

DOI: <http://doi.org/10.32792/utq.jceps.09.01.20>

## **Effect of Specific Concentrations of Superphosphate on Growth *Chroococcus Sp* and *Navicula***

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### **Abstract:**

The study included the isolation and diagnosis of *Chroococcus* and *Navicula*, the *Chroococcus* is considered to be the Cyanophyta green algae and the *Navicula* algae from the Diatoms where they were collected from ALhfar river`s Which lies south of the city of Nasiriyah in the back of the Souk Al-Shuyukh and their cultivation on the center ground( chu -10) , Superphosphate fertilizer was present in four concentrations (1%, 3%, 5% and 10%) , in addition to the control coefficient. The results showed the effect of superphosphate fertilizer on preparation of algal. For *Chroococcus*, superphosphate fertilizer has led to variation in moss , with the highest growth rate (590 cells / 100 ml) on the seventh day at concentration (3%) and the lowest rate (80 cells / 100 ml) on the ninth day at concentration (10%). The results of the effect of superphosphate fertilizer on the algae of the *Navicula* showed a difference in growth of moss with the highest growth rate (900 cells / 100 ml) on the seventh day at concentration (1%) and the lowest value of (310 cells / 100 ml) on the ninth day at concentration (10%).

**Keywords:** *Chroococcus*, *Navicula*, (chu -10) and Superphosphate fertilizer.

### **1-Introduction:**

Super phosphate fertilizer contains P<sub>2</sub>O<sub>5</sub> and is manufactured as follows:  
 $[Ca_3(PO_4)_2]_3 \cdot CaF_2 + 14 H_3PO_4 + 10H_2O = 10Ca(H_2PO_4)_2 \cdot H_2O + 2HF$  was a high phosphorus source and its sulfur content does not exceed 1%. This is the most widely used source in the united states and globally until 1960 when ammonium phosphate fertilizer began to spread and compete. This compost is made in Iraq in a large phosphate fertilizer facility in Akashat / Iraq. In general, superphosphate fertilizer is either in powdered form or in the form of powder, pelletized granules and pellets size 1-4 mm diameter are preferred so as to reduce the surfaces of contact with adsorption surfaces and thus reduce adsorption and precipitation [1]. Phosphorus, which is a key element in the composition of superphosphate fertilizer, is important in that it is included in the composition of energy compounds ATP, which encourages photosynthesis and metabolism as it enters the synthesis of DNA and RNA as well as the construction of phosphate sludge [2] Phosphorus is one of the most important determinants of the growth of phytoplankton in fresh aquatic environments. [3] Hypoproteinemia leads to disturbances in photosynthesis and impedes growth and leads to cell death [4], and increase it leads to an apparent food enrichment [5]. PO<sub>4</sub> (phosphorus compounds inorganic) represents the form used by aquatic organisms [6]. Algae are the main base of the major biopsies and their proliferation has been of great interest since the invention of microscope and to date, algae also contribute to the process of self-purification in the bodies of water through the process of photosynthesis where dissolved oxygen gas is released, thus sustaining the gas balance between oxygen and carbon dioxide between air and water. [7] It is the basis of all nutritional levels in the food chain in aquatic systems, making it the base of the food pyramid. [8, 9] Note that [10] diatoms are sensitive to ionic water content, nitrate, phosphorus, and dissolved oxygen in water. The intensity of light was the main determinant of photosynthesis processes at the mouth of the Lanyang His River. The growth rates of phytoplankton were low in the estuary area, characterized by acacia and high concentrations of plant nutrients [11]. The aim of the study is to study the effect of specific concentrations of superphosphate fertilizer on growth *Chroococcus* and *Navicula*.

### **2-Materials and methods of work:**

Washing and sterilizing tools used , the tools used in the tap water were washed with distilled water and then with 20% dilute hydrolysis acid and then washed with distilled water and dried with an electric oven of 105°.

#### **2-1 Collection of Sample:**

Samples of the surface water were collected from various areas of the AI-hfar river and saved it in clean plastic bottles of 500 cm<sup>3</sup> and brought to the laboratory. The sample was confirmed using a 4% concentration of malline at the concentration of microscopic examination while the other part was left uninhabited for the purpose of the culture .

#### **2-2 The middle of the plant:**

Using the Chu-10 medium modifecation and the axis by [12] to develop the algal isolates (Table 1), the seed medium was prepared in Stock solutions and stored in the refrigerator at a temperature of 4 m without sterilization until use, Where specific amounts are mixed when preparing the plant medium and completes the required size and adjusts the pH between (7 - 7.4) when planting the algae by adding drops

of sodium hydroxide solution (0.2N) The implantation was then sterilized using an autoclave electrode with a temperature of 121°C and pressure (1.5 lb / kg) for 20 minutes.

**Table (1):** Ingredients of the Chu-10 plant medium used for the development of algae in the current study

Concentrate g / 100 ml distilled water	Salts
2.5	MgSo4.7H2o
5.76	Ca(NO3)2.4H2O
1.585	NaHCO3
0.262	Na2SIO3
0.146	FeCL3
0.318	Na2.EDTA
3.583	CaCL2.2H20
1	K2HPO4
0.0045	MnCL2.4H2O
0.0007	MoNa2O4
0.0057	ZnSO4.5H2O
0.002	CuSo4.5H2O
0.072	H3BO3
7.4	PH

### 2-3- Isolation and purification of algae:

For the purpose of obtaining the farm Unialgal Culture used the method of planning the dishes of the agar and after a series of dilution to obtain farms single-algal [13] . A single algal farms was purified from germs according to [14] detailed in[15] Diagnosis of algae Sources adopted [16] [17] and [18] in the diagnosis of *Chroococcus* algae and described below :

Division: Cyanophyta (Blue green algae)

Class: Cyanophyceae

Order:Chroococcales

Family: Chroococcaceae

Genus: *Chroococcus* sp.

As for *Navicula* algae, the following sources were adopted in classification [19], [20], [21]

Division: Ditomphyta

Class: Bacillariophyceae

Order: Naviculales

Family: Naviculaceae

Genus: *Navicula*

### 2-4 Preparation of superphosphate fertilizers

The standard solutions were obtained with concentrations of 1000 mg / L for superphosphate fertilizer by dissolving the fertilizer in the water free of ions. Concentrations were attended by the necessary dilution. Concentrations (0-1-3-5-10%) of fertilizer were prepared.

### 2-5 Addition of superphosphate fertilizer

We isolate the isolates by adding (0.10) of the liquid effluent plant as inoculums to 250 mL water bottles containing a medium fed with superphosphate fertilizer (0-1-3-5-10) of manure and using three replicates per concentration , Incubated with temperature ( $27 \pm 2$ ) m with a period of (12 hours light: 8 hours dark) with a daily shake the flasks and a sample was planted without adding superphosphate fertilizer to be considered as a control sample.

### 2-6 Measuring growth rate

Used to calculate or count the algae method counting chamber was used in this way slide named petroff - hausser slide which is a fragment of a partitioned into large squares and small cells are calculated in which the cells algae after taking the size of the known sample and placed in the slide.

**2-7 Statistical analysis:** - The ANOVA test was used in the statistical analysis related to this study. [22]

### 3- Results and Discussion:

The results of Table (2) showed an increase in the growth rate of *chroococcus* algae with an increase in the concentration of superphosphate fertilizer. The maximum growth rate of this algae was 590 (100 ml) at 3% on the seventh day and the lowest growth rate was (80) ) at 10% concentration on the ninth day.

The results of the statistical analysis showed significant differences between days and concentrations at a probability level ( $P < 0.05$ ) and a difference in the value of ( F ) where the lowest value of  $F = 3$  on the first day and the highest value of  $F = 1225.500$  on the seventh day , this increase in growth is due to the addition of fertilizer because it contains phosphorus (which is the main component of this fertilizer) and phosphorus play a large role in the division of cells and increase the number and processes of energy release and vital events and this is consistent with [23]. A study of the Mississippi River in the United States also confirmed that dissolved phosphorus plays an important role in controlling the primary productivity of aquatic animals in this river because it is a determinant of phytoplankton in river water, depending on its concentration in the river [ 24] .

**Table (2) shows the effect of superphosphate fertilizer on the growth of *hroococcus***

Con	1day	3day	5day	7day	9day
0%	60	120	350	300	180
1%	40	190	440	480	400
3%	50	230	520	590	450
5%	40	110	200	150	110
10%	60	100	210	130	80
	F=3.000 p<0.05 Sig=0.072	F=97.500 p<0.05 Sig=0.000	F=591.900 p<0.05 Sig=0.000	F=1225.500 p<0.05 Sig=0.000	F=867.900 p<0.05 Sig=0.000

Con= concentration

The results of Table (3) showed the effect of certain concentrations of superphosphate fertilizer on the algae of the *Navicula* showing a difference in growth of algae, with the highest growth rate (900 cells / 100 ml) on the seventh day at the concentration of 1% and the lowest value (310 cells / 100 ml) at 10% concentration, The results of the statistical analysis showed significant differences between the days and concentrations at the probability level ( $P < 0.05$ ) and the difference in the value of F). The lowest value (F

= 3.900) on the first day and the highest value of  $F = 2298.000$ ) on the seventh day, we note that growth has increased and reached its maximum when left at the concentration of 1% on the seventh day and this is what I have studied for the waters of the River Mississippi in the United States that dissolved organic phosphorus plays an important role in controlling primary productivity for the halis in this river because it is a specific ' for plant halis In the waters of the river depending on its concentration in the river [24] . The increase in growth is also due to the addition of compost to contain the phosphorus component which is the main ingredient of this fertilizer) and phosphorus plays a big role in cell division, increase in number, and energy liberalization processes and vital events and this is consistent with [23].

**Table (3) shows the effect of superphosphate fertilizer on the growth of algae (*Navicula* )**

Con	1day	3day	5day	7day	9day
0%	80	180	320	440	500
1%	100	270	610	900	710
3%	90	290	630	880	790
5%	100	180	340	400	420
10%	110	190	300	330	310
	F=3.900 p<0.05 Sig=0.037	F=86.100 p<0.05 Sig=0.000	F=817.500 p<0.05 Sig=0.000	F=2298.000 p<0.05 Sig=0.000	F=1200.900 p<0.05 Sig=0.000

Con =concentration

We note from the results that both algae reacted to the superphosphate fertilizer but the *Navicula* is more sensitive to the lower concentrations compared with the *chroococcus* algae, and it was noted that increasing the concentration of manure adversely affected the growth of the mosses answsd this is consistent with a study conducted in a lake in Germany proved the dominance of diatoms and green algae while reducing the concentration of plant nutrients in the lake water [25] .

#### 4- Conclusions:

We note from the study that the response of both algae to superphosphate fertilizer and that *Navicula* moss is more responsive to superphosphate fertilizer at low concentrations compared with *Chroococcus* moss and both algae decrease their growth at high concentrations of this fertilizer

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