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FRESH WATER ALGAE OF SINDH-IV AN ECOLOGICAL SURVEY OF PHYTO PLANKTON (OSCILLA TORIACEAE) OF PHOOSNA LAKE, DISTRICT BADIN SINDH PAKISTAN

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Abstract

The present communication concerns with the enumuration of phyto-planktonic algal species belonging to the genera *Spirulina, Arthrospira, Lyngbya*, and *Oscillatoria* of fimaly *Oscillatoriaceae* along with physico-chemical analysis of Phoosna lake dist: Badin Sindh, Pakistan.

These species in ponds and lakes, damage the quality of water. Some of the species of *Oscillatoriaceae* have been reported to cause water blooms. The present marphotaxonomical study of Oscillatoriace present in this lake is the first study of this lake conducted with an aim to gain knowledge of this region. The information collected will help in better understanding of lakes of this region.

Introduction

Phoosna a shallow eutrophic lake, is situated in between 68.55 longitude (in East) and 24.50 latitude (in North) at a distance of 20 k.m. from Badin, 5 k.m. towards north of Hyderabad-Badin road. It is a private owned fishing lake, spread over an area of 500 acres. The lake is shallow, about 2-3 meter deep, filled with canal water. Since it is surrounded by agriculture land, consequently it also recieves leached nutrientsfrom its surrounding fields. In many aquatic environments, the plankton assemblages have been shown to be an important production component of the ecosystem and the role of planktons as natural food for fish in aquatic ecosystem (Pearsal, 1932; Rodhe, 1948; Naygard, 1949; Lin, 1972; and Rai, 1978).

The province of Sindh being very rich in fresh water resources in the form of lakes and ponds. Title in known about the phyto-planktonic algal flora of this region. The available literature on algal flora of Pakistan mostly concerns with algae collected from ditches and ponds (Siddique and Faridi, 1964; Faridi,

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and Malik, 1981; Aizaz and Farooqi, 1972; Arbani and Sahato 1991; Leghari et al 1991; Legari and Sultana 1993; Hage and Leghari 1993; and Sahato and Arbani 1993).

The present study is the first study of this lake. Attempt has been made to carry out ecological and systamatics survey of *Oscillatoriaceae* of this lake.

Materials & Mathod

The collections were made once a month from March to May 1993 and January 1994. The samples were collected between 10 A.M. to 1.00 P.M. at 3 stations, spread over 3 sides of lake; directely by toeing of plankton collecting net from the epiliminion layer and also by filtering about 20 liters of water from the hypoliminion layer with the help of sampler.

The specimens were brought to the laboratory and studied a fresh and after preservation in 4% formalin.

All the methods used for the analysis of physio chemical and biological parameters were followed as given in "Standard Methods for the Examination of Water and waste water (APHAAWWA, 1985).

Table-1

Showing the Physico-Chemical Characteristics of Lake

pH-	8.2-8.5
Air temperature	28°C
Water surface temperature	30°C
Water bottom temperature	25°C
Soil temperature	22.5C
Humidity	45%
Sechi Disc	42.5 inch
T.D.S.	170 ppm
Conductivity	8.49 1-msc
Total hardness	516 ppm
Ca hardness	258 ppm
Mg hardness	258 ppm
Ca Cl_2	286.38 ppm
Mg Cl_2	29.928
Salanity	3.8 ppt

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Ortho Phosphate	0.03-0.245, mg/1
Density	30c.1.0044g/1
CO_2	50 ppm
Dissolved oxygen	8 mg/1
Ammonia nitrogen	0.04 ppm
Saturation	75%
Light intensity	1885-1985 1ux
Turbidity above/below	20-140/5-45
Weather	dry hot
Soil	muddy and saline
Zone	sub tropical

Table 2

List of the species observed in the collection from these waters

Spirulina

1.	*S. laxa*	Smith G.M.
2.	*S. Laxissima*	West. G.S.
3.	*S. meneghiniana*	Zonard ex Gomont
4.	*S. sublissima*	Küetz ex Gomont
5.	*S. gigantea*	Schmidle

Arthospira

1.	*A. jenneri*	(Küetz) Stizenb ex Gomont
2.	*A. massurtil*	Kuffareth

Oscillatoria

1.	*O. Acumata*	Gomont
2.	*O. agardhil var. aeqicrassa*	(Elenk)
3.	*O. amphibia*	Agard. ex Gomont
4.	*O. anguina*	(Bory) Gomont
5.	*O. calcutensis*	Biswas

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6.	*O. chlorina*	Küez (after Fremy)
7.	*O. formosa*	Bory ex. Gornont
8.	*O. jasorvensis*	Vouk
9.	*O. jenesis*	G. Schmid
11.	*O. limosa*	A.G ex Gomont
12.	*O. okeni*	A.G. Gomont
13.	*O. princeps var. pseudolimpsa*	Vaucher ex. Gomont
14.	*O. okeni*	A.G ex. Gomont
15.	*O. subbrevis*	chmidle
16.	*O. willei*	Gardner ex Drouet

Phormidium

1.	*Phormidium corium*	(Ag) Gomont
2.	*P. inundatum*	Kuetz (after Gomont).
3.	*P. laminosum*	Gomont.

Lyngbya

1.	*Lyngbya aeruginea-caerulea*	(Kuetz) Gomont.
2.	*L. corticicola*	Bruhlet Biswas
3.	*L. major*	Meneghini ex Gomont
4.	*L. taylorii*	Brouet & Strickiand

Observation

Data of 25 physico-chemical parameters recorded every month from March to May 1993 and January 1994 is presented in Table-1. During this period of observation. Air Temp ranged: 28°C-35.2; S. Water Temp. 27.5-33°C; Water B. Temp. 25-30°C; Soil temp. 20-24.5°C; Humidity 31-49%; Sechi disc 19-42.5 Inch; T.D.S. 160-170 Ppm; Conductivity 8.49MSC-1 12.34 MSC-1; Total hardness 516 ppm, Salinity 3-3.0 ppt; Orthophosphate 0.03-0.245 Hg/1; Refrex index 1.3325-1.3328; density 30°C 1.0044 1.0058 g/l, $C0_2$ No free 50 ppm; Dissolved oxygen 8 9.5 Mg/1; Ammonia nitrogen 0.02 0.04 ppm; Saturation 64%-75%; Weather dry hot and cold.

Result and Discussion

The 30 phytoplanktonic species of *Oscillatoriaceae* identified from this lake during the period of study are listed in table 2. These species were found to be dominant due to hardness of water. Many toxic species were also recorded.

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The filamentous algal species belonging to *Oscillatoria, Lyngbya* and *Spirulina* are the most favaured algae.

The present investigation confirms the presence of these species in the water. The growth and yeild of fishes such as *labeo rohita, catla catla cirhina mirgala*, feeding on these algae has been found to be satisfactory in the water, where phyto planktonic algae are present through out the year.

The study of these water bodies is also important in the sense that thick blooms caused by species belonging to *Oscillatoria,* and *Spirulina*, have result in several instances of oxygen diplition. Large sclae mortality has also been reported from fish ponds of District Badin.

Ecological parameters and phyto plankton composition of this lake indicate that this lakes is of eutrophic nature.

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