



Fayoum University
Faculty of Science
Botany Department

**Exploration of red tide and its impact on
phytoplankton communities in Lake Qarun,
El-Fayoum - Egypt**

By

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of
The requirements for the degree of

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Approval Sheet

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Summary

Qarun Lake is the only enclosed saline lake in Egypt. It's located in the western desert in the deepest part of El-Fayoum depression and lies at 83 km of south west of Cairo. It receives the agricultural drainage water from the surrounding cultivated land. This drainage water reaches the lake by two greatest drains namely, El-Batts and El-Wadi drains.

Continuous water evaporation from such closed ecosystem increases concentration of salts, pesticides and other pollutants. As a result this changes water quality and affects biology of the lake. Such changes lead to the decrease in the inhabiting biota as well as algal blooming.

This study was concerned with determining Physico-chemical and biological characters of the lake. The sampling program was carried out on monthly basis from May 2015 and continued till April 2016 (12 successive months). Four sampling stations were selected to cover the main difference in water quality of the lake that affected by the agriculture drainage water from El Bats at the east and El Wadi Drains at the middle of the lake.

Physico-chemical Characters:

- Physical analysis of the lake water revealed that air and water temperatures were more or less in the same trend, values of Secchi disc indicated that the water of the lake concerned as a turbid water bodies, total dissolved solids (TDS) and electrical conductivity (EC) were in the same trend and cleared that the lake suffered from progressive increase of salinity except at the west station due to the effect of El Wadi drain and pH values recorded were in the alkaline side.

- Chemical analysis showed that increasing of nutrients (ammonium, nitrite, nitrate, phosphate, silicate) in the lake water especially in front of the drains (the west station). The alkalinity is characterized by increasing of bicarbonate values as compared with carbonate one and dissolved oxygen concentrations were high during the blooming months.

Biological Characters:

- Eighty nine species of phytoplankton belonging to six classes were recorded in the lake. The recorded classes were Dinophyceae, Bacillariophyceae, Cyanophyceae, Cryptophyceae, Euglenophyceae, and Chlorophyceae. Sixteen species of them were the

dominant and only four species were responsible for the blooming phenomenon.

- Chlorophyll "a" and phaeopigments were in the same trend and their highest concentrations were recorded during January at the east station.

- The highest concentrations of chlorophyll "b" and "c" were obtained at the east station during March.

- Values of primary productivity indicated that the lake is highly productive and the highest values of gross production, net production, photosynthetic activity and respiration rate were recorded during the blooming months.

Conclusion

- The increased nutrient level in the lake by time show an exacerbated problem of eutrophication which lead to economic effect on fish production.

- Blooming has no toxic effect on fauna of the lake due to the dominant species recorded are not

toxic, the lake is not stagnant and fish mortality was not recorded as a result of the blooming phenomenon in the lake.