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Research Paper

A PRELIMINARY CHECK-LIST OF ALGAE IN SHADAWANKA RIVER, BAUCHI, NORTH-EASTERN NIGERIA

Sindama, A

Biological Sciences Department, College of Natural and Applied Sciences, Kwararafa University Wukari, Taraba State Nigeria.
sindamaalex@yahoo.com

Abstract: The investigation of the Plankton algae of Shadawanka River were undertaken for 8 months (February – September, 2007) using a Standard Plankton net of mesh size 55 μ m. Six algal Taxa were observed, out of which Two hundred and sixty Four species were encountered belonging to Seventy nine genera. Diatoms form the bulk of the Planktonic algae with the highest species abundance of One hundred and thirty seven species from Thirty seven genera. Next in abundance were the green algae with seventy three species belonging to Twenty two genera. The blue green algae had twenty six species from fourteen genera while Euglenophyceae had Twenty five species belonging to four genera. However, Phaeophyceae and the Xanthophyceae were sparsely represented. Only a species was encountered in the Phaeophyceae while in the Xanthophyceae, two species was observed from a genus. Most of the Species encountered were Freshwater species.

Keywords: ALGAE, SHADAWANKA RIVER, NIGERIA

Introduction

Studies on the freshwater algae are patchy. Of the World's known algal species described belonged to those of the temperate aquatic systems. In Africa, literatures on Algae were mostly, those reported from East and South Africa. In Nigeria- West Africa, these studies are scanty which has been mostly restricted to those on Lentic systems those include the Works of Ezra and Nayaya (1999), Ezra and Nwankwo (2001). Ezra (2001, 2007) other studies non Lentic water around Nigeria are those of Imovore (1968) on Eleiyele reservoir, and (1970) on The Kainji Dam. Egborge (1979), on Lake Asejire, Kahn (1984), Kahn and Ejike (1983) on Jos-Plateau Water Reservoir, Kadiri (1988; 1996, 1999, 2003), Kadiri and Opute (1989) on the Ikpoba Reservoir. Studies on Lotic systems were relatively fewer these include Kelly and Ali (1993), Ezra (2006) on ATBU Stream Bauchi, Ezra *et al.*, (2008) on Shadawanka River.

Materials and Method

The Study Area

Shadawanka river is a major river in Bauchi, situated South of Shadawanka village and East of Wintin-dada, off Jos road. it is as a result of two confluence rivers namely Zamfara and Lafiyari and runs through the Shadawanka Military Barracks to a major freshwater reservoir "The Gubi Dam". The river provide water to the populace for domestic uses, irrigation purposes during the dry season and also watering for animals. Common aquatic macrophytes in the river are: *Nymphia lotus Linn*, *Andropogon sp*, *Heteropogon* and *Pistia sp*.

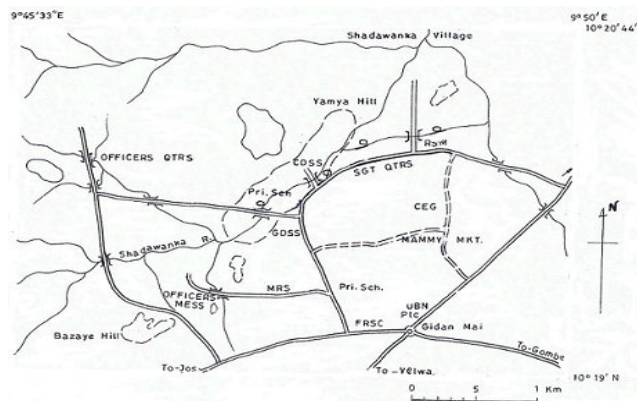


Figure: 1. Map of Shadawanka Military Barracks Showing Shadawanka River

Collection and Identification of Algae

Planktonic blue-green algae were sampled with plankton net of 55 μ mesh size towed at a low speed for 10min and immediately fixed in 10% unbuffered formalin and transported to the laboratory in a cooler packed with ice, prior to observation under the microscope. Identification of algae was carried out using a UNICO binocular microscope; relevant keys for identification were made to Needham and Needham (1962) and Prescott (1961).

Physical and Chemical Parameters

Surface water samples were collected in clean 500ml polyethene bottles and transported to the laboratory for analysis, Electrical conductivity was estimated using a combo conductivity meter, Model H1-98129,. Nutrients were determined Spectrophotometrically using the Atomic Absorption Spectrophotometer Model GVP 210, and Dissolved Oxygen by the Wrinklers method and BOD by Evaporation Method as Suggested by APHA, (1985), however Temperature, pH, Transparency were measured *in situ* using; a mercury bulb thermometer, portable Cyber scan pH meter; Model pH²⁰ and a 12cm Secchi disc respectively.

Identification of Algae

Identification of algae is carried out using a Unico binocular microscope. Photomicrographs were taken using an Olympus Photomicroscope to further aid identification. References on identification of species of algae were made to that of Patrick and Reimer (1961, 1965 and 1975), Needham and Needham (1962), Prescott (1966a and 1962b), Watanabe (1977) and Kadiri (1988, 1993, 1996, and 2003).

Algal Cell Count

Water samples were vigorously shaken each to make an even distribution of the algal materials. A dropper was used to collect a drop to a cleaned slide and covered with a slide cover slip and examined. Algal cells were counted per each field of view for each sample. A total of 30 fields of views were observed for each drop, algal species were identified, counted and scored appropriately in a score sheet (Lackey, 1938). In colonial forms and filamentous algal forms, each is counted as a single cell from the total cell count of each 30 fields of views obtained. The relative abundance of each respective taxon in each sample was also determined and recorded.

List of Planktonic Algae From Shadawanka River February- September, 2007

Class: Bacillariophyceae	Class : Chlorophyceae
Order: Pennales	Order: Chlorococcales
<i>Achnanthes convergens</i> . H. Kobayensi	<i>Ankistrodesmus braunii</i> .(Naeg) Brauner
<i>A.delicatula</i> . (Kutz) Grun.	<i>A.falcatus</i> (Chod) Ralfs.
<i>A. inflata</i> . Boyer	<i>A.fractus</i> . (West and West)Brun.
<i>A. lanceolata</i> . Breb.	<i>A.fusiformis</i> (Corda) sensukors.
<i>A. lanceolatum</i> . Wyoming	<i>A.graciles</i> . Korshikov.
<i>A. levanderi</i> (Breb) Grun.	<i>Ankistrodesmus</i> sp.
<i>A. linearis</i> . (W. Smith) Grun.	<i>Botryococcus protuberans</i> G. S. West
<i>A. microcephala</i> .(Kutz)Grun	<i>Chara</i> sp
<i>A. minutissima</i> . Kutzling.	<i>Characium accuminatum</i> . A.Braun
<i>Achnanthes</i> sp	<i>C.gracilipes</i> . Lambert.
<i>Actinastrum hanstzchii</i> . Lagerh.	<i>Characium</i> sp
<i>Actinaceum wollei</i> . Agardh.	<i>Characium vacuolatum</i> . Lee et Bold.
<i>Ammonoensis constata</i> . Boyer.	<i>Chlorella vulgaris</i> . Beig.
<i>Ammonoensis sphearophora</i> .(Ehrenb) Pfizer	<i>Chroococcus minutus</i> . (Kutz) Naegeli.
<i>Amphora calumetrica</i> . Kutz	<i>Chlorocytium lemneum</i> . Williams.
<i>A.coffeaformis</i> (Ag) Kutz	<i>Crucigenia rectangularis</i> . (Naeg) Kom-legh
<i>A.cuspidata</i> . Kutz.	<i>C.tetrapodia</i> (Kirk) West and West.
<i>A.ovalis</i> Kutz.	<i>Kirchneriella elongata</i> . G. M. Smith.
<i>A. submontana</i> . Kutzling	<i>K.linearis</i> . G. M. Smith.
<i>Amphyphora ornata</i> . Nitzsch.	<i>K. obesa</i> . (Bernard) G. M.Smith.
<i>Aphanothea stagnina</i> (Spreng) A. Braun	<i>Kirchneriella</i> sp
<i>Asterionella formossa</i> .Hassall.	<i>Oocystis biospora</i> . Kg.
<i>Asterionella</i> sp	<i>O. solitaria</i> . Wittrock.
<i>Cocconeis disculus</i> .(Schum) Cl.	<i>Pediastrum botroanum</i> . Meneghii
<i>C.Pedulus</i> . Ehr.	<i>P. biradinum</i> . Meyen.
<i>C. placentula</i> . Ehr.	<i>P. duplex</i> . West and West.
<i>C. speciosa</i> . Her	<i>P. lestyanum</i> .Meneghii
<i>C. sublittoralis</i> . Hendy.	<i>Scenedesmus accuminatus</i> (Lagerh) Chod.
<i>Cymbella affinis</i> . Kutzling.	<i>S. arcus</i> . Meyen.
<i>C. linearis</i> . Grun.	<i>S. calyptratus</i> . Comas.
<i>C. lunata</i> . W.Smith.	<i>S. curvicaudal</i> . Brebbisson.
<i>C. minuta</i> .Rabh	<i>S. incrassatulus</i> . G.M. Smith.
<i>C. minuta</i> . Wyoming.	<i>S. intermediates</i> . Chod.
<i>C. ocellata</i> . Ehr.	<i>S.opoliensis</i> . P. Richter.
<i>C. striata</i> . (Kg)Grun.	<i>S. perforatus</i> Lemmermann.
<i>C. turgidula</i> . Cleve.	<i>S. quadracaudal</i> . Grun.
<i>C.turgidula</i> . Ehr.	<i>Scenedesmus</i> sp.
<i>C. tumidula</i> . Greg	<i>S. spinosus</i> . Chod.
<i>C. ventralis</i> . Kutz.	<i>S. ventralis</i> . Kom-legh.
<i>C. ventricosa</i> . Kutz.	<i>Tetraedron biforcatum</i> (Wolle) Lagerh.
<i>Cuscinodiscus lacustris</i> . Grun.	<i>T. minimum</i> . Hansgirg
<i>Diatoma elongata</i> . Bory	<i>T. regulare</i> . Kutz.
<i>Diatoma</i> sp.	<i>T.tumidulum</i> . Riemsh.
<i>D.vulgaris</i> . Bory	<i>T.trigonum</i> . Hansgwg
<i>Diplonies ovalis</i> (Naeg) Cleve	<i>Tetrastrum elegans</i> . Playf
<i>D. ovalis</i> (Hilse) Cleve.	<i>T. heterocanthum</i> . Chod
<i>Echinosperrum</i> sp	<i>T. triangulare</i> . Komareck
<i>Echinophospharella luminetica</i> . G. M.Smith.	<i>Westella butryoides</i> . (W. West) De Wild.
<i>Entzia acuta</i> . Labour.	<i>W. linearis</i> . G. M. Smith.
	<i>Wolle saccata</i> (Wolle) Bornet and Flahault.

- Eucampia zodiacus*. Ehr.
Eunatia exigua. Grun.
E. flexuosa. Wyoming.
E. gracilis(M. Perag)Herib.
E. Nagaeli. Hustedt.
E. pectinalis. A. Boyer.
E. pectinalis. Ehrenberg
E. solieritti. A. Boyer.
Eunotia sp
E. sudetica. Ehr.
E. venetris. (Kg) O.Mull.
Fragillaria acus. Grun
F. brevisstrata. Grun.
F. fenestrata. Kützing.
F. pinnata. Ehr.
Fragillaria sp
Frustulia rhomboides Cleve.
Frustulia sp
F. vulgaris(Thwaites). De Toni.
Genecularis sp.
Gomphonopsis herculeana. Cleve
Gomphonema abbreviatum (Ag) Kütz.
G. appicatum (Kütz) Grun.
G. brasiliensis. Huntsmann.
G. graciles. Ehr.
G. grovei. Kütz.
G. ingulatum. Hust.
G. olivaceum(Lynb)Kützing
G. rubusta. O.Mull.
Gomphonema sp
G. subclavatum. Kütz
G. subtilis. Ehr.
G. tetrastigmatum.Horikawa et Okuno.
Hantzschia dakarensis. Ehr.
Melosira granulata. Ehr.
M. solida. Eulenstein.
Melosira sp.
Meridion circulare. Agardh.
Mesotaenium Kranstai. Ehrenberg
Monoraphidium arcuatum. Hindak.
M. contorium.(Thur) Kom-legh
M. graffi (Berk) Komle-legh.
Navicula americana. Ehr.
N. arvensis. Hustedt.
N. baccillum. Wyoming.
N. confervecea.(Kg)Grun.
N. contenta. Kütz.
N. capitata. Hust.
N. explanata. Hust.
N. gysingensis. Grun.
N. menisculus. Hust.
N. mutica. Kütz.
Navicula oppurtuna. Hust.
N. radiosa. Kütz.
Navicula sp
Nitzschia acicularia. W. Smith.
N. filiformis. Kütz.
N. linearis(Agardh)W.Smith
N. sigmoidea(Kütz) W.Smith.
N. venecularis(Kg) Grun.
Peronia fibule. Hust.
Pinnularia biseps. Gregory.
P. gibba. Ehr.
P. parvular. A. Boyer.
P. pinnata. A. Boyer.
Pinnularia sp.
P. subcapitata. Hust
Rhicospheria curvata (Kütz) Grunow
Surirella ovata. Kütz
S. robusta. Ehr.
Surirella sp.
Syndera cyclopus. W.Smith.
S. nana. (Nitzsch) Ehr.
S. pulchella. Kg.
S. rumpens. Kg
Syndera sp.
S. ulna.Kütz
Taballeria fenestrata. Wyoming.
T. flocculosa. (Roth) Kützing
Taballeria sp
- Order: Zegnematales
Euastrum sp.
E. sobordinata. Kützing.
Closterium biclavatum (Borges) Scott and Prescott.
C. cynthia. Cynthia
C. diana. Kützing.
C. giganteum. Breb.
C. graciles. Grun
C. incurvum. Breb.
C. infractum. T. West.
C. jeneri. Ralfs.
C. lanula. Stein.
C. moniliferum. G. S. West.
C. pseudolanula. Breb.
Closterium sp.
Closterium toxo. Lemmermann
Cosmarium rodum. Gutw.
Oedogonium inconspicuum. Hirn.
Spirogyra angulare. Transeau.
S. porticalis. Cleve.
Spirogyra sp
Staurastrum cerates. Krieg.
Staurastrum sp
Class: Chlorophyceae
Order: Volvocales
Asterococcus superbus. Scherffel
- Class: Cyanophyceae
Order: Chroococcales
Anabaena minutissima. Kütz.
A. spiroides.
Anabaena sp
Aphanocapsa sp
Calothrix fusca(Kütz) Bornet and Flahault.
C. stagnalis. Gomont.
C. stellaris. Bornet and Flahault.
Chariopsis cylindrical.(Lambert)Lemmermann.
Chroococcus dispers (Kiessl)Lemmermann
C. minutus (Kütz) Nagaeli.
Cylindrospermum muscicola. Clark and Jensen.
Gloecystis major. Gerneck.
Gleocapsa aeruginosa. Kützing.
Microcystis aeruginosa. Kützing.
M. complanata. Hust.
M. protocystis. Kützing.
Rhombocystis complanata. Chod.
Stigonema mimillosum (Lynb) Agardh ex Flah et Borne.
Oscillatoria agardii. Gormont.
O. baccillum. Stein.
O. granular. Gardner.
O. homelii. Lemmermann.
O. Tanganyika. Grun.
Pleurotaenium coronatum. Ehr.
Class: Euglenophyceae.
Order: Euglenales.
Euglena acus. Ehrenberg.
E. acculeata. Christiu.
E. acuminatum. Skvortzow.
E. allorgii. Deflande.
E. oxyuris.(Minor)Prescott.
E. proxima. Dang.
Euglena sp.
Lepocinclis acuta. Prescott.
L. playfairiana. Deflande.
Phacus acuta. Prescott.
Phacus acuminatum. Skvortzow.
P. caudata. Hubner.
P. chloroplastes. Prescott.
P. nordstedii. Lemmermann
P. Pseudoswirenkoi. Prescott.
Phacus sp.
P. triquet. Dijadin.
Trachelomonas armata (Playf) Deflande.
T. baccillifera. Stein.
T. girardiana. Playf.
T. hexangulata. Swirenko.
T. hispida. Stokes.
T. lefferi. Prescott.
T. similis. Stokes.

Order: Centrales
Coscinodiscus sp
Cyclotella comta. Kutz.
C.glomerulata(Kutz) Cleve.
C.michiganiana. Kutzing
C.ocellata. William.
C. ovata. Kutzing.
Cyclotella sp.
C.superb. Fricke.

Trachelomonas sp.

Class: Phaeophyceae
Order: Laminariales
Saccorhiza polyschides. Norton & Burrows

Class: Xanthophyceae.
Order: Heterococcales
Ophiocytium capitatum. Lee Dale & Hibberd
Ophiocytium sp

CONCLUSION

Changes in season were attributed to Rainfall and solar radiation which might have led to the significance of Low transparency, high electrical conductivity could be as a result of turbulence. The dominance of diatoms during both seasons than other groups of algae agrees with the works of Ezra (2006) and John (2000). The poor representation of the green is an attestation of poor nutrient status of the river this agrees with the works of Kadiri (1999) several other factors could have contributed to the abundance of the green algae, these include, favourable temperatures, nutrients ratios and low vulnerability to grazing Zooplanktons this is in consonance with the work of Shapiro (1990). The River is therefore classified as the Class II type, from the classification of African waters (Kadiri, 1999).

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