

## ON THE OCCURRENCE OF CYANOPHYTA FROM KARACHI, PAKISTAN.

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### Abstract

Twenty genera and 49 species of fresh water blue-green algae belonging to Chroococcales and Nostocales were identified from ponds, ditches and wet soil of Karachi. The order Nostocales with 12 genera and 31 species was more abundant than Chroococcales with 8 genera and 18 species. The species of Chroococcales were found submerged in water and occurred infrequently as compared to Nostocales, which were more frequent on wet soil than in ponds.

### Introduction

The Cyanophyta are more closely related to the procaryotic bacteria than to eucaryotic algae, a relationship that has led to a recent drive for the recognition of the term "Cyanobacteria" (Lee, 1980). It is a very interesting group of photoautotrophs. Like other groups of fresh water algae, they have also been reported from Pakistan (Ghose, 1923; Faridi, 1971).

Of a variety of habitats blue-green algae have been found to grow in saline soils (Ali & Sandhu, 1972), in sewage oxidation ponds (Ahmed, 1974), in paddy fields (Ali *et al.*, 1978), as epizoons on turtle (Anjum *et al.*, 1980) and snail shells (Hussain & Anjum, 1982) and as soil binder (Anjum *et al.*, 1982) mostly from the northern areas of Pakistan. They have also been reported from interior of Sind (Nazneen, 1974, Leghari & Arbani, 1983), Karachi (Farzana & Nizamuddin, 1979; Pervaiz & Ahmed, 1981) as well as from Baluchistan (Hussain *et al.*, 1984). The present paper reports the occurrence of Cyanophyta from Karachi area.

### Materials and Methods

The algae were collected in specimen tubes from the ponds, pools, ditches and the patches of wet soil from Karachi University Campus (longitude 67° East and latitude 25° North). Due to overflow of water tanks and water outlets in the campus, the patches of wet soil became densely populated by blue green algae. The specimens were preserved in 4% formalin, stained in aniline blue and identified after Desikachari (1959).

Table 1. Occurrence of various species of Cyanophyta from Karachi area.

Algal species	Periodicity of occurrence	Type of occurrence	Habitat
<b>I. CHROOCOCCALES</b>			
1. Chroococcaceae			
<i>Aphanocapsa banarensensis</i> Bharadw.	+	floating	ditch
<i>A. biformis</i> A. Br.	+	epipelic & floating	wet soil & pond
<i>Aphanothece stagnina</i> (Spreng.) A. Br.	+	floating	ditch
<i>Chroococcus minutus</i> (Kütz.) Näg.	+	epipelic & epiphytic	wet soil & pond
<i>C. pallidus</i> Näg.	+	epiphytic	ditch
<i>C. turgidus</i> (Kütz.) Näg.	+	epiphytic	pond
<i>Coelosphaerium dubium</i> Grunow	+	floating	pond
<i>C. kuetzingianum</i> Näg.	+	floating	pond
<i>Gloeocapsa crepidinum</i> Thuret	+	floating	pond
<i>G. gelatinosa</i> Kütz.	+	floating	ditch
<i>Gomphosphaeria aponina</i> Kütz.	+	epipelic & epiphytic	ditch & pond
<i>G. lacustris</i> Chodat	+	epiphytic	pond
<i>Microcystis aeruginosa</i> Kütz.	++	floating	ditch
<i>M. elabens</i> (Bréb.) Kütz.	+	epiphytic	pond
<i>M. elongata</i> Desikach.	+	epiphytic	pond
<i>M. marginata</i> (Menegh.) Kutz.	++	epiphytic	pond
2. Entophysalidaceae			
<i>Chlorogloea fritschii</i> Mitra	+	epipelic & floating	wet soil & pond
<i>C. microcystoides</i> Geitler	+	floating	ditch
<b>II. NOSTOCALES</b>			
1. Oscillatoriaceae			
<i>Arthrospira massartii</i> Kuffar.	++	floating	pond
<i>A. platensis</i> (Nordst.) Gomont	+++	floating	pond & ditch
<i>Lyngbya baculum</i> Gomont	+	epipelic	wet soil
<i>L. martensiana</i> Menegh ex Gomont	++	epipelic	wet soil
<i>L. mesotricha</i> Skuja	+	epiphytic	pond

<i>L. palmarum</i> (Mart.) Bruhl et Biswas	+	epiphytic	pond
<i>L. putealis</i> Mont. ex Gomont	++	floating	pond & ditch
<i>L. rubida</i> Frémy	+++	floating	pond & ditch
<i>Oscillatoria kuetzingiana</i> Näg.	+++	floating & epipelic	ditch & wet soil
<i>O. limosa</i> C. Ag. ex Gomont	++	epipelic	wet soil
<i>O. princeps</i> Vaucher ex Gomont	++	floating & epipelic	pond & wet soil
<i>O. proteus</i> Skuja	+	epipelic	wet soil
<i>O. raoi</i> De Toni	++	epipelic	wet soil
<i>Phormidium mucosum</i> Gardner	+	epipelic	wet soil
<i>P. rotheanum</i> Itzigsohn	++	floating	pond & ditch
<i>P. tenue</i> (Menegh.) Gomont	+++	floating & epipelic	pond, ditch & wet soil
<i>Spirulina laxissima</i> West	+++	floating	pond & ditch
<i>S. subtilissima</i> Kütz. ex Gomont	+	floating	pond
2. Nostocaceae			
<i>Anabaena ballygungei</i> Banerji	++	epipelic	wet soil
<i>A. circinalis</i> Rabenh. ex Born. et Flah.	+	epipelic	wet soil
<i>A. fertilissima</i> Rao	+++	floating & epipelic	ditch & wet soil
<i>A. sphaerica</i> Born. et Flah.	+	floating	ditch
<i>A. variabilis</i> Kütz. ex Born. et Flah.	++	epipelic	wet soil
<i>Nostoc calcicola</i> Bréb. ex Born. et Flah.	+	epipelic	wet soil
<i>N. punctiforme</i> (Kütz.) Hariot	++	epipelic	wet soil
3. Scytonemataceae			
<i>Scytonema chiastum</i> Geitler	++	floating	ditch
<i>S. stuposum</i> (Kütz.) Born. ex Born. et Flah.	++	epipelic	wet soil
<i>Tolypothrix bouteillei</i> (Bréb. et Desm.) Forti	+	floating	pond
4. Microchaetaceae			
<i>Microchaete elongata</i> (Fremy) Desikach.	+	epipelic	wet soil
5. Rivulariaceae			
<i>Calothrix brevissima</i> West	++	epiphytic & epipelic	pond & wet soil
<i>Rivularia manginii</i> Frémy	++	epiphytic	pond

+ occasionally occurring, ++ frequently occurring, +++ dominantly occurring

### Results and Discussion

Of the 20 genera and 49 species identified (Table 1) 8 genera and 18 species were of the order Chroococcales and 12 genera and 31 species of Nostocales. Blue-green algae included in the orders *viz.*, Chamaesiphonales, Pleurocapsales and Stigonematales were not encountered as also reported by Perwaiz & Ahmed (1981). With the exception of *Microcystis aeruginosa* and *M. marginata* all the species of Chroococcales were occasional in their occurrence, while vast majority of the species of Nostocales were more frequent and dominant presumably because members of Nostocales produce hormogonia and thus have a better chance of distribution over Chroococcales, which lack this property.

It is interesting to note that all the species of Chroococcales were found submerged in water either as floating or epiphytic algae. However, *Aphanocapsa biformis*, *Chlorogloea fritschii* and *Chroococcus minutus* were found on wet soil and in ponds and ditches. *Calothrix*, *Chlorogloea*, *Coelosphaerium*, *Gomphosphaeria*, *Microchaete*, *Rivularia*, *Scytonema* and *Tolypothrix* are the genera not hitherto reported from this area.

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