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Recording New Species of Algae in Baghdad Environment within the Tigris River – Iraq

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Abstract: Four different types of algae were recorded for the first time in the Iraqi aquatic environment in the city of Baghdad within the Tigris River, which belongs to the three Division of the algae, represented by the tributary *Coleochaete* sp. Return to the Division Chlorophyta and the algae *Stipitococcus crassistipatus* and *Chrysidiastrum catenatum* Returning to the division of Chrysophyta algae and moss *Gymnodinium* sp. Return to the Division of algae Pyrrhophyta.
Keywords: Recording species, diagnosed algae, division and green algae

INTRODUCTION

Phytoplankton is composed of both eukaryotic and prokaryotic species. It colonizes the upper part of the water column, down to the limit of penetration of light.The structure and abundance of the phytoplankton populations are mainly controlled by inorganic nutrients such as nitrogen, phosphorus, silica and iron. Phytoplankton usually undergoes a fairly predictable annual cycle, but some species may develop explosively and form blooms.Onsmaller time scales, phytoplankton growth and division is tightly linked to the diel cycle. Phytoplankton is present in both fresh and marine waters, but here we focus on fresh water phytoplankton (The Tigris River Environment).

The Tigris River is one of two main sources of drinking water for Iraq, serving population approximately seven million people settled in Baghdad city, this river usually affected by agricultural and industrial eutrification and the sewage effluents, which provide suitable environment for. Algae most commonly occur in water, be it fresh water, marine, or brackish. However, they can also be found in almost every other environment on earth, In most habitats they function as primary producers in the food chain which producing organic material from sun light, carbon dioxide, and water [1]. Although algae used as biomarkers for many types of pollutants, algae considered as a pollutants [2]. Also used for estimation ecological conditions at aquatic environment [3]. The eutrification is in part due to sewage effluents, high turbidity, river discharge or by agricultural runoff.

Planktonic algae dominate the surface of standing waters where light is bright enough for them to produce food by photosynthesis. The planktonic algae community is typically composed of green algae, blue-green algae, diatoms, and euglenas forming bloom that depend on lake trophic status and these blooms are considered desirable as the beginning of the food chain. Many species of algae are involved in algae blooms and these species change over time based on temperature, light, nutrients, and other factors [4].

Present work aimed to study the systematic account for algae and to add new records species of algae for the first time in marshes of Iraq.

MATERIAL AND METHODS

Diagnosis of algae

The non-diatom algae were isolated and diagnosed by microscopic examination, depending on the number of references to classify of non-diatom [5-8].

For the quantitative study subsurface water samples (1 liter) were collected from each station. One liter of each sample was taken in a measuring cylinder mixed with 2 ml of Lugol's iodine solution (as preservative), allowed to sediment for 10 days and was then concentrated to 100 ml. The same steps were repeated for one week to sediment the last 100 ml to 10 ml [9]. The haemocytometer method was used [10].

Detailed studies were made under a compound microscope with camera and microns (µm) were used to describe the diameter (L: length and W: width) of each examined taxon and photographs were taken also [11] Identified, taxa were checked by the checklist of [12-14].

Chemical analysis

a- Water temperature; measured locally by graduated mercuric thermometer from 0- 100 C؛.
b- pH; measured by pH meter after calibration pH meter with buffer solutions 4, 7 and 9.
c- Electrical conductivity; measured by conductivity meter, results reached with units µS/cm.
d- Nitrate NO3; limita7on of NO3 depend on method of [15] took 50 ml of water sample after filtration for removing suspended materials, then added 1ml of HCl (1 normal), mixed well then concentration measured by spectrophotometer on wavelength 220 nm. Results reached by unit of mg/l.
e- Nitrite NO2; method of [15] followed to determine NO2, took 10 ml of filtered samples, diluted by 50 ml of distilled water, 1 ml of sulphanil amid with shaking gently, after two minutes added N-1-dihydrochloridenaphthyl Ethelendiamin. Sample leK 5 minutes then measured absorption of produced

Description of the Study Area

The algae found in the environment of the city of Baghdad within the environment of the Tigris River in the area of Zaafaraniya, a region of some agricultural on both sides of the Tigris River within the region and is located near the power plant and a different industrial plant, The figure 1, the presence of new species algal on the Tigris River in the city of Baghdad in Iraq are placed.

Fig-1: shows the location of the study

RESULTS AND DISCUSSION

Through accurate diagnosis and relying on modern and scientific sources we were able to detect new species of algae not diagnosed in Iraq so far and we will include them in the list of algae of Iraq and we will show it as follows:

Division:	Chlorophyta (Chlorophycophta)
Class:	Chlorophyceae
Order:	Coleochaetales
Family:	Coleochaetaceae
Genus:	Coleochaete

Coleochaete sp.

A Characteristic feature of the vegetative cells in Coleochaete is the presence of unsheathed bristles; Coleochaete is a soil alga in the order Coleochaetales, subfamily Charophyceae, of the Chlorophyta, or green algae. This alga produces a small vegetative thallus as the major, haploid part of its life cycle. This thallus produces egg cells toward its periphery. Once the eggs are fertilized, the zygotes are retained in this position on the parent thallus and supplied with nutrients through specialized transfer cells. Many people think that Coleochaete is an excellent model for the algal ancestor of land plants and may be a modern representative of the algal group that gave rise to the land plants. In this picture you can see the characteristic appearence of Coleochaete, with its pattern of vegetative cells radiating from the center of the thallus. On the periphery are the larger egg cells.As shown in Figure (2).

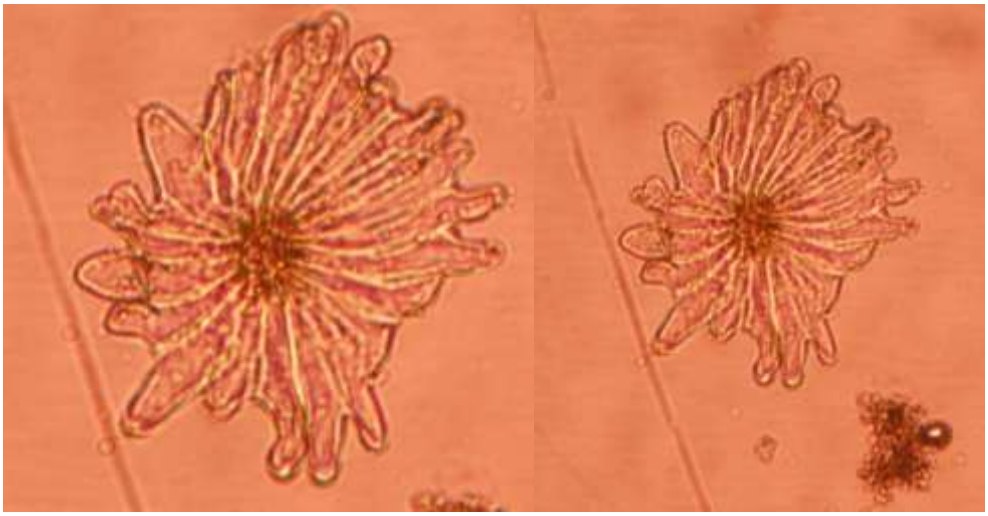

Fig-2: algae *Coleochaete sp.*

Division:- Chrysophyta.
Class:- Chrysophyceae.
Order:- Rhizochrysidales.
Family:- Rhizochrysidaceae.

Chrysidiastrum catenatum

Characters as described for the genus; cells 12-15µ in diameter without processes,45-60 µ wide including processes.As shown in Figure (3).

Fig-3: algae *Chrysidiastrum catenatum*

Division:- Chrysophyta.
Class:- Xanthophyceae.
Order:- Rhizochloridales.
Family:- Stipitococcaceae.

Stipitococcus crassistipatus

Lorica broadly (sometimes narrowly) Flask-shaped, attenuated anteriorly to form a short wide neck and reduced posteriorly into a thick stipe which is 1.5 - 2µ wide; protoplast ovoid to subglobose, with 2 laminate chromatophores; lorica 7.6-8µ in diameter, 18-20µ long.

This species differs in haring a stipe which is much stouter less tapering than in the other described forms.As shown in Figure (4).

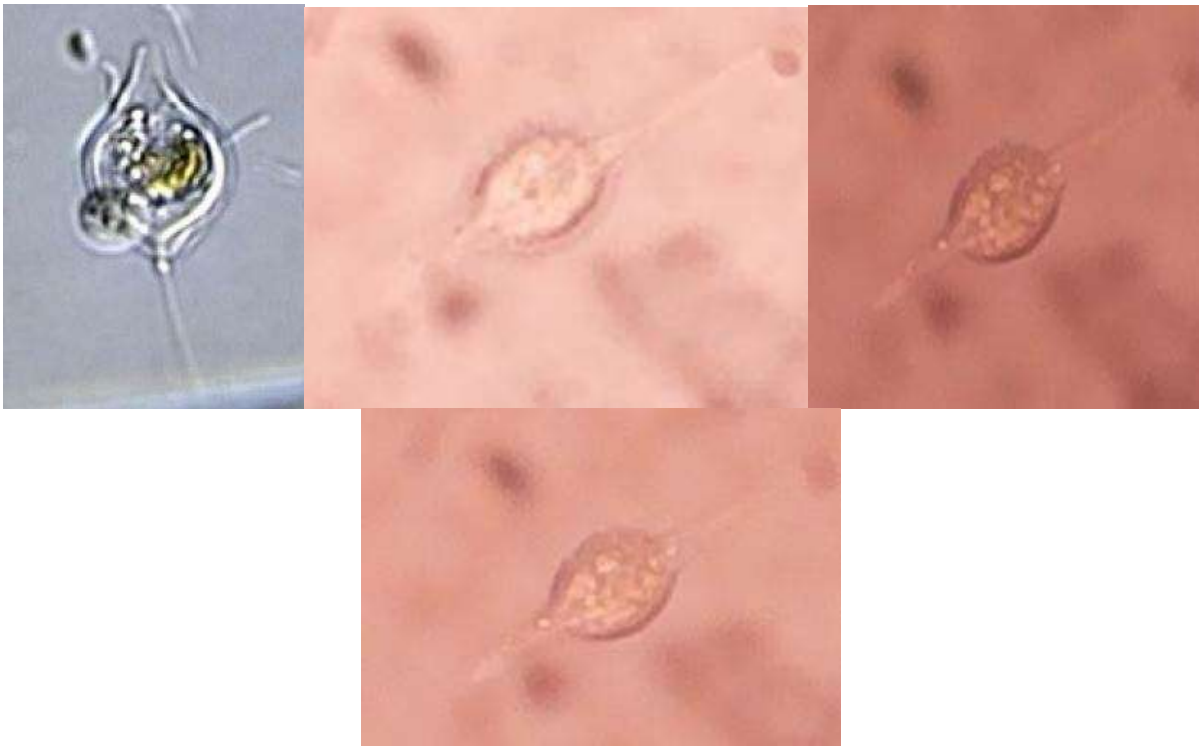

Fig4: algae *Stipitococcus crassistipatus*

Division:- Pyrrhophyta.
Class:- Dinophyceae.
Order:- Gymnodiniales.
Family:- Gymnodiniaceae.

***Gymnodinium* sp.**

Cells ovoid, ellipsoid, or pyriform, the transverse furrow complete, spirally turning to the left and dividing the cell into 2 equal (or slightly unequal). differently shaped portions; longitudinal furrow extending to the poles or only part way into the epicone and hypocone, but always farther into the latter than the former; pigmented species with numerous, golden-brown, elongate or ovoid chromatophores which are radially arranged; membrane smooth (in our specimens) or with longitudinal striations. As shown in Figure (5).

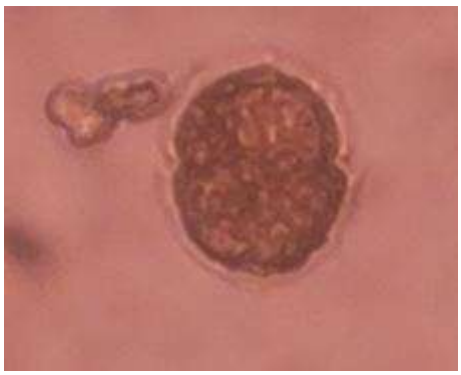

Fig-5: algae *Gymnodinium* sp

These kinds of new algal undiagnosed from the rest of the studies, research and even another list of the types of algae by [16] which recorded 2647 type have not been diagnosed with these types and even the rest of the algal menus studied by many researchers in the research centers and university professors and Atarih and messages Graduate Studies undiagnosed these eight species, and these algal species present in the Tigris river environment within the city of Baghdad.

The new algae were observed in the Tigris River during the four year seasons to determine the optimal conditions for these new types of algae, as shown in Table (2), which includes most of the chemical tests of these species within the Tigris River environment.

Table 2: The most important physical chemical tests of the environment of algae present within the environment of the Tigris River

Parameters	Spring	summer	autumn	winter
pH	7.8	7.81	7.86	7.65
T (c˚)	25	36.2	25.2	12.9
Sal (‰)	0.1	0.1	0.2	0.3
EC (µs/cm)	718	668	864	1175
TDS(ppm)	390	352	432	501
NO_2(ppm)	4.6	4.6	5.1	4.6
NO_3(ppm)	6.2	6.9	6.1	6.25
SO_4(ppm)	169	186	198	196
Turbidity (NTU)	20	55.6	12.2	23.1

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