



A preliminary survey on corticolous algae from Gangaraju Madugula forest region, Eastern Ghats of India. Andhra Pradesh.

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Abstract:

Eastern Ghats harbours beautiful tropical forests from lower group to higher group of the plant kingdom. Present communication deals with algae which inhabiting on the barks of the large tree populations. Corticolous algae, which generally occur or grow on the barks of woody plants, are widespread in tropical subtropical and temperate regions of the Globe. Very little attention was paid on the corticolous algae from Eastern Ghats of India. They appear as green, brown or black patches on the tree trunks of the woody plants. Seasonal studies were made for period of one year from June 2015 to May 2016. In this present exploration on corticolous algae, a total of 17 algal genera were identified. Genera such as *Aphanocapsa*, *Calothrix*, *Plectonema*, *Chroococcus*, *Desmococcus*, *Stigonema*, *Lyngbya*, *Phormidium*, *Trentipohlia*, *Gloeocapsa*, *Nostoc*, and *Pleurococcus* are dominant forms in the tropical forest of the G.Madugula region.

Key words: Corticolous algae, Paderu forest division, Eastern Ghats of India.

Introduction

Algae are basically aquatic habitat, but some genera of this group able to colonize on variety of terrestrial habitats (Hoffman, 1989). Some on buildings, damaged walls, rocks and on temples (Tripathy et al, 1999; Adikary, 1997 and 2000; Tirkey& Adhikary, 2006). Cyanobacteria are common in terrestrial habitats and have important biological activity in the ecosystem acting to adding the nitrogenous compounds to the soil. (Singh, 1961; Whitton, 2000). Studies on aerophytic algae of the Eastern Ghats were very limited. Bhakta et. al. (2014) studied the diversity of corticolous algae from the Similipal Biosphere reserve, Odisha. In the present study information was collected on diversity of the algal forms in different parts of the G.Madugula forest division of Eastern Ghats of India.

Study sites and Methods

Plant materials were collected seasonally from the G.Madugula near Paderu division of Eastern Ghats of India and this region was situated between latitudes 18° 10' and longitudes 18° 79' above the ground level. Thick forest vegetation, moderate climatic conditions favours the growth of algae on the trunks of the trees. Field trips were made in three seasons of the period from June 2015 to May 2016. Collection of materials was conducted randomly from different trees trunks. Collected samples were placed in eppendorf tubes using scalpel and needles and transported them in to the laboratory at Visakhapatnam. After initial examination, maintained them on solid agar medium. They were incubated in BOD growth chamber at 25°C temperature with 9μ moles m²s⁻¹ light intensity for 8 hours during 09 00 to 17 00 hours. After one week material were identified with help of the monographs and manuals (Desikachary, 1959 and Komárek and Anagnostidis, 1999, 2005).

Results and Discussion

Data on environmental parameters such as air temperature, humidity and rainfall at study sites were obtained from Agricultural Research Station, Chintapalli. Air temperature in the study area varied from 17 to 33°C, humidity ranged from 62 to 92% and rainfall varied from 22 to 292 mm during June 2015 to May 2016. These climatic factors may be responsible for the growth and development of algal populations along with some bryophytes on the trunks of the tree species in the study area. Patches of algae was observed on the trunks of big plants, besides here and there some terrestrial algae were also reported. But in the present investigation data was collected on corticolous algae only.

Table 1. List of Corticolous algal genera present in the study and area along with their families

S.No	Name of the genera	Family
1	<i>Aphanocapsa</i> sps.	Chroococcaceae
2	<i>Calothrix</i> sps.	Rivulariaceae
3	<i>Chroococcus</i> sps.	Chroococcaceae
4	<i>Desmococcus</i> sps.	Chaetophoraceae.
5	<i>Gloeocapsa</i> sps.	Chroococcaceae
6	<i>Lyngbya</i> sps.	Oscillatoriaceae
7	<i>Nostoc</i> sps.	Nostocaceae
8	<i>Phormidium</i> sps.	Oscillatoriaceae
9	<i>Plectonema</i> sps.	Oscillatoriaceae
10	<i>Pleurococcus</i> sps.	Chaetophoraceae
11	<i>Stigonema</i> sps.	Stigonemataceae
12	<i>Trentipohlia</i> sps.	Trentepohliaceae

Table 1 shows the list of the algae present on the tree barks of the study sites. In this preliminary survey algal forms were identified up to genus level only with help of monographs and images in the internet. A total of 12 genera were reported and maximum members were belongs to Cyanophyceae followed by Chlorophyceae (Table-1).

Table 2. Distribution of corticolous algae in the study site during June, 2015 to May, 2016.

S.No	Name	Monsoon	Post monsoon	Pre monsoon
1	<i>Aphanocapsa</i> sps.	+	-	-
2	<i>Calothrix</i> sps.	-	+	+
3	<i>Chroococcus</i> sps.	+	+	-
4	<i>Desmococcus</i> sps.	+	+	-
5	<i>Gloeocapsa</i> sps.	+	+	+
6	<i>Lyngbya</i> sps.	+	-	+
7	<i>Nostoc</i> sps.	+	-	+
8	<i>Phormidium</i> sps.	+	+	+
9	<i>Plectonema</i> sps.	+	-	+
10	<i>Pleurococcus</i> sps.	+	+	-
11	<i>Stigonema</i> sps.	+	+	-
12	<i>Trentipohlia</i> sps.	+	+	+

Table 2 shows the seasonal distribution of micro algae during June 2015 to May 2016 in the study sites of this forest zone. Maximum number (11) of genera was reported in monsoon season while minimum number (7) was recorded during summer season. Post monsoon season also favours the growth of the algae and 8 plants were recorded in this season (Table 2). During the rainy season tree barks of this tropical forest was colonized by the species of *Polytrichum* (Bryophyte) and lichens such as foliose lichens. Cyanophyceae members are able to grow successfully in summer season where temperature was high with dry conditions.

The results of this present investigation reveal that members of the Cyanophyceae are major component in the corticolous algae of G.Madugula region. Further studies on distribution and species level identification will be conducted in tropical forest regions of the North coastal Andhra Pradesh.

References

Adhikary,P. 1997. Cyanobacteria occurring on the temple and monuments of India and Nepal. J. Microbial., 43: 157-226.

Adhikary, P.2000. Epilithic Cyanobacteria on the exposed rocks and walls of temples and monuments of India. J. Microbial., 40: 67-81.

Bhakta, S., L. Pattanaik, P. Dutta, E. Sahu and A.K. Bastia. 2014. Diversity of corticolous algae from Similipal Biosphere reserve, Mayurbhanj, Odisha . *Phykos*. 44 (1): 9-16

Desikachary, T.V. 1959. Monograph on Cyanophyta, I.C.A.R. New Delhi.

Hoffman, L. 1989. Algae of terrestrial habitats. *The Botanical Review* 55:77-105.

Komárek, J. and Anagnostidis, K. 2005. Cyanoprokaryota, II. Teil Oscillatoriales, Band 19/2, Süßwasserflora von Mitteleuropa, Elsevier GmbH, Munchen, 759 pp.

Singh, R.N. 1961. Role of blue-green algae in nitrogen economy of India. New Delhi, Indian Council of Agricultural Research.

Tirkey, J. & Adhikary, P. 2006. Blue green algae in the biological soil crusts of different regions of India. *Weinheim* 117: 280-306.

Tripathy,P; A. Roy; N. Anand & S. P. Adhikary, 1999. Blue-green algal flora on the rock surface of temples and monuments of India *Feddes Repertorium* 110 1-2, 133-144

Whitton, B.A. 2000. Soils and rice fields. Pp 233-255. In: Whitton, B.A. & Potts M. (eds.) *The Ecology of Cyanobacteria*. Dordrecht, Kluwer Academic publishers.