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ORIGINAL ARTICLE

Determining the Type of Diatome in the Lau Seruai River in Patumbak District by Acid Destruction in 2022

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Abstract:

Background: drowning victims are almost always found, because around us there are many ditches, wells, ponds, rivers, lakes, oceans and floods are also not uncommon, so it is appropriate that drowning cases are often found. Diatoms as a diagnostic tool for drowning cases need to be examined to ensure that the drowning case is indeed a drowning case and also to determine whether the victim has indeed drowned where the victim was found.

Methods: this research is descriptive, namely to determine the type of diatoms in the Lau Seruai river in 2022. By taking samples of river water in the Upper, Middle and Lower parts, then treated by acid destruction, then centrifuged and then viewed under a microscope.

Results: From the results of the study found 11 species of diatoms, the types of diatoms found at the Upstream station were: Navicula sp, Fragilaria, Nitzschia sp, Surirella sp, Skeletonema, Cyclotella, Pinnularia sp, at the Middle station found: Spirogyra sp, Nitzschia sp, Skeletonema, Navicula sp , and at the Lower Station found: Symbella sp, Fragilaria, Surirella sp, Pinnularia sp, Synhedra, Coconeis, Nitzschia sp, Navicula sp. The diatom shapes found at the Hulu station are: circular, elliptical, elongated, square. in Central station found: Ellipstic, Elongated. at the Downstream station found: Ellipstic,Elongated,Square.

Conclusion: Of the 11 species of diatoms found, there are different types of diatoms found at each station on the Lau Seruai river in Deli Serdang Regency. The shape of diatoms in the Lau Seruai river is quite varied, namely: Circular, Elliptic, Elongated, Square

Keywords: Drowning, Diatome.

Introduction

Background; Drowning is a process of respiratory distress due to submersion or immersion caused by a liquid medium. Immersion occurs when the upper airway is above the surface of the water, while submersion occurs when the upper airway is below the water surface.

Drowning can be caused intentionally or unintentionally. Drowning may be secondary to other illnesses, such as seizures, head injury (traumatic brain injury), alcohol ingestion, fainting, and heart rhythm disturbances. The cause of intentional drowning is generally due to attempted suicide (can be caused by major depression or bipolar disorder). (Amri A, 2007: Baker. Jeffery J and Garland E. Allen, 1982)

The presence of diatoms in various waters can be used as an indicator or indication of the place of death and the cause of a person's death either by drowning or drowning (Punia, 2011). When a person drowns or is submerged in water, the diatoms in these waters will enter the body along with the inhalation of water (Piette and Letter, 2006). Diatoms that are inside the victim's body can be used as supporting evidence in showing the place of death of the victim or the crime scene (Place of Case) (Peabody and Cameron, 2010).

The World Health Organization (WHO) states it is important to make serious policies to address deaths due to drowning. In the latest report from a 2016 study, according to WHO, every year 322,000 people die worldwide due to drowning. WHO reports that more than 90% of drowning deaths occur in rivers, lakes, wells, irrigation canals and even water storage places. domestic in poor countries. children and adolescents experience the most accidents disproportionately.

In Indonesia, according to WHO, the number of drowning cases is 3.3 per 100 thousand people, or close to 9000 people in 2016. As in many other Southeast Asian countries, drowning is often believed by the public to be an unavoidable accident.

Several previous studies related to diatoms, among others, by Asan Petrus (2014), Determining the types of diatoms in the Deli and Badera rivers in the city of Medan at the Upstream, Middle and Downstream stations by acid destruction. Research by dr. Edwin Parlindungan Lubis (2019), examines the types of diatoms in the Padang River and Bailang River in the Cliff City of North Sumatra. Examination of Diatoms with Acid Destruction in the Klembah River and Sibarau River, Tebing Tinggi City by Joko Arianto (2019), research by Hendrik Meirialdi Saputra, Knowing the types of diatoms in the Seikambing River and Sulang Saling River in Medan City. Diagnosis of someone's death due to drowning in a river is difficult to identify because the river is a flowing water, so bodies that drowned in the upstream part of the river may be found in the downstream part of the river. Therefore, it is necessary to identify the types of diatoms in the river parts of Deli Serdang Regency, Patumbak District, namely the upstream, middle and downstream parts of the river to find out the case of the first location of drowning corpses. The identification of the types of diatoms in the Lau Seruai river has never been carried out, therefore this study needs to be carried out to determine the types of

diatoms in one of the rivers in Deli Serdang Regency, Patumbak District, North Sumatra, namely the Lau Seruai river.

Method

The type of research conducted is descriptive research, namely to determine the types of diatoms in the Lau Serai river, Patumbak District, in helping to determine the place of occurrence of the drowning victim. The study was conducted to determine the type of diatoms with the acid destruction method by taking water from the river at a depth of 1 meter to 2 meters from the water surface with a plankton net (plankton net), then the plankton sample that was netted would be collected in a bucket which was then poured into bottles as much as 20 ml and preserved using Lugol's solution as much as 3 drops and labeled, then brought to the laboratory in which each ingredient is mixed with a concentrated sulfuric acid solution with the same volume, then left for 24 hours, then heated with fire The small ones are brought to a boil and then dripped with concentrated nitric acid until the liquid is clear, then each is put into a centrifuge tube with the same size and an even number of tubes at 3000 rpm for 15 minutes. The sediment (sediment) is washed with distilled water and then centrifuged again. for 15 minutes at a speed of 3000 rpm and then the sediment look under a microscope at 400x magnification. Pay attention to the shape of the diatoms found, then identify them using books (Edmonson (1963), bold and win (1985) and pennak (1989).

This research has been approved by the Ethics Committee for Health Research Implementation no. 480/KEPK/USU/2022 dated 7 June 2022.

Result

Description of Research Site

This research was carried out on the Lau Serai River, which is in Deli Serdang Regency, Patumbak District, North Sumatra. This location was chosen based on the consideration that this river is close to where I live and this river is one that has a famous tourist area with Buih Beach, so it is often an alternative for local tourists, especially from Deli Serdang district, Medan City and its surroundings. And in this river there have also been found bodies that died from drowning, so data on the types of diatoms in the Lau Seruai river are very important, especially in handling drowning cases that will occur in the future.

Description of Diatome in Lau Seruai River

The results of this study are the results of research collected from microscopic examination data on water sourced from the Lau Serai river at upstream, middle and downstream stations with each station taking four samples of 20 ml each, then carrying out acid extraction for 24 hours then heated over low heat until it boils and then dripped with concentrated nitric acid until the liquid is clear, then each is put into a centrifuge tube with the same size and an even number of tubes at a speed of 3000 rpm for 15 minutes, the sediment is washed with distilled water. then centrifuged again for 15 minutes at 3000 rpm and then the sediment was seen under a microscope with 400 times magnification. From the results of

microscopic examination, all examination materials found 18 types of diatoms with 7 types of diatoms at the upstream station, 4 types of diatoms at the middle station and 8 types of diatoms at the downstream station, with a total of 11 types of diatoms in the Lau Seruai river.

Table 1. Distribution of Diatom Types in the Lau Seruai River at Upstream, Middle and Downstream stations.

Location	stations.		
	Upstream	Middle	Downstream
Lau Seruai River	Navicula sp Fragilaria Nitzschia sp Surirella sp Skeletonema Cyclotella Pinnularia sp	Spirogyra sp Nitzschia sp Skeletonema Navicula sp	Symbella sp Fragilaria Surirella sp Pinnularia sp Synhedra Coconeis Nitzschia sp Navicula sp

From Table 1. above, it can be seen that in the Lau Seruai river, the types of diatoms found at the Hulu station are: Navicula sp, Fragilaria, Nitzschia sp, Surirella sp, Skeletonema, Cyclotella, Pinnularia sp, in the Middle station found: Spirogyra sp, Nitzschia sp , Skeletonema, Navicula sp, and at the Lower Station found: Symbella sp, Fragilaria, Surirella sp, Pinnularia sp, Synhedra, Coconeis, Nitzschia sp, Navicula sp.

Table 2. Distribution of Diatom forms in the Lau Seruai River at Upstream, Middle and Downstream stations.

Location	**Form**	stations.		
		Upstream	Middle	Downstream
Lau Seruai River	Sirkular Elliptic Elongated Square	+ + + +	- + + -	- + + +

From table 2. above, it can be seen that in the Lau Seruai river, the diatom forms found at the Hulu station are: circular, elliptical, elongated, square. in Central station found: Ellipstic, Elongated. at the Lower station found: Ellipstic, Elongated, Square.

Discussion

In general, the presence of this diatom, especially its abundance, in the waters is influenced by several factors, namely the type of water that flows or is inundated, as well as the physical and chemical qualities of the waters such as light intensity, temperature, brightness, current speed,

dissolved oxygen, free carbon dioxide, pH, depth, predators. and the content of nutrients (nitrogen and phosphate levels).

The results obtained at the time of this study (taking material in May 2022) on the Lau Seruai river there were 11 species of Diatome with each station being the same and some being different (varied), this also

occurred in the Sei Kambing river and Sulang Saling River. in the research by Hendri Meirialdi Saputra in 2020, the Batangtoru river and the Parsariran river in South Tapanuli in the Amalan Surya Hutabarat study in 2020, the Padang river and the Bailang river in Tebing Tinggi in the Edwin Parlindungan Lubis research in 2020. This is in accordance with the theory which states that the species diatoms as well as the amount / abundance varies at each location (Graham and Wilcox. 2000). While some of the same types of diatoms are found at each station and river, this is also in accordance with the theory which states that several types of diatom species have the ability to adapt very quickly to the environmental conditions in which they live (Dixit et al, 1992. Mills et al, 2002), these different fluctuations are very likely to be influenced by the presence of surface currents and also by the different current speeds at each station. The movement and velocity of these different currents causes changes in diatom abundance fluctuations, because these currents carry plankton which will be distributed and can accumulate in a certain place.

In this study, in the Lau Seruai river, circular (round), Elliptic (Elip/elongated round), Elongated (elongated), Square (square/rectangular) diatom shapes were found which were different from what Situmorang had done in the Siak river, Pekanbaru area in 2015. In 2011 the diatoms found were linear, quadrilateral and polygons, while circular and elliptical shapes were not found.

Conclusion

1. From the results of the study found 11 species of diatoms namely Navicula sp, Fragilaria, Nitzschia sp, Surirella sp, Skeletonema, Cyclotella, Pinnularia sp, Spirogyra sp, Symbella sp, Synhedra, and Coconeis.
2. There are differences in the types of diatoms found at each station on the Lau Seruai river in Deli Serdang Regency.
3. The shape of diatoms in the Lau Seruai river is quite varied, namely: Circular (round), Elliptic (Eliptical / elongated round), Elongated (elongated), Square (square / rectangular)

Suggestion

1. The results obtained in this study do not provide a comprehensive picture of the types of diatoms in the Lau Seruai river considering the limited duration of the study. This causes the need for further research .
2. To get a clearer picture of diatoms, it is necessary to do research with better tools and instruments.

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