

DISTRIBUTION OF PHYTOPLANKTON IN LAKES OF TIRUMALKUDAL NARASIPURA OF MYSORE DISTRICT

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ABSTRACT

Four freshwater lakes of Tirumalakudal of Mysore district were studied for the diversity and abundance of phytoplankton. Among the eight groups Cyanophyceae were the most abundant as compared to Bacillariophyceae. Euglenophyceae were less dominant while Dinoflagellates and Chrysophyceae were least dominant. Many members of Cyanophyceae formed blooms which often lead to eutrophication of lake waters. It is essential to develop conservation strategies for control of lakes based on the diversity and abundance of phytoplankton blooms.

Keywords: Plankton, Lakes, Chlorophyceae, Bacillariophyceae, Chlorococcales, Desmidiaceae, Euglenophyceae

INTRODUCTION

The earliest of the studies on freshwater phytoplankton were those of Patrick (1948) on the distribution of Bacillariophyceae and Round (1981) who worked on the benthic communities. Prescott (1982), Gandhi (1998) made a study of objectionable algae and their control. Plankton composition of freshwater lakes were studied by Seenayya(1972), while Bharathi and Hosmani(1974) made an extensive study of the plankton in lakes of Dharwar. Seasonal diversity was studied by Nygaard(1976) in lakes of Denmark. Aiyaz *et al.*(2010) studied diversity index of algal flora. Hosmani(2010) reported the importance of algal diversity in lake ecosystems. Basavarajappa *et al.* (2010) have given a detailed account of the diversity of phytoplankton in lakes of Mysore.

Although it appears that a great deal of work has been done on plankton ecology, there are still many potential areas with indigenous algae being not reported. An attempt has been made to assess the phytoplankton diversity of four lakes of Tirumalakudal Narasipura of Mysore district. There is absolutely no report of algae from this part of the country.

MATERIAL AND METHODS

Mysore district is located between 11^o 30' and 12^o 50' north latitude and 75^o45' and 77^o 45' east longitude. Tirumalakudal Narasipura is located about 60 km south of Mysore and is known for the historic temples. The four lakes (Alguda Lake, Bannur Lake, Kaglipura Lake and Kurabura Lake) are located at a distance of 12 kms apart, they differ in shape and size and in the usage. The water is mainly used for irrigation. Two of the lakes receive channel water from Kabini River, a tributary of Moolehole River from Kerala State.

Samples for the estimation of phytoplankton were collected from surface water for a period of one year. Composite sampling was done. Collection, preservation, identification, and enumeration were done following the methods described by Hosmani(2010). The numbers of the organisms were expressed as organisms/litre (o/L)

RESULTS AND DISCUSSION

Individual algae occurring in the plankton were identified and enumerated. They were grouped according to the classification of Prescott (1982) and total counts of each group and each lake are presented in Table 1.

Table 1. Distribution of Phytoplankton in the lakes of T. Narasipura of Mysore (o/L)

Plankton	Alguda lake	Bannur Lake	Kaglipura Lake	Kurabura Lake
Chlorophyceae	8960	10080	11520	4640
Bacillariophyceae	40000	29293	32813	21920
Cyanophyceae	41280	21760	9280	53460
Desmidaceae	9920	5920	34053	1920
Chlorococcales	14880	15840	3520	22880
Euglenophyceae	16320	7520	1440	13440
Chrysophyceae	200	640	200	800
Dinophyceae	2240	200	1440	640

Note: Numbers denote Organisms/litre.

Eight groups of plankton were recorded. They constitute Chlorophyceae, Bacillariophyceae, Cyanophyceae, Desmidaceae, Chlorococcales, Euglenophyceae, Chrysophyceae and Dinophyceae. The distribution patters of plankton in each of the lakes is presented in Fig. 1.



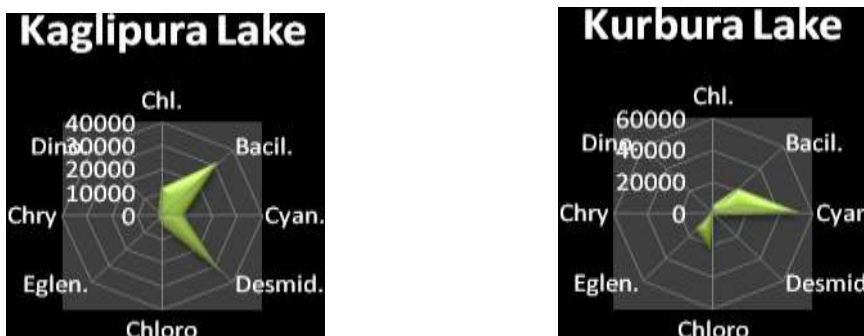


Fig 1: Plankton diversity in each Lake (2011)

In Alguda Lake Bacillariophyceae and Cyanophyceae dominate, followed by the predominance of Euglenophyceae and Chlorophyceae. In Bannur Lake the dominance is similar to Alguda lake but Chlorococcales predominante. Kurbura Lake is dominated by Cyanophyceae and Chlorococcales. The distribution of plankton in Kaglipura Lake indicates that Desmidaceae and Bacillariophyceae are dominant. This lake often receives fresh water from the canal and this may be the reason for dominance of Bacillariophyceae and Desmidaceae. The hierarchy of plankton dominance in the Lakes is shown below.

Alguda Lake: Cyanophyceae> Bacillariophyceae> Euglenophyceae >Chlorococcales> Desmidaceae> Chlorophyceae >Dinophyceae>Chrysophyceae

Bannur Lake: Bacillariophyceae> Cyanophyceae> Chlorococcales >Chlorophyceae> Euglenophyceae> Desmidaceae> Dinophyceae >Chrysophyceae

Kaglipura Lake: Desmidaceae> Bacillariophyceae >Chlorophyceae >Chlorophyceae> Cyanophyceae> Chlorococcales> Euglenophyceae> Dinophyceae> Chrysophyceae

Kurubara Lake: Cyanophyceae> Chlorococcales> Bacillariophyceae >Euglenophyceae> Desmidaceae> Chrysophyceae >Dinophyceae

To generalize, the distribution of plankton is that Cyanophyceae dominate in Alguda Lake and Kurubara Lake, While Bacillariophyceae dominates in Bannur Lake. Kaglipura Lake supports luxuriant Desmidaceae. These two lakes often receive fresh water from a channel while the other two lakes receive rain water and are stagnant for most part of the year. It is reported that lakes receiving river water support Bacillariophyceae and Desmidaceae in higher numbers (Patrick, 1948)

The overall distribution of plankton in the four lakes is presented in Fig. 2.

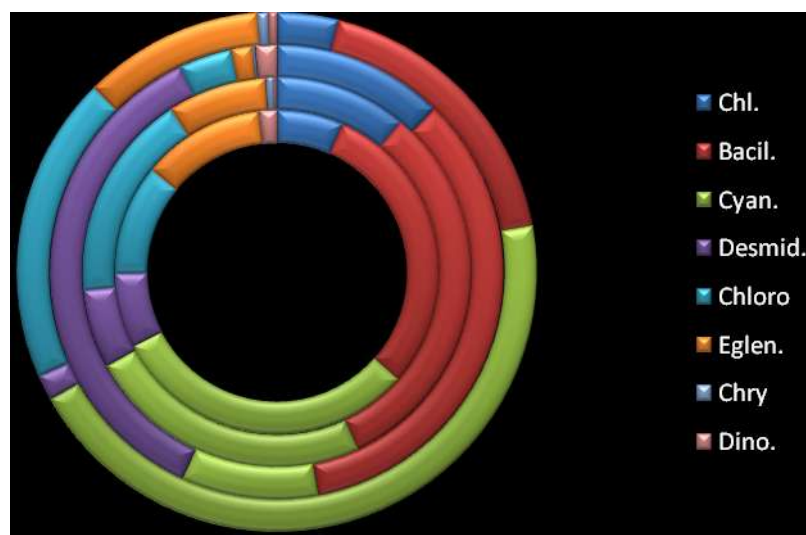


Fig. 2: Phytoplankton diversity in the lakes of Tirumalakudal Narasipura(2011)

Cyanophyceae are the most dominant group of plankton. The subdominant groups are Bacillariophyceae and Chlorococcales. The Euglenophyceae are next with slightly higher numbers. Chlorophyceae fluctuate between high and low values, while Chrosophyceae and Dinophyceae are poorly represented. Desmidaceae are low but occur as a bloom in Kaglipura Lake.

CONCLUSION

The study describes the distribution of phytoplankton in four lakes of Tirumalakudal Narasipura. Cyanophyceae and Bacillariophyceae dominate the lakes. Desmids are abundant in Kaglipura lake while the other groups are unevenly distributed. The dominance of Cyanophyceae is an indication of Eutrophication mainly due to organic pollution. Bacillariophyceae appear in blooms in all four lakes. The highest number of plankton recorded was that of Cyanophyceae. The study indicates that all four lakes are tending to become eutrophic and development of blooms may further lead to health hazards of cattle and humans. Conservation strategies for control of blooms and eutrophication are essential features.

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