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The seasonal changes of non-diatom phytoplankton algae after the confluence of Tariq project in the Tigris river north of Baghdad

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Abstract:

The study included seasonal samples of non-Diatom phytoplankton algae from Tigris River after convergence the Tariq project north of Baghdad starting from February 2015 until March 2016, The study identified 53 species that were found in four division of algae, Chlorophyta record more number 37 species (16 genus), Cyanophyta recorded 14 species, (11 Genus), Euglenophyta and Chrysophyta are recorded one species each other's . The majority of species were recorded in seasonal Summer and autumn The study also recorded a new species for Iraqi flora of algae from chlorophyte that is *A. hantzschii* var. *elongate* G.M.Smith.

Keywords: Seasonal samples, Non-Diatom phytoplankton, Tigris , Tariq project.

Introduction

Iraq has abundant water resources represented by the Tigris and Euphrates rivers and their tributaries, led to the emergence of ancient civilizations and these two rivers are still the lifeblood of the Iraqi environment, and any imbalance or

mismanagement of these rivers is reflected significantly on all aspects of life in Iraq [1].. The Tigris River is exposed during its course before entering the city of Baghdad for many sources of pollution and most of the human activities of household wastes and heavy water as well as water resulting from the disposal of agricultural land and some remnants of the facility and small plants on both banks, and the presence of some tributaries and isolates that increase the suspended materials and increase the Concentration of ions and salts, [2,3].The Tariq project brings water from Dujail river north of Nasrinstitution ,its flow through agriculture land within Sheikh Hamad region. this project cared industrial waste from institution and agricultural waste and sewage ,meet with Tigris river in Tarmiyah northern Baghdad .These contaminants and other additives have led to a significant change in the chemical and physical characteristics of theTigris river water, which has a significant impact on different aquatic organisms[3], especially phytoplankton, which is the base of the food chain in the aquatic environment [4]. This change led to the emergence of a group of algae tolerant of pollution and others could not resist also helped to the emergence of new species exotic to the environment as a result of the presence of one or more variables in the water of the river, as confirmed by many researchers [5] ,so the study aims to identify qualitative change of non-diatom phytoplankton algae in this site.

Material and Methods

Sample collection and identification

The area study in a section of the Tigris River within the Tarmiyah township [AlsheikhHamad area]after convergence with Tariq project. The site was selected by using a GPS device with E 44019"33.3588' and N33053"18.9816' north of Baghdad. This site characterized downstream of river and fast flow , the mixing water of Tariq project with different contaminants to water of Tigris river [Fig. 1] .



.Fig. 1 : The Tigris river section and Tariq project with(ST) study area

Collection of samples:

The water samples were collected monthly from February 2015 to March 2016 from the surface water 30 cm depth. The samples of the Phytoplankton algae were collected by using a special net with a diameter of 20 µm. [6], which capacity 250 ml and was preserved by Logalsolution. In the laboratory Non Diatom algae were diagnosed with temporary slides and examined in light microscope by using magnified bower 100x, 400x, 1000x based on the available classification sources.[7,8,9,10,11,12,13].

Results and Discussion

The results of study were diversity of phytoplankton in the study site, 53 taxa were identified including 37 species (16 genus) from Chlorophyta, Cyanophyta recorded 14 species, (11 Genus), Euglenophyta and Chrysophyta are recorded one species each other's (Table 1)(Fig 2).

There are many species of chlorophyte especially during Summer and autumn, (Fig. 3). The main species of chlorophyte often found in condition of high dissolved oxygen and temperate temperature [14]. This is characterized by the location during the summer and autumn, add to the presence of organic waste.[14,3].

Coelastrum sp. and *Oocystis borgei* found in high dissolved oxygen concentration [15,16].

Where the flow velocity increases the melting of air oxygen and acts to mix the water column that is found in the current study. While cyanophyta found in low flow environment [17]. t, and want to be attach [5].

The current study was able to new record species from chlorophyte added to the Iraqi list [18]. *Actinastrum Hantzschii* var. *elongatum* G.M. Smith. (fig.2)

Systematic position

Division : Chlorophyta

Class: Chlorophyceae

Order: Chlorococcales

Family: Scenedesmaceae

Genus: *Actinastrum Hantzschii* var. *elongatum* G.M. Smith (Prescot, 1982, Pl.65, Figs2)

This species characterized by: Colonial planktonic, composed of 4-8 cells cylindrical, very slightly if at all narrowed toward the apices, larger than in the typical plant, cells 4-5 µ in diameter, 30- 35µ long, phytoplanktonic algae) [12].

Table 1 : List of identified phytoplankton species in Tigris River-Middle of Iraq (2015-2016)

Taxa	Winter	Spring	Summer	Autium
Division: Cyanophyta				
Class: Cyanophyceae				
1. Order: Chroocococales				
Family: Chroococaceae				
<i>Chroococcusvarius</i> A. Braun.				
<i>Gleocapsaaetuginousa</i> (Gram) Keutzing				
<i>Gleocapsapunctata</i> . Naegeli.				
<i>Holopedium irregular</i> Lagerheim.		+		
<i>Microcystis</i> sp.		+		
<i>Merismobediaglauca</i> (Ehrenb.) Naegeli.				
<i>Merismobediapunctata</i> Meyen.		+		
<i>Merismobediatenuissima</i> Lenmmerwann.				
<i>Synechococcusaerugionsus</i> Naegeli.			+	
2. Order: Nostocales				
Family: Nostocaceae				
<i>Anabaena wiscensinense</i> Prescott.				+
<i>Nodulariaspumigena</i> Mertens in Jurgens.				+
<i>Nostoclinckia</i> (Roth) Bornet.			+	
3. Order: Oscillatoriales				
Family: Oscillatoriaceae				
<i>Arthrospiraplatis</i> var. non			+	
<i>Constricta</i> (Banexjii).				

<i>Oscillatorialacustris</i> (Kleb.)Geitler.				+
Division: Chlorophyta Class: Chlorophyceae 1. Order: Chlorococcales a- Family: Coelastraceae				
<i>Coelastrumcambricum</i> Archer.	+	+		+
<i>C. microsporum</i> Maegeli in A.Braun				+
b- Family: Hydrodictyaceae				
<i>Pediastrumbroyanum</i> var. <i>undulatum</i> Wille.				+
<i>P. duplex</i> var. <i>cohaerens</i> Bohlin.				+
<i>P. duplex</i> var. <i>reticulatum</i> lagerheionLagerheim.				+
<i>P. integrum</i> Naegeli.				+
<i>P. sculptatum</i> G.M.Smith.			+	
<i>P. simplex</i> (Meyen)Lemmermann.				+
<i>P. simplex</i> var. <i>duodenarium</i> (Bailey)Rabenhorst .			+	+
<i>P. tetras</i> (Ehrenb.)Ralfs.			+	
c- Family :Oocystaceae				
<i>Ankistrodesmusconvolutus</i> Corda.				
<i>A. falcatus</i> var. <i>mirabilis</i> G. S. West.				
<i>A. fractus</i>		+	+	+
<i>Chlorella vulgaris</i>		+	+	+
<i>Kirchneriellacontorta</i> (Schmidle). Bohlim.				

<i>Oocystisborgei</i> Snow.	+	+		+
<i>Tetraedron minimum</i> .(A.Braun)Hansg.		+		
<i>Westellabotryoides</i> .(W.West) De Wildemann.		+		
d- Family: Scenedesmaceae				
<i>Actionastriumgracillium</i> G. M. Smith.			+	+
<i>A. hantzschii</i> var. <i>elongata</i> .G.M.Smith*				+
<i>A. hantzschii</i> Lagerheim.			+	
<i>Crucigeniaquadrata</i> .		+	+	
<i>Scenedesmusobliquus</i> .		+	+	
<i>S. quadricauda</i> .		+	+	
<i>S. quadricauda</i> var. <i>westii</i> .			+	
<i>S. bernardii</i> .			+	
<i>S. quadricauda</i> var. <i>maximus</i> .				+
<i>S. arcuatus</i> var. <i>Platydiscus</i> . G. M. Smith.				+
<i>S. bijuga</i> (Trup.) Lagerheim.			+	+
<i>S. bijuga</i> var. <i>alternans</i> (Reinsch) Hans.			+	
<i>Scendesmus</i> sp.			+	
<i>S. quadricauda</i> var. <i>longspina</i> .			+	
<i>Tetrallantoslagerheimii</i> Teiling		+		
e - PALMELLACEAE				
<i>Sphaerocystis</i> schroeteriChodat.	+	+		

2. Order: Ulotichales

Family : Ulotichaceae

*Ulohrixtenuissima*Kuetzing.

+

3. Order: Siphonocladales(Cladophorales)

Family :Cladophoraceae

Cladophoraglomerata (L.) KTZ.

+

Cladophorainsignis(Ag. C. A) Kg.

+

Cladophoraoligoclona(L.) Hoe KTZ.
(synt. *C. rivularis*).

+

4. Order: Zygnematales

Family :Zygnemataceae

Cosmariumeneghiniide Brebisson.

+

+

Division: Euglenophyta

Class: Euglenophyceae

Order: Euglenales

Family: Euglenaceae

Euglena gnacilles. Klebs.

+

Divisryion: Charysophyta

Class: Xanthophyceae(Heterokontae)

Order: Vaucheriales

Family: Vaucheriaceae

Vaucheriasessilis(Vauch.) de Candolle.

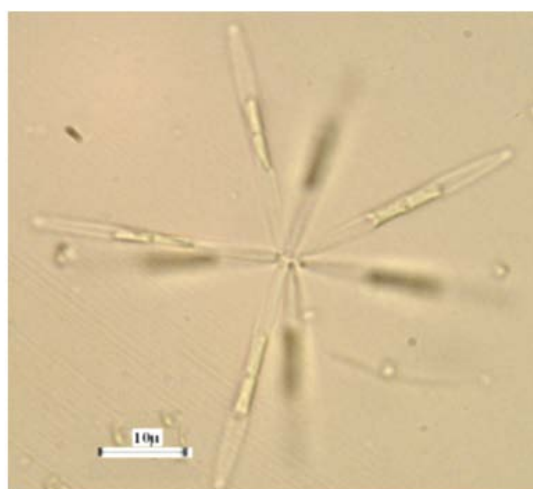
+



Fig. 2: Species abundance of phytoplankton Division in Tigris river



Fig. 2: Species abundance of phytoplankton Divi



; different seasons in Tigris river

Fig4 New record species *Actinastrum Hantzschii* var. *elongatum* G.M.Smith

References

- [–]Ali, U.;Syed, J. H.;Malik, R. N.; Katsoyiannis, A.; Li, J.; Zhang, G. and Jones, K.C.Organochlorine pesticides (OCPs) in South Asian region: a review. *Science of the Total Environment*, Vol.476/477,pp.705–717.2014.
- [1] Hassan, B. A.; Ibrahim, T. M.; AL-Salman, I. M. and Ismae, A. M.Impact of water mixing areas in qualitative variations of phytoplankton algae and some physiochemical characteristics of water on a section of Tigris River/ Iraq. *Plant Archives* V(18) 2, 2477-2484 pp.2018
- [2] Al-Kaisi, K. A. Study on algae of water system in Iraq. Ph. D. Thesis Univ. of North Wales Pangor. UK.1964
- [3] Al-Magdame, B. A. H. Study the community of Algae(Diatoms) in river Tigris between Baghdad and Al- Dujail. A ThesisSubmitted to council College of Education for Pure Sciences, Ibn Al-Haitham University of Baghdad. 275pp.2016
- [4] Naw, M. W. D. and Win, S. S. Morphology and Nutritional Values of Green Alga *Cladophora* from Kachin State. *Universities Research Journal* 2011, Vol. 4, No. 1.2011
- [5] Al-Salman ,I.M. and Hassan ,B. A.Seasonal Variations of Epipellic Non-Diatomic Algae at the Confluence of Al-Therthar with Tigris River. North of Baghdad. *Engineering and technology Journal*,N36(3):253-258pp.2018

- [6] **APHA (American Public Health Association)** .Standard Method for the Examination of Water and Wastewater st.ed21.2005
- [7] **Nurul-Islam, A.K.M and Begum, Z.T.** Studies on the phytoplankton of Dacca District order: Chlorococcales J. Asiatic Soc. Pakistan 15, (3): 227- 271.1970
- [8] **Nural-Islam, A.K.M. and Khatun, M.** Preliminary studies of the phytoplanktons of polluted water. Sci. Res. East Reg. lab., Pakistan, 3(2): 94-109. 1966.
- [9] **Nural-Islam, A.K.M. and Zaman, K.M.** Limnological studies of the River Buriganga III. Biological aspect. J. Asiatic Soc. Bangladesh (Sc.), 1(1): 45-65.1975
- [10] **Parsons, T.R., MA~TA, Y. &Lalli, C.M.** .A manual of chemical and biological methods for seawater analysis. Oxford,1984
- [11] **Prescott, G.W.**How to know the freshwater algae. 3rd edDubugue, Iowa1979
- [12] **Prescott, G. W.**Algae of the Western Great Lakes Area William, C. Brown Co., Publ. Dubuque, Iowa,1982 977 pp.1982
- [13] **Desikachary, T. V.** Cyanophyta. Indian Council of Agricultural Rese- arch New Dalhi. 686 pp,1959
- [14] **Al-Saadi, A. J. N.** Biological diversity of softness and some environmental factors affecting it in the Euphrates River in central Iraq. Master of Science, Faculty of Science, University of Babylon.2013.
- [15] **Ramos,G. J. P. ; Bicudo, C. E. M. and Moura, C. W. N.** Diversity of green algae (Chlorophyta) from bromeliad phytotelmata in areas of rocky outcrops and “restinga”, Bahia state, Brazil Rodriguésia 69(4): 1973-1985 pp.2018
- [16] **Guimarães-Souza BA, Mendes GM, Bento L, Marotta H, Santoro AL, Esteves FA, Pinho L, Farjalla VF & Enrich-Prast A** Limnological parameters in the water accumulated in tropical bromeliads. ActaLimnologicaBrasiliensia 18: 47-53.2006
- [17] **Prasanna, R., R. Kumar, S. R. Kumar and L. Nain** .Cyanobacterial biodiversity and niche adaptation in lignocellulosic substrates. Metabolic versatility of cyanobacteria,Phycological Society, India. Phykos, 44 (1): 33-40,2014
- [18] **Maulood, B. K., F. M. Hassan, A. A. Al –Lami, J. J. TomaandIsmail.**Checklist of Algal Flora in Iraq. Baghdad Ministry Eonviroment Iraq : 93 pp..2013