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Assessment of Fresh Water Algal Diversity of Jawhar, Dist-palghar (M.S), India

Vikrant Ravindra Chandanshive*[1], and Pravin Bhagwat Cholke[2]

*[*1] **Department of Botany, ACS Jawhar College, Palghar 401603, M.S., India***
*[2] **PDEA's P.B, Anantrao Pawar College, Pirangut, Pune 412 115, M.S., India***

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ABSTRACT

Documentation and identification of algal diversity is one of the aspects for attestation of the algal diversity of a particular area. During the present study of water bodies, total 32 genera belong to five classes were recorded viz. *Chlorophyceae*, *Cyanophyceae*, *Desmidophyceae*, *Bacillariophyceae and Euglenophyceae*. The inland algae are highly diverse according to geology and geo-climatic factors. Algae are the key organisms in the water pollution indication, aquatic food chain and play a vital role in the release of oxygen. They can tolerate any environmental stress conditions. The alga is habitat-specific and its presence depends upon the season variation. This article explains the inventorization and enlists the presence of algae, which was found in different running water and stagnant water bodies like Dams, streams, ponds, and lakes, etc. The present preliminary study carried out for the promise of algal species. The study area was unexplored by anyone for the assessment of algal diversity.

***Key words**: Jawhar Algal, Jay sagar Dam, Khadhad Dam, Pada's (ponds), Wagh River*

Introduction

Jawhar Talukha is a part of Western Ghats. It's 140 Km and 80 km away metropolis likes Mumbai and Nashik. Its elevation is about 447 meters and co-ordinates are N 19 ^{0}54'46'' E 73^{0}13'51''. Geographically the climate is highly versatile. In the monsoon season, July has high Precipitation (1394mm) whereas the April & May season has high temperature (33.7 degrees Celsius). By virtue of its bio-geographical location, it has plenty of rainfall and hence having many water bodies' likes running and stagnant. The prominent water bodies of the area as Wagh River, Khadkhad Dam, Jai Sagar Dam etc. Now a day's due to urbanization and industrialization the area has become polluted and posing threat to the existing diversity including algae. There are enormous applications of use of algae like, biofuel, protein source and algal Nanoparticles synthesis **(ANPS)**. Hence Documentation of exhibiting algal forms of various water bodies is almost important. This baseline data can be used in future to check the threat, caused by urbanization to exhibiting algal diversity.

Materials and Methods

The algal samples were collected from 05 different locations of Jawhar tahasil of Palghar district and are as Wagh River, Khadhad Dam and Jai sagar Dam, Kapricha pada, Sunrise nagar twice a month. The present investigation was carried out from April - 2020 to December-2020.

The macro-algae were collected with the help of forceps whereas micro-algae by using planktonic net. The algal samples were collected in plastic

Details of different water bodies areas as (Table No.1)

Sr. No	Name of water body	Location	Type	Away from Jawhar
1	Wagh River	Jawhar	Running	21 km
2	Khadhad Dam	Jawhar	Stagnant	11 km
3	Jay sagar Dam	Jawhar	Stagnant	04 km

bottles and stored using 4 % of formaldehyde and capped. The algae were identified with help of algal monographs such as *cyanophyta* by Desikachari (1959) and other various available sources.

Results and Discussion

The observation shows that the Jawhar place is highly diverse with the geo-climatic region. The algal biodiversity of Jawhar exhibit **32** genera belong to five classes. The class *Chlorophyceae* Shows **12** spe-

Table 2.

Class	Habitat	Date of collection	
1.***Chlorophyceae***			
a.	*Chlamydomonas polypyrenoideum Prescott*	Jay sagar Dam	22/05/2020
b.	*Characium nasutum Rabenh*	Jay sagar Dam	22/05/2020
c.	*Dictyosphaerium ehrenbergianum Naeig*	Kapricha pada	01/06/2020
d.	*Selenastrum bibraianum reinsch*	Sunrise nagar	03/06/2020
e.	*Zygnema insigne (Hass.) Kuetzing*	Sunrise nagar	03/06/2020
f.	*Spirogyra crassa Kuetz*	Wagh river	11/09/2020
g.	*Ulothrix zonata*	Sunrise nagar	03/06/2020
h.	*Cladophora glamerata (L.)Kueitz*	Khadhad Dam	18/07/2020
i.	*Scenedesmus arcuatus*(Lemm.) Lemm	Sunrise nagar	03/06/2020
j.	*Pandorina morum (Muell.) Bory*	Jay sagar Dam	03/06/2020
k.	*Pithophora mooreana Collins*	Wagh river	01/08/2020
l.	*Eudorina elegans Ehrenberg*	Sunrise nagar	03/06/2020
2.***Cyanophyceae***			
a.	*Chroococcus turgidus (Kuetz) Nageli*	Sunrise nagar	03/06/2020
b.	*Aphanocapsa delicatissima West & West*	Kapricha pada	01/06/2020
c.	*Microcystis incerta Lemmermann*	Jay sagar Dam	22/08/2020
d.	*Merismopedia glauca(Ehrenb.) Naegeli*	Sunrise nagar	03/06/2020
e.	*Oscillatoria tenuis Ag, ex Gomont*	Kapricha pada	18/07/2020
f.	*Gomphosphaeria aponina Kuetzing*	Jay sagar Dam	22/04/2020
g.	*Aphanothece microscopic Naegeli*	Wagh river	01/12/2020
h.	*Anabaena constricta (Szafer) Geitler*	Kapricha pada	01/05/2020
i.	*Lyngbya aesturji leibman ex gomont*	Wagh river	19/12/2020
3.***Desmidophyceae***			
a.	*Closterium moniliferum (Bory) Her*	Khadhad Dam	18/07/2020
b.	*Cosmarium sexnotatum*	Wagh river	01/12/2020
4.***Bacillariphyceae***			
a.	*Cyclotella meneghiniana Kuetz*	Jay sagar Dam	22/04/2020
b.	*Pinnularia viridis*	Jay sagar Dam	22/04/2020
c.	*Synedra ulna (Nitz.) Ehr.*	Wagh river	01/12/2020
d.	*Navicula viridula v. capitata*	Wagh river	15/12/2020
e.	*Nitzschia palea (Kuetz) W. Smith*	Kapricha pada	01/05/2020
f.	*Fragilaria virescens Ralfs*	Kapricha pada	18/07/2020
g.	*Cymbella tumida*	Kapricha pada	01/05/2020
5.***Euglenophyceae***			
a.	*Euglena minuta Prescott*	Wagh river	01/12/2020
b.	*Phacus ranula Pochmann*	Wagh river	01/12/2020

cies, *Cyanophyceae* shows **09** species, *Desmidophyceae* shows **02** species, *Bacillariophyceae* shows **07** species and class *Euglenophyceae* shows two species. It was also observed that the monsoon season has moderate diversity where as summer and post-monsoon is more diverse. Basically some members of *Desmidophyceae, Bacillariophyceae* and *Euglenophyceae* are observed in stagnant water bodies or in polluted water (Eutrophication). It is also confirmed that the diversity of Jay Sagar Dam and Khadhad Dam has

Some Photographs of the represented Forms

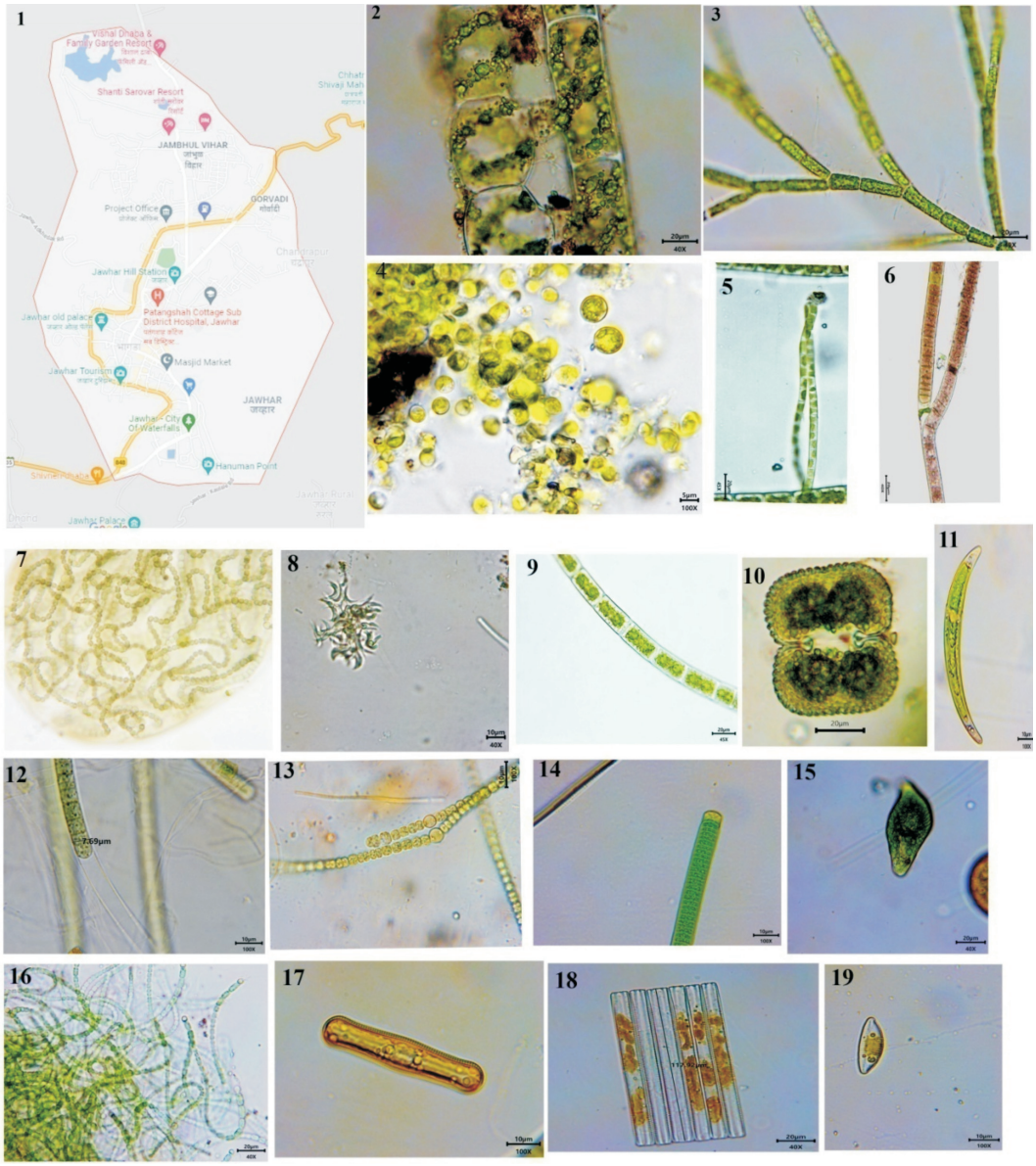

PLATE NO. 1

Fig. 1. No. 1: Jawhar, 2. *Spirogyra crassa Kuetz*, 3. *Chaetophora elegan* (Roth) *C. Aardh*; 4. *Chorella vulgeris Beijerinck*, 5. *Klebsormidium flaccidum*; 6. *Scytonema coactile montagne* ex Born et Flah; 7. *Nostoc corneum* Ag ex Born et Flah; 8. *Selenastrum bibraianum* reinsch; 9. *Zygnema insigne* (Hass.) Kuetzing; 10. *Cosmarium sexnotatum*; 11. *Closterium monififerum* (Bory) Her; 12. *Lyndbya aesturji* leibman ex gomont; 13. *Anabaena constricta* (Szafer) Geitler; 14. *Oscillatoria tenuis* Ag, ex Gomont; 15. *Euglena minuta* Prescott; 16. *Cylindrospermum* sp; 17. *Synedraulna* (Nitz.) Ehr; 18. *Fragilaria virescens Ralfs;* 19. *Cymbella tumida.*

Table 3.

Class	Species	Jay Sagar Dam Monsoon Pre/post	Wagh river Monsoon Pre/post	Khadhad Dam Monsoon Pre/post
Chlorophyceae	*Chlamydomonas polypyrenoideum* Prescott	+++		+
	Chorella vulgaris Beijerinck		++	
	Dictyosphaerium ehrenbergianum Naeig	+		++
	Selenastrum bibraianum reinsch	++	++	++
	Zygnema insigne (Hass.) Kuetzing	+		
	Spirogyra crassa Kuetz			++
	Ulothrix zonata	+++		
	Chaetophora elegan (Roth) C.Aardh.	++		
	Scenedesmus arcuatus(Lemm.) Lemm			+
	Pandorina morum (Muell.) Bory	+		
	Klebsormidium flaccidum	+		
	Eudorina elegans Ehrenberg	+++		++
Cyanophyceae	*Nostoc corneum* Ag ex Born et Flah			+
	Aphanocapsa delicatissima West & West	+++		+
	Scytonema coactile montagne ex Born et Flah	+		
	Merismopedia glauca (Ehrenb.) Naegeli	+		
	Oscillatoria tenuis Ag, ex Gomont	+		
	Gomphosphaeria aponina Kuetzing			+
	Aphanothece microscopic Naegeli			+++
	Anabaena constricta (Szafer) Geitler	++	+	+
	Lyngbya aesturji leibman ex gomont			
Desmidophyceae	*Closterium moniliferum* (Bory) Her	++	+	+
	Cosmarium sexnotatum	+	+	
Bacillariphyceae	*Cyclotella meneghiniana* Kuetz			+
	Pinnularia viridis	++	+++	
	Synedra ulna (Nitz.) Ehr.	+		+
	Navicula viridula v. capitata			
	Nitzschia palea (Kuetz) W. Smith	+		+
	Fragilaria virescens Ralfs	+		++
	Cymbella tumida		+	
Euglenophyceae	*Euglena minuta* Prescott	+	+	
	Phacus ranula Pochmann			+

+ + += more frequency, + + = moderate frequency, += less frequency.

more diversity of class *Chlorophyceae and Cyanophyceae were as class Euglenophyceae, Desmidophyceae was* less diverse. The occurrence of rich algal flora indicates the place has high levels of nutrients present. The presence of algae like *spirogyra spp* and *Anabaena spp* in excess *amount* indicate poor diversity of community in the represented regions. The population of the *Chlorella spp* was very low throughout the year except rainy seasons and *Chroococcus spp* show less frequency in rainy seasons. The Cyanobacterial bloom present in Dam or River (fresh water ecosystem) that releases the compounds like heptotoxins and neurotoxins. Such water taken in diet regularly the compound produces adverse effect to human health. So it is imperative to do surveys of different regions. (See table number 2)

Conclusion

According to seasonal variation the algal diversity of Jawhar is highly variable with geo-climatic regions. The comparative analysis in between post monsoon and pre-monsoon season indicates the post monsoon is highly diverse with the dominance of class *Chlorophyceae, Cyanophyceae* and *Bacillariphyceae*. So it is necessary to enlist the inland algal diversity before they disappears. We further investigate the parameter like diatom index for river water, dam water pollutions, understanding its drinking portability. (Plate No. 1).

The following algal species were encountered during the surveys (Table 2).

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