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# EVALUATION OF WATER VARIABLES AND HEAVY METALS CONCENTRATION IN FISH SPECIES COLLECTED FROM RIVER GURARA AT IZOM, NIGER STATE

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## ABSTRACT

Heavy metals are potentially toxic to human and the environment. Metals toxicity depends on the chemical form in which they exist. In this work, an evaluation of water variables and heavy metals concentration in fish species collected from River Gurara at Izom, Niger State were examined. Three stations were selected for the sampling and the metals investigated were Lead (Pb) (0.1-1.10); Iron (Fe)(5.61-20.7); Manganese (Mn) (0.02-0.06 and Copper(Cu) (0.6-0.90). The physicochemical parameters determined were Dissolved oxygen (D.O) (11.8-15.17mg/l), Biochemical oxygen demand (B.O.D) (9-16mg/l); pH(7.7-9.0); Electrical Conductivity(0.01-2.5μs/cm); Total dissolved solid (T.D.S) (67-133ppm); Temperature (24-27$^0$c); Sodium (Na) (4.2-6.83mg/l); Chlorine (Cl) (2.8-5.22mg/l); Potassium (k)(1.43-6mg/l); Nitrate ($N0_3$) (0.5-1.5mg/l)and Phosphorus ($Po_4$) (0.11-3.5mg/l). The collected fish tissue was digested and analyzed using Atomic Absorption Spectrophotometer (A.A.S.). The mean concentration of heavy metals showed that copper (0.6-0.90) in the fish species was not significantly (P>0.05) different in all species sampled. Iron was found to be above the maximum acceptable limit (0.3mg/l) by WHO. Similarly, manganese was slightly lower compared with iron, Lead was within the maximum acceptable limit (0.01mg/l) While pH was neutral in all stations, Temperature was within the range of 24-27$^0$C. Dissolved oxygen and Biochemical oxygen demand fluctuated slightly between (11.8-18.2mg/l) and (9-16mg/l) respectively. Although, this values were relatively moderate, there effect on most organic contaminants are weak organic acids, and are more likely to enter organisms at low pH because they are un-ionized. The fish species collected within the study period were *Chrysicthys walker sp.; Tylochromis jentinki sp., Hepsetus odoe sp., Barbus callipterus, Brycinus nurse, Petrocephalus sp. and Alestes baremose*. The findings indicated that the water have high level of total dissolved solids, slightly Alkaline and the high concentration of Iron in fish species, showed that the water was contaminated.

**Keywords**: Evaluation, Water Variables, Heavy Metals, Fish species.

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## INTRODUCTION

Water quality is important to the health and protection of aquatic surrounding and hydrology. The return of renewable freshwater to humans include water for drinking, irrigation, industrial-uses, production of fish, and for such in-stream uses as amusement, transportation and garbage disposal (Jackson *et al*., 2001). Water plays a major role in the cycling of waste and can be a vector if develop into a source of harmful substances and diseases. The quality and firmness of water depends on such factors as geology of catchment, climatic conditions, moody and anthropogenic input etc. (Bricker and Jones, 1995; Markich and Brown, 1998; Bellos, *et al*., 2004). Water can be edgy with heavy metal load source from windswept soils/rocks, mining and metallurgical release and industrial emissions (Boari *et al*., 1997; Adams, 2001). The levels of heavy metals in some inland river in the area and Niger, mainly those which drain their contents into coastal waters have been reported (Wogu and Okaka,; 2011). Amoo *et al*. (2005) and Oyewale and Musa (2006) reported the levels of heavy metals in Lakes Kainji and Jebba on River Niger. Environmental and health data concerning the level and rate of heavy metals in domestic water of lower River Niger drain are inadequate and scattered. There are anthropogenic actions like washing of different kind of stuff, defecating and also discarding of cassava peel on the river banks. These human activities going on in the lower part of Gurara River at Izom in Niger State amplify the pollution of the River. There is need for a lucid and review of heavy metals in the River system in vision of the human activity along the bank of the River. Studies have been done to identify heavy metals pollutant in some water bodies in Nigeria (Olaifa, *et al*., 2004; Omoregie *et al*., 2002). Gurara River at Izom with its tributaries is the main River that traverses the length and breadth of Gurara Local Government metropolis in Niger state where it serves as the source of domestic, agricultural and water consumption. It is the major sources of fresh water fish for populace of Izom and is exploited by artisanal fishermen. It is also the final drainage release for all waste waters from domestic and agricultural source within and around Izom and environs, hence the need for this research.


FIG 1 HYDROLOGICAL MAP OF NIGER STATE

## MATERIALS AND METHODS

### Description the study area

The study area covers the lower Gurara River at Izom with an area within Latitudes 7°11' N and 9°25' N and Longitudes 7°05'E and 7°07' E, an area almost 150km$^2$. The common climatic condition in the area was marked by two main regimes: the wet and the dry seasons. The wet (rainy) season is from April to October while the dry season starts in November to March. The mean monthly temperatures are high throughout the year. A mean annual temperature of 22°C is typical of the area. The area lies within the Guinea Savanna belt of Nigeria. Human activity in the stations are washing of cloths, bathing, defecating and fishing. Three sampling stations were selected. There was a local mining site some few meters away from station(-1-) which is been noted as the source of heavy metal present in that water. There is a water treatment plant at the River side in station (-2-). In station (-3-), a lot of anthropogenic activities were noted as a result of a villages around the river bank. Activities like dumping of cassava peel directly in to the water, washing of harvested farm products at the bank of the river, defecating and discarding of all kinds of domestic waste materials in to the River.

### Collection of samples

The study was carried out for six months between March and August 2016 in Gurara River at Izom. Water samples and fishes species were collected once in a month between 8:00am – 12:00pm. Water samples were collected using washed and dried plastic bottles for physico-chemical parameters analysis. Water parameters were determined using APHA, (1998) Methods. Fish samples were collected from Gurara River monthly. Sample of fish species are harvested and sorted using set gill net with three different mesh sizes of 1, 2 and 3 mm and transported in an ice box to the laboratory, Department of Biological sciences, F.U.T, Minna for digestion and analysis.

### HEAVY METAL DETERMINATION

Selected fish samples were oven dried for 24 hours at 60°C.They were pooled and milled with a mortar and pestle. The digestion was done by taken 10g of each grounded samples with 10 ml $HNO_3$ and heated on a hot plate for 30 minutes. After complete digestion, the residue was allowed to cool and filter into a 100ml volumetric flask and diluted with distilled water to 100 ml make. Digested samples were stored in pre-cleaned bottles before analysis using atomic absorption spectrophotometer.(Buck Scientific 210 VGP model) at the central teaching laboratory, F.U.T., Minna.

### Physico-chemical parameters

Samples were collected monthly from March, 2016 to August, 2016 from three stations usually between 8:00am and 12:00 noon. The physico-chemical parameters investigated in each case were water temperature, pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), conductivity, Total dissolved solid (TDS), Nitrate ($NO_3$), Sodium (Na), Potassium (K), Phosphorus ($PO_4$) and Chlorine ($Cl^{-2}$ according to the method of APHA,(1998) and Adeosun *et al.* (2011).

### Data Analysis

The range, mean and standard error, for each parameter and station were calculated, using descriptive analysis. Physical and chemical features of stations were compared using two-way ANOVA. Significant ANOVA ($p<0.05$) were used to identify differences between station means. Canonical correspondence analysis (CCA) was used to evaluate relationship between fishes and physicochemical variables in water using past statistical package (Dickman & Rygiel 1996). Taxa richness (Margalef indices), diversity (Shannon, & Simpson dominance indices) and evenness indices were calculated using the computer BASIC programmed, sp DIVERS (Ludwig and Reynolids, 1988).

## RESULTS

### Physico-chemical parameters of samples collected from Gurara River

The summary of physicochemical parameters obtained from the three sampling stations of the river is shown in Table 1 below. pH, Temperature, Conductivity, Dissolve oxygen (DO), biochemical oxygen demand (BOD), Total dissolved solid (TDS), showed significant difference (P>0.05) between the months. Sodium, Potassium, Nitrogen, Chlorine and Phosphorus were significantly different (P<0.05) among the stations sampled.

Table:1. Mean and standard deviation, of physicochemical parameters of samples collected from Gurara River from March to August, 2016. (range provided in parentheses)

| | | | | F-VALUE | | P-VALUE | |
|---|---|---|---|---|---|---|---|
| | Station 1 | Station 2 | Station 3 | MONTHS | Stations | MONTHS | Station |
| pH | 8.23±0.58 | 8.57±0.39 | 8.1±0.22 | 33.3 | 4.1 | 0.06 | 0.37 |
| | (7.6-9.00) | (6.8 –9.7) | (7.7-9.0) | | | | |
| Temperature(°C) | 25.5±0.43 | 25.4±0.48 | 21.43±3.81 | 3.84 | 4.46 | 1.32 | 0.41 |
| | (24 – 27) | (24 – 27) | (26 – 27) | | | | |
| Conductivity(μs/cm) | 0.23±0.19 | 0.49±0.41 | 0.44 ± 0.37 | 33.3 | 4.1 | 2.64 | 0.28 |
| | (0.01-1.2) | (0.02-2.5) | (0.02 –2.3) | | | | |
| Dissolved oxygen (mg/l) | 16.48±0.54 | 14.43±0.63 | 15.82±0.98 | 3.33 | 4.1 | 0.25 | 0.06 |
| | (15 –17.7) | (11.8 – 16) | (13 – 18.2) | | | | |
| B.O.D (mg/l) | 11.33±0.49 | 10.75±0.35 | 11.92±0.95 | 3.33 | 4.1 | 0.24 | 0.37 |
| | (10 -13) | (9 – 11.5) | (9 – 16) | | | | |
| T.D.S (ppm) | 82.2 ± 0.37 | 88.8±11.56 | 96.0±12.76 | 3.33 | 4.46 | 0 | 0.09 |
| | (67– 102) | (76 - 135) | (96 – 133) | | | | |
| Sodium (mg/l) | 5.59 ± 0.37 | 5.53 ± 0.48 | 5.37 ± 0.21 | 3.32 | 4.1 | 0.4 | 0.49 |
| | (4.5– 6.83) | ( 4.2 –6.6) | (4.7 – 5.8) | | | | |
| Potassium (mg/l) | 3.45 ± 0.86 | 3.56± 0.67 | 3.84 ± 0.77 | 3.33 | 4.1 | 0 | 0.31 |
| | (1.43– 5.4) | (2 – 5.6) | (2.11 – 6) | | | | |
| Nitrate (mg/l) | 0.90 ± 0.19 | 1.84 ± 0.63 | 1.86 ± 0.49 | 3.33 | 4.1 | 0.12 | 0.08 |
| | ( 0.5 – 1.5) | (0.7 – 4.3) | ( 0.6 – 3.5) | | | | |
| Chlorine (mg/l) | 4.01± 0.42 | 4.30 ± 0.34 | 4.18 ± 0.31 | 3.33 | 4.1 | 0.02 | 0.18 |
| | (2.8 – 5.2) | (3.4– 5.22) | (3.2 – 5.1) | | | | |
| Phosphorus (mg/l) | 0.89±0.23 | 1.58±0.21 | 1.86±0.49 | 3.33 | 4.1 | 0.04 | 0.01 |
| | (0.11– 1.4) | (1.0–4.3) | (0.6–3.5) | | | | |

## RESULTS

The pH values showed that the highest value recorded was (9.7) in March (Station 2). The lowest was recorded in April (Station 2). There was no difference between the stations. (P<0.05). The result of temperature recorded showed that the highest value obtained was (27°C) in August in all the stations. In March which a value of (26°C) were recorded throughout the stations. April May and June values obtained were also constant between the stations. The lowest value recorded was (23°C) in July (Station 3). There were significant differences (P>0.05) in electrical conductivity throughout the months. The electrical conductivity fluctuates between the stations throughout the period of study. The highest value recorded was (2.5µs/cm) in May (Station 1), and the lowest was recorded in August in station 2 and 3 with a value of (0.2µs/cm).The result of dissolved oxygen obtained in this study showed a gradual fluctuation from March to August of dissolve oxygen during the study period. The highest value recorded was (18.2mg/l) in July (Station 3), and the lowest were in April and June. However, there was a slight difference between the stations (P<0.05). The result of BOD obtained showed that, they were significantly different (P<0.05) between the stations throughout the months. The lowest valve recorded was (9mg/l) in April (station 3) and July (Station 2). The highest value (16mg/l) was recorded in August (station 3).The result of total dissolve solid (TDS) showed significant differences (p<0.05) between the stations throughout the months. The highest valve obtained was (135ppm) in August (station 2). While the least value was obtained was in May and April (Station 1).The result of sodium showed that, there was generally high concentration of sodium throughout the months. The highest value (6.83mg/l) was recorded in March and April in the same station (Station 1). The lowest value was (4.2mg/l) in June, (Station 2).The result of potassium above showed that there was a high concentration of potassium in July (Station 3) with a value of (6mg/l). There was no significance difference (p<0.05) in August between station 1, 2 and 3. The lowest value was (1.36mg/l) recorded in March (Station 1). The result of nitrogen obtained in this study showed a slight variation throughout the period of the work. The highest value (4.3mg/l) was obtained in May (Station 2) and (0.23mg/l) was the lowest in (March station 1). Chlorine value (5.44mg/l) was recorded in March (Station 2) and the lowest value (2.8mg/l) was obtained in June. The result of phosphorus was significantly different (p>0.05 within the stations and months. The lowest value (0.11mg/l) was recorded in March (Station 1). And the highest value was (2.2mg/l) recorded in July and August (Station 2).

### Concentration of heavy metals in the fish species

Table 2 below indicate a summary of the results of heavy metals obtain for the three sampled stations. Iron was significantly higher (p>0.05) than other metals with copper, lead and manganese significantly low (p<0.05). Concentration of Lead ion was almost found to be low in all the fish species collected from the river except in *Chrysicthys walkari* were higher value of (1.1mg/l) was recorded followed by(0.8mg/l) in *Hepsetus odoe*, and the lowest value was recorded in *Barbus callipterus* which was (0.3mg/l). The result of water sample was also analyzed to be low, with a value of (0.1mg/l). There was no significant difference (p>0.05) of lead between the fishes. Concentration of iron was significantly very high (p<0.05) both in fish species collected from the river and water sample with a value of (5.63mg/l). The highest value was recorded in *Tylochromis jentinki* which was (20.70 mg/l). And follow by *Chrysicthys walkari* which was (8.00mg/l) and (5.53mg/l) in *Alestes baremose*. *Hepsetus odoe* was also found to be high with a value of (6.19mg/l). The lowest value of lead concentration was found in *Brycinus nurse* with a value of (2.32mg/l) and *Petrocelphalus, which* was (1.51mg/l). There was no significant difference (p<0.05) of lead concentration between those two species of fish. The result of Manganese concentration in all the fishes was generally low except in *Chrysicthys walkari* with a value of (6.60 mg/l). There was no significant difference between the rests of the fishes throughout ($P>0.05$).There was no significant difference of copper concentration in all the fishes and in the water sample analyzed. The value of water sample obtained was (0.11mg/l). The highest value of copper concentration obtained was from *Chrysicthys walkari* with a value of (0.60mg/l) and followed by *Barbus callipterus* with a value of (0.19 mg/l). The lowest value was from *Petrocephalus* with a value of (0.01mg/l) ($P<0.05$).

Table2. Concentration of heavy metals in the tissue of fish species in River Gurara

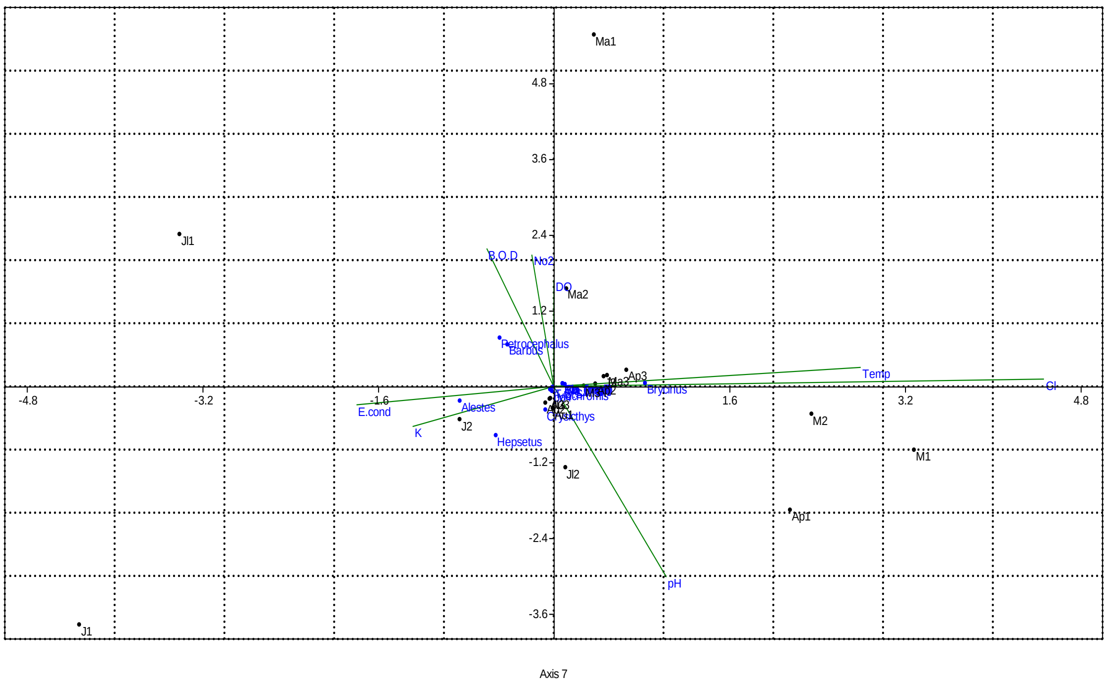
| Fish species | Pb (mg/g) | Fe (mg/g) | Mn (mg/g) | Cu (mg/g) |
|---|---|---|---|---|
| *Chrysicthys walkari* | 1.1 | 8 | 6.6 | 0.6 |
| *Tylochromis jentinki* | 0.5 | 20.7 | 0.73 | 0.11 |
| *Hepsetus odoe* | 0.8 | 6.19 | 0.32 | 0.13 |
| *Barbus callipterus* | 0.3 | 2.43 | 0.77 | 0.19 |
| *Brycinus nurse* | 1 | 2.32 | 0.42 | 0.11 |
| *Petrocephalus* | 1 | 1.51 | 0.13 | 0.01 |
| *Alestes baremose* | 0.7 | 5.53 | 0.55 | 0.12 |

## Taxa richness, Diversity, Evenness and Dominance indices

Taxa richness calculated as margalef's index, Shannon-Weiner, evenness and Simpson's index for the three stations are presented in (table 3). Shannon Weiner index and Evenness index analysis showed that there was no significant difference ($P>0.05$) between station 1 and 2. However, the lowest significant ($P<0.05$) value was recorded in station 3. Taxa richness was higher in station 1 followed by station 2 and station 3.

**Table 3: Taxa richness, diversity, evenness and dominance indices**

| O | Station 1 | Station 2 | Station 3 | Total |
|---|---|---|---|---|
| Taxa _S | 7 | 4 | 1 | 7 |
| Individual | 21 | 6 | 1 | 27 |
| Dominance D | 0.161 | 0.3333 | 1 | 0.1742 |
| Simpson _ 1-D | 0.839 | 0.6667 | 0 | 0.8258 |
| Shannon_ H | 1.885 | 1.242 | 0 | 1.851 |
| Evenness e ^H/S | 0.9412 | 1.674 | 1 | 0.9098 |
| Margalef | 1.971 | 1.674 | 0 | 1.82 |




Canonical Correspondence Analysis (CCA) Of The Fish Distribution and Environmental Variables In Gurara River at Izom, Niger State.

Table 4: Mean and standard deviation, maximum and minimum range of heavy metals(mg/L) of water collected from Gurara River

| | Station 1 | Station 2 | Station 3 | F-VALUE MONTHS | Stations | P-VALUE MONTHS | Stations |
|---|---|---|---|---|---|---|---|
| Lead (mg/l) | 0.13±0.03 (0.1-0.2) | 0.53±0.16 (0.2-0.8) | 1.10±0.00 (1.10-1.10) | 4.76 | 5.14 | 0.58 | 0 |
| Iron (mg/l) | 5.90±0.23 (5.61-6.19) | 5.81±0.23 (5.30-6.20) | 20.36±0.13 (20.1-20.7) | 4.76 | 5.14 | 0.15 | 7.1 |
| Manganese (mg/l) | 0.03±0.00 (0.02-0.03) | 0.04±0.00 (0.03-0.04) | 0.06±0.00 (0.06-0.06) | 4.76 | 5.14 | 0.8 | 0 |
| Cupper (mg/l) | 0.68±0.19 (0.11-0.90) | 0.31±0.19 (0.09-0.9) | 0.6±0.00 (0.6-0.6) | 4.76 | 5.14 | 0.25 | 0 |

## DISCUSSION

The water of Gurara river is generally cloudy with high total dissolved solid values ranging from 77-135ppm, with low conductivity (<0.01µscm-1) except in July (station 2) where conductivity reached up to (2.5µs/cm) during the peak of the rainy season, fresh water usually has TDS levels between 0 and 1,000mg/l, depending on the geology of the region, climate and weathering, and other environmental features that affect sources of dissolved materials and its transport to a water system. High level of TDS and conductivity render the water less fit for drinking and irrigation (Adams, 2001). Dissolve oxygen(DO) level and biological oxygen demand requirements (BOD, were within guideline values for fresh water, except Station two with high domestic activities with DO of $< 6.00$ mg/L,(5.40 and 5.85 mg/L). The European Union (EU, 2006) freshwater fisheries directive requires that when oxygen concentration falls below 6.00 mg/L, member state should use provision of article 7(3), which pursue an agenda for water renewal and aquatic life 'conservation and sustainability. These levels are not a threat to the health of the water since nutrient load NO3 -, 0.65 to 1.49 mg/L and PO43-, 0.41 to 0.87 mg/L are low. The low nutrient load also explains the low to moderate levels of BOD requirement. The levels of DO and BOD observed are consistent with the findings of Tripathi, *et al*. (1999), and were within guideline levels. Analysis of variance showed that temperature; pH, DO and conductivity of water did not show significant variation ($p > 0.05$) between sample stations. This suggests that the water quality is valuable for aquatic life. The concentration levels of the measured heavy metals in River Gurara may partly be a function of the current pH and seasonal distinction. According to Ogunfowokan *et al*. (2005), the openness and toxicity of heavy metals in their aquatic environment is distorted depending on the pH of water body. During the investigation, the values of sodium and Chlorine were low.

Taxa richness calculated as margalef' index, Shannon-Weiner, evenness and Simpson's index for the three stations are presented in. Shannon Weiner index and Evenness index analysis showed that there was no significant difference (P>0.05) between station 1 and 2. However, the lowest significant (P<0.05) value was recorded in station 3. Taxa richness was higher in station 1 followed by station 2 and station 3.In this study the CCA facilitate the identification of the effect of various environmental parameters on the distribution and abundance of fish species collected. All the fish species except *Petrocephalus baus* were closely related and favored by pH, Conductivity, Chlorine, Temperature and potassium concentration in the river. Generally, The Environmental variables favored the presence of all the species samples during this research. Heavy metals concentration in the river at all sampling points were found in the following order: Fe>Mn>Pb>Cu. Heavy metals in water may be attributed to the increased cover of the aquatic ecosystem by higher plants which absorb metals from water sediment, huge amounts of raw sewage, agricultural and industrial waste water discharged into the river (Abdel-Moati *et al*., 1997). Farming activities contribute to the levels of some metals in surface water through run-off. Most importantly, the high level of iron content in the water has no identifiable points source though, it has been reported that iron occurs at high levels in Nigeria soils (Adefemi *et al.*, 2004; Aiyesanmi, 2006).The toxicity and accumulation of heavy metals of River Gurara at Izom is high and the villagers solely depend on the water for their livelihood. The heavy metals (Fe, Pb, Cu and Mn) concentration in the water body shows that it is above the the recommended maximum acceptable limits of the World Health Organization (WHO, 2011) and Nigeria Industrial Standard (NIS, 2007 The analyses has also shown that the river water had iron concentrations above the WHO prescribed limit of 0.03 mg/L for drinking water both for the wet and dry seasons respectively. High iron concentrations in water are extensive and constraints in rural water supply. Although, iron in water has no direct health consequences, problem may arise if communities decide not to use this water and return to old polluted sources (MacDonald *et al.*, 2005). However, excessive iron concentration can cause damage to the cells of gastrointestinal tract and also damage the cells in the heart and liver (Adriano, 2001). In addition, concentration of iron in water might be as a result of serious anthropogenic activities going on at the river bank. This observation was in line with the work of (Olaifa *et al.*, 2004: Omoregie *et al.*, 2002). This observation was also similar to the result of Olatunde and Oladele (2012) who observed that iron was the dominant metal in the muscle of *clarias gariepinus*.

Lead level was higher than maximum permissible limit of 0.01 mg/L set by WHO (2011) and NIS (2007) in all water samples collected. This is indicative that Pb is ever-present in our environment with diverse pollution sources. A greater percentage of all metals were higher than the permissible limit, but the pollution rating was not alarming as almost all values were barely higher than the permissible limits.

Copper concentrations in the water were within the range of 0.06-0.09mg/l dry and wet season. Copper was the only heavy metal with low concentrations in both the wet and dry season. Common sources of copper in drinking water may come from corrosion of household plumbing systems and erosion of natural deposits. Long term exposure may lead to liver or kidney damage, Salaudeen and Adeloju (2016).. Copper concentrations fell below the WHO prescribed limit for drinking water (2.0mg/l). Copper is among the most toxic metals in the aquatic environment. It is toxic in very low concentration. It is released into the environment primarily as dormant spray in agriculture, as a fungicide in marine paints, and from tailings from copper mines. In urban areas, copper is present in storm water runoff from roads due to tire wear. Copper is much more soluble in soft water, (less than 75 mg/l) than in hard water. It is highly toxic to fish because it disrupts normal electrolyte (salt) balance. Aiyesanmi (2006).

Manganese in water sample analyzed has range of 5-20mg/l in the dry and wet season. The results of analyses also showed that manganese concentration were above WHO allowable value of 0.1 mg/l for drinking water. The high concentration of manganese is of concern because it generally dissolves under soft reducing conditions to produce the mobile divalent manganese ion which when expose to air is oxidized to hydrated oxide that form black coloration and can stain plumbing and cloths (Hem, 1992; Hounslow, 1995). Water quality can be affected when the rate of atmospheric evidence, storm water run offs, domestic or industrial waste discharge surpasses the carriage ability of water (US EPA, 1998).

It was reported that among water and aquatic quality parameters, salinity, pH and temperature bear direct stress effect that are purely and seasonally variable within ecosystem types and for which natural biological communities are adapted to the site-specific conditions (ANZECC, 2000). In addition, water salinity, pH and temperature have major effect on the bio-available concentration of heavy metals. Thus, the threshold levels for salinity, pH, temperature and priority heavy metals may need to be based on site-specific eco-toxicology and biological effects data.

## CONCLUSION

Generally, the concentration of heavy metals was higher than permissible limit recommended by World health organization, (W.H.O, 2011) and the Nigerian industrial Standard (N.I.S.2007). Iron was the highest compared to other metals. This have showed threat especially when view in the community health. This may be result of domestic sewage discharge and other anthropogenic activities taking place in the river shoreline.

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