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RESEARCH ARTICLE

ALGAL DIVERSITY OF OSMANIA UNIVERSITY CAMPUS, HYDERABAD, TELANGANA, INDIA

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ABSTRACT

A survey of the algal flora of the Osmania University campus revealed that it was rich. The total number of algal genera recorded were 68, out of which 32 genera belonged to Chlorophyceae; 19 to Cyanophyceae; 13 to Bacillariophyceae; 3 to Euglenophyceae; 2 to Charophyceae and 1 to Dinophyceae. It was very interesting to note that on *Cladophora*; *Oedogonium*, *Characium* & *Stichosiphon* were epiphytic. However highest number of genera were represented by Chlorophyceae. Epiphytic algae were present on unbranched filamentous *Oedogonium* and on branched filamentous *Cladophora* and *Pithophora*. It was *Gomphonema* and *Achnanthes* are attached to the other algal members by mucilaginous pad at their base.

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INTRODUCTION

Biodiversity generally refers to the variety and variability of life on Earth. One of the most widely used definitions defines it in terms of the variability within species, between species, and between ecosystems. It is a measure of the variety of organisms present in different ecosystems. The richness of biodiversity depends on the climatic conditions and area of the region. Algae form the vital source of energy as primary producers and serves as a direct source of food to the other aquatic plants and animals; they also act as useful tool for the assessment of water quality. The algal growth in a habitat influences the ecosystem. Algae occur in a wide variety of ecosystems. In Telangana State extensive work was carried out on the algal flora of the lakes and ponds of Hyderabad. Zafar (1964) worked on the distribution of unicellular and colonial forms in the fish ponds of Hyderabad. Munawar (1972) worked on the Euglenineae in certain polluted and unpolluted environments. Johnson (2006) worked on the algal flora of Banjara and Nadimi Lakes. Later Johnson (2012) compiled the algal flora of the Lakes of Hyderabad. Skacelova et al, 2013 worked on Biodiversity of fresh water algae and Cyanobacteria on deglaciated northern part of James Ross Island, Antarctica. Shrivastava et al, 2014 worked on Algal Biodiversity in Freshwater Reservoir of Durg. Osmania University, the beacon light of higher education and a centre of

academic excellence, was established in the year 1918, founded by His Exalted Highness Mir Osman Ali Khan, the Seventh Nizam of Hyderabad State. It has the pride of being the seventh oldest university in the country, the third oldest in South India and the oldest in the state of Telangana. It was the first University to impart higher education through Urdu as the medium of instruction, in addition to the other media, particularly English and the vernacular Telugu. The Osmania University is the largest affiliating University in Asia with around 720 affiliated colleges spread over 3 districts of Telangana (Hyderabad, Ranga Reddy and Medak) catering to the educational needs of nearly 3.2 lakh students. It was accredited with a 'FIVE STAR' rating by the NAAC in the year 2001, and reaccredited with the highest grade 'A' in 2008. It has been ranked Seventh by the survey conducted by Week Hansa Research and ranked Fifth by India Today Neilson Survey among the top Indian Universities during the year 2015, Osmania University has been conferred with the coveted status of University with Potential for Excellence (UPE) during 2012. With a sprawling campus on 1600 (6 km²) acres towards the east of the historic city of Hyderabad, Osmania University is a multi – faculty and multi – locational university, offering a comprehensive education system with over 66 academic disciplines and 53 departments spread over eight campuses and eight constituent colleges. This is an ever expanding university right from the day of its inception and ever growing with the growth of ideas, science and technology and other academic disciplines. In the present study, algal

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flora from Arts College, General Library, Botany, Zoology, Physics and Chemistry premises were studied.

MATERIALS AND METHODS

The algal samples were collected with the help of forceps and preserved in 4% formalin. The samples were brought to the laboratory and identified using Smith (1950); Desikachary (1958) etc.

Algae were collected from the following places:

- Botany Department – three sides + Green House.
- Zoology Department – three sides.
- Chemistry Department – four sides.
- Well – near Botany Department.
- Landscape Garden pond.
- Workshop – near Botany Department.
- Arts College – four sides.
- Fountain in front of Arts College and
- General Library.

All the 9 places are located in the Osmania University Campus. The author had the privilege of collecting and preserving these algal samples during the year July 1975 – June 1976 as a student of M.Sc. Botany.

RESULTS AND DISCUSSIONS

The Algal Diversity of Osmania University Campus was rich represented by 5 divisions i.e. Chlorophyta, Euglenophyta, Chrysophyta, Pyrophyta and Cyanophyta; 6 classes and 68 genera as shown in Table 1 and Table 2.

Table 2. List of Various Genera according to Smith (1950) classification – Osmania University Campus, Hyderabad, Telangana

S. No	I. Chlorophyta	II. Euglenophyta	III. Chrysophyta	IV. Pyrophyta	V. Cyanophyta
	Chlorophyceae	Euglenophyceae	Bacillariophyceae	Dinophyceae	Cyanophyceae
1.	<i>Phacotus</i>	<i>Euglena</i>	<i>Melosira</i>	<i>Peridinium</i>	<i>Microcystis</i>
2.	<i>Chlamydomonas</i>	<i>Phacus</i>	<i>Cyclotella</i>		<i>Chroococcus</i>
3.	<i>Pandorina</i>	<i>Trachelomonas</i>	<i>Fragillaria</i>		<i>Gloethece</i>
4.	<i>Volvox</i>		<i>Synedra</i>		<i>Aphanocapsa</i>
5.	<i>Sphaerocystis</i>		<i>Eunotia</i>		<i>Aphanothece</i>
6.	<i>Tetraspora</i>		<i>Achnanthes</i>		<i>Synechocystis</i>
7.	<i>Ulothrix</i>		<i>Navicula sp</i>		<i>Coelosphaerium</i>
8.	<i>Microspora</i>		<i>N. confervoides</i>		<i>Merismopedia</i>
9.	<i>Stigeoclonium</i>		<i>Gyrosigma</i>		<i>Stichosiphon</i>
10.	<i>Chaetophora</i>		<i>Pleurosigma</i>		<i>Phormidium</i>
11.	<i>Trentepohlia</i>		<i>Gomphonema</i>		<i>Lyngbya</i>
12.	<i>Sehizomeris</i>		<i>Cymbella</i>		<i>Microcoleus</i>
13.	<i>Oedogonium</i>		<i>Amphora</i>		<i>Nostoc</i>
14.	<i>Cladophora</i>		<i>Nitzschia sp</i>		<i>Cylindrospermum</i>
15.	<i>Rhizoclonium</i>		<i>N. scalpelliformis</i>		<i>Anabaena</i>
16.	<i>Pithophora</i>				<i>A. saccata</i>
17.	<i>Characium</i>				<i>Scytonema</i>
18.	<i>Pediastrum</i>				<i>Dichothrix</i>
19.	<i>Hydrodictyon</i>				<i>Rivularia</i>
20.	<i>Coeastrum</i>				<i>Gloetrichia.</i>
21.	<i>Chlorella</i>				
22.	<i>Oocystis</i>				
23.	<i>Tetrahaedron</i>				
24.	<i>Scenedesmus</i>				
25.	<i>Mougeotia</i>				
26.	<i>Zygnema</i>				
27.	<i>Spirogyra</i>				
28.	<i>Sirogonium</i>				
29.	<i>Closterium</i>				
30.	<i>Cosmarium</i>				
	Charophyceae				
1.	<i>Chara</i>				
2.	<i>Nitella.</i>				

Table 1. Number of genera of various algal classes from the Osmania University campus, Hyderabad, Telangana District, India

S. No	Class	Number of genera
1.	Chlorophyta	30
	Chlorophyceae	2
2.	Euglenophyta	3
3.	Chrysophyta	13
4.	Pyrophyta	1
5.	Cyanophyta	19
	Cyanophyceae	68
	Total	68

In the Osmania University Campus the algal classes in decreasing number of algal genera were as follows:-

Chloro > *Cyano* > *Bacillario* > *Eugleno* > *Charo* > *Dino*

The algal flora was dominated by Chloro, Cyano & Bacillariophyceae members. Euglenophyceae members were few while the Dinophyceae were rare. The unbranched filamentous of *Oedogonium* were epiphytic on branched filamentous *Cladophora*, *Pithophora* and *Chara*. This was also commonly observed in the freshwaters of United States. *Oedogonium* may be epiphytic on leaves and stems of submerged water plants and upon *Cladophoraceae* or larger species of *Oedogonium*.

In the present survey *Characium* sp. was epiphytic on *Cladophora* in Landscape Garden Pond, Hyderabad. Dixit 1937, observed *Characium ambiguum* epiphytic on *Pithophora* in a pond at Borivali, Bombay during August. Venkataraman 1957, observed *Characium ambiguum* epiphytic on *Oedogonium* sp. in a pond at Banaras.

Table 3. Epiphytic forms – in Osmania University Campus, Hyderabad, Telangana

1.	<i>Oedogonium</i>	Epiphytic -----	<i>Cladophora</i> <i>Pithophora</i> <i>Chara</i>
2.	<i>Characium</i>	Epiphytic -----	<i>Cladophora</i>
3.	<i>Bulbochaete</i>	Epiphytic -----	<i>Zygnema</i>
4.	<i>Achnanthes</i>	Epiphytic -----	<i>Oedogonium</i>
5.	<i>Gomphonema</i>	Epiphytic -----	<i>Cladophora</i> <i>Pithophora</i>
6.	<i>Stichosiphon</i>	Epiphytic -----	<i>Cladophora</i>

Bulbochaete was epiphytic on *Zygnema* in this study. According to Smith 1950, *Bulbochaete* may be epiphytic on submerged water plants and upon *Cladophoraceae* or larger species of *Oedogonium*. The species of *Achnanthes* was epiphytic on *Oedogonium* filamentous Chlorophyceae members in the Osmania University Campus. Similar observations were reported by Smith 1950, in the United States. The frustules of *Gomphonema* were epiphytic on *Cladophora* and *Pithophora* and borne on gelatinous pads. Similar observation was made by Smith 1950. In this survey *Stichosiphon* was epiphytic on *Cladophora*. *Stichosiphon* belongs to Cyanophyceae and family Desmocarpaceae as classified by Smith 1950.

Conclusions

The Osmania University Algal flora was rich dominated by 32 genera belonging to Chlorophyceae and Charophyceae, 19 genera of Cyanophyceae and 13 Bacillariophyceae members. The most dominant epiphytic Alga was *Oedogonium* on *Cladophora* / *Pithophora* / *Chara*.

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