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Plankton Diversity Of Chirag Shah Darga Lake District Hingoli, Maharashtra, India

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Abstract:
The present paper deals with the plankton diversity of Chirag Shah Darga lake Diatrict Hingoli, Maharashtra during the study period of January 2021 to December 2022 The phytoplankton represented by chlorophyceae, bascillariophyceae, cyanophyceae was also found zooplanktons like rotifers, cladocerans, copepods and ostracods. While high numbers of phytoplankton and zooplankton diversity were found from Chirag Shah Darga lake, District Hinholi.

Keywords: Plankton diversity, Chirag Shah Darga Lake, Phytoplankton, Zooplanktons.

Introduction:

The word "plankton" comes from the Greek word means "Wandering." Victor Hensen (1887) coined the term "plankton" to describe the aquatic populations of drifting and floating animals that are predominantly propelled by water currents rather than by their own swimming prowess. Plankton included Animal and plant-based creatures are in that category. Phytoplankton refers to the plant portion i.e. plankton, while zooplankton refers to the animal portion. Saproplankton also third class of organisms known as is capable of absorbing dissolved organic materials. The families Chlorophyceae, Cyanophyceae, and Bacillariophyceae include the bulk of phytoplankton. It plays a crucial role in the food chain due to their special capacity to fix inorganic carbon it also increases organic matter through primary production. Singh & Sharma, 2012 frequent studies on the phytoplankton in freshwater lakes with respect to light availability.

Materials and Methods:

Study Area:

Plankton diversity of studied in Chirag Shah Darga lake in District Hingoli during study period from Jun 2021 to December 2022, it situated at 190 34’40N and 770 06’10E. Monthly samples were taken from the site. Phytoplankton were collected by Van-Dorn sampler and counted by using Sedgwick-Rafter(S-R) cell. Identification was made by APHA and IAAB-1998 Jhingarn at et. 1989.

Plankton Sampling and Preservation:

Sampling was made between 8.00 am to 10.00 am. 50 L of water will be filtered through plankton net of bolting silk No.25. Add few drops of 4% formalin sample will enumerated by Sedgwick - Rafter Cell method (APHA, 1991).. Identification of zooplankton will done under microscope using keys and monographs of and rotifers ,copepods, cladocerans and ostracods each sample was

taken into account and results were expressed in number of organisms / Lit.

Result and Dissection:

The phytoplankton population was represented by the Chlorophyceae, Bascillariophyceae, Cyanophyceae, and Euglenophyceae in theTable 1. Chlorophyceae group was represented by species of *Chlorella vulgaris*, *Chlanydomonas* sp., *Chadophora fracta*, *Closterium* sp., *Helimeda* sp., *Spirogyra condensata*. It was the most significant contributing about 23% of the total annual production. Chlorophyceae exhibited maximum density during April and may inhibiting maximum population during summer and minimum during winter shown in Figure 1. Bascillariophyceae also an important group of phytoplankton encountered having a contribution of 38% of the total annual production. It maximum value was noted in the months April (Table. 1) during summer season. However its maximum density was noticed during summer season. The group was represented by speices as *Bascillario*, *Diatoms*, *vragillaria*, *Navicula viridula* , *Nitzschia angustata* and *Synedra*. Cyanophycease was also an important group having contribution of 15% to the annual production exhibited the highest density during the month of April and may. Maximum density during summer and minimum during rainy season were found and represented by *Anabaena* fertilissima, *Anacystic*, *Merismopedia punctata* , *Microcystis aeruginosa* , *Nostoc*, *Oscillatoria clorina* , *Phormidium uncinatum* . Euglenophyceae It contributes 24% of the total phytoplankton production and was represented by Euglena sp. Seasonal variation of phytoplankton along with temperature changes. May be due to oxygen and CO2 variations along with other chemical characteristic of water. The group was represented by speices *Euglena acus*, *Euglena viridis*. Phytoplankton density (No. of org/Lit) of Chirag Shah Darga lake June 2021 to May 2022 represented in Figure 1.Tripathy et.al., have reported that besides oxygen and CO2 variations and physico-chemical characteristic like temp. Ph, chloride Alkalinity calcium magnesium, nitrates and sulphates in different seasons which affects growth of diatoms species, several another have been emphasized the importance of water temperature in the periodicity of blue green algae (Chakraborty, R.D. et.al., 1977: George, J.P., 1970: Pandey and Das 1994: Reynolds, C.S. et. al., 1981).

Table 1: Checklist of Phytoplankton from Chirag Shah Darga lake 2021 to May 2022.

	Phytoplankton species	
1	Chlorophyceae	*Chlorella vulgaris* *Chlanydomonas sp.* *Chadophora fracta* *Closterium sp.* *Helimeda sp.* *Spirogyra condensata*
2	Bascillariophyceae	*Bascillario* *Diatoms* *Vragillaria* *Navicula viridula* *Nitzschia angustata* *Synedra ulna*
3	Cyanophycease	*Anabaena fertilissima* *Anacystic sp.* *Merismopedia punctata* *Microcystis aeruginosa*

		Nostoc sp. *Oscillatoria clorina* *Oscillatoria limosa* *Phormidium uncinatum*
4	Euglenophyceae	*Euglena acus*

Table 2. Monthly variation of Phytoplankton (No./Lit) from Chirag Shah Darga lake Jun2021 to May 2022.

Months Phytoplankton	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Total
Chlorophyceae	65	137	25	30	65	221	45	165	25	25	920	650	2373
Bacillariophyceae	25	300	70	35	280	302	210	55	515	390	977	700	3859
Cyanophyceae	15	99	25	21	190	150	125	117	165	140	209	255	1511
Euglenophyceae	221	67	35	30	25	85	198	300	310	350	410	455	2486
Total	326	603	155	116	560	758	578	637	1015	905	2516	2060	10229

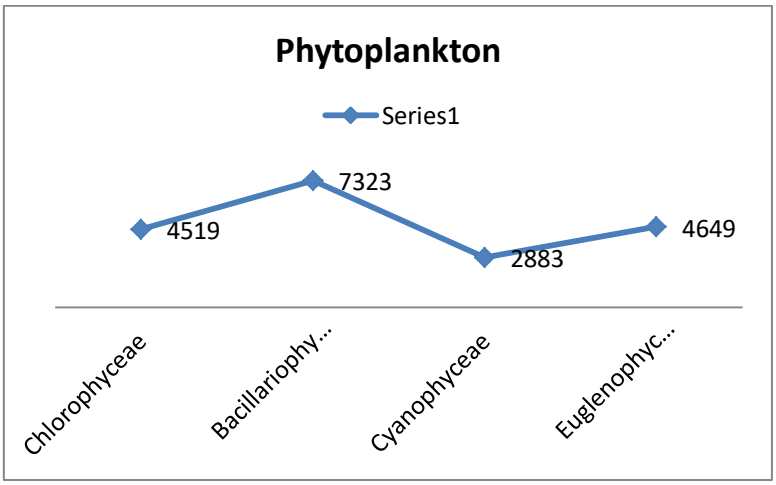

Figure 1. Phytoplankton density (No. of org/Lit) of Chirag Shah Darga lake June 2021 to May 2022.

Zooplankton Diversity:

Zooplankton numbers and diversity in the Chirag Shah Darga lake shown in the Table 3. 09 species were species of rotifers present with there, 07 species of cladocera and there species of 04 copepods. 02 Ostracoda species found in Chirag Shah Darga lake . Total zooplankton number ranged from 284 to 350 individual L-1.t the zooplankton principally; rotifer > cladocera > copepod>ostracoda. Zooplankton drastically produced in the month of May. Rotifers tremendous increase during the month of May. Cladocerans number of was high in the month of May and low in June. Copepods decreased remarkably in the month September and high in March. Ostracoda density high in June and aw in January shown in Table 4. Zooplankton density (No. of org/Lit) of Chirag Shah Darga lake June 2021 to May 2022 represented in Figure 2. Rotifers (28.94%) population, copepods (25.42%), cladocerans (18.52%), ostracods (16.84%) and protozoan

(10.26%) respectively in two diverse pond of North Bihar Manzer et al., (2005) has found. Temperature, transparency, turbidity, conductivity, tranceparancy , dissolved oxygen ,COD etc plays an important to regulate diversity and seasonal population density of the zooplankton by Patil, 2011.

Table 3: Checklist of Zooplankton from Chirag Shah Darga lake June 2021 to May 2022.

Rotifera	**Cladocera**	**Copepoda**	**Ostracoda**
Philodina gregaria	*Bosminopsislongirostrisb*	*Mesocyclops leuckarti*	*Heterocyprisincongruens*
Branchionusrubens	*Ceriodaphnia quadrangular*	*Macrocyclops albidus*	*Eucypris virens*
Lecanecurvicorni	*Ceriodaphnia laticaudata*	*Tropocyclopsprasinus*	
Trichocercapusilla	*Indiolonagnapat*	*Cyclops strenuus*	
Branchionusurceolari	*Chydorussphaericus*		
Branchionus forficula	*Kurzialatissima*		
Branchionuscaudatus	Nicsmirnoviuseximius		
Branchionusurceolari			
Keratellaprocurva			

Table 4. Monthly variation of Phytoplankton (No./Lit) from Chirag Shah Darga lake June 2021 to May 2022.

Months / Zooplankton	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Total 2021
Rotifer	390	345	286	255	240	205	210	380	412	415	440	450	4028
Cladocera	199	210	240	260	265	275	260	302	310	325	350	380	3376
Copepoda	238	190	215	165	170	160	175	210	250	290	264	290	2617
Ostracoda	280	200	170	160	165	170	120	150	265	235	200	230	2345
Total	1107	945	911	840	840	810	765	1042	1237	1265	1254	1350	12366

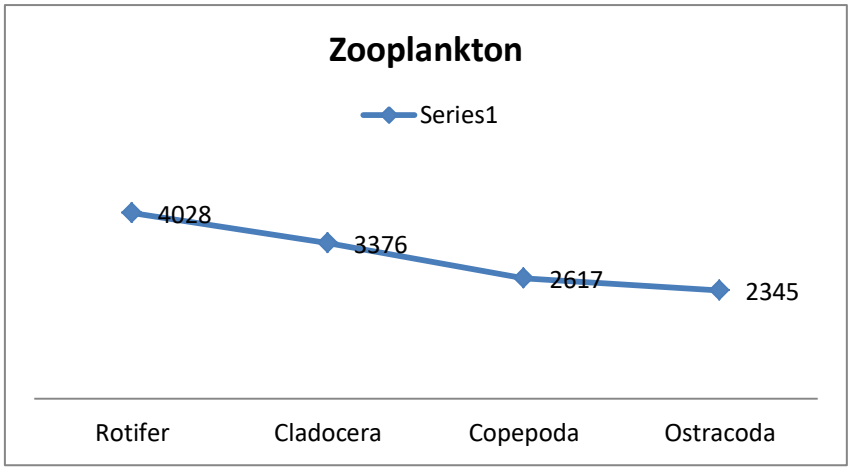

Figure 2. Zooplankton density (No. of org/Lit) of Chirag Shah Darga lake June 2021 to May 2022.

Conclusion:

Total 21 numbers of phytoplankton are found in of Chirag Shah Darga lake June 2021 to May 2022. The total 22 genera of zooplankton are found in Siddheshwar reservoir during two year of June 2021 to

May 2022. The diversity of zooplankton in Siddheshwar reservoir followed a sequence as: Rotifera>Copepoda>Cladocera > ostracoda.

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