PHYSICAL AND CHEMICAL SCRUTINY OF OBIZI RIVER IN AWKA SOUTH LOCAL GOVERNMENT AREA OF ANAMBRA STATE, NIGERIA FOR DOMESTIC CONSUMPTION.

Abstract

The Obizi River in the Awka South Local Government Area of Anambra State was examined physically and chemically to evaluate its contamination level and suitability for home use. It is important for recreational, fishing, cooking, drinking, and other applications. Its typical applications for drinking, cooking, fishing, recreational activities and other uses are limited since it flows through a canal that might be contaminated by industrial, agricultural, and other human activities. Nitrate mg/l, nitrite mg/l, magnesium mg/l, zinc mg/l, total dissolved solid (TDS) mg/l, hardness mg/l, sulphate mg/l, phosphate mg/l, alkalinity mg/l, acidity mg/l, sodium mg/l, biological oxygen demand (BOD) mg/l, chemical oxygen demand (COD) mg/l, total suspended solid (TSS) mg/l, TS mg/l, oxygen demand (OD) mg/l, and potassium mg/l are among the parameters that were evaluated. Total dissolved solids (TSS) were calculated as the difference between total solids and total dissolved solids. The zinc and nitrate elements within the samples were measured using the ultraviolet (UV) VIS spectrophotometric method. Sulphate was determined turbidimetrically by the absorption spectrophotometry. Magnesium content, total hardness, and alkalinity were measured through titration. TDS (mg/L) was measured with a Multi-Meter (HI 991300, Hanna Equipments, Romania), potassium and sodium ions were assessed by flame photometric technique, chemical oxygen demand (COD) was identified photometrically using the SpectroQuant Nova 60 COD cell test (Merck) in the range of 10 – 150 mg/L. Biological oxygen demand (BOD) was determined using the OxiDirect BOD system and total suspended solids (TSS) was calculated as the difference between total solids and total dissolved solids. Phosphates were measured using the ascorbic acid method, total solids were estimated gravimetrically, and oxygen demand (OD) was measured on-site using a dissolved oxygen meter JENWAY-3405 (Manufacturer: Barloworld Scientific Ltd., England). To find out if the results were significant or not, the parameters were subjected to an ANOVA single factor analysis. The analysis's conclusion was that the data were statistically not significant. Since nitrate and OD were above the World Health Organization's (WHO) limit while most other physicochemical parameters were below it, the ANOVA result showed that there was no significant difference between the physicochemical characteristics of the water samples. With the exception of nitrite and OD, which are above the WHO limit for domestic drinking water and other purposes, it was discovered that the majority of the physicochemical parameters fell within the organization's water quality standards for these purposes. As a result, the water quality is not good and should not be drunk unless treated.

Keywords: Physical and chemical scrutiny, obizi river, ANOVA, water quality, drinking purpose.

1. INTRODUCTION

One of the most significant substances that make up the majority of life on Earth is water. Our planate's surface is submerged in water to the extent of 70.9%. Of which, the oceans contain 97% of the world's water wealth, with ice caps making up the remaining 2.4%. Surface water resources are undoubtedly exposed to impacts from anthropogenic activities. Poor access to clean water and poor sanitation especially in developing nations have resulted to wide outbreak of water-related diseases (Duressa *et al.*, 2019).Consequently, about 88% of diarrhea cases globally, are caused by poor water quality (Muhammed *et al.*, 2016). However, population growth, industrial and domestic activities, effluent contamination of water sources has greatly hampered efforts to deliver portable water to households (Duressa *et al.*, 2019). Several studies conducted in developing nations including in Kenya and Vietnam (Grady *et al.*, 2015) and south western Nigeria (Bisi-Johnson *et al.*, 2017) reported high risks of drinking water contamination with pathogens that greatly compromised public health. In countries that are developing, a large number of people do not have access to clean water (Gonçalves *et al.*, 2019). The Sustainable Development Goals, also known as the SDGs and the Millennium Development Goals (MDGs) have sped up efforts to ensure that everyone has access to safe drinking water. According to reports, between 2000 and 2015, the percentage of the world's population using improved water resources increased from 81% to 89% (UNESCO *et al.*, 2019). Despite this progress, there is still a problem with access to safe drinking water; in 2015 alone, 29% of the world's population (2.6 billion people) did not have access to improved sources, while 844 million people continued to lack access and 144 million people were gathering drinking water from water bodies such as rivers and lakes (UNESCO *et al.*, 2019, WHO. 2015; WHO/UNICEF, 2019). Sub-Saharan Africa accounted for 58% of the 144 million people who drew drinking water from ponds, rivers, and lakes (UNESCO *et al.*, 2019). Only 43% of people in Sub-Saharan Africa presently have access to enhanced resources, suggesting that the region has not made much progress in improving access to improved drinking water (WHO *et al.*, 2015; Mkwate *et al.*, 2017). According to Ezenwaji (2014), even with increased effort in water supply to both urban and rural areas in Nigeria over the years, it is doubtful that the country will meet the millennium development goals target of ensuring that half the population of Nigeria have improved water sources. As a result, there have been several incidents of water-borne illnesses, which pose a risk to public health. The knowledge of the multifaceted aspects of aquatic environmental chemistry, which include the origin, composition, reactions, and movement of water, is based on an understanding of water chemistry. Since human welfare is closely correlated with water quality, it is of utmost importance to humanity. Water-borne illnesses having historically been linked to the pollution of drinking water, according to UNICEF and WHO (2015). Adopting a water safety plan (WSP) is necessary to preserve public health, as stated in the WHO Guidelines for Drinking Water Quality (GDWQ). It creates broad standards for drinking water quality, giving all countries a single point of reference for figuring out what constitutes safe drinking water. This makes regular monitoring of water resources and appropriate safeguarding of the water supply from contamination necessary. In order to reduce these contaminations and guarantee that the residents of the Awka South Local Government Area in Anambra State, Nigeria, always have access to clean water, it is necessary to conduct a physical and chemical analysis of the Obizi water.

2. RESEARCH AREA

AN EXPLANATION OF THE RESEARCH AREA

Anambra State is located in the Southeast Nigeria. Awka is the capital and location of the government. "Light of the Nation" is the state's motto. Enugu State to the east, Kogi State to the north, Imo State and River State to the south, and Delta State to the west all form boundaries. With an estimated land area of 4887 km^2, Anambra State is situated between Latitudes 5° 45´ and 6°46´ N and Longitudes 6°31E´ and 7° 03´ E. The State of Anambra experiences a tropical environment with average yearly temperatures of 27^0C and 1828 mm of rainfall. The State is expected to have 5,527,800 people living there, according to the results of the most recent population count in 2016. Awka is situated in the rainforest climate zone, with an average annual temperature of 33^0C and an average annual rainfall of 1,400 mm in the north and 2,500 mm in the south. Its latitude is $6.33\overline{3}$ N and its longitude is 7.000° E. It has a total area of 613 SQ. KM, of which 21% is plateau and 15% is highland. There are two distinct seasons in this region: the wet season and the dry season. According to Onwuka *et al.*, (2012), the dry season lasts roughly four to five months from November to April, whereas the rainy season occurs from March to September. It's a normal savanna with grass covering it.

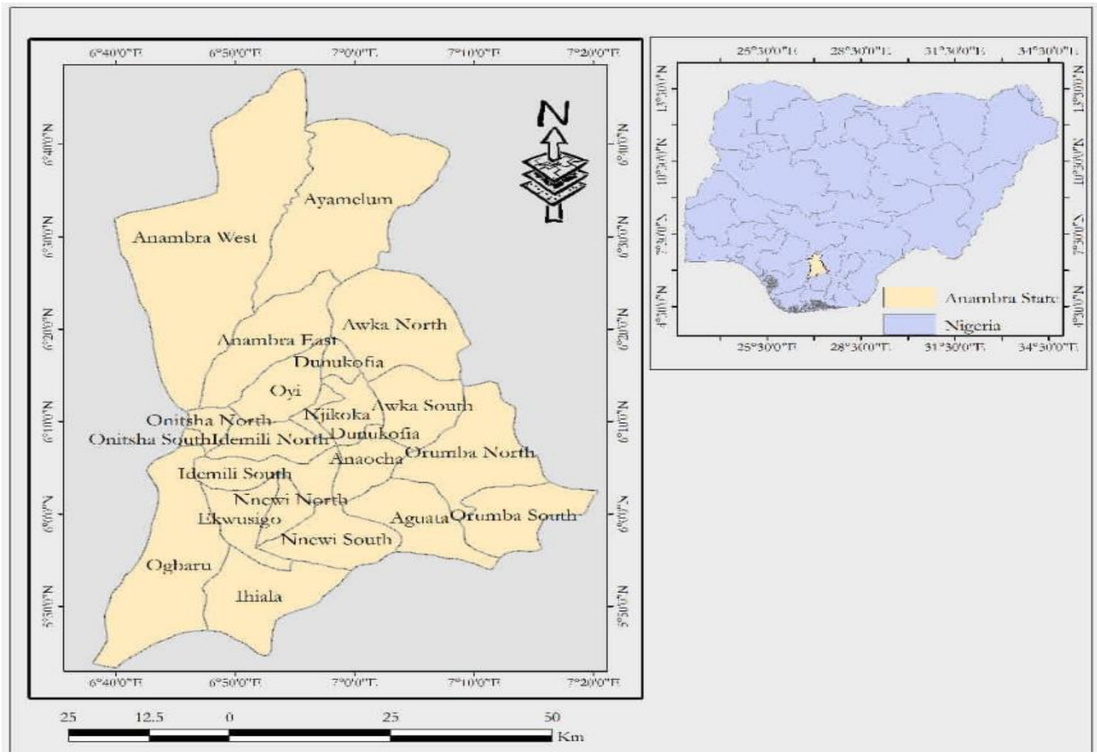

Figure 2.1: Research Area Map

3. MATERIALS AND METHODS

Following the protocol outlined by APHA (2005), water for physico-chemical analysis was aseptically collected from the Obizi River in the Awka South Local Government Area of Anambra State using 250 ml screw-capped sampling bottles. Three samples in total were taken, one of which is the upstream sample, which is situated about 800 meters upstream of the point where domestic and agricultural waste enters the river to discharge effluents. The site known as the effluent intake point is situated downstream of the first site. This location is the point at which community members' agricultural and domestic waste runoff into the river. Downstream, this is situated approximately 700 meters downstream of the discharge entering point. The samples were gathered early in the morning. In order to preserve the water samples' temperature while being transported to Springboard Laboratory for analysis, the sample was set on ice in a cooler. In July, in the rainy season, was when the water sample was taken. After being collected, the sample was examined within 24 hours. The material was chilled to 40°C in cases when analysis was postponed. Every glass container used to gather water samples was autoclaved for 15 minutes at 1200 degrees Celsius to ensure sterilization. A number of parameters were evaluated, including the following: nitrate mg/l, nitrite mg/l, magnesium mg/l, zinc mg/l, TDS mg/l, hardness mg/l, sulphate mg/l, phosphate mg/l, alkalinity mg/l, acidity mg/l, sodium mg/l, BOD mg/l, COD mg/l, TSS mg/l, TS mg/l, OD mg/l, and potassium mg/l. ANOVA Single-Factor statistical analysis was performed on the collected data to ascertain whether the parameters and the World Health Organization's (WHO 2018) recommended limit differed significantly.

4. RESULTS AND DISCUSSION

Table 4.1: THE WATER EXAMINATION RESULTS

S/N	PARAMETER	SAMPLE A CONC.	SAMPLE B CONC.	SAMPLE C CONC.	WHO
1	Nitrate mg/l	4.544	6.895	2.565	10
2	Nitrite mg/l	0.01	0.05	0.02	0.02
3	Magnesium mg/l	0.889	0.895	0.902	2.0
4	Zinc mg/l	0.053	0.065	0.003	5.0
5	TDS mg/l	122.33	103.82	74	500
6	Hardness mg/l	28	28	24	100
7	Sulphate mg/l	56.47	64.39	45.78	100
8	Phosphate mg/l	7.488	6.93	4.899	100
9	Alkalinity mg/l	132.55	103.37	87.78	200
10	Acidity mg/l	74.93	75.65	45.89	100
11	Sodium mg/l	0.140	0.153	0.163	200
12	BOD mg/l	56.65	67.87	56.89	100
13	COD mg/l	102.44	75.86	103.89	200
14	TSS mg/l	4.00	3.22	7.32	500
15	TS mg/l	12.633	10.74	81.32	500
16	OD mg/l	43	55	56.43	10
17	Potassium mg/l	7.933	7.355	5.474	10

4.1: NITRATE

Sample A had 4.544 mg/l of nitrate, Sample B had 6.895 mg/l, and Sample C had 2.565 mg/l. Figure 4.1 illustrates the variation of nitrate concentrations in this research region. Every water sample collected from various places was discovered to fall within the WHO's permitted range of values. On the riverbanks, autotrophic nitrobacter combine nitrite and oxygen to make nitrate. Surface runoff, washing operations, nitrate leaching into rivers, sewage, fertilizer use, and other nitrate-rich wastes are the main causes of nitrate presence in rivers. Algal assimilation accounts for the lowest nitrate value. Table 4.5 one-way analysis of variance (ANOVA) revealed that the mean were not statistically significant at $p<0.05$ and were not advised for consumption.

4.2: NITRITE

As seen in figure 4.1, the range of nitrite concentrations in this research region was 0.01 mg/l to 0.05 mg/l, with sample A having 0.01 mg/l, sample B having 0.05 mg/l, and sample C having 0.02 mg/l. All of the water samples collected from various sites was found to fall within the WHO-recommended tolerable range of values, with the exception of sample B, which had a concentration of 0.05 mg/l, beyond the recommended limit. On the other hand, site B reported the highest concentration, which decreased downstream. Nitrites are found in rivers due to a variety of sources, including commercial fertilizers, naturally occurring nitrites from the breakdown of mineral rocks, nitrogen-containing chemicals used in agriculture, and municipal, industrial, and sewage effluent that is high in ammonia. The rise in nitrate ion concentration indicates the existence of nitrite. High nitrite content in river water could be a sign of contamination. Although nitrite is a valuable source of nutrients for plants, it becomes more harmful with high pH and high ammonia levels. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.3: MAGNESIUM

One-way analysis of variance (ANOVA) in Table 4.5 also revealed that the mean were not statistically significant at $p<0.05$ and not recommended for drinking purposes. Magnesium concentrations in this study area varied in the range of 0.889 mg/l to 0.902 mg/l shown in figure 4.1, with sample A having 0.889 mg/l, sample B having 0.895 mg/l, and sample C having 0.902 mg/l. All the water samples from different locations were found to be in the acceptable range of values prescribed by the WHO. All the recorded values lie below the maximum allowable limits for drinking purposes.

4.4: ZINC

The study area's zinc concentrations ranged from 0.003 to 0.065 mg/l, as shown in figure 4.1, with samples A, B, and C having 0.053 mg/l, 0.065 mg/l, and 0.003 mg/l, respectively. All of the water samples from various locations were found to be within the WHO's permitted tolerance values. The presence of zinc in rivers is a result of zinc dissolving from water distribution pipes, which has an impact on the quality of household water consumption. One-way analysis of variance (ANOVA) in Table 4.5 also revealed that the mean were not statistically significant at $p<0.05$ and were not advised for drinking.

4.5: TOTAL DISSOLVED SOLID

The total dissolved solids (TDS) concentrations in this study area varied between 74 mg/l to 122.33 mg/l, as shown in figure 4.2. Sample A had 122.33 mg/l, Sample B had 103.82 mg/l, and Sample C had 74 mg/l. All the water samples from various locations were found to be in the permissible range of value prescribed by the World Health Organization. TDS is made up of inorganic salts and dissolved materials, and the samples contain dissolved solids at levels that do not endanger human life. The greater concentration obtained in sample A may be due to soil leaching, and the minimum value obtained in sample C may be due to earth silt. This is consistent with research conducted by Gayathri *et al.,* (2013) and Ehiagbonare and Ogunrinde, (2010). The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.6: HARDNESS

As seen in figure 4.2, the hardness of the water in this study location ranged from 24 to 28 mg/l, with sample A having 28 mg/l, sample B having 28 mg/l, and sample C having 24 mg/l. Every water sample collected from various places was discovered to fall within the WHO's permitted range of values. The term "hardness of water" refers to the degree to which high concentrations of the cations calcium (Ca^{2+}) and magnesium (Mg^{2+}) in water samples have dissolved minerals (Saidu and Gimba, 2019). High soap usage during home washing and cleaning contributes to the occurrence of hardness in water (WHO, 2011). The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.7: SULPHATE

As can be seen in figure 4.2, all of the water samples had modest sulphate contents, ranging from 45.78 to 64.39 mg/l. Sample A had 56.47 mg/l, sample B had 64.39 mg/l, and sample C had 45.78 mg/l. Every single water sample collected from various sites was found to be within the WHO's permitted drinking water levels. Water naturally contains sulphate due to leaching from common minerals such as gypsum (Manivaskam, 2005). Its concentration tends to grow with the discharge of household sewage and industrial waste. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.8: PHOSPHATE

As seen in figure 4.2, the phosphate concentration ranged from 4.899 to 7.488 mg/l for all the water samples. Sample A had 7.488 mg/l, Sample B had 6.93 mg/l, and Sample C had 4.899 mg/l. The results collected from various sites were all much below the WHO's recommended limits for drinking. The inorganic phosphate content may have been influenced by human washing and cleaning activities as well as surface water runoff, agriculture runoff, and rain. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not suggested for consumption.

4.9: ALKALINITY

Figure 4.3 illustrates the low alkalinity level of all the water samples, which ranged from 87.78 to 132.55 mg/l. Sample A had 132.55 mg/l, sample B had 103.37 mg/l, and sample C had 87.78 mg/l. The results collected from various sites were all much below the WHO's recommended limits for drinking. An increase in bicarbonates in the water may be the cause of the high alkalinity concentration. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for consumption.

4.10: ACIDITY

Figure 4.3 illustrates the range of acidity values for the water samples in this study area: sample A had 74.93 mg/l, sample B had 75.65 mg/l, and sample C had 45.89 mg/l. Every water sample collected from various places was discovered to fall within the WHO's permitted range of values. Landfills, power plants, confined animal feeding operations, chemical dumps, and industrial pollutants are the main sources of acidity in rivers. The pH of acidity is 6.5 or lower. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.11: SODIUM CONTENT

Sample A had 0.140 mg/l of sodium, Sample B had 0.153 mg/l, and Sample C had 0.163 mg/l. Figure 4.3 illustrates the variation of sodium level in water in this study location. The WHO's allowable drinking criterion was not met by any of the water samples from the various locations, therefore they are safe for human consumption. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.12: BIOCHEMICAL OXYGEN DEMAND

Figure 4.3 illustrates the range of BOD concentration in the water samples studied in this area: sample A had 56.65 mg/l, sample B had 67.87 mg/l, and sample C had 56.89 mg/l. Every water sample taken from various places fell short of the WHO's safe drinking threshold. The amount of oxygen required by bacteria to break down organic materials in samples under aerobic circumstances is known as biological oxygen demand, or BOD. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for consuming.

4.13: CHEMICAL OXYGEN DEMAND

Water in this research region had varying chemical oxygen demand contents, as shown in figure 4.4, ranging from 75.86 mg/l to 103.89 mg/l. Sample A had 102.44 mg/l, sample B had 75.86 mg/l, and sample C had 103.89 mg/l. Every water sample taken from various places fell short of the WHO's safe drinking threshold. Another crucial factor in determining the quality of the water is COD. Use of detergents from washing clothing at home and from cow poop may be the cause of high COD concentration. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.14: TOTAL SUSPENDED SOLID

Figure 4.4 illustrates the range of TSS concentration in the water samples from this study area, sample A had 4.00 mg/l, sample B had 3.22 mg/l, and sample C had 7.32 mg/l. Every water sample taken from several places fell well short of the WHO's recommended level for drinking. Carbonates, bicarbonates, chlorides, phosphates, and nitrates of calcium, magnesium, sodium, potassium, manganese, organic matter, salt, and other particles make up the total suspended solids. According to Mahananda *et al.*, (2005), the presence of total suspended solids causes turbidity because of silt and organic materials. In this study region, the range of TSS levels in the water was observed. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.15: TOTAL SOLID

Figure 4.4 illustrates the range of TS concentrations in this study location, with sample A having 12.633 mg/l, sample B having 10.74 mg/l, and sample C having 81.32 mg/l. It was discovered that every water sample collected from various places fell within the WHO's permissible value range. The main cause of higher total solids values in river water is the presence of silt and clay particles. Sample C has larger total solids content than the other samples because of runoff from several bathing ghats, municipal solid waste dumps, and other wastes. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for consumption.

4.16: OXYGEN DEMAND

Figure 4.4 illustrates the range of oxygen demand concentrations in this research location, with sample A having 43 mg/l, sample B having 55 mg/l, and sample C having 56.43 mg/l. It was discovered that every water sample taken from various sites above the WHO-recommended tolerable level of value. The quantity of gaseous oxygen dissolved in an aqueous solution is measured as oxygen demand, which is given as percentage saturation. According to WHO (2015), the tolerance level for inland surface waters used as bathing and raw water is 3 mg/l, the acceptable range for maintaining aquatic life is 4 mg/l, and the tolerance limit for drinking is 10 mg/l. The mean in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for drinking.

4.17: POTASSIUM

As seen in figure 4.4, the range of potassium values in this research area was 5.474 mg/l to 7.933 mg/l, with sample A having 7.933 mg/l, sample B having 7.355 mg/l, and sample C having 5.474 mg/l. It was discovered that every water sample collected from various places fell within the WHO's permissible value range. Although all recorded values are within the WHO standard standards for for consumption (10 mg/l), sample A had the highest result in comparison. The weathering of rocks is the primary source of potassium in naturally occurring fresh water, however the dumping of waste water causes an increase in potassium levels in contaminated water (James, 2000). The means in Table 4.5 one-way analysis of variance (ANOVA) were also not statistically significant at $p<0.05$ and were not advised for consumption.

Table 4.2: ANOVA TABLE FOR SAMPLING POINT A

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	17	654.06	38.47412	2051.584
Column 2	0	0	#DIV/0!	#DIV/0!
Column 3	0	0	#DIV/0!	#DIV/0!

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0	2	0	0	1	3.738892
Within Groups	32825.35	14	2344.668			
Total	32825.35	16				

Table 4.3: ANOVA TABLE FOR THE SAMPLING POINT B

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	17	610.263	35.89782	1492.007
Column 2	0	0	#DIV/0!	#DIV/0!
Column 3	0	0	#DIV/0!	#DIV/0!

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0	2	0	0	1	3.738892
Within Groups	23872.12	14	1705.151			
Total	23872.12	16				

Table 4.4: ANOVA TABLE FOR THE SAMPLING POINT C

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	17	597.326	35.13682	1307.047
Column 2	0	0	#DIV/0!	#DIV/0!
Column 3	0	0	#DIV/0!	#DIV/0!

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0	2	0	0	1	3.738892
Within Groups	20912.75	14	1493.768			
Total	20912.75	16				

Table 4.5: ANOVA TABLE FOR THE THREE SAMPLING POINTS

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	17	654.06	38.47412	2051.584
Column 2	17	610.263	35.89782	1492.007
Column 3	17	597.326	35.13682	1307.047

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	104.0057	2	52.00284	0.032162	0.96837	3.190727
Within Groups	77610.21	48	1616.879			
Total	77714.22	50				

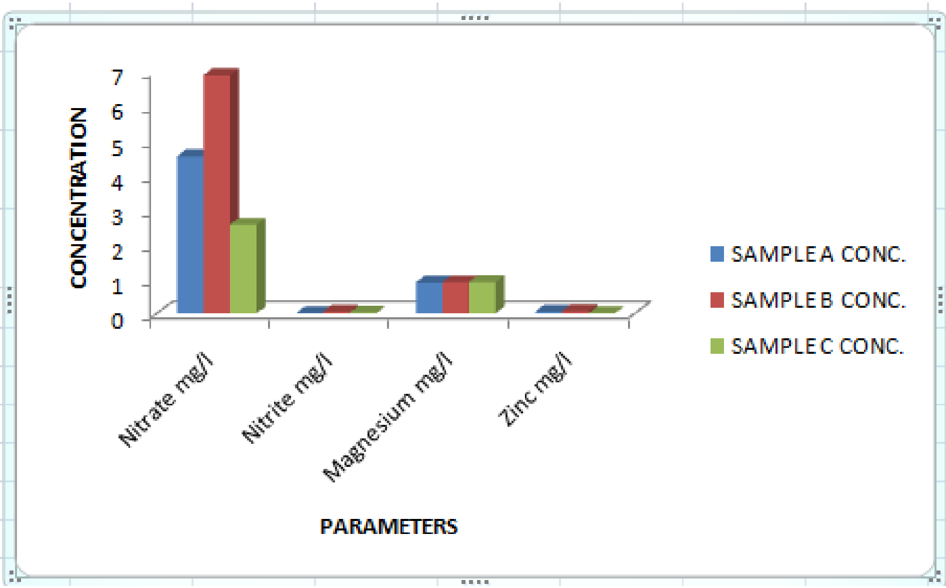

Figure 4.1: Nitrate, Nitrite, Magnesium and Zinc of the water samples

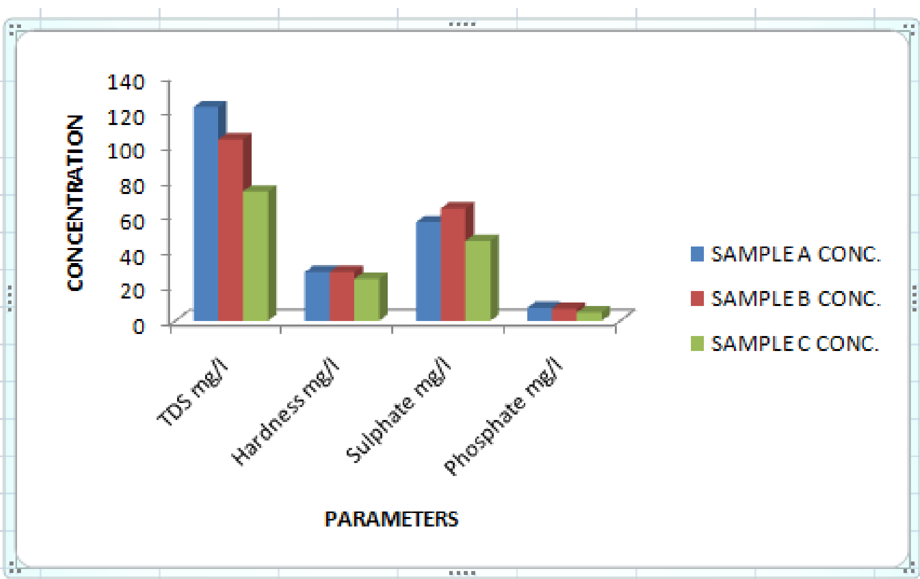

Figure 4.2: TDS, Hardness, Sulphate and Phosphate of the water samples

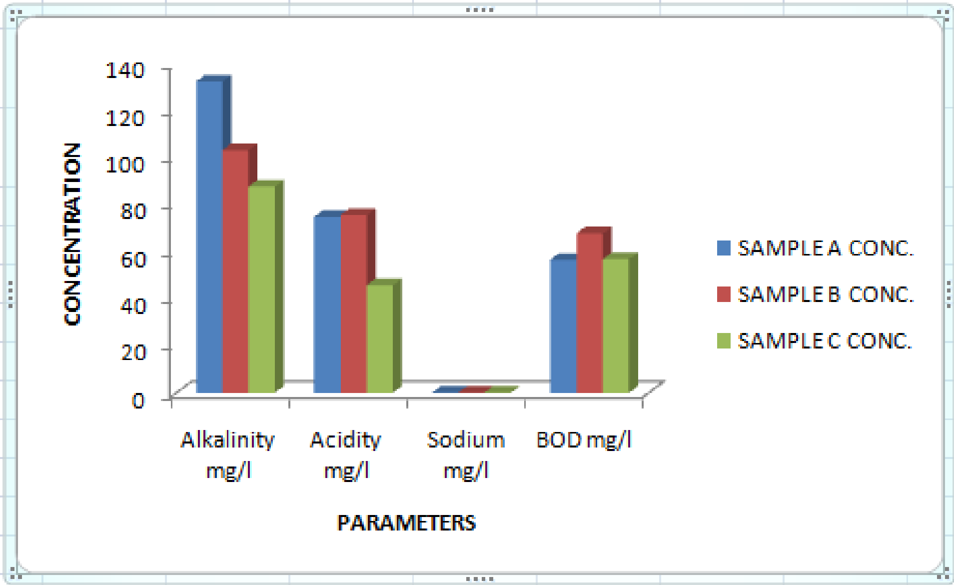

Figure 4.3: Alkalinity, Acidity, Sodium and BOD of the water samples

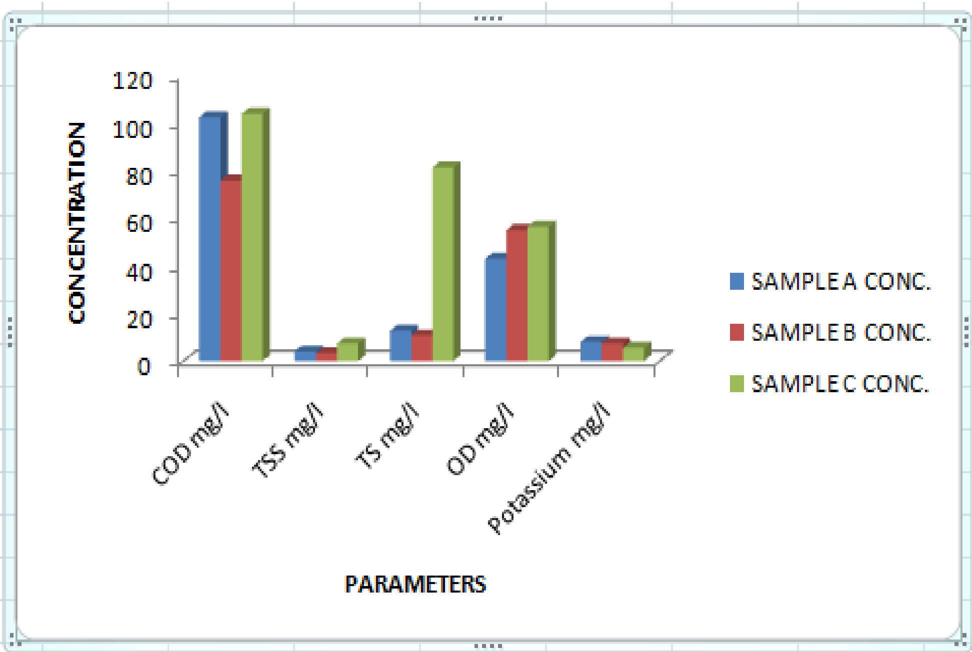

Figure 4.4: COD, TSS, TS, OD and Potassium of the water samples

5.1: CONCLUSION

One of the most significant rivers in the Awka-South Local Government Area of Anambra State, the Obizi River provides numerous means of irrigation for the metropolis. It also contains a variety of trash. The river has always been extremely important and is becoming more so every day. However, the river is currently contaminated. Its water's cleanliness is deteriorating daily, just like that of other rivers in the city. When the study's results were compared to WHO guidelines, it became clear that while the majority of the water variables were under the WHO's tolerance limit, some, notably OD and nitrite, were beyond the limit. The ANOVA result further indicated that the physicochemical properties of the water samples do not significantly differ from one another. Furthermore, the outcomes demonstrated that the water, in the absence of any kind of treatment, is inappropriate for human consumption and other household uses.

5.2: RECOMMENDATIONS

i. Further research on this river is required in order to ascertain the microbiological population.

ii. Raising awareness among individuals of the risks associated with drinking untreated contaminated water is imperative.

iii. The government must act immediately to prevent an increase in the amount of pollutants entering water bodies and to update their water purification system.

CONFLICT OF INTEREST

There is no conflict to declare.

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