Plant Archives Vol. 19, Supplement 2, 2019 pp.1949-1952 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

A STUDY OF QUALITATIVE, CLASSIFICATION SOIL ALGAE IN SOME AREAS FROM BAGHDAD, IRAQ

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Abstract

A study of taxonomic quality of soil algae was conducted with some environmental variables in three sites of local gardens (Kadhimiya, Adhamiya and Dora) within the governorate of Baghdad for the period from October 2016 to March 2017. The study identified 28 species belonging to 16 species in which the predominance of blue green algae (18 species) Followed by Bacillarophyta algae (7 species) and three types of Chlorophyta. The study showed an increase in species of *Oscillatoria*. The results showed no significant differences between sites in temperature, pH and relative humidity, while there were clear differences between sites for salinity and nutrient The study showed a difference of irrigation water quality and use of different fertilizers helps some different environment variables, rates and the impact on the difference in the quality of the soil algae

Keywords: Blue green algae, Salinity, Soil algae, Fertilizers.

Introduction

Algae, the Simple plants grow in any medium containing water or moisture, and play a key role in the food chain as it is an important food source for animal and fish in water, and an essential oxygen product in all environments (Huynh and Serediak, 2006; Serediak and Huynh, 2011) Algae can be found on dry land, wet soil, rocks, tree trunks, building walls, and even fungi that can be found in the formation of lichens. They can also be found under the surface for a few centimeters and with little lighting. (Ohtonen *et al*., 1999; Kim *et al*., 2008, Hoffmann 1989).

These places of soil are affected by severe levels of drought and low or high intensity of light and these sharp fluctuations in light and heat are more severe than their variability in the physiological adaptations of the aquatic environment and therefore, as land is subjected to many environmental pressures such as exhaustion and heat these pressures can be borne by types of Algae are bluish greens and some eukaryotes are sheltered microhabitats to protect themselves which play a major role in increasing organic matter and nitrogen in the soil and this helps to increase the cohesion of their minutes and makes them resistant to erosion by wind and water (Kim *et al*., 2011, Elster *et al.,* 2008).

Many international researchers have been interested in the diagnosis and classification of terrestrial algae that's important to install carbon and increase the fertile soil (John, 1988; Kovacik, 2000; Rindi and Guiry, 2004 Kaštovská *et al*., 2005). Most of the studies on the quantity and quality of algae in the aquatic environment, Phytoplankton, Benthic Algae (Epipelic Algae and Epiphytic algae) (Kazem, 2005: Al-Asadi and others 2009; Al-Tai, 2010) as for as the algae attached to the soil locally, only a few studies have been completed (Al-Salkhi, 2017). Therefore, the current research topic, which aims to diagnose and classify algae attached to the soil in gardens house.

Materials and Methods

The samples of wet soil containing algae were collected monthly from three houses gardens in Kadhimiya, Adhamiya and Dora from 3 October to March, 2017.

Soil samples containing green-colored layers between the plants were collected in the shade. The surface layer of the soil was removed with a small thickness by a sharp-edged blade. It was placed in sterile plastic containers and was studied and transferred to the laboratory to isolate algae. The soil bred method was mentioned by Al-Salkhi (2017). Lund (1945). The soil was placed in the Petri dishes, moistened with distilled water, covered with cleaning paper and left to the following day. The leaves were placed in a clean tube and 10 mL distilled water and a few were added In addition, the algae samples were analyzed by the method (Barber and Haworth, 1981) and were also examined by optical microscopy. The diagnosis of algae was based on some of the major global and local sources (1989), Nurul-Islam (1982), Nurul- Islam and Haroon (1959), Nurul-Islam (1985), Wehr and Sheath (2003), Dela Zari-Barroso *et al*., (1973), Patrick and Riemer, Hustedt (1930); Komárek and Hauer, (2013).

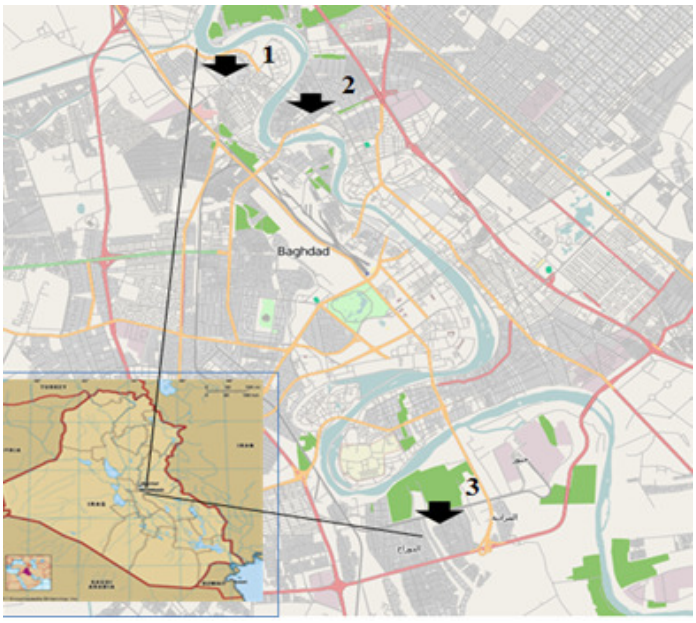

Fig. 1 : Map showing the studied are with sampling stations : (1) Al-Kadhimiya, (2) Al-Adhamiya, (3) Al-Dawruh

Results and Discussion

The results in Table 1 showed that Temperature, pH and Relative Humidity% values in soil extract were almost convergent all soil samples. While amount of phosphate in soil samples showed that soil sample AL-Kadhimiya

recorded the highest rate (2.01mg/L.) as for both regions approximated the phosphate rate. Nitrate values recorded significant differences between sites, AL-Adhamiya recorded the highest rate (19.42 mg/L.). The results showed that there were no moral differences between the sites for the temperature, pH and Humidity as the highest rate temperature 24.95 in the Kadamiyah while the validity of the hydrogential bonds were prepared as a base rounds of the three areas, while the highest rate of humidity was 38.33 in the course compared to the three areas, the reason for the temperatures of the three areas in the Baghdad city is one system. The soil areas studied characteristic equivalent tend to alkaline maybe that's because the soil does not contain accumulated plant parts, its presence and transformation into organic matter, that lead to an increase CO_2, which reduces the values of pH (Ayenimo *et al*., 2005).

Table 1 : Some physiochemical properties of the soil within the study area

Areas / variables	AL- Kadhimiya	AL-Adhamiya	AL-Dawruh
Temperature	22.50-27.40 63.1 ± 24.95	22.45-26.66 24.55±1.73	22.23-25.55 1.18±23.40
pH	7.34-7.98 0.29±7.61	7.55-7.89 0.14±7.73	7.33-7.99 0.26±7.71
Relative Humidity%	22.00-46.00 36.17±9.58	25.00-45.00 36.50±7.48	23.00-48.00 38.33±9.48
NO_3mg/L.	6.62-9.10 7.39±0.90	11.45-24.33 19.42±5.54	7.45-21.45 14.39±5.37
PO_4 mg/L.	1.68-2.31 2.01±0.22	1.23-1.67 1.44±0.19	1.30-1.94 1.65±0.26
Salinity%	0.30-0.66 0.42±0.13	34 .0-1.07 0.72±0.30	0.88-2.33 1.66±0.59

Table 2 : A lists of the diagnosed algae from soil samples in three sites at Baghdad city during 2016

Aldawruh	AL-Adhamiya	Kadhimiya-AL	Taxa
Cyanophytae			
+	-	+	*Anabaena sp.*
+	-	+	*Aphanothece castagenei*
-	-	+	*Chroococcus minor*
+	-	+	*Lyngbya birgei*
+	-	+	*Oscillatoria tenuis*
-	-	+	*O.formosa Bory*
+	+	-	*O.limosa*
-	+	-	*O.princeps*
-	-	-	*O. acuta*
+	+	-	*O. amoena*
+	-	+	*O. anguina*
+	-	-	*O. nigra*
-	-	+	*O. sancta*
-	+	-	*Oscillatoria sp*
-	-	+	*Phormidium ambiguum*
-	-	+	*Phormidium sp*
+	-	+	*Spirulina subsalsa*
-	-	+	*Synechoceus aeruginosus*
Chlorophyceae			
+	-	-	*Chlamydomonas globose*
-	-	+	*Chlorella sp.*
_	-	+	*Gloeocystis major*
Bacillarophyceae			
+	+	-	*Cymalopleuro solea*
+	-	-	*Gomphonema acuminatum*
+	-	+	*Nauicula acicutaris*
-	-	+	*N.confor vacea*
-	-	-	*N. atomns*
+	-	+	*Nitizshia verm*
+	-	-	*Syndra fusiculate*
15	5	17	Sum.

The results showed that there were no moral differences between the sites for the heat and walnutical and humiliated holes as the highest rate of temperature of the 24.95 in the Kadamiyah while the validity of the hydrogential bonds were prepared as a base of the rounds of the three areas, while the highest rate of rear humidity was 38.33 in the course compared to the three areas, the reason for the temperatures of the three areas in the Baghdad city system is one system (in the emero-standing system). The sovereignty of the regular areas will be due to the lack of alarmate in the soil. Its outbreaks will precise and transform them into organic materials that lead to an increase in the oxylist of the carbon, which reduces the values of pH (Ayenimo *et al*., 2005). Salinity results showed that there were significant differences between the study areas if the highest rate was recorded in the Dora area of 1.66. The reason for the salinity increase due to the use of wells by the people of the house to irrigate their gardens. As salinity increases in groundwater, On the surface after evaporation (Negmish and his group, 2006).

Nitrate and phosphate are important nutrients for plants and algae, and are important determinants of growth. Nitrates are produced in the soil either from the use of fertilizers or from the decomposition of living organisms after their death. Phosphate compounds are increased in the soil when phosphate fertilizers are used and the organic matter which is associated with phosphorus is reduced. The results showed that there were significant differences between the study sites in the concentration of nutrients with the highest nitrate rate of 19.42 mg / L in Adhamiya and the lowest rate of 7.39 mg / L (Keeney and Nelson, 1982; 2004; Glass *et al*., 2009; Lavoie *et al*. Recorded in Kadhimiya, on the contrary record the highest rate of the mosaics T 2.01 mg / L in Kadhimiya and the lowest rate of 1.44 mg / L was recorded in Adhamiya

Twenty eight genera including 16 species were diagnosed from the soils. Eighteen genera including 18 species of Cyanophyta, 7 genera including four species of Bacillariophyceae and 3 genera including three species of Chlorophyta that were identified Table (2). The highest number of algae species was recorded in Al-Kadhimiya site (17 species) while Al-Adhamiya recorded the lowest number of species (5). Table (2) This difference is due to the increase of the phosphate nutrients in Kadhimiya. Salinity was low compared to the high salinity and phosphates And the high watering and high humidity of the Kadhimiya site helped to increase the number of algae attached to the soil Line *et al*., 2016; Karsten *et al*., 2007b). The blue-green algae showed the highest number of species in the three locations, followed by Bascillarphyceae and finally Chlorophyceae, as they were more tolerant of environmental stimulants of vegetable algae and this is consistent with some studies that have study Soil Algae (Srinivas and Arena, 2016)

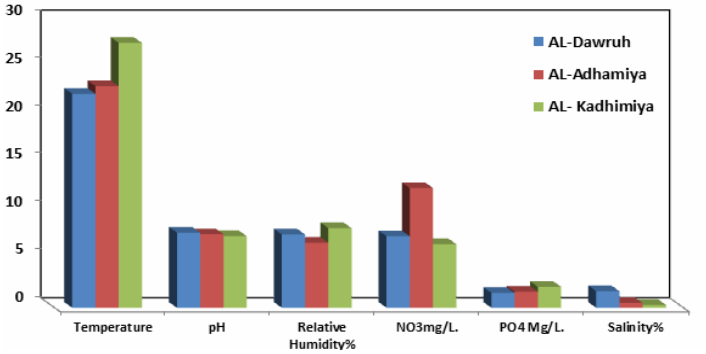

Fig. 3 : Shows the physical cheap variables in the three areas with the Baghdad

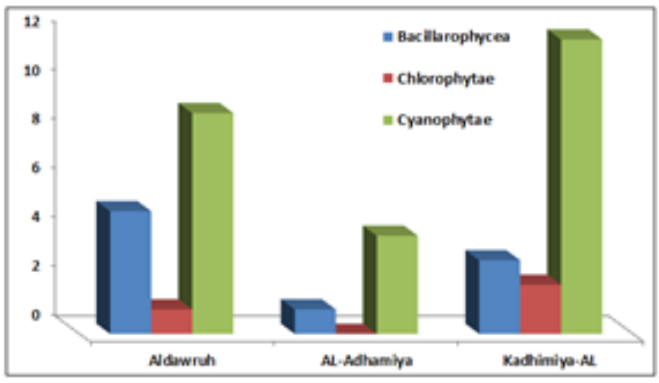

Fig. 4 : That appear the types of algae registered in the three sites within a city

Conclusion

Soil algae that's highly capability more resistant to environmental factors than water algae and the diversity ,density according to the research results depend on the humidity and light ,also their diversity is greatly affected by the amount of nutrients that reach the soil.

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