



CHECKLIST OF SUBAERIAL ALGAE FROM KARNATAK COLLEGE CAMPUS, DHARWAD

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Article Received on 21/07/2022

Article Revised on 11/08/2022

Article Accepted on 31/08/2022

ABSTRACT

In present study an attempt was made to document Subaerial Algae from Karnatak College Campus, Dharwad to fill a gap of valid document. In present study a total of 40 taxa belonging to 24 families from 16 different sites of natural and artificial substratum were surveyed. Members of Microcystaceae and Trentepohliaceae were highly distributed in the study area.

KEYWORDS: Subaerial Algae, KCD Campus, Checklist.

INTRODUCTION

Algae are simple photoautotrophic organisms which are mainly aquatic; some of them successfully colonized terrestrial environments, particularly the streptophyten lineage which gave rise to land plants. Among the subaerial forms, Cyanoprokaryotes have been most successful in colonizing terrestrial environments. Till early 19th century there was no specific term as “subaerial algae” which is now accepted after Fritsch (1907) described them as the algae which grow without aquatic environment but on other surfaces. Petersen (1915) for the first time used “aerial” which is equivalent to today’s subaerial algae.

Subaerial algae are terrestrial algae that live on stable exposed surfaces above the soil, they are particularly abundant in areas with humid climates sometimes causes significant economic problems. Some members of Cyanoprokaryotes and Trentepohliales are well known agents of Biodeterioration of man-made constructions; they remain underexplored and relatively unknown.

Subaerial algae studies are available mostly from Europe with very limited research from other continents particularly Asia. The prokaryotic cyanobacteria and the eukaryotic Chlorophyta account for the largest numbers of species currently described. Chlorophyceae and Ulvophyceae, among the Chlorophyta, are monophyletic groups, which includes several widespread genera (*Chlorella*, *Stichococcus*, *Chlorococcum* and Trentepohliales respectively). Other forms include members of Bacillariophyceae, Desmidiaceae and Xanthophyceae, their studies in India are highly limited and underexplored. India being a tropical country,

promises rich diversity of subaerial forms which needs to be seriously considered for future studies.

In this paper, The authors chief aim remains to point out that even such a small area like KCD campus when explored could represent the richness of the Subaerial algal flora in this region. The paper suggests a further need for such work.

MATERIALS AND METHODS

Karnatak College Dharwad is the centenary college in Dharwad and recognised as a heritage value of Karnataka state. The college campus is spread over 55 acres with lush beautiful vegetation, promising noteworthy diversity of subaerial algal populations.

Monsoon surveys were conducted in sixteen areas (Table 1) of KCD campus for the period 2019-22. During the sampling period the relative humidity was found to be in the range of 80-100.

Table 1: Sample Details.

Sample code	Name of the Location sampled	Substratum details	Location
a	Botany Dept	Walls, Ceilings and Wet Bricks	15.451911, 74.996376
b	Thuja tree near Botany Dept	Corticolous	15.451942, 74.997090
c	False Ashoka tree near Botany Dept	Corticolous	15.451298, 74.996606
d	Mahogani tree near Botany Dept	Leaf surface	15.451794, 74.995941
e	Araucaria tree near Botany Dept	Corticolous	15.451794, 74.995941
f	Cycas tree near Botany Dept	Corticolous	15.449353, 74.991559
g	Microbiology Dept	Wet Walls	15.452625, 74.997479
h	Termite mound near Microbiology Dept	Vertical mound surface	15.452740, 74.997283
i	Yoga Dept	Wet walls	15.453620, 74.996725
j	Leaking Concrete Tank near Canteen	Dripping concrete wall	15.452592, 74.997501
k	Abandoned house near Canteen	Wet wall	15.452074, 74.998032
l	Eucalyptus tree near Health centre	Corticolous	15.455178, 74.998498
m	Leaking Concrete Tank near Geography Dept	Dripping concrete wall	15.451766, 74.997842
n	Rain tree near Commerce building	Dripping concrete wall	15.453292, 74.998855
o	College Principal Bungalow	Wet walls	15.453421, 74.998974
p	Corresponding Author's residence	Wet wall	15.453417, 74.996609

Dept: Department

Samples were collected in labelled zipped 6 X 7cm polythene bags. They were immediately transferred to the laboratory and were observed for diacritical morphological characters under Light Microscope. The observed specimens were documented through Zeiss Microscope camera. For future needs some part of the collected specimen were subjected to preservatives and stored in 5ml microtubes. Cyanoprokaryotes and Green Algae samples were preserved in 2% formalin and 2% M3 fixative respectively.

For Morpho-taxonomic enumeration of Cyanoprokaryotes, standard monographs of Desikacharya (1959), Komarek (2013), Komarek *et al.* (2014), Hauer (2022). For Green algae, synopsis of Ettl and Gärtner (1995) were mainly referred.

usually caused by green algae and cyanoprokaryotes. A total of 40 taxa of subaerial algae on the natural and artificial substratum surveyed (Table 2) belonging to the families Synecocaceae (2); Merismopediaceae (1); Microcystaceae (5); Chroococcaceae (1); Chamaesiphonaceae (1); Xenococcaceae (1); Pseudanabenaceae (2); Schizothricaceae (2); Phormidiaceae (2); Oscillatoriaceae (1); Syctonemataceae (3); Rivulariaceae (1); Microchaetaceae (1); Tolypothrichaceae (1); Nostaceae (2); Chlorococcaceae (2); Chlorellaceae (1); Ulothrichaceae (1); Chaetophoraceae (1); Chaetophoraceae (1); Desmidiaceae (1); Mesotaeniaceae (1); Naviculaceae (1) and Trentepohliaceae (5). Members of Microcystaceae and Trentepohliaceae were highly distributed in the study area.

RESULTS AND DISCUSSION

The patches or biofilms that colours the walls in different shades of green, reddish-orange or purple-black are

Table 2: Survey Data.

Sr. No.	Taxa	Family	Sample Code
1	<i>Aphanothece castagnei</i>	Synecocaceae	a
2	<i>Gloeothece rupestris</i>	Synecocaceae	a
3	<i>Aphanocapsa muscicola</i>	Merismopediaceae	a
4	<i>Gloeocapsa atrata</i>	Microcystaceae	a
5	<i>Gloeocapsa punctate</i>	Microcystaceae	a
6	<i>Gloeocapsa rupestris</i>	Microcystaceae	a
7	<i>Gloeocapsa kuetzingiana</i>	Microcystaceae	a
8	<i>Gloeocapsa alpina</i>	Microcystaceae	i
9	<i>Chroococcus cohaerens</i>	Chroococcaceae	a
10	<i>Chamaesiphon</i> sp. cf.	Chamaesiphonaceae	a
11	<i>Chroococciopsis kashayi</i>	Xenococcaceae	g
12	<i>Pseudanabaena amphigranulata</i>	Pseudanabenaceae	i
13	<i>Leptolyngbya valderiana</i>	Pseudanabenaceae	i
14	<i>Schizothrix fragilis</i>	Schizothrixaceae	a

15	<i>Microcoleus vaginatus</i>	Schizothrixaceae	p
16	<i>Phormidium autumnale</i>	Phormidiaceae	p
17	<i>Phormidium hansgirgii</i>	Phormidiaceae	j
18	<i>Blennothrix</i> sp. cf.	Oscillatoriaceae	n
19	<i>Scytonema drilosiphon</i>	Syctonemataceae	a, j, n
20	<i>Scytonema hoffmanni</i>	Syctonemataceae	a, o
21	<i>Brasilonema</i> sp. cf.	Syctonemataceae	a
22	<i>Calothrix bharadwajae</i>	Rivulariaceae	p
23	<i>Microchaete</i> sp. cf.	Microchaetaceae	f
24	<i>Tolypothrix distorta</i>	Tolypothrichaceae	e
25	<i>Cylindrospermum bengalense</i>	Nostaceae	a
26	<i>Nostoc commune</i>	Nostaceae	a
27	<i>Chlorococcum humicola</i>	Chlorococcaceae	k
28	<i>Macrochloris</i> sp.	Chlorococcaceae	h
29	<i>Chlorella minutissima</i>	Chlorellaceae	k
30	<i>Stichococcus minutus</i>	Ulothrichaceae	h
31	<i>Desmococcus olivaceus</i>	Chaetophoraceae	a
32	<i>Cosmarium</i> sp.	Desmidiaceae	a
33	<i>Cylindrocystis</i> sp.	Mesotaeniaceae	a
34	<i>Gyrosigma</i> sp.	Naviculaceae	j
35	<i>Trentepohlia minima</i>	Trentepohliaceae	l
36	<i>Trentepohlia abietina</i>	Trentepohliaceae	l
37	<i>Trentepohlia monilia</i>	Trentepohliaceae	c, a
38	<i>Trentepohlia umbrina</i>	Trentepohliaceae	a
39	<i>Printzina</i> sp.	Trentepohliaceae	i
40	<i>Cephaleuros parasiticus</i>	Trentepohliaceae	d

1. *Scytonema drilosiphon* 2. *Trentepohlia umbrina* 3. *Gloeocapsa punctuata* 4. *Tolypothrix distorta*



Species visible on Natural and Artificial substratum



Rock



Soil



Soil



Pipe



Roof Ceiling



Wall

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