CHAPTER VI

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In Maharashtra very few workers have paid attention on ecological study of algal biodiversity of lentic and lotic environment. To fulfill the lacuna it was thought worth to study of limnology of algae in Maharashtra and hence the present investigation was carried out, ecological studies of algae from Sulwade Barrage of Dhule district of Maharashtra. The Biotope was supported a rich and varied Biocenose at all the stations of Barrage. In present study, 283 total algal taxa were reported from barrage sites. The composition of Chlorophyceae and Cyanophyceae was greater in species composition as compared to other groups of algae.

The periodicity of algae was affected by water temperature and other parameters in general. The population of Chlorophyceae and Cyanophyceae was dominant as compared to other Bascillariophyceae groups of algae from study area.

Seasonal percentage of four groups of algae was observed at each six station of barrage. In first year study, maximum seasonal percentage of Chlorophyceae was observed in barrage while minimum seasonal percentage of Euglenineae was recoreded. The total population of four groups of algae was greater at stations S-I, S-IV and S-VI as compared to other stations of barrage. In present study water temperature played important role in periodicity of Green algae and Blue-green algae. The concentration of dissolved oxygen of the sites of barrage was slightly higher at the river station. This might be due to the fact that the station of barrage was least disturbed than to river sites. This follows the principal of water pollution. This was also tallied by statistical data.

Nygaard’s trophic state indices calculated for all stations of barrage was showing eutrophic nature of barrage and river except Diatoms and
Euglenoides indices. The compound index which had widest range and it very sensitive. It holds good index for assessing the eutrophication of all stations of Barrage in present study.

The pollution tolerant genera and species of four groups of algae were recorded at all stations of Barrage. According to Palmer, in present study 37 pollution tolerant genera and 23 pollution tolerant species were recorded from the sites of study area. The most pollution tolerant species of *Navicula* (3), *Oscillatoria* (5) and, *Secenedesmus* (2) were recorded in present study. Palmer’s pollution index calculated for all stations of Barrage showed that the pollution was greater at S-VI, S-IV and S-I stations. The degree of organic pollution was increased from station S-II and S-III from down streams i.e. in the sequence of S-VI > S-IV > S-I > S-V > S-III > S-II the total score of S-I, S-IV and S-VI stations of barrage was greater than 20 indicating confirmed high organic pollution. Thus in present study, algal communities were used as indicators of organic pollution.

Saprobiity index calculated at all stations of barrage according to Pantle and Buck (1955). Showed β–Mesosaprobic, Kolkwitz and Marson’s (1908) systems was used for classifying the algal taxa into four saprobic levels for all stations of barrage. The correlation between physico-chemical parameters and algae was made for all stations of Sulwade barrage. The water blooms of *Microcystis* was observed on large scale only at S-IV and S-VI stations of Barrage. Water temperature played important role in the periodicity of blue-green in present data. DO values of lentic bodies of Sulwade Barrage were higher than those of lotic bodies of River station S-II.

Multifactoral correlation of 18 parameters for all stations of barrage was made by statistical analysis. This data is also supported by palmer’s Pollution Index, Nygaard’s indices and saprobiity index. The physico-chemical parameters also showed the higher concentration of
pollutant parameters as it was supported by statistical analysis data of multifactoral correlation.

The population density of four groups of algae was recorded at each month for all stations of Sulwade Barrage during period of two years. The algal periodicity was affected by water temperature and other parameters during the summer season. In general the population of Chlorophyceae was dominant as compared to the other groups of algae. The seasonal percentage of four groups of algae was more in summer season at all stations for two years. While seasonal percentage of blue-green algae and diatoms were more in winter and summer season at majority of the sites for two years.

The population of four groups of algae was less at sites of River stations S-II and Barrage Stations S-III and S-V as compared to other sites of Sulwade Barrage. The total populations of Euglenoids was less in all stations as compared to other groups of algae in present study. The pollution tolerant genera and species of four groups of algae from six stations of barrage were recorded according to Palmer (1969). The most pollutions tolerant species of *Navicula*, *Oscillatoria* and *Euglena* were recorded in present study. By using Palmer’s index of pollution for rating of water samples as high or low organically polluted six stations were studied. The highest degree of pollution was observed at stations S-VI, S-IV, and S-I. The pollution tolerant genera and species were more as compared to those of remaining three stations in present study.

By using Palmer’s pollution index number, the total score of three stations i.e. S-I, S-IV and S-VI was greater than 20 indicating the confirmed high organic pollution. Thus the pollution tolerant algal communities can be used as ‘Bioindicators’ of organic pollution.

Nygåards indices of different groups of algae viz. Myxophcean, Chlorophycean, Diatoms, Euglenophyte and compounds were used toget mineral evolution of the extent of pollution of sites. Trophic state indices
were calculated for all stations. All the indices were eutrophic nature of sites except diatoms indices. The compound index which had the widest range and was very sensitive holds good index for assessing the eutrophication of all stations of barrage. Kolkwitz and Marsson’s system was used for classifying the four saprobic levels of all stations saprobic index of Sulwade Barrage stations showed β–Mesosaprobic nature of water. No physapribian alage was recorded in present study. The water quality of barrage was assessed by physico-chemical index, trophic indices and saprobity index.

The number of algal taxa observed in Sulwade Barrage was 283 of these, 109 belonging to Bacillariophyceae and 14 belonging to Euglenineae. Among four groups of algae, Chlorophyceae was dominant in present study. In Chlorophyceae, dominant genus was *Scenedesmus* represented by 18 species.

In present investigation maximum number of algae was observed from April two June some extent in October, from which Chlorophyceae were found dominant during the period of investigation.