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Original Research Article

Seasonal Propagation of Green Algae in Kara–Kyr Lake Bukhara Region

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Abstract: Identifying the types of microscopic algae that are prevalent in water basins and studying their importance is one of the most pressing issues awaiting solution today. In this regard, research has been conducted to observe the classification of Lake Kara-Kyr in Bukhara region and the study of the types of microscopic algae in the water, the seasonal propagation. Commonly accepted algal methods and plant identifiers were used to determine the types of microscopic algae. According to the results, a total of 41 species belonging to the Chlorophyta division were identified in Kara-Kyr Lake. The seasonal propagation of the identified species was analyzed and 35 species were recorded in spring, 38 in summer, 28 in autumn, and 11 in winter.

Keywords: collector, filtration, eutrophication, algae, invasion, microscopic, photosynthesis.

INTRODUCTION

Kara-Kyr Lake (lake system) is located in the northwest of the Bukhara oasis. Kara-Kyr Lake was formed in 1960-70 due to the accumulation of collector water. The northern collector is the main source of lake water. Water enters the lake through the northern collector at 30-40 m^3 / sec, but there is no possibility of discharge. As a result of the increase in collector water in periods of winter and spring, the area of the lake reaches 26.5-27.2 thousand hectares due to the formation of small ponds Figure 1. During the hot summer days, evaporation and filtration are high, and the area of the lake is significantly reduced to 10-12 thousand hectares due to a decrease in the amount of water entering the lake to 5-10 m^3 / sec. The maximum depth of the lake is 7-8 meters, the average depth is 2.0-2.5 meters, and the minimum is 0.7-1.8 meters. The maximum depth of the Kara-Kyr Lake is 5-10% of the total area, the average depth is 15-20%, and the minimum depth is 70-80% [2, 3].

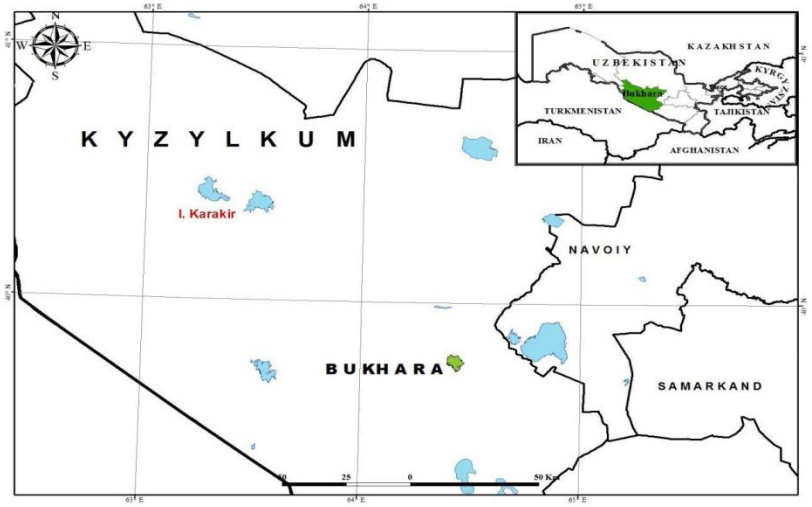

Fig-1: Location of lake Karakir

RESEARCH METHODOLOGY

In order to determine the types of algae, samples were collected using the Apstein network from the water intake of the lake, near the shore, in the middle and deepest parts. Apstein net size № 76, water inlet diameter 20 cm. The collection and processing of the material was carried out according to the generally accepted method. Samples were collected, a few drops of 3 % formalin were added to it, and the species were identified. XDS-3, B-380 microscope was used during the work. In determining the types of algae scattered in the lake, O. V. Anisimova, M. A. Gololobova's manual was used. The water temperature was determined on a symbolic thermometer, and the degree of clarity of the water was determined using a Sekki disk. Algological samples were taken from Kara-Kyr Lake in spring, summer, autumn and winter, the composition of the species was determined in the laboratory [1, 5, 7].

RESEARCH RESULTS

Seasonal samples were collected to identify species belonging to the Chlorophyta division of microscopic algae. During the study season, the average air temperature was 32-36 ^{0}C, the water temperature was 24-26 ^{0}C, and the water clarity was 3.0-3.5 m. The average value of dissolved oxygen in water is 5.26 mg / l, the saturation index is 75.1%. The rate of dissolved oxygen in water depends mainly on the intensity of photosynthesis and water aeration. Only in a strong wave does the dissolved oxygen content in water increase to 9.5-10.2 mg / l. Oxygen storage is much higher in Kara-Kyr Lake. The reason for this is the eutrophication of the lake. Where the depth of the lake is 4-5 meters, the water-soluble oxygen content is much lower at 2.5-3.0 mg /l. This is due to the abundance of organic residues at the bottom of the water and the lack or non-occurrence of circulation. Oxygen saturation of water occurs as a result of invasion, particularly due to a sharp increase in the amount of algae. High water temperature and salinity lead to a decrease in the amount of dissolved oxygen in the water [3, 4, 6].

The results of the analysis showed that 41 species and species belonging to the Chlorophyta division hit Kara-Kyr Lake. They belong to 4 classes, 8 disciplines, 12 families and 14 categories. The seasonal distribution of the identified species was analyzed and 35 species were detected in spring, 38 in summer, 28 in autumn, and 11 in winter (Figure 2).

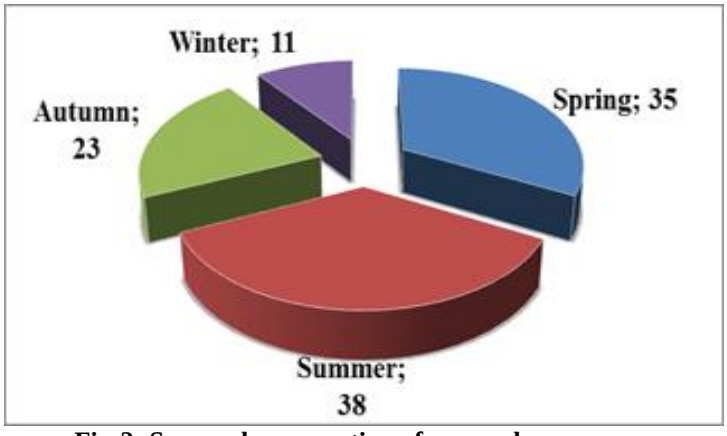

Fig-2: Seasonal propagation of green algae

Most representatives of the Chlorophyta division were found in the spring and summer, and the seasonal propagation varied depending on water temperature. In the spring there are *Chlamydomanadas sphnicola* Frint et Takeda, *Chlorococcum infusionum* Menegh, *Pediastrum boryanum* (Turp) Menegh, *P. simplex* Meyen, P. *tetras* (Ehr) Ralfs, *Scenedesmus acuminatus* Chodat, *S. acuminatus. biseriatus* Reinsch, *S. obliquus* (Turp) Kutz, *S. quadricauda* (Turp) Breb, *S. quadricauda. eualternans* Proschk, *S. acutiformis* Schroed, *Ankistrodesmus acicularis* Korschik, *A. angustis* Bern, *A. arcuatus* Korschik, *A. minutissimus* Korschik, *Oedogonium intermedium* Wittz, *Chlorella. vulgaris* Beyer, *Ch. ellipsoidea* Geneck, *Ch. pyrenoidosa* Chick, *Ulothrix zonata* Kutz, *U. tenerrima* Kutz, *U. variabilis* Kutz, *Cladofora fracta* Kutz, *Cl. glomerata* (L) Kutz, *Closterium dianae var. arcuata* (Breb) Rahenh, *C. malinvernianum* DeNot, *C. parvulum* Nag, *Cosmarium botrytis var. mediolaeve* West, *C. calcareum* Wittr, *C. granatum* Breb, *C. laeve var. septentrionale* Will, *Staurastum dispar* Breb, *Spirogyra calospora* Cleve, *Mougeotia nummuloides* (Hassal) De Toni, *M. parvula* Hassal. With the increase in air temperature in the summer, species that did not occur in the spring months have emerged this season. A total of 38 rounds were identified during the summer. These are *Chlamydomanadas sphnicola* Frint et Takeda, *Chlorococcum infusionum* Menegh, *Pediastrum boryanum* (Turp) Menegh, *P. simplex* Meyen, *P. tetras* (Ehr) Ralfs, *Scenedesmus acuminatus* Chodat, *S. acuminatus biseriatus* Reinsch, *S. obliquus* (Turp) Kutz, *S. quadricauda* (Turp) Breb, *S. acutiformis* Schroed, *Ankistrodesmus acicularis* Korschik, *A. angustis* Bern, *A. arcuatus* Korschik, *A. fusifarmis* Corda, *A. minutissimus* Korschik, Oos Wittz, *Chlorella. vulgaris* Beyer, *Ch. ellipsoidea* Geneck, *Ch.*

pyrenoidosa Chick, *Ulothrix limnetica* Lemm, *U. zonata* Kutz, *U. tenerrima* Kutz, *U. variabilis* Kutz, *Cladofora fracta* Kutz, *Cl. glomerata* (L) Kutz, *Closterium dianae var. arcuata* (Breb) Rahenh, *C. malinvernianum* DeNot, *Cosmarium angulosum* Breb, *C. botrytis var. mediolaeve* West, *C. calcareum* Wittr, *C. granatum* Breb, *C. laeve var.septentrionale* Will, *Staurastum dilatatum var.hibernicum* W.G.S. West, *S. muticum* Breb, *Spirogyra calospora* Cleve, S. *varians* (Kutz) Czurd, *Mougeotia nummuloides* (Hassal) De Toni, *M. parvula* Hassal. In the autumn there are *Pediastrum boryanum* (Turp) Menegh, P. *simplex* Meyen, *P. tetras* (Ehr) Ralfs, *Scenedesmus acuminatus* Chodat, *S. acuminatus. biseriatus* Reinsch, *S. obliquus* (Turp) Kutz, *S. quadricauda* (Turp) Breb, *Ankistrodesmus angustis* Bern, *A. minutissimus* Korschik, *Oedogonium intermedium* Wittz, *Chlorella vulgaris* Beyer, *Ch. ellipsoidea* Geneck, *Ch. pyrenoidosa* Chick, *Ulothrix zonata* Kutz, *U. tenerrima* Kutz, *Cladofora fracta* Kutz, *Cl. glomerata* (L) Kutz, *Closterium malinvernianum*, *Cosmarium calcareum* Wittr, *C. granatum* Breb, *Staurastum dispar* Breb, *Spirogyra calospora* Cleve, *Mougeotia parvula* Hassal species were identified. A total of 11 rounds were encountered during the winter. Therefore, in winter, the clarity of the lake water was 2.0–2.5 m when measured by the Sekki disk. This indicates a low number of green algae. *Scenedesmus quadricauda* (Turp) Breb, *Ankistrodesmus acicularis* Korschik, *Oedogonium intermedium* Wittz, *Chlorella. vulga*ris Beyer, *Ch. pyrenoidosa* Chick, *Ulothrix limnetica* Lemm, *U. zonata* Kutz, *U. tenerrima* Kutz, *Cladofora fracta* Kutz, *Cl. glomerata* Chick, *Spirogyra calospora* Cleve species encountered during the winter.

CONCLUSION

The fact that the species and species composition of algae in the algae flora of the Black Sea varies depending on the seasons is explained by the influence of hydro chemical and hydro physical parameters of the water.

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