covering the upper part of the pipe with the palm of the hand as it was lifted out. Once the substrate was obtained, it was placed in a plastic bag and analyzed in the laboratory. Water quality measurements were taken three times at weekly intervals over a period of three weeks. Water quality parameters were measured directly in the field before collecting crab samples at each sampling point.

2.4. Data Analysis

Data from the calculations and measurements of environmental parameters were tabulated, then described descriptively and linked to previous studies to arrive at scientific conclusions that describe the habitat characteristics of *P. pardus* crabs in the Tanduk River in Rumbio Village, Kampar District. Water quality parameters and substrate parameters were compared with crab density to determine suitable habitats for *P. pardus* crabs. Regression analysis was then used to establish the relationship between water quality and crab density. Data were analyzed using MS Excel.

3. Result and Discussion

3.1. Number of Crab Samples

The number of *P. pardus* crabs obtained during sampling in the Tanduk River in Rumbio Village varied at each station. Based on the research results, the differences in the number of crabs caught at each station are closely related to the condition of aquatic vegetation, such as *Barclaya* sp and *Poliopodiophyta* that inhabit the Rumbio River. The number of crabs caught in the Tanduk River in Rumbio Village can be seen in Table 1.

Table 1. Number of crabs caught

Sampling Size	Station	Number of Crabs
1	1	7
	2	10
	3	15
Number		32
2	1	10
	2	16
	3	29
Number		55
3	1	11
	2	14
	3	23
Number		48

In Table 1, 32 *P. pardus* crabs were collected in the first, 55 in the second, and 48 in the third. The lowest number of crab specimens was found at Station I, likely due to the station's proximity to residential areas, which results in a high influx of pollutants into the water body. The contaminated water makes it difficult for freshwater crabs to survive, potentially explaining the low number of specimens collected. Another possible reason for the low number of crabs obtained at Station I is the sparse aquatic vegetation, which does not provide a suitable habitat for crabs. As stated by Jacoby (2011), aquatic vegetation indirectly influences the presence of crabs. The research results conducted in the Tanduk River in Rumbio Village found the freshwater crab species *P. pardus* with varying densities at each station. The crab density data are presented in Table 2.

Table 2. Crab density

Sampling period	1	2	3
Number of crabs caught (S1)	7	10	11
Accumulation with the previously captured amount (Xi)	0	7	17
Number of crabs caught (S2)	10	16	14
Accumulation with the previously captured amount (Xi)	0	10	26
Number of crabs caught (S3)	15	29	23
Accumulation with the previously captured amount (Xi)	0	15	44

Thus, the density calculated from the catch results of P. pardus crabs in the Tanduk River, Rumbio Village, Kampar District, at three stations varied. At Station 1, the crab density was 10 individuals; at Station 2, the crab density was 16 individuals; at Station 3, the crab density was 29 individuals. The lowest density was found at

Station 1, while the highest density was at Station 3. The variation in crab density is influenced by environmental conditions such as the abundance of aquatic vegetation along the river, food availability, and the distance from plantations and human settlements.

3.2. Water Quality

The results of water quality measurements conducted during the study in Rumbio Village (Table 3).

Table 3. Water quality measurement

Station	Water quality parameters				
	Temperature (°C)	Brightness(cm)	DO	CO_2 (mg/L)	Phosphate(mg/L)
1	27,3	29,6	6,1	15,6	0,09
2	27,6	28,3	6,2	10	0,11
3	27,3	32,6	6,6	6,3	0,11

Based on the temperature measurements taken at each station, there was not much difference between them, as each station still had natural vegetation. The temperature measurements taken at the Tanduk River in Rumbio Village were still ideal for the survival of *P. pardus* crabs. According to Lesmana (2011), temperature can affect the speed of chemical reactions in water. As temperature increases, chemical reactions occur more rapidly; however, the concentration of gases in the water, such as oxygen, decreases, which affects aquatic organisms.
Based on the table of light intensity measurements in the Tanduk River in Rumbio Village, the highest value was recorded at Station 2 at 50 cm, and the lowest at Station 3 at approximately 12 cm. According to Nuriya et al. (2010), the optimal turbidity level for aquatic organisms is between 30 and 40 cm or higher. The turbidity level in water bodies is influenced by depth and the presence of organic and inorganic materials. High turbidity indicates that sunlight does not penetrate deeply into the water.

The pH measurement results for the Tanduk River in Rumbio Village were consistently low at station 1, with a value of 6. Low pH values are not suitable for supporting crab life, so the number of crabs found at station 1 was lower than at other stations. The pH values are also influenced by rainfall and domestic waste disposal, as Station 1 is located relatively close to residential areas. During the study, dissolved oxygen measurements in the Tanduk River in Rumbio Village ranged from 5.7 to 7.2 mg/L. The lowest dissolved oxygen value was found at Station 1, which was 5.7 mg/l, while the highest dissolved oxygen value was found at Station 3, which was 7.2 mg/l. The highest value was found at Station 3, which was 7.2 mg/L. The high dissolved oxygen value was due to the abundance of aquatic plants.

The highest CO_2 content measurement in the Tanduk River in Rumbio Village was recorded at station 1, at 17 mg/L, while the lowest was at station 3, at 6 mg/L. The high CO_2 content was caused by the Tanduk River being used by the surrounding community for various activities, including the direct disposal of all types of waste. This is highly dangerous for the survival of *P. pardu* crabs and other river organisms, as the maximum acceptable CO_2 content for river organisms is around 15 mg/L. The highest phosphate content measured in the Tanduk River in Rumbio Village was found at station 3, at 0.1327 mg/L, and the lowest phosphate content was found at station 1, at 0.0730 mg/L. The results of these phosphate measurements indicate that the Tanduk River in Rumbio Village is fertile

3.3. Determination of Aquatic Substrate

Based on Table 4, the sediment in the Tanduk River in Rumbio Village is of the sandy gravel type. At station one, the percentage of sediment is 31.72% gravel, 64.81% sand, and 3.47% silt, indicating that station one has the highest values for sand and gravel. At Station 2, the percentage of gravel is 31.02%, sand 65.45%, and silt 3.54%. Station 2 also shows the highest values for sand and gravel. At station three, the percentage of gravel is 22.70%, sand 73.93%, and silt 3.37%. Station three is the same as the previous station, with sand and gravel dominating the sediment.

Table 4. Sediment types at each research station

Sampling Point	Sediment Proportion			Sediment Types
	% Gravel	% Pasir	% Lumpur	
Station 1	31.72	64.81	3.47	Gravelly Sand
Station 2	31.02	65.45	3.54	Gravelly Sand
Station 3	22.70	73.93	3.37	Gravelly Sand

The organic content of sediments is influenced by the type and nature of the substrate that accumulates organic matter carried by water flow. Finer particle texture and size can facilitate the absorption and deposition of organic matter on the bottom of a water body. In contrast, sandy sediments have a coarser texture and more widely spaced pores, making it difficult for organic matter to settle and accumulate effectively (Amin et al., 2012).

4. Conclusions

Based on the research results conducted in the Tanduk River in Rumbio Village, different crab densities were found at each station. The density of *P. pardus* crabs was around 10 individuals at Station 1, 16 individuals at Station 2, and 29 individuals at Station 3. The variation in crab density is influenced by various factors such as environmental conditions, the condition of aquatic vegetation living in the river flow, and food availability. Based on the analysis conducted, it was concluded that the water quality in the Tanduk River in Rumbio Village remains good and does not significantly affect crab density. Additionally, all measured water quality parameters remain within the acceptable range for the presence of crab organisms.

5. References

Amin, B., & Nurrachmi, I. (2012). *Kandungan Bahan Organik Sedimen dan Kelimpahan Makrozoobentos sebagai Indikator Pencemaran Perairan Pantai Tanjung Uban Kepulauan Riau.* Prosiding Seminar Hasil Penelitian Dosen di Lembaga Penelitian Universitas Riau Tanggal 19 December (Vol. 10) .

Febriani, I.S., Windarti, W., & Efawani, E. (2017). *Stomach Content Analysis of Parathelphusa Pardus From the Sawah Village, Kampar Regency, Riau Province.* Universitas Riau.

Jacoby C.J. (2011). *Potential Effects of Water Withdrawal on Blue Crab, White Shrimp, Brown Shrimp, and Pink Shrimp*. (pp. 83-84). St. Johns River Water Management District

Lesmana, S.I. (2011). *Fisikal Training, dalam Mata Kuliah Gizi*. Olahraga

Nuriya, H., Hidayah, Z., & Syah, A.F. (2010). Analisis Parameter Fisika Kimia di Perairan Sumenep Bagian Timur dengan Menggunakan Citra Landsat TM 5. *Jurnal Kelautan: Indonesian Journal of Marine Science and Technology,* 3(2): 132-138

Prianto, E. (2007). *Peran Kepiting sebagai Spesies Kunci (Keystone Spesies) pada Ekosistem Mangrove. Prosiding Forum Perairan Umum Indonesia.* Balai Riset Perikanan Perairan Umum. Banyuasin. 9 (1), 97-98.

Ramona, W. (2021). Karakteristik Habitat dan Kepadatan Kepiting (*Parathelphusa pardus*) di Perairan Rawa Desa Sawah Kecamatan Kampar Utara Provinsi Riau. Universitas Riau

Ruppert, E.E., Fox, R.S., & Barnes, R.D. (2003). I*nvertebrate Zoology: A Functional Evolutionary Approach, 7th ed*. Brooks Cole Thomson: Belmont, CA. 53(4): 662-664