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Eco-Diversity of Algal Species of Shirpur Dist. Dhule (M.S.)

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Abstract:
Algae are photosynthetic, thalloid group of plants. They are ubiquitous in habitat i.e. they found in all the possible habitat. A great majority of them are truly aquatic and grows in ponds, lakes, puddles, etc. Besides occurring in aquatic habitats, algae are found abundantly on tree, trunks rocks and in association with other plants and animals (Gupta, 2014). Algal communities' chiefly cyanobacteria (Blue-Green Algae), green algae, diatoms, and Euglenoids which play key roles in soil fertility, nitrogen cycling, and crop productivity. Present study focuses on the eco-diversity of algal species of Shirpur tehsil of Dhule district. The present work was carried out from September-2024 to February 2025. The collection of algae from the different 04 locations such as Karvand dam, Aruanwati dam (Sangavi), Boradi, and Samryapada has been taken place.

Keywords: Algae, eco-diversity, biodiversity, Shirpur.

Introduction:

Khandesh region is comprises three districts viz., Jalgaon, Dhule and Nandurbar. Several water reservoirs like rivers, dams, nalas, lakes, ponds, streams, ditches are available which are collection stations, as the diatoms are cosmopolitan in habitat (Mahajan, 2022). Algae are the photosynthetic, thalloid, aquatic group of plants. Algae have ubiquitous nature i.e. they grow in almost all possible habitat.

Algae are playing a vital role in this world, and they are the predominant primary producer in any aquatic ecosystem. Algae are ecologically significant because they engage in symbiotic relationships with bacteria across various ecosystems. It supplies food and oxygen for many species in the aquatic environment, and it's vitally crucial to maintain CO_2 of the carbon cycle via photosynthesis to balance the CO_2 concentration in the atmosphere. (Ramaraj, 2010). Cyanobacteria are a large and morphologically diverse group, which can survive in all kinds of water, with some species living in freshwater while others thrive in brackish water or the marine environment (Malakar, 2012)

Rising temperatures have dramatic impacts on algae, with rice-field cyanobacteria showing optimal growth up to 25°C, with increases of 60% in growth and 54% in protein content. However, further temperature increases to 45°C result in a 20% decline in growth parameters. This temperature sensitivity

makes algae particularly vulnerable to climate warming. (Nasreen Amin, 2024). Algal communities' chiefly cyanobacteria (Blue-Green Algae), green algae, diatoms, and euglenoids which play key roles in soil fertility, nitrogen cycling, and crop productivity. However, ongoing climate change introduces faster temperature shifts, increased droughts, erratic monsoons, and more frequent algal blooms, presenting both opportunities and challenges for algal diversity. (Natarajan, 2024)

Material and Methodology:

The present work was carried out from September-2024 to February 2025. The collection of algae from the different 04 locations of Shirpur tehsil were carried out. For these locations like Karvand dam, Aruanwati dam (Sangavi), Boradi, and Samryapada area were selected. Collection of algal samples were taken twice in a month.

The algal samples were collected in bottles. The collected samples were then brought to laboratory for further investigation. The samples were stored in 4% formaldehyde in plastic bottles. Identification the algal species were done using various monographs & relevant literature. Monographs like Cyanophyta by Dr. T. V. Desikachary. (1959), Zygnemaceae by Dr. M. S. Randhawa (1959) were used.

Results and Conclusion

The present work shows that Shirpur tehsil is the region of Khandesh belongs to Dhule district. During present study a total of 12 samples were collected in six months i.e. from September 2024 to February 2025. Algal forms belonged to Chlorophyceae, Bacillariophyceae, Euglenophyceae and Cyanophyceae were observed, identified and recorded as per Desikachary (1959) and Randhawa (1959).

Total 33 taxa of algae under 43 genera were isolated and reported from the localities of Shirpur tehsil and surrounding area, of these 14 taxa under 18 genera belonged to Chlorophyceae, 7 taxa under 7 genera belonged to Bacillariophyceae, and 2 taxa under 2 genera belonged to Euglenophyceae and 10 taxa under 16 genera belonging to Cyanophyceae (Table.1).

Table 1: Total number of algal taxa and genera from the locality of Shirpur tehsil and surrounding area

Sr.No.	Class	Taxa	Genera
1.	Chlorophyceae	14	18
2.	Bacillariophyceae	7	7
3.	Euglenophyceae	2	2
4.	Cyanophyceae	10	16
	Total	**33**	**43**

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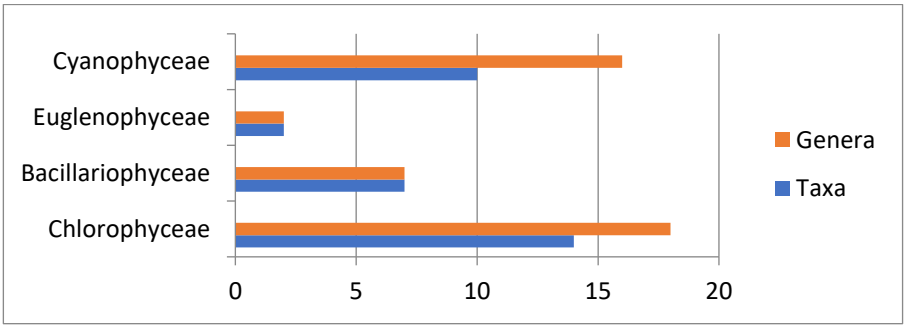

Fig 1: Graphical Presentation on Classes of Algae found

Table 2: Algae found at various sites of the city

Sr. No.	Name of the Algae	Class	Site -I	Site - II	Site - III	Site - IV
1.	*Ankistrodesmus falcatus*	Chlo.	+	++		+
2.	*Characium nasutum* Rabenh	Chlo	+		+	+
3.	*Chlamydomonas polypyrenoideum*	Chlo	++	+		+
4.	*Chlorella vulgaris*	Chlo	+	+		
5.	*Chlorococcum humicola*	Chlo		++		+
6.	*Chlorococcum infusionum*	Chlo			++	
7.	*Cladophora glamerata* (L.) Kueitz	Chlo	+		+	+
8.	*Dictyosphaerium ehrenbergianum* Naeig	Chlo		+	+	
9.	*Eudorina elegans* Ehrenberg	Chlo	++	+		+
10.	*Pandorina morum* (Muell.) Bory	Chlo	+		+	
11.	*Pithophora mooreana* Collins	Chlo				+
12.	*Scenedesmus arcuatus* (Lemm.) Lemm	Chlo	+		+	
13.	*Scenedesmus bijuga*	Chlo	+			+
14.	*Scenedesmus quadricauda*	Chlo		+		
15.	*Selenastrum bibraianum* Reinsch	Chlo			+	
16.	*Spirogyra affinis*	Chlo	++	+	+++	+
17.	*Spirogyra crassa* Kuetz	Chlo	++	+	++	+
18.	*Zygnema insigne* (Hass.) Kuetzing	Chlo		+		
19.	*Cyclotella meneghiniana* Kuetz	Bacillario.			+	+
20.	*Pinnularia viridis*	Bacillario.	+			
21.	*Synedra ulna*	Bacillario.		++		+
22.	*Navicula viridula*	Bacillario.			+	
23.	*Nitzschia palea*	Bacillario.	++			
24.	*Fragilaria virescens* Ralfs	Bacillario.	+			+

25.	*Cymbella tumida*	Bacillario.		+		
26.	*Euglena minuta*	Eugleno.	+		+	
27.	*Phacus ranula*	Eugleno.		+		
28.	*Anabaena constricta*	Cyano.	++		+	
29.	*Anabaena fertilissima*	Cyano.		+		
30.	*Aphanocapsa delicatissima* West & West	Cyano.	+		+	
31.	*Chroococcus turgidus (Kuetz)* Nageli	Cyano.		++		+
32.	*Gomphosphaeria aponina* Kuetzing	Cyano.	+			
33.	*Lyngbya hieronymusii*	Cyano.	+		++	+
34.	*Merismopedia glauca (Ehrenb.)* Naegeli	Cyano.		+		
35.	*Microcystis aeruginosa*	Cyano.	++		+	
36.	*Microcystis incerta* Lemmermann	Cyano.		+		
37.	*Nostoc linckia*	Cyano.	++	+	++	+
38.	*Nostoc muscorum*	Cyano.		+		
39.	*Oscillatoria angustissima*	Cyano.	+		++	
40.	*Oscillatoria Formosa*	Cyano.		+		
41.	*Oscillatoria subbrevis*	Cyano.	+			
42.	*Phormidium fragile*	Cyano.		++		
43.	*Phormidium tenue*	Cyano.			+	

Conclusion

The present studies concluded that, the members of **Chlorophyceae** represented by **14 Taxa** with **18 genera** among the 14 taxa *Scenedesmus* represented with 3 species. **Bacillariophyceae** represented by **7 Taxa** with **7 genera**. **Euglenophyceae** represented by **2 Taxa** with **2 genera**. **Cyanophyceae** represented by **10 Taxa** with **16 genera** of which *Oscillatoria* represented with 3 species**.** Thus, the members of **Chlorophyceae** are dominant in the water bodies of Shirpur tehsil.

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