Evaluation Of Benthic Macro-Invertebrates Along the Upper Course of River, Imo - State, Nigeria

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Abstract- ***The Physico-Compound boundaries and benthic full scale spineless creatures along the upper-course of Otamiri River, Imo State, Nigeria was led between the long stretches of July to September, 2017 to decide the effect of the new digging and other anthropogenic exercises close by the waterway. Every other month surface water tests and silt were gathered from three examining stations along the waterway between July-September, 2017. Water temperature, momentum, and not set in stone in-situ, while other physico-synthetic boundary were investigations utilizing traditional field and standard lab strategies. Smelling salts, Carbon dioxide (CO2) and complete suspended strong (TSS) were seen to be over as far as possible, conductivity and CO2 show spatial huge contrasts at P < 0.05, absolute disintegrated strong (TDS) shows a positive critical relationship with alkali, and TSS with TDS at P < 0.01. Nine (9) taxa of benthic large scale spineless creatures were recorded involving two (2) phyla: Annelida, and Arthropoda. Chironomus sp recorded the most elevated rate wealth (83.6%) and the most noteworthy Shanon weinner's variety file (H=2.516), while Aquatic Earthworm, and Hilipus unifasciatus recorded the least rate plenitude (0.3%) separately. Testing station one recorded the most elevated rate bounty and overwhelmed by Chironomus sp. In this manner, however digging and getting free from weeds caused environment obliteration and end of large-scale spineless creatures in station 2 and 3, yet had upgrade the water ebb and flow and decrease gatherings of squanders around these stations. Digging can be reached out to other course of the waterway as a fighting measure to lessen squander aggregations on the stream.***

Indexed Terms- ***Large Scale Spineless Creatures, Physico-Substance Boundaries, Anthropogenic Exercises, Digging.***

I. INTRODUCTION

Many gatherings of living beings have been utilized as marks of water quality or natural changes in new water bodies, including Plankton, Macrophytes, protozoan, fish and different creatures (Atobatele et al, 2005); of these, benthic full scale spineless creatures have been most widely used to screen and survey by and large soundness of the oceanic climate, as they fill in as great possibility for long haul observing project connecting with anthropogenic effects (Spaak and Bauchrowitz, 2010, and Adebayo et al, 2016a). They are dependable markers since they burn through all or the majority of their live cycle in water; they are not difficult to gather, recognized in the research center and, in contrast to fish, have restricted portability. On account of their powerlessness to get away from contamination, full scale spineless creatures have the ability to incorporate the impacts of the stressors to which they are uncovered, in blend and after some time.

In any case, benthos large scale spineless creatures fluctuate incredibly in their reaction to variety in water quality, which ranges between somewhat open minded (for example Chironomus hatchlings, Tubifex hatchlings, Leehes, Physa spp, Bulinus spp, Indoplanobis spp, and so forth), to touchy species (Stone flies, Mayflies, Water creepy crawlies, and so on) Along these lines, looking at shifts in the benthic networks after some time could give understanding into the major ecological occasions and interaction influencing the inhabitant biota (Woke and Wokoma, 2007). Subsequently, this review focused on: a) To evaluate the benthic large scale invertebrate organization of the upper course of Otamiri River; b) To draw the possible impacts of the new digging exercises and other anthropogenic releases nearby the stream.

II. MATERIALS AND METHODS

Concentrate on Area Description: Otamiri River is situated inside the tropical rainforest belt of Nigeria and lies between scope 05o 23'N to 05o 30'N, and longitude 6o 58' E to 7o 04' E (Figure 1). The region is low lying being for the most part around 300m above ocean level. The waterway runs from Egbu, where it has its major re-energize asset and slices through Nekede, Ihiagwa, Eziobodo, Olokwumuisi, Mgbirichi, Umuagwoand at long last to Ozuzuin Etche town of stream province of Nigeria, where it at last joins to the Atlantic Ocean (Anyanwu 2009). The area encounters a mean yearly temperature of 27oC and a yearly precipitation of 200-300mm, with the vast majority of the months (April to November) described with high precipitation. The stream serves the previously mentioned cross over networks as primary wellsprings of water for Industrial, Agricultural, and Domestic use.

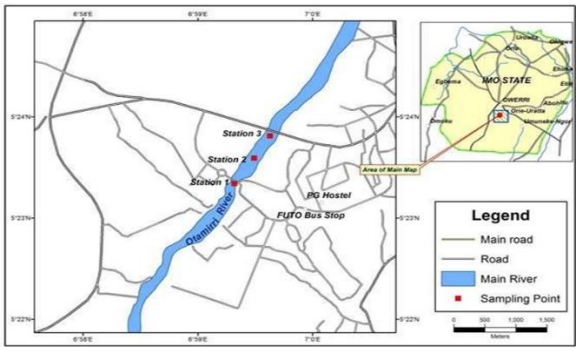

Figure 1: Map of Otamiri River showing the Sampling Stations

III. SAMPLING DESIGN AND ANALYSIS

Three (3) examining stations were chosen for study on the waterway dependent on their closeness to the distinctive anthropogenic exercises around the stream. Surface water inspecting for physico-substance boundaries was done two times month to month for a considerable length of time (July to September, 2017) between 08:00-11:00 hours on each examining days across the three testing stations. Field estimations of temperature, current, and still up in the air involving mercury in-glass thermometer, floater and stop-watch, and Secchi-plate (Ruttner, 1963, and Wetzel and Likens, 2000), separately. Surface water tests for synthetic boundaries were gathered in 1L plastic containers and kept in a fridge earlier its investigation. Water test for disintegrated oxygen was gathered in 250ml glass examining jugs and fix promptly with 2ml every one of Winkler's answers An and B appropriately, as depicted by Mackereth (1963). Additionally, silt tests for benthic large scale spineless creatures test from each inspecting station was pulled utilizing Eckman snatch. Three arbitrary repeat tests from each station were pulled into a pre-name sterile polythene pack and moved to the research center for arranging, recognizable proof and recording.

IV. LABORATORY ANALYSIS

Water tests for compound boundaries were broke down in Central Research Laboratory, Federal University of Technology Akure, Ondo State, Nigeria utilizing standard technique (APHA, 1998). While the dregs test were washed through graduated strainers of 0.5mm in the research center, division of Fisheries and Aquaculture Technology, Federal University of Technology Owerri, Imo State. Arranging of the full-scale spineless creatures in the residue test was upgraded by staining the washed dregs tests with Rose Bengal arrangement. The full-scale spineless creatures were recognized utilizing distinguishing proof aides of Needham and Needham (1975), Odiete (1999), and Hawkin (2000). Each distinguished taxon was counted and the quantity of people recorded. The examples were safeguarded utilizing 10% formalin.

V. FACTUAL ANALYSIS OF DATA

Bivariate and multivariate insights as given by the SPSS Version 22.0, and MS Excel 2010 programming were utilized in the examination of the information on the physico-compound boundaries. The assurance of spatial fluctuation fairness (homogeneity) in the method for the physico-synthetic boundaries was made with single direction investigation of difference (ANOVA), further mean detachment was made with the Duncan Multiple Range Test (DMRT). The investigation of the natural information was made with a blend of lists. Species variety and not set in stone with Shanon-Wiener's list (H), Margalef's file (D), and Equitability (J) utilizing PAST Version 3.

VI. RESULTS AND DISCUSSION

The distinct after effects of the physico-compound boundaries of the upper course of Otamiri River, Imo State is displayed in Table 1. Of the relative multitude of boundaries estimated, alkali, absolute suspended strong (TSS), and carbon (iv) oxide surpassed the NESREA (2011) suggested limit for sea-going life forms, while smelling salts, and complete suspended strong were seen to surpass the WHO (2008) standard breaking point for drinking water.

Table 1: Descriptive insights of the Physico-substance Parameters of Otamiri River during the review time frame

Parameters	Mean±SE	NESREA (2011)	WHO (2008)
Temperature (^{O}C)	26.878±0.209	a	30-32
Transparency (m)	0.901±0.085	NS	-
Current (m/s)	0.244±0.056	NS	-
pH	5.111±0.409	6.5-8.5	7.0-8.5
Alkalinity (mg/L)	22.667±1.073	NS	-
Conductivity (µS/cm)	26.444±2.930	NS	≤1,000
Ammonia (mg/L)	0.623±0.085	< 0.1	< 0.1
Total Dissolved Solid (mg/L)	13.611±1.625	NS	≤200.0
Total Suspended Solid (mg/L)	5.597±0.320	0.25	≤5.0
Nitrate-Nitrogen (mg/L)	0.053±0.003	9.1	≥10.0
Dissolved Oxygen (mg/L)	6.653±0.323	Not <6.0	≥5.0
Hardness (mg/L)	34.000±2.452	NS	-
Carbon IV Oxide (mg/L)	45.528±4.101	<20.0	-
Chloride (mg/L)	49.056±2.084	300	-

- SE = standard error of mean, NS = Not Specified, and a = [a] except in mixing zones, temperature increase by a 7- Day Average of the Daily Maximum temperatures (7-DADMax) shall not be more than 0.3 ºC above natural background conditions

The surpassing centralizations of alkali in the waterway could be the resultant impacts of the exercises of the degradable bacterial on natural squanders that was brought into the stream from the run-off of the climate, which clarify the recorded relationships at $p<0.01$ among alkali and complete disintegrated strong. This was seen to be higher at the beginning of the blustery season when the waterway flow was low. Comparable pattern of higher alkali focus have been recently revealed by Adebayo, et al (2016a and 2016b), where the creators saw that higher smelling salts fixations harmonizes with the high deluge of downpour that carried squanders into the stream and get aggregated in the process because of low flow of the waterway. The recorded decreased alkali focus (0.623±0.085mg/L) in this examinations contrast and the recently announced higher grouping of 1.36±0.112mg/L by Adebayo, et al (2016b) in the stream could be because of the digging exercises on the waterway that empower all the more free streaming of the waterway and the resulting decrease of waste aggregations in the stream. Similarly suspension of strong waste particles in the water that was brought into the stream by run-off and disintegration of strong waste from the deferring terrains could be liable for the recorded high fixation in TSS of the waterway. The time of the greatest TSS in Otamiri River that harmonizes with the recorded time of least water momentum in the stream was not a mishap as water flow forestalls aggregations of suspended issues in the water bodies. The propensity for TSS to disable light entrance into the waterway and ensuing impact on water straightforwardness was set up in this review, as time of high TSS harmonizes with the time of low straightforwardness of the stream. High TSS is fit for stopping up fish gill which could additionally result into fish pressure, diminished development, smothered invulnerable framework prompting expanded defenselessness to infection and osmotic brokenness and passing, as prior proposed by Bilotta and Brazier (2008). This concurred with the past report on high TSS fixation and its ensuing impacts by Ajibade (2004) in Asa Dam (Kwara State), Osibanjo et al. (2011) in Rivers Ona and Alaro in

Ibadan, and Adebayo and Ayoade (2017) in Itapaji Reservoir. Besides, the noticed month to month varieties in a portion of the physic-compound boundaries estimated as displayed in Figure 1 to 4, just as the recorded spatial varieties in conductivities and carbon (iv) oxide that contrasts essentially at $p< 0.05$ across the testing stations could be credited to rain actuation and run-off from the suspending lands.

CONCLUSION AND RECOMMENDATION

Hence, following the Shannon-Weiner variety record esteems above 3.0 demonstrating that the construction of the natural surroundings is steady, while values under 1.0 show that there are contamination and corruption of the living space structure (Shannon, 1948; Mandaville, 2002), and Margalef's water quality list esteems more prominent than 3.0 show clean condition, values under 1.0 demonstrate serious contamination and middle qualities demonstrate moderate contamination (Margalef, 1974, and Lenat et al., 1980); Otamiri River is having helpless territory structure. Further digging of the whole course of the waterway will be of added advantage as this will additionally upgrade a superior flow on the water and speedy unstick of the dissolved materials into the stream body, bringing about a genuinely perfect climate.

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