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Studies of Fresh Water Toxic Phytoplanktonic (Microcystis) of Keenkjhar Lake, Thatta, Sindh, and Pakistan

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Zameer Ali PalhE-mail: zameer_ali110@hotmail.com, Cell No# +923462739014kh_lashari@yahoo.com, Cell N# +923313506615**Abstract**

The present study is the first study of Keenkjhar lake carried out to gain the knowledge about the toxic Phytoplanktonic Cyanophyta (Microcystis). In which total of 14 phytoplanktonic Cyanophyta (Microcystis) species were recorded during January 2004 to December 2004. A large number micro organism including a variety of Cyanobacterial toxic species have been observed. Hence the present research work was planned to resolved phytoplanktonic Cyanophyta (Microcystis) of Keenkjhar Lake.

Key Word: Toxic Phytoplanktonic Cyanophyta (Microcystis) of Keenkjhar Lake.

Introduction

Cyanophytes are potentially excellent source of food due to their rapid growth rates, high protein content (Carmichael, W.W, 1989) Phytoplanktonic Cyanophyta (Microcystis) species is an essential components of aquatic ecosystem and should be within an optimum rangeto ensure proper productivity. A large number of Phytoplanktonic Cyanophyta (Microcystis) species can be produce blooms, which some time has determined effect (Gromove *et al.* 1996) some species produce toxin (Fulton and Pearl 1987), that spoil the water quality and are toxin to fish population often leading to mass mortality (Sultaua *et al.*, 1999), toxic bloom fresh water Cyanophyta have been known for 100 years. These fresh water toxin from Cyanophyta are of concern to veterinarians, wild Keenkjhar Lake and environmental protection agencies. Cyanophyta have been implicated in gastroenteritis outbreak in

human population (Makoto, *etal* 1992) has isolated a diarrhea like toxin from Microcystis aeruginosa. Species Cyanophyta (Microcystis) have been studied by many authors (Makoto, *etal* 1992 ; Habib *et al* 1993; Khaton 1994; Sahato and Lashari, 2005; Muhammad Ali *et al.*, 2005, Korai *etal.*, 2008). The species of Cyanophyta (Microcystis) have been recorded first time from Keenkjhar Lake, no data are available regarding the poisonous algal flora of this lake, which led us to design the present investigation.

Material and method

The Keenkjhar Lake, Thatta, Sindh, was surveyed from January 2004 to December 2004 from six stations of keenjhar lake (Fig1) 1. Sunhari, 2. Helaya, 3. Noori spot, 4. Boating spot, 5. Restrjing spot, and 6. Khumbo. samples were collected with for the study of Phytoplanktonic cyanophaya were collected with No.25 U planktonic net

towards with motor boat travailing with slow speed up to depth of 0.5mete. Samples were preserved in 4% formalin .A quantitative study of phytoplanktonic cyanophaya was made with high

microscope and species identification were made by reference to(Davis ,1955; Desikachary,1959; Prescott ,1962; Leghari and Arbani ,1984).

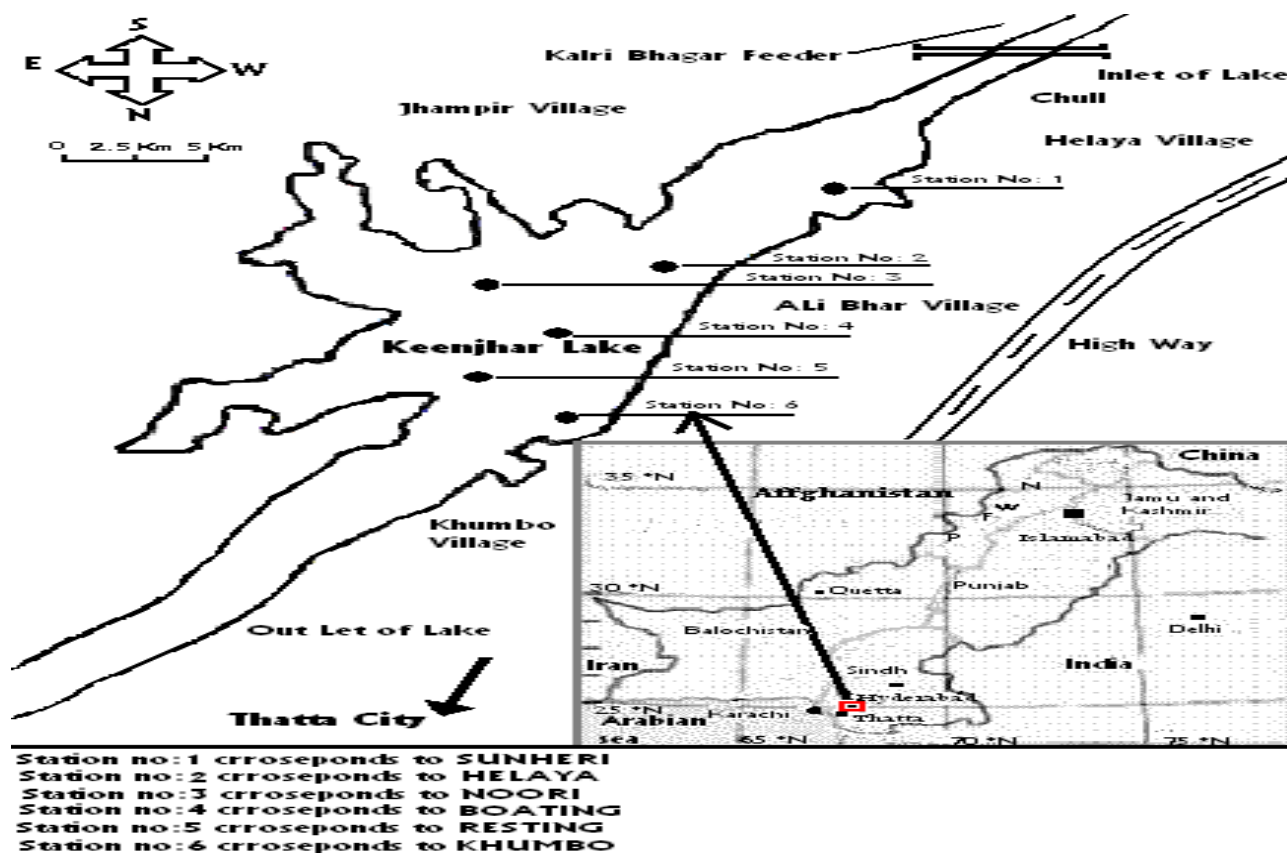


Figure1.Sampling stations of keenjhar lake during the studies.

Table No.1: List of toxic Phytoplanktonic Cyanophyceae (Microcystis) recorded during study January 2004 to December 2004 from the Keenjhar Lake.

Cyanophyceae	Jan	Feb	March	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Microcystis flas-aquae	+	+	++	++	+++	+++	+++	+++	++	+	++	++
Microcystis pulverea	++	++	+++	+	+++	++	+++	+++	+	++	+++	+++
Microcystis lamelliformis	+++	+++	++	+++	++	+	++	++	+++	+++	++	+
Microcystis aeruginosa	+++	+++	+++	++	+++	+++	++	+++	++	++	+++	+++
Microcystis aeruginosa var.elongata	++	++	+	+++	++	++	+++	+	+++	++	++	++
Microcystis robusta	+	++	+++	++	+++	++	+	+++	++	+++	+++	+++
Microcystis pulverea var.recemiformis	++	++	++	+++	++	+++	+++	+	+++	++	++	+

Microcystis pseudofilementosa	+	+++	+++	++	+	++	++	+++	++	+++	++	+++
Microcystis orissica	+++	++	++	++	+++	+++	+++	++	++	+++	++	+
Microcystis holsatica	++	+	++	+	++	+	+++	+++	++	+++	+++	+++
Microcystis rivularis	+++	+++	+++	++	+++	+++	++	++	++	+	++	++
Microcystis wesenbergi	++	++	++	+++	++	++	++	+++	+++	+++	++	++
Microcystis elabens	+	++	+++	++	+++	+++	+++	+	++	+	++	+++

+++ = Abundant ++ = Common + = Rare

Result and Discussion

14 toxic phytoplanktonic Cyanophyta (Microcystis) species were identified belonging to order Chroococcales. Microcystis species were collected from six stations of Keenjhar lake (Fig.1) Microcystis gradual increase from winter to summer, with a peak in June-August population slowly declined up to December at all stations (Korai *et al*,2008).The species were observed irregularly during various season, with maximum generally in summer (Sahato and Lashari,2005).under normal condition in enclosed water bodies of tropical impoundments, a continuous high population of Phytoplankton, specially Microcystis aeruginosa was found throughout the year with blooming period in summer (Lashari *et al*,2014) our results are agreement with those (Nazneen,1980;Arbani and Sahato,1995 and Nazneen,2000).In highly eutrophic lakes ,blooms of Microcystis observed from late spring until autumn can cause serious problem , especially in water used as drinking supply. In such blooms the dominance of Microcystis species other than M.aeruginosa has often been noted (Watanabe *et al*,1988).Blue green algal blooms result in number of problems, including off-flavor in fish,toxic substance, shallow chemical and thermal stratification, taste and odor of drinking water, phytoplankton die-off

and an unsightly appearance (Kamran *et al*,2003and K.H.lashari2014.). A large number of Phytoplankton population can produce blooms, which some time have detrimental effects, Phytoplankton blooms is not always wanted because some species produce toxin (Sahato and Lashari,2005 and Lashari *et al*,2014).Knowledge of the plankton biomass a viable in a ecosystem is of fundamental importance for fish culture, since this spoil water quality and may be toxic to fish populations , possibly leading to mass mortality (Lashari *et al*,2014),when blooms form many fishes are killed due to lack of oxygen in water.Blooms are found by Microcystis species (Table.1) which are prominent throughout the year in fish pond (Sahato and Lashari,2005).The first reports of fresh water incident of fish poisoning were as early as the 1880s(Kafka,1882). Cyanophytes blooms in fresh water and brackish water are widely recognized as being capable of producing variety of toxin, including repleds, alkaloids,organophosphorous compounds and lipopolysacharides (Carmicheal,1989 and Gorham and Carmicheal,1989).Another harmful effect of phytoplanktonic Cyanophyta (Microcystis) is the production of toxic organic substances, these substances have caused the death of many kinds of wild and domestic animals. Fish ,like land animals and birds, have also been victims of algal

poisoning .It is frustrating to note that fish kills are routinely attributed to botulism ,to change in water temperature and lack of oxygen due to gill blockage by sand or to water blanketing by insecticides and industrial pollutants. The role of algal toxins is generally unknown rather than ignored.

Conclusion

The results of analysis provide base line structure of metal toxicity and accumulation in aquatic food chain in order to assess the possible risk to human health due to water and food consumption offered by lake. On the basis of our finding, it is possible to recommend various steps for better systematic management of Keenjhar Lake in terms of its productivity and control of algal blooms, which are hazardous to entire to aquatic ecosystem.

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