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ANALYSIS OF WATER QUALITY BASED ON COMPOSITION AND ABUDANCE OF PHYTOPLANKTON IN RASAU JAYA RIVER

Analisis Kualitas Perairan Berdasarkan Komposisi Dan Kelimpahan Fitoplankton Di Sungai Rasau Jaya

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ABSTRACT

The river has a flow of water that flows to a lower place so that river water quality can be influenced by human activities. Human activities along the river. Rasau Jaya River is often used by the community as a disposal media for various kinds of waste so it can affect water quality and the presence of phytoplankton in the water. The purpose of this research is to determine the effect of environmental parameters on the composition and abundance of phytoplankton that can evaluate the level of pollution using phytoplankton that can determine the level of pollution using the saprobic index in the Rasau Jaya River. Saprobic index in Rasau Jaya River, West Kalimantan. The research was conducted in September - October 2024. Physical and chemical sampling and phytoplankton sampling was carried out at 3 points with the determination of the station using the purposive sampling method by looking at the activities around the location of the Rasau Jaya River. Purposive sampling method by looking at activities around the sampling location. Sampling location. The observation variables used are abundance index, diversity, uniformity, dominance, and probity as well as physical and chemical parameters - chemical parameters. The results of the study obtained phytoplankton composition consists of 30 genus from 4 classes namely Bacillariophyceae (37%), Cyanophyceae (10%), Chlorophyceae (50%), and Euglenophyceae (3) with abundance ranging from 713 - 2816 cells/l. The abundance at station 3 was lower than the abundance at station 1 and 2, the diversity index ranged from 1.43-2.58 (medium), the uniformity index ranged from 0.48-0.79 (medium-high), dominance index ranged from 0.09-0.11 (low), and saprobic index in the month of September ranged from 0.83-0.91 (β -Mesosaprobic) and October ranged from 1.0-1.11 (β -Meso /oligosaprobic) both classified as lightly polluted. Multiple linear regression analysis obtained ammonia parameter has sig 0.024 < 0.050 with an influence of 96.9%. Judging from the results of the data obtained, the water quality conditions of the Rasau Jaya River have been lightly polluted by organic and inorganic waste.

Key words: Phytoplankton, Water Quality, Abundance, Composition, Saprobity

ABSTRAK

Sungai Rasau Jaya sering dimanfaatkan masyarakat sebagai media pembuangan berbagai macam limbah sehingga dapat mempengaruhi kualitas air dan keberadaan fitoplankton diperairan. Tujuan penelitian ini untuk mengetahui pengaruh parameter lingkungan terhadap komposisi dan kelimpahan fitoplankton yang dapat menentukan tingkat pencemaran dengan menggunakan indeks saprobik di Sungai Rasau Jaya, Kalimantan Barat. Penelitian dilakukan pada bulan September – Oktober 2024. Pengambilan sampel fisika dan kimia serta fitoplankton dilakukan pada 3 titik dengan penentuan stasiun menggunakan metode purposive sampling dengan melihat aktivitas sekitar lokasi pengambilan sampel. Variabel pengamatan yang digunakan yaitu indeks kelimpahan, kelimpahan relatif, keanekaragaman, keseragaman, dominansi, dan saprobitas serta parameter fisika - kimia. Hasil penelitian yang didapat komposisi fitoplankton terdiri 30 genus dari 4 kelas yaitu Bacillariophyceae, (37%) Cyanophyceae (10%), Chlorophyceae (50%), dan Euglenophyceae (3%) dengan kelimpahan berkisar 713-2816 sel/l. Kelimpahan pada stasiun 3 lebih rendah dibanding kelimpahan pada stasiun 1 dan 2, indeks keanekaragaman berkisar 1,43-2,58 (sedang), indeks keseragaman berkisar 0,48-0,79 (sedang hingga tinggi), indeks dominansi berkisar 0,09-0,11 (rendah), dan indeks saprobik pada bulan september berkisar 0,83-0,91 (β –Mesosaprobik) dan Oktober berkisar 1,0-1,11 (β –Meso/oligosaprobik) keduanya tergolong tercemar ringan. Analisis regresi linier berganda didapat parameter ammonia memiliki sig 0,024 < 0,050 dengan pengaruh sebesar 96,9%. Dilihat dari hasil data yang didapat, kondisi kualitas air Sungai Rasau Jaya telah mengalami tercemar ringan limbah organik dan anorganik.

Kata Kunci: Fitoplankton, Kualitas Air, Kelimpahan, Komposisi, Saprobitas

INTRODUCTION

The Rasau Jaya River is a tributary of two branches of the Kapuas River between the villages of Kuala Dua and Rasau Jaya, which is often used by the community as a medium for disposing of household waste, livestock waste, agricultural waste, port activity waste, TPA (Final Disposal Site), industry, and MCK (bathing, washing, toilets). Based on these activities, it can have an impact on the waters, namely the occurrence of disturbances and physical, chemical and biological changes in the river waters which cause pollution.

Phytoplankton can be used as an indicator of water quality using the water saprobic index. The water saprobic index is measured using the type of phytoplankton found, because each type of phytoplankton is a component of a certain saprobic group that will affect the saprobic value (Indrayani *et al*., 2014). This study was conducted using the approach of phytoplankton abundance and the composition of each water physical and chemical parameter. The approach of phytoplankton abundance and composition as well as water physical and chemical parameters were used to review the quality of water in rivers, especially in the Rasau Jaya River.

The aim of this study was to determine the influence of environmental parameters on the composition and abundance of phytoplankton in the Rasau Jaya River as well as the diversity, uniformity, dominance and saprobic index in the Rasau Jaya River, Sungai Raya District.

RESEARCH METHODS

This study was conducted for 2 months in September–October 2024 which was carried out in the Rasau Jaya River, Kubu Raya Regency (Figure 1). Sampling was carried out in situ and ex situ. Ex situ water samples were analyzed at the Enviro Laboratory and phytoplankton samples were identified at the Aquatic Resources Management Laboratory, Tanjungpura University. Phytoplankton identification used the identification books of Davis (1955) and Edmondson (1959).

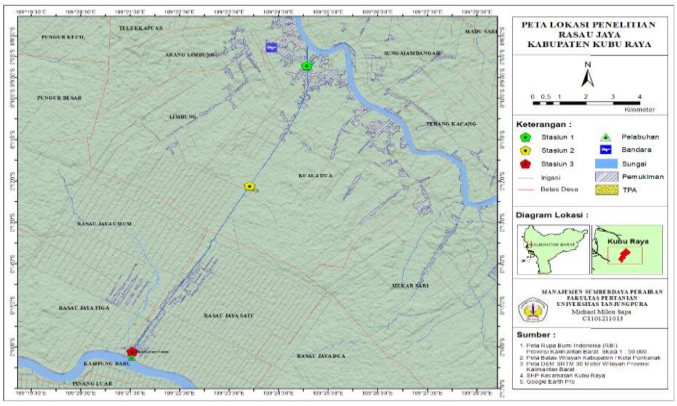

Figure 1. Research Location Map

Tools and materials

The tools and materials used during the research were plankton net with a size of 25 µm, DO meter, pH meter, secchi disk, 10L bucket, mobile phone, 250 ml and 1000 ml bottles, rope, floating objects, meter, coolbox, 1% lugol, label paper, microscope, SRC and identification books Davis (1955) and Edmondson (1959).

Research Implementation

Determination of sampling stations using purposive sampling or paying attention to the activities around the sampling environment. The location of the station is divided into 3 stations, station 1 is in the residential area and market, station 2 is in the TPA (Final Disposal Site) area, and station 3 is in an area where there is port activity. Plankton sampling is carried out 2 times per month with sampling carried out at 9 points and every 3 points are composited so that each station has 3 samples at 09.00 - 15.00 WIB.

Data Analysis

Multiple Linear Regression

Multiple linear regression analysis to determine how much influence the independent variable has on the dependent. By using the following equation:

$$Y = a + b_1X_1 + b_2X_2 + ... + b_8X_8 + e$$

Information:

Y: Phytoplankton, a: Constants, e: Error, b1, b2, ..., b8: Regression coefficient, x1: temperature, x2 brightness, x3: pH, x4: DO, x5: BOD, x6: nitrate, x7: ammonia, x8: phosphate.

Phytoplankton Abundance

Determination of phytoplankton abundance is carried out based on the sweep method on the Sedgwick rafter. The number of phytoplankton The abundance of phytoplankton is expressed quantitatively in the number of individuals/liter (APHA, 1998 *in* Sulastri, 2018).

$$N = n\ x \frac{1}{Vd}\ x \frac{Vt}{Vcg}\ x \frac{Ot}{Op}$$

Information:

N = Phytoplankton abundance (sel/l)
n = The amount of phytoplankton obtained
Vd = Volume of filtered water (l)

Vt = Sample bottle water volume (ml)
Vcg = Water volume in SRC (ml)
Ot = SRC cross-sectional area (mm^2)
Op = Area under observation (mm^2)

Relative Abundance (KR)

The relative abundance of phytoplankton was calculated using the following formula::

$$KR = \frac{ni}{N} \text{ x } 100\%$$

Information:
KR = Relative Abundance of Phytoplankton
ni = Abundance of a Species
N = Abundance of All Kinds

Diversity Index (H')

Diversity index to determine the level of stability of a community in waters. By using the Shanon-Wiener equation (Odum 1998 *in* Sihombing *et al.*, 2015) as follows:

$$H' = -\sum_{i=1}^{n} (\mathrm{Pi} \ln Pi)$$

Information:
H' = Shannon-Wiener diversity index
S = Number of species
Pi = ni/N
ni = Number of individuals of species i
N = Total number of species

With the criteria, namely if H' <1 low diversity/polluted, 1≤ H' ≤ 3 medium diversity/semi-polluted, and H' >3 high diversity/clean water.

Uniformity Index (E)

The uniformity index can describe the abundance of individual organisms, namely whether they are even or not, with the equation according to Odum, (1998 in Yuliana & Ahmad, 2017) as follows:

$$E = \frac{H'}{\mathrm{Hmax}}$$

Information:
E = Uniformity index
H' = ni/N
Ni = Number of individuals of type i
H max = Number of phytoplankton species

Classification of population community conditions based on the uniformity index (Krebs, 1989 in Khaeriyah 2015) as follows: E < 0.4 low uniformity, 0.4 < E < 0.6 medium uniformity, E> 0.6 high uniformity.

Dominance Index (C)

The dominance index uses the equation according to Odum (1998 in Yuliana and Ahmad, 2017) as follows:

$$C = \sum_{i=1}^{n} \left(\frac{\mathrm{ni}}{\mathrm{N}}\right)^2$$

Information :
C = Dominance index
Ni = Number of individuals of the species (individuals/liter))
N = total number of all species

Classification of population community conditions based on dominance based on (Odum, 1994) in (Khaeriyah 2015) as follows: C < 0.50: Low dominance; 0.50 < C < 0.75: Medium dominance; 0.75 < C < 1: High dominance.

Saprobic Index

The pollution level of the Rasau Jaya River is calculated based on the Saprobic Index (SI) calculation based on the equation (Dresscher & Van Der Mark, 1976; Soewignyo *et al*., 1986; Andriansyah, 2014) as follows:

$$SI = \frac{(C + 3D - B - 3A)}{(A + B + C + D)}$$

Information :
SI = Saprobic Index, ranging from -3.0 to 3.0
A = Number of organisms from the Cyanophyta group
B = Number of organisms from the Euglenophyta group
C = Number of organisms from the Chlorophyta + Diatom groups
D = Number of organisms from the Cryshophyta group

RESULT

Phytoplankton Composition

The results of phytoplankton observations at each station obtained 4 identified classes, namely Bacillariophyceae, Cyanophyceae, Chlorophyceae, and Euglenophyceae. Based on the results of the analysis, the composition of phytoplankton that was found in abundance in the Rasau Jaya River waters was from the Cyanophyceae class with 50% and Bacillariophyceae 37%, while the lowest came from the Euglenophyceae class with a composition percentage of 3% (Figure 2).

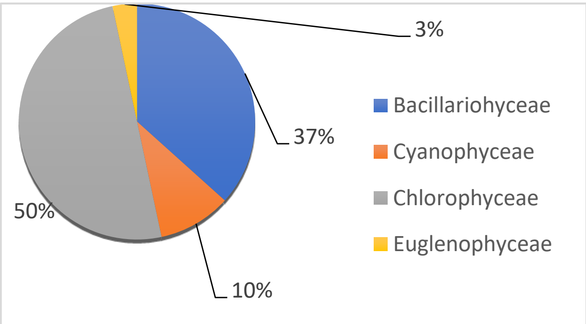

Figure 2. Composition of Phytoplankton Classes in the Rasau Jaya River

Phytoplankton Abundance

The calculation results obtained the highest abundance at station 2 with 2816 cells/l, while the lowest abundance at station 3 with 713 cells/l. While the calculation results of the relative abundance in percentage in phytoplankton obtained the highest with a KR value of 17.28% in the *Oscillatoria* sp type and the lowest relative abundance value with a KR value of 0.05% in the *Micrasterias* sp type.

Table 1. Abundance (cells/l) and Relative Abundance (%) of Phytoplankton

No	Genus	Phytoplankton Abundance (sel/l)			Number of KF (sel/l)	Total KR (%)
		S1	S2	S3		
1	*Amphipleura* sp.	3	0	13	15	0,29
2	*Amphora* sp.	8	0	0	8	0,14
3	*Biddulphia* sp.	13	20	0	33	0,63
4	*Cyclotella* sp.	133	193	8	333	6,40
5	*Denticula* sp.	65	0	15	80	1,54
6	*Fragillaria* sp.	0	165	0	165	3,18
7	*Navicula* sp.	228	345	115	688	13,24
8	*Pinnularia* sp.	28	30	103	160	3,08
9	*Pleurosigma* sp.	63	3	18	83	1,59
10	*Surirella* sp.	33	8	38	78	1,49
11	*Synedra* sp.	8	3	15	25	0,48
12	*Nodularia* sp.	188	288	48	523	10,06
13	*Oscillatoria* sp.	370	430	98	898	17,28
14	*Spirulina* sp.	33	38	8	78	1,49
15	*Chlorococcum* sp.	3	10	0	13	0,24
16	*Closteriopsis* sp.	5	0	18	23	0,43
17	*Closterium setaceum*	20	20	10	50	0,96
18	*Closterium* sp.	23	3	20	45	0,87
19	*Cosmarium* sp.	23	3	20	45	0,87
20	*Geminella* sp.	93	138	0	231	4,45
21	*Gymnozyga* sp.	15	83	38	135	2,60
22	*Micrasterias* sp.	0	3	0	3	0,05
23	*Mougeotia* sp.	43	85	0	128	2,45
24	*Pseudostichococcus* sp.	13	490	83	585	11,26
25	*Spirogyra* sp.	20	20	10	50	0,96
26	*Spondylosium* sp.	28	88	20	135	2,60
27	*Staurastrum* sp.	0	10	0	10	0,19
28	*Volvox* sp.	95	35	8	138	2,65
29	*Zygnemompsis* sp.	93	310	0	403	7,75
30	*Euglena* sp.	28	0	13	40	0,77
	Amount	1667	2816	713	5194	100

Diversity, Uniformity, and Dominance Index

Based on Figure 3, the lowest diversity index was obtained at station 3 with a value of 1.43, while stations 1 and 2 had high values and were still classified as moderate, the uniformity index was categorized as moderate ranging from 0.48 to 0.79 and the dominance index was classified as low ranging from 0.09 to 0.11.

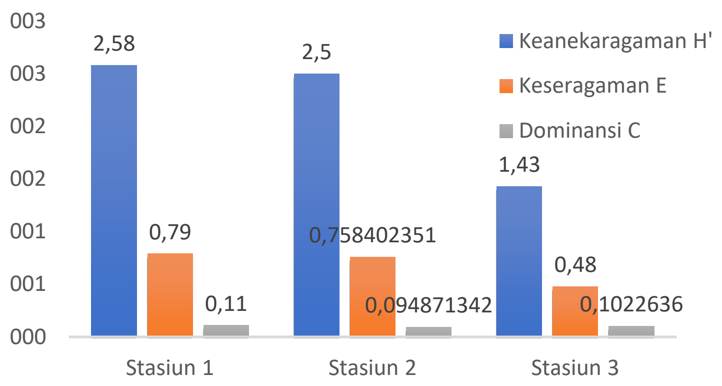

Figure 3. Diversity, Uniformity, and Dominance Index

Saprobic Index

Table 2 shows that the saprobic index in the Rasau Jaya River in September was in the β-Mesosaprobic phase with a light level of pollution, and in October it was in the β-Meso/oligosaprobic phase with a light level of pollution of organic and inorganic materials.

Table 2. Saprobic Index in Rasau Jaya River

Observation Time	Saprobic Index	Saprobic Phase	Pollution Level	Pollutants
Sept 1	0,83	β –Mesosaprobik	Light	Organic and Inorganic Materials
Sept 2	0,91			
Okt 1	1,0	β –Meso/oligosaprobik		
Okt 2	1,11			

Water Quality Parameters

The results of measuring water quality parameters in the Rasau Jaya River are in Table 3. There are pH, BOD, ammonia and phosphate that do not comply with the class III quality standards in Government Regulation of the Republic of Indonesia Number 22 of 2021.

Table 3. Results of Physical and Chemical Parameters

Parameters	**Unit**	**Station**			**Quality standards**
		1	**2**	**3**	
Temperature	ºC	31,45	32,74	33,44	Dev 3
Current Speed	m/s	0,11	0,18	0,13	-
Brightness	cm	18,52	35,03	19,43	-
Water Depth	cm	50,86	37,96	138,82	-
TSS	mg/l	16,76	7,27	12,26	100
pH	-	5,65	4,38	5,29	6-9
DO	mg/l	3,0	2,6	3,3	>3
BOD	mg/l	28,78	30,70	27,90	<6
Nitrate	mg/l	1,33	1,15	1,68	20
Ammonia	mg/l	3,90	5,61	1,33	0,5
Phosphate	mg/l	5,8	15,5	3,2	1,0

Relationship between Physical and Chemical Parameters on Phytoplankton Abundance

The relationship between independent and dependent variables can be seen in Table 4. It shows that the ammonia parameter has a significant effect on the abundance of phytoplankton in the Rasau Jaya River with a sig value of 0.024 with a unidirectional or positive relationship which means that when ammonia increases, phytoplankton also increases. While the t value is negative or the relationship is not unidirectional, when the independent variable increases, the dependent variable decreases.

Table 4. Data on the Relationship of Phytoplankton to Environmental Parameters

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	Constant (a)	2850,591	1352,328	2,108	0,126
	Temperature	-51,408	24,237	-2,121	0,124
	Brightness	1,726	20,292	0,085	0,938
	pH	-200,637	171,821	-1,168	0,327
	DO	95,713	187,653	0,510	0,645
	BOD	-8,433	5,766	-1,462	0,240
	Nitrate	-69,305	84,075	-0,824	0,470
	Ammonia	81,227	19,265	**4,216**	**0,024**
	Phosphate	0,314	25,741	0,012	0,991

The linear regression equation is obtained (Table 4), namely: Y = (2850.591) - 51.408X1 + 1.726X2 - 200.637X3 + 95.713X4 - 8.433X5 - 69.305X6 + 81.227X7 + 0.314X8 + e

Table 5. Coefficient Data (R2)

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.983^a	0,966	0,877	127,898

Based on the R coefficient data, there is an influence between the independent and dependent variables of 96.6% and 3.4% is influenced by other variables.

DISCUSSION

Phytoplankton Composition and Abundance

Based on the results of phytoplankton observations, 30 genera from 4 classes were found (Figure 2). The most abundant phytoplankton classes found were Chlorophyceae and Bacillariophyceae, this is because these two classes can survive in environmental conditions that do not allow other classes to survive. According to Dedi (2012 in Putrianti *et al*., 2015), Chlorophycae and Bacillariophyceae can survive with acidic pH and high temperatures. This explanation is in accordance with the conditions of the Rasau Jaya River which has an acidic pH and high temperature. The Euglenophyceae class with the least composition because the condition of the Rasau Jaya River is indicated to be polluted by waste that is dumped directly along the river. This is reinforced by Widiana (2013), who stated that the Euglenophyceae class tends to prefer clean water conditions and can appear and disappear quickly if the waters are polluted.

The abundance of phytoplankton at station 3 has a lower abundance than stations 1 and 2 (Table 1). This is because station 3 is a port area that causes phytoplankton to be carried by ship currents entering and leaving the sampling location. The genus *Oscillatoria* sp has the highest value with an abundance of 898 cells/l and a relative abundance of 17.28%. According to Hastuti *et al*., (2018), *Oscillatoria* sp can reproduce well in waters that have a neutral or wet pH. This is in accordance with the pH conditions in the Rasau Jaya River which has a wet pH so that *Oscillatoria* sp can be found in abundance. Meanwhile, the genus *Micrasterias* sp is the least found with an abundance of 3 cells/l and a relative abundance of 0.05%. According to Abdel Raouf *et al*., (2012 in Ramadhan *et al*., 2019), *Micrasterias* sp is often found in waters that are not polluted to light. Therefore, *Micrasterias* sp is rarely found, which indicates that there are differences in the conditions of the Rasau Jaya River that are not suitable for this genus. The difference in the number of genera that are rarely found can be influenced by the ability of each type of phytoplankton to utilize different nutrients.

Diversity, Uniformity and Dominance Index

The results of the Shannon-Wiener phytoplankton calculations in the Rasau Jaya River (Figure 3) show that the diversity of phytoplankton in the Rasau Jaya River is classified as moderate/moderately polluted. The diversity value at station 1 has a high value compared to stations 2 and 3. The diversity index in waters can be influenced by environmental conditions and low DO levels can interfere with the growth of phytoplankton in the waters. This is reinforced by the statement (Pambudi *et al*., 2017), high and low levels of dissolved oxygen in waters can affect the diversity of phytoplankton.

The uniformity index is classified as low to high (Figure 3). Differences in the uniformity index can be caused by differences in the ability of each type to adapt to differences in physical and chemical parameter conditions at each station. The high uniformity value is also caused by a low dominance index which allows phytoplankton to spread evenly in the waters so that no species dominates. According to Afif (2014), a high uniformity index will indicate that each species is evenly distributed without any dominating species.

The dominance index ranges from 0.09-0.11 which is considered low, indicating a dominance value approaching 0, meaning that there is no dominant phytoplankton in the Rasau Jaya River. The low dominance index can be caused by the diversity index in the Rasau Jaya River being classified as moderate. This is in line with the statement (Sirait **et al**., 2018), stating that the dominance index is inversely proportional to the diversity index.

Saprobic Index

The saprobic index value (Table 2) describes the condition of the river in the β-Mesosaprobic and β-Meso/oligosaprobic phases with low levels of pollution and there are organic and inorganic pollutants in the waters, the amount of pollutant load can be seen based on the BOD and DO results during the study. According to Fadzry *et al*., (2021), high BOD values will cause a decrease in DO levels because phytoplankton will utilize dissolved oxygen to carry out respiration which indicates that the waters are polluted. Based on these results, the condition of the Rasau Jaya River contains organic and inorganic waste which is indicated to be produced by human activities along the river from residential waste and TPAS (Final Waste Disposal Site). The same results in the study (Mada *et al*., 2023), showed that the level of pollution of the Rasau Jaya River was lightly polluted which was indicated to be caused by TPA waste and the community along the river so that it affected the pH, DO, and BOD values which were not in accordance with the quality standards.

Water Quality

Rasau Jaya River is peat waters so that the pH of peat waters will follow their natural conditions. The pH value in peat waters has a high acidity level with a pH ranging from 3-5 causing the water in peat soil to be acidic (Kiswanto *et al*., 2019). There are many phytoplankton found in the Rasau Jaya River from the Chlorophyceae and Bacillariophyceae classes which are able to survive with pH levels <7. This is reinforced by Zurkartika's research (2017), there is a high abundance of the Chlorophyceae and Bacillariophyceae classes with the same pH conditions in the Rasau Jaya River. The results of DO measurements showed an increase due to the photosynthesis process by phytoplankton which produces oxygen in the waters. According to (Fadzry, 2021), it is emphasized that dissolved oxygen is very important for aquatic organisms so that if the DO concentration is low, there is a high presence of organic pollutants. The high BOD value at each station is due to the entry of organic matter from residential wastewater, restaurants, markets and landfills originating from rainwater discharge and seepage that can enter the river which causes high BOD values. Based on research by Naillah *et al*., (2021), it was stated that the BOD value of waters will increase during the rainy season ranging from 25.67 - 58.36 mg / L which has a significant relationship between BOD and the rainy season.

Based on the results of measuring the nutrient content in the waters, it was found that nitrate in the Rasau Jaya River is classified as good for phytoplankton growth. In the research of Gurning *et al*., (2020), it was stated that nitrate ranging from 0.9 - 3.5 mg / l still supports phytoplankton growth. According to Effendi (2003), the nitrate content in the waters if it exceeds the quality standard will cause rapid enrichment and growth of algae in the waters. Meanwhile, the ammonia and phosphate content have quite high values which are indicated because the Rasau Jaya River is a place for dumping community waste such as cow dung, human waste, animal carcasses, washing materials and agriculture. High ammonia and phosphate can affect the abundance of phytoplankton in waters because both are used by phytoplankton as proteins in the cell growth process. According to Astriana *et al*., (2022), phosphate content is an important nutrient in the formation of chlorophyll-a and the photosynthesis process in phytoplankton.

Based on Table 3, the TSS value tends to be higher in the upstream and downstream of the Rasau Jaya River, which is part of the confluence of the Kapuas River water which carries all dissolved solids through the tidal process in the Rasau Jaya River. According to Effendi (2003), high TSS content will cause turbidity which will inhibit the photosynthesis process because it prevents light from entering the water.

It can be seen that the temperature at each station has a gradual increase, this is because the high and low temperatures in river water are influenced by the openings of vegetation on the banks of the river so that the intensity of light can directly enter the river water, in addition, the observation time which is getting later is a factor in increasing the temperature. According to Effendi, (2003), the optimal temperature range for phytoplankton growth in waters is 20ºC - 30ºC. The temperature in the Rasau Jaya River has a temperature that is classified as being in the optimal temperature range for phytoplankton growth in waters.

Based on the results of the current speed values (Table 2), it can be said that the current of the Rasau Jaya River is classified as a slow current. According to (Sari *et al*., 2012 *in* Siagian *et al*., 2019) rivers with current speeds <0.25 m/s are classified as slow currents. The current speed in a river can affect the distribution of phytoplankton because its movement is limited so that phytoplankton tend to follow the current.

Depth and brightness can affect phytoplankton in carrying out photosynthesis because the deeper the river, the brightness decreases, which will reduce the intensity of sunlight entering the river. Differences in brightness levels in waters can be affected by depth, turbidity and weather when making observations in the field. In addition, stations 1 and 3 are part of the upstream and downstream of the Rasau Jaya River, which is where the river water from the

Kapuas Besar and Kapuas Kecil rivers enters and exits, which tends to be brown in color, so it can affect the clarity of the water.

CONCLUSION

Phytoplankton in Rasau Jaya River obtained 30 genera from 4 classes with abundance ranging from 713-2816 cells/l. The diversity index ranged from 1.43-2.58 classified as moderate/half polluted, the uniformity index ranged from 0.48-0.79 classified as low to high, and the dominance index was classified as low ranging from 0.09-0.11. The saprobic index in September and October ranged from 0.98-1.11 classified as the β Meso/oligosaprobic phase containing light organic and inorganic materials. The results of multiple linear regression analysis obtained ammonia parameters that affect phytoplankton abundance with a sig value of 0.024.

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