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DIVERSITY AND SEASONAL FLUCTUATION OF PHYTOPLANKTON IN INDRAYANI RIVER AT MOSHI, DIST PUNE. M.S. INDIA

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Abstract:
Planktons are small, most sensitive floating community. Some time it is target of water pollution. Phytoplanktons are the subject of great interest becomes of their role as primary producers in an aquatic ecosystem. Most of the time zooplankton community depends on phytoplankton. The effect of environmental variables play role in altering the phytoplankton density. Water sample were collected monthly during (September 2016 to August2017) at three selected sampling station from Indrayani River, Moshi, Pune. Collected water sample were analyzed qualitatively and quantity wise for their algal population. A total of 62 species were recorded at selected sampling stations. Chlorophyceae was most abundant than Bacillariophycea, Cyanophycea and Euglenophycea. The greater algal population was recorded at station-II than station-I & station-III. The diversity of different phytoplankton is more in summer season than during winter and rainy season.
Keywords:- Diversity, density, Moshi, Indrayani River

Introduction:

Planktons are microscopic, aquatic plants, which plays important role in aquatic ecosystem. In planktonic study there are two types of plankton which are majorly studied viz. Phytoplankton and Zooplankton. The phytoplankton plays an important role in aquatic ecosystem as a producer. On these producer some fishes are depends as well some zooplanktons also depends. So it plays very vital role in ecosystem. In river there are large numbers of phytoplankton, whose growth are depends on the temperature, pH and phosphate, Nitrate content in that River.

The Diversity and seasonal fluctuation of phytoplankton is observed at Moshi, during one year study period (2016-17). The similar work is also carried by different researcher like Deorari; B.P.(1993), Unni KS(1993), Trivedy(1984), Benndoni J(1982), Eldrige EF(1943), Pillai M.K.(1986), Kant S(1977), Nandan SN(2005), Kamath C(2006), Gupta S.(2009), Adesau(2008), Shekharetal Kaparapu J.(2013), Ingole and Kadam(2010), from different fresh water bodies of India.

Material and Methods

Study Area

River Indrayani is one of the major rivers in Maharashtra state which originated from village Kurvande near Lonavala, Pune, which further meets to Bhima River. The Moshi is located at the bank of Indrayani River. Most of the population in Moshi is dependent upon river Indrayani for irrigation as well as Moshi is recently developed so some Industrial zone are also in Moshi. The river Indrayani passes from Dehu to Alandi and at the middle zone of that is Moshi. The area of phytoplankton diversity study at Moshi is about 6 km. 'Site A' was fixed at near the river residency it is banadory of Chikhali-Moshi, 'Site B' near the Moshi Ghat, 'Site C' near the Ostia project.

Water of Indrayani is used for irrigation and also some fisherman catches the fishes from bank of Indrayani at Moshi. Present work has been done on three sampling sites of Indrayani Rivers at Moshi, for the estimation of winter, summer & rainy seasons remained more or less constant through the year.

Method of Collection of Sample

The present investigation was carried out for a period of one year from June to September 2017. For the biological studies sample was collected from the Indrayani River and it was fixed in 5% formalin for sedimentation. This sediment sample was observed under microscope for algal composition and diagram was drawn. The phytoplankton was identified from standard literature like Edmondion(1959), Needham and Needham(1962) were used.

Observations

Table-01:- Diversity of phytoplanktonic group of Indrayani River

Chlorophyceae	Cyanophyceae	Bascillarophyceae	Euglenophyceae
Chlorella spp	*Anabaena spp.*	*Diatoma spp.*	*Euglena ascus*
Chlamydomonas	*Microcystis spp.*	*Diatoma vulgare*	
Closterium spp.	*Oscillatoria spp.*	*Frustulia spp.*	
Oedogonium spp.	*Rivularia spp.*	*Fragilaria spp.*	
Chlorella valgaris		*B. moniliforme*	

Scenedesmus spp.	*Navicula spp.*
Spirogyra spp.	*Navicula americana*
Tetraspora spp.	
Ulothrix zonata	
Volvox spp.	
Zygnena spp.	

Table-02:- Seasonal Variation (%) of Phytoplankton in the fresh water of Indrayani River

Season	Chlorophyceae	Cyanophyceae	Bascillarophyceae	Euglenophyceae
Winter	60	76	102	12
Summer	143	23	314	24
Rainy	35	145	31	06
Total	238	244	447	42
Percentage	24.51%	25.12%	46.03%	4.32%

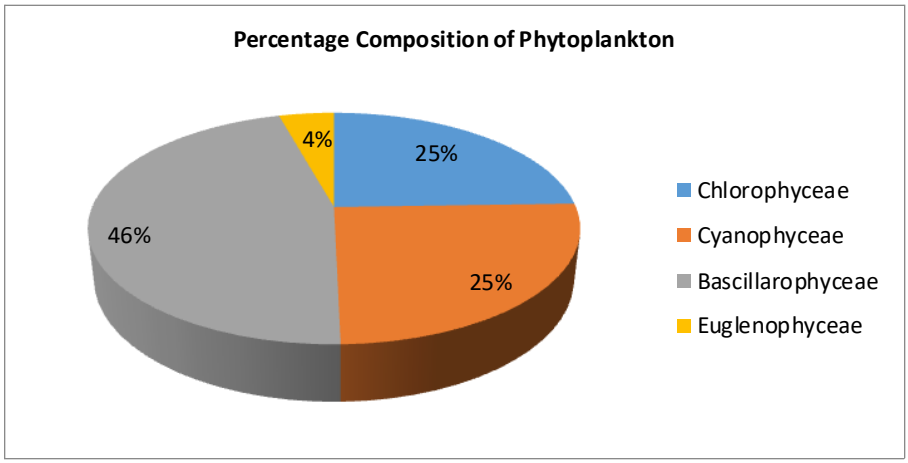

Figure-01:- Percentage Composition of Phytoplankton in the fresh water of Indrayani River

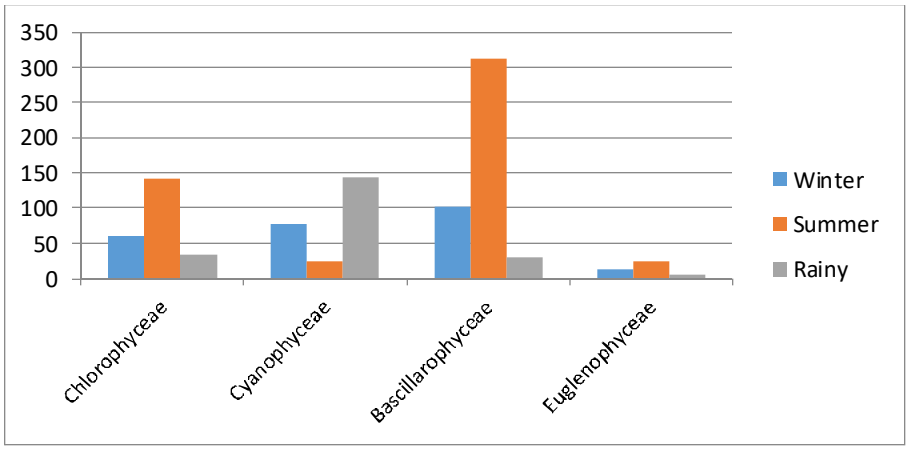

Figure-02:- Seasonal Fluctuation of Phytoplankton in the fresh water of Indrayani River

Result and Discussion –

The population of phytoplankton in Indrayani River at Moshi recorded four major groups' viz. Chlorophyceae, Bacillariophyceae, Cyanophyceae and Euglenophyceae. From the present work showed that the population of phytoplankton and analysis of diversity interrupted that **Chlorophyceae 11 species**, **Bacillariophyceae 07 species**, **Cyanophyceae 04 species**, **Euglenophyceae 01 species**. The diversity of phytoplankton groups are shown in table No-1 and seasonal variation of phytoplanktonic species shown in table No-2. In

the present investigation, the production rate of phytoplankton is high during summer season and low in winter and rainy season.

Maximum density of phytoplankton was recorded at site A and site B than site C. Because at site A the domestic and Industrial work water added and also site B include domestic water added in Indrayani River.

In given four class of phytoplankton Chlorophyceae species are abundant than other species. Thus, qualitatively Chlorophyceae formed the largest group and was followed by other group. The entire phytoplankton group was recorded throughout the year.

In the given study it is observed that during summer season, Bacillariophyceae, Chlorophyceae and Euglenophyceae were most abundant than rainy season. Bhatnaga G.P.(1988) also recorded the effective seasonal changes on phytoplankton population and also suggest that due to physio-chemical condition like temperature, CO^2, O^2, transparency of water. Van Den Hoek et.al.(1995) reported that higher Chlorophyceae are a large and important group of fresh water algae. The Chlorophyceae group is most dominant group of phytoplankton.

Conclusion –

From the given study it is concluded that the phytoplankton community is recorded in 4 classes and 23 species. The density of phytoplankton is abundant in summer season than winter and rainy seasons.

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