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Abundance of Gastropods in The Estuary Area of Liku Village, Samaturu District, Kolaka Regency

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Abstract

Gastropods have an important role in the aquatic food chain. The purpose of this study was to determine the abundance of Gastropod species in the area around the estuary of Liku Village, Samaturu District, Kolaka Regency. This research was conducted in Liku Village, Samaturu District, Kolaka Regency. The research variable consists of the independent variable (X) in the form of the calculation of gastropod abundance and the dependent variable (Y), namely the estuary area of Liku Village, Samaturu District, Kolaka Regency. The method used in this practicum is the plot placement method with the design of using observation stations for 3 repetitions in which 5 plots of observation sampling are made in each station, so that in total there are 15 data collection times. The data analysis technique used is descriptive technique. The abundance calculation results showed that the abundance of 2 species *Telescopium telescope* and the *Littorina scabra* species.

Keywords: Estuary, abundance, Gastropods.

A. Introduction

Gastropods are Molluscs that undergo modification from a bilateral symmetrical shape to a rotating form. In twisting there is a change in angle 1800 (Jasin, 1987). Gastropods are often referred to as univalves because they have a single shell, where the shell rotates, which causes all of its organs to twist (Kimball, 1999).

Gastropods are associated with the mangrove ecosystem as their living habitat, namely as a shelter, spawning and as a foraging area for their survival (Nontji, 2007). Gastropods are the class that can most easily adapt to environmental conditions compared to other classes of the Mollusca phylum, so that these Gastropods can be found in various places ranging from land, fresh water, sandy areas, sea, brackish areas, even in estuary areas.

Estuary is a transition area between river water and sea water. Sea water flows into the estuary area in high tide conditions and returns to the sea at low tide (Campbell, 2012). In this area there is a mixture of sea water with fresh water from the mainland, so that the water becomes brackish with a salinity ranging from 5 - 16.5 ‰. The mixing of sea water with fresh water makes the estuary area unique, namely the formation of brackish water with fluctuating salinity.

In the estuary area, there are environmental changes including changes in salinity caused by the influence of tides and changes in seasons. Changes in environmental conditions have caused

variations in the number of Gastropod species found in the estuary area. However, this estuary area receives nutrients carried by the river, so that the estuary area becomes a productive area which causes this area to be occupied by various types of animals including gastropods. Diversity of gastropods in Samaturu waters not yet known. Therefore the data gastropod community information very important so that researchers conduct a study on gastropod diversity in Estuaria waters, meandering village. Based on the foregoing, a study was conducted on "Gastropod Abundance in the Estuary Area of Liku Village, Samaturu District, Kolaka Regency"

B. Literature Review

Gastropods are molluscs that have undergone a modification from a bilateral symmetrical shape to a rotational form. In the twisting, there was a change in angle 1800. Gastropods are actually also aquatic animals, although some live on land. To avoid drying out the body, these animals make grafts and these grafts are a place for these animals to take shelter in adverse conditions. The graft will be closed by closing which is called the epiphragma (Jasin, 1987).

The shell of the gastropod is spiral-shaped. Legs for creeping, clear head shape, with tentacles and eyes. In the buccal space (cheek) there is a radua (toothed band). Breathe with gills and lungs or both. Habitat in the sea, fresh water, and on land. Sex is separate or hermaphrodite, oviparous or ovoviviparous. Typical development concerns trocopore larvae and veliger larvae (ciliated trochophore larvae) (Brotowidjoyo, 1990).

Gastropods are also called univalves because of their single shell. This shell can rotate, as are all the organs in the animal's body. In adults there is no plane of symmetry although these animals develop from bilaterally symmetric larvae. This animal has a clear head with two eyes which are often found on the stalk (Kimball, 1999).

The gastropod's most distinctive characteristic is a process known as torsion (torsion). During development an asymmetrical muscle is formed, and one side of the visceral mass grows faster than the other. The contractions of the muscles and the uneven growth cause the visceral mass to rotate until 1800, such that the anus and mantle cavity are placed over the head in adult animals. Most of the gastropods are protected in a single, spiral-shaped shell where the animal can enter when there is a threat (Campbell, 2002).

Gastropods are attractive relatively large animals. Asymmetric shell and usually curled like a screw twist to the right. This animal carries a shell, its legs are large and wide to crawl on rocks or to reduce sand or mud. In this class of animals, there is a reduction in several body organs to adjust the size of the shell, such as the reduction of one kidney, some types have one gill. The limpet shell does not appear to be threaded, although at the larval level, the shell is threaded which then disappears after becoming an adult (Romimoharto, 2007).

C. Methodology

1. Research Design

The design of this practicum is the use of 3 observation stations with a size of 5 x 5 m in which 5 plots are made in each station with a size of 1 x 1 m for sampling observations. So that in total there are 15 data retrieval times.

The population in this practicum is all Gastropod species that live in the estuary area of Liku Village, Samaturu District, Kolaka Regency. The samples in this practicum are all Gastropod species found in the station in the estuary area of Liku Village, Samaturu District, Kolaka Regency.

2. Instruments

The tools used in this study were film bottles, thermometer, endrefractoslinometer, and 1x1 m quadrant. The materials used in this study were label paper, raffia rope and plastic bags. Data collection procedures in this study are: (1) Conduct observation of the observation area; (2) Choosing the observation location, namely in the estuary area; (3) Make 3 observation stations with a size of 5 x 5 m in which 5 observation plots are made in each station with a size of 1 x 1 m; (4) Measuring environmental parameters at each observation station in the form of ambient temperature; (5) Taking every sample of Gastropod species found in each observation plot; (6) Insert each observation sample obtained into a film bottle or bag and then label the species found in each observation plot; (7) Identifying Gastropod species found in the Biology Unit Development Laboratory; (8) Count the number of each species obtained by station and observation plot then enter it in the observation table; (9) Calculate the abundance of each species obtained.

3. *Technique of Data Analysis*

The data analysis technique used is descriptive technique using the following formula:

$$\text{Abundance} = \frac{10.000 \times b}{a}$$

Information:

b = the number of gastropoda found

a = catchment area / area / plot

Gastropod Abundance Data Analysis in Estuary Areas:

$$K = \frac{10.000 \text{ X } b}{a}$$

Information :

K: Abundance

b: Number of species found

a: Area of response / Area / Plot

D. Findings and Discussion

1. Findings

Based on the results of research that has been carried out at stations I, II and III, 2 species were found. Namely Telescopium telescope, and Littorina scabra. The abundance of Gastropod species in the estuary area of Kaju Angin, Liku Village, Samaturu District, Kolaka Regency at Station I, Station 2 and Station 3 can be seen in Table 1

Table 1. The Abudance of Gastropo Species

Station	Plot	Total	Description
1	1	2	SP. A = 2
	2	5	SP. A = 3
			SP. B = 1
	3	7	SP. A = 5
			SP.B = 2
	4	5	SP. A = 2
			SP. B = 3
	5	1	SP. A = 1
2	1	9	SP. B = 9
	2	8	SP. A = 2
			SP. B = 6
	3	2	SP. A = 1
			SP. B = 1
	4	14	SP. A = 7
			SP. A = 7
	5	5	SP. A = 4
			SP. B = 1
3	1	7	SP. A = 4
			SP. B = 3
	2	12	SP. A = 3
			SP. B = 9
	3	13	SP. A = 2
			SP. B = 11
	4	10	SP. A = 5
			SP. B = 5
	5	19	SP. A = 5
			SP. B = 14

In the same way, the most gastropod data was obtained, which can be seen in table 2 .

Table 2. The Most Gastropod Data

NO.	Species	Sample			Σ	Abundance
		1	2	3		
1.	*Telescopium teleskopium*	13	14	19	46	30,7
2.	*Littorina scabra*	6	27	42	75	50

Based on the table above, it is known that the results of observations of the Gastropod community in the estuary area of Liku Village, Samaturu District, Kolaka Regency, consist of 2 species, namely *Telescopium telescope*, and Littorina scabra. From the data it is also known that the abundance value of Gastropod species in the Estuaria area, Liku Village, Samaturu District, Kolaka Regency for *Telescopium telescopic* species is 30.7 ind / m2 and Littorina scabra is 50 ind / m2.

2. Discussion

The estuary area is a meeting area between sea water and water, where this area is greatly influenced by tides. This tidal effect affects the salinity level of this estuary area. However, the estuary area is an area with high productivity, because it contains a lot of nutrients that are carried by the river flow. So that in this estuary area there are many various animal species, including Gastropods.

The presence of these gastropod species is highly influenced by environmental conditions such as salinity, temperature, and the substrate which is always changing. Species with high abundance are considered to be able to easily interact both interspecifically and intraspecifically in fighting over various nutrients that support their life, besides these organisms have the ability to adapt to their environment, and vice versa.

Based on observations and calculations of the abundance of gastropod species found in the estuary area in Liku Village, Samaturu District, Kolaka Regency, it is known that the species Littorina scabra has the highest abundance, namely 50 ind / m2. This is presumably because this species is able to live well in the environmental conditions in the estuary area and is able to adapt to the environmental conditions in the estuary area which are always changing. Alfaro (2007) states that Littoraria scabra is slower to migrate downward (0.6 cm / minute) during high tide compared to upward migration (1 cm / minute) during high tide.

According to Ernawati et al (2019), Littorina scabra is a very small herbivorous sea snail. mostly live in intertidal areas, some species can only be found when the tide is maximal. The habitat of this type is found in abundant nipah forests, in swamps and on the seashore of the mangrove area. The results of the research by Kusuma et al (2020) show that mangrove areas that are affected by tides are good habitats for these gastropods.

Meanwhile, the lowest abundance was found in the Telescopium telescopic species, which was 30.7 ind / m2. This is presumably because this type of gastropod is considered less able to compete with other species and is also less able to adapt to environmental conditions in the ever-changing estuary areas.

According to Putri et al (2017), Telescopium telescopium is a type of gastropod that is found scattered in fishpond areas close to river mouths with a mud substrate that is rich in organic matter and has a high protein nutrient content, which can meet the needs of animal protein. Telescopium telescopium is generally found in aquaculture areas bordering mangrove forests (Hamsiah et al., 2002).

The results of research by Samman et al (2014) show that the area of ex-pond land that tends to be open is the preferred habitat for telscopium. Meanwhile, around the river estuary which tends to be more covered by mangrove density, the snails do not like this habitat preference. As explained by Hamsiah et at. (2002), the popaco snail index was found to be high in open mangrove areas such as former pond land

E. References

Alfaro, A.C., (2007). Migration and trail affinity of snails, Littorariascabra, on mangrove trees of Nananu-i-ra, Fiji Islands. Marine and Freshwater Behaviour and Physiology 40, 247–255

Brotowidjoyo, M., (1990). *Zoologi Dasar*. Erlangga. Yogyakarta.

Campbell. (2002). *BiologiJilid 2*. Erlangga. Jakarta.

Campbell, N.A., Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., & Jackson, R.B. (2012). Biologi Jilid 2. Edisi 8. Terjemahan D.T Wulandari. Jakarta: Erlangga

Ernawati, L., Anwari, M. S., & Dirhamsyah, M. (2019). Keanekaragaman Jenis Gastropoda pada Ekosistem Hutan Mangrove Desa Sebubus Kecamatan Paloh Kabupaten Sambas. *Jurnal Hutan Lestari*, *7*(2).

Hamsiah, D., Djokosetianto, E.M., Adiwilaga, K. & Nirmala. (2002). Peran Keongpopaco, *Telescopium telescopium*L., sebagai Biofilter Pengelolaan Limbah Budidaya Tambak Udang Intensif. Akuakultur Indonesia *1*(2): 57-63

Jasin, M., (1987). *SistematikaHewanInvertebrata dan Vertebrata*. Sinar Wijaya. Surabaya.

Kimball, J.W., (1999). *Biologi Jilid 3*. Erlangga. Jakarta.

Kusuma, E. W., Nuraini, R. A. T., & Hartati, R. (2020). Komposisi Jenis Gastropoda di Mangrove Desa Kaliwlingi dan Sawojajar, Jawa Tengah. *Journal of Marine Research*, *9*(2), 167-174.

Nontji, A. (2007). Laut Nusantara. Penerbit Jambatan. Jakarta.

Putri, M. K. D., Pringgenies, D., & Radjasa, O. K. (2012). Uji Fitokimia Dan Toksisitas Ekstrak Kasar Gastropoda (*Telescopium telescopium*) Terhadap Larva Artemia salina. *Journal of Marine Research*, *1*(2), 58-66.

Romimoharto, K., & Juwana S., (2007). *Biologi Laut*. Jakarta: Djambatan.

Samman, A., Batu, D. T. L., & Setyobudiandi, I. (2014). Konsentrasi merkuri dan hubungannya dengan indeks kepadatan keong popaco (*Telescopium telescopium*) di Kao Teluk, Halmahera Utara. *DEPIK Jurnal Ilmu-Ilmu Perairan, Pesisir dan Perikanan*, *3*(2).