



## Research Article

## Report on aero-algal form from Konkan coastal area

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**Abstract:** There are very few reports on the occurrence of aero algal forms near coastal area. Konkan beaches in coastal Maharashtra are famous as hot tourist spots, visited by nearly few thousand visitors per year. This is the first aero algal report from a Guhagar beach. Sample was collected using fan as sampler (Jogita. T. Pandkar, 2011) from a residential bungalow (Mody villa) situated near Guhagar beach. Total 12 algal forms were recorded from a single sample collected within 10 days, indicating towards the effective use of fan as a sampler. Cyanophyta was found to be dominant group followed by Chlorophyta. Out of 12 algal forms recorded, 09 were identified upto generic level and 05 forms were identified upto species level. Various cyanophycean forms recorded were *Chroococcus*, *Nostoc*, *Phormidium*, *Microcoleus* & *Microcystis*. Chlorophycean forms recorded were *Chlorella* & *Spirogyra* respectively. Forms such as *Chlorella*, *Microcystis* & *Phormidium* known to be allergenic to human beings have been encountered, indicating the presence of potential allergens in the air.

**Keywords:** Aero-algal forms, Cyanophyta, Fan Dust Sampling, Guhagar, Konkan Beach, and Potential Allergens.

## Introduction

The first report on aero-biological studies was by Lucretius in 55 B.C, who observed dust particles dancing in a ray of sunlight. Afterwards further pursue of literature indicates the sub-branching of aero-biology, as a result of concentrating on only one or two aspect from the collected samples. This is followed by development of many different kind of sampling apparatus based on different principles (Eva Henningson *et al.*, 1981)(3), categorized into different categories (Jogita. Pandkar, 2011) (9). Simultaneously the sampling sites were getting differentiated into indoor sampling site or outdoor sampling sites, from rural area or urban area and so on. But no efforts were made to study the presence of air borne organisms near coastal areas and beaches, the most frequently visited place. There are very few reports on the occurrence of aero algal forms near coastal area, (Stevenson, R.E *et al.*, 1962) (13) reported occurrence of air borne marine phytoplankton, (Jordanov, D *et al.*, 1959) (10) and (Vodenicharov *et al.*, 1971) (15) reported aero algal forms from black sea coastal rock.

Konkan beaches in coastal Maharashtra are famous as hot tourist spots, visited by nearly few thousands visitors per year. But not a single report has been there for the presence of aero algal diversity and its impact on human health. Hence the work was undertaken.

## Materials and Methods

Guhagar which is 42 kms from Chiplun is situated between sahyadri mountain range and Arabian Sea. It is one of the most inhabited beaches in coastal Maharashtra, located at 17° 47' N 73° 32' E with an average elevation of 10 meters. It has a temperate

climate all throughout the year with maximum yearly temp of 34°C while the minimum yearly temperature was 18°C. The relative humidity is more in summer as the Arabian Sea is in west coast.

Sample was collected using fan as sampler (Jogita. T. Pandkar, 2011) (9) from a residential bungalow (Mody villa) situated near Guhagar beach. Before collecting samples, the fan blades were washed well and finally cleaned with alcohol to avoid all possible residues –contaminants.

Fans were then allowed normal use for a period of 10 days. Sample was then collected on a clean plain paper with the help of drawing brush. It is then brought to laboratory for further studies.

Part of the sample was then dropped into sterilized test tube containing B-G 11 medium for culturing. Part of the remaining sample was macerated with dilute Hydrochloric acid. It was then washed well with sterilized distilled water using a centrifuge. The sediment was mounted on a clean glass slide with glycerine for further microscopic examination. Similarly, cultures were allowed to grow under natural climatic condition. Algal growth was observed after 30 days. Slides were prepared using iodine as staining medium and glycerine as mounting medium.

Identification of algal forms was done on the basis of morphological characters by comparing them with available literatures. Fritsch (1935, 1945) (4,5) and Desikachary (1959) (2).

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## Results

Total 12 algal forms (Slides and cultures) were recorded from the single sample collected indicating the high efficiency of the sampler used. Out of these, 06 forms belonged to group Cyanophyta (03

coccoid and 03 filamentous) & 03 forms belonging to group Chlorophyta respectively. Cyanophycean forms were identified upto species level while the Chlorophycean forms were identified upto generic level only. Three forms were unidentified.

**Table I.** Summary of Aero-algal forms obtained from fan dust sample

Sr. No	Particulars	Culture	Slides	Total
1	Number of samples	1	1	2
2	Total algal forms	4	8	12
3	Cyanophyta	2	4	6
4	Coccoid cyanophyta	1	2	3
5	Filamentous cyanophyta	1	2	3
6	Chlorophyta	2	1	3
7	<i>Chroococcus minutus</i>	1	1	2
8	<i>Nostoc muscorum</i>	1	-	1
9	<i>Chlorella</i>	1	1	2
10	<i>Spirogyra</i>	1	-	1
11	<i>Phormidium angustissimum</i>	-	1	1
12	<i>Microcoleus chthonoplastes</i>	-	1	1
13	<i>Microcystis litoralis</i>	-	1	1
14	unidentified	-	3	3

## Results and Discussion

This is the first aero algal report from a Guhagar beach. Total 12 algal forms were recorded from a single sample collected within 10 days, indicating towards the effective use of fan as a sampler. As usual, Cyanophycean forms (03 Coccoid & 03 Filamentous) were in abundance, followed by chlorophycean (03) forms. Out of 12 algal forms recorded, 09 were identified upto generic level and 05 forms were identified upto species level. Various cyanophycean forms recorded were *Chroococcus*, *Nostoc*, *Phormidium*, *Microcoleus* & *Microcystis*. Chlorophycean forms recorded were *Chlorella* & *Spirogyra* respectively (Table-I).

Forms such as *Nostoc* & *Spirogyra* were reported from culture only, similarly forms such as *Phormidium*, *Microcoleus* & *Microcystis* were reported from slides only. *Chroococcus* and *Chlorella* were reported from both slides and cultured respectively (Table- I). It indicates that sampling should be followed by culturing which will help to study the forms which were in the form of dormant viable spores, difficult to observe during slides scanning. Such findings, indicating presence of viable algal spores from house dust (Holland, R. D *et al.*, 1973) (8) & (Bernstein, I.L *et al.*, 1970) (1) have been reported. Forms such as *Chlorella* (Tiberg, E *et al.*, 1955) (14) & *Microcystis* and *Phormidium* known to be allergenic to human beings, Nair *et al.*, (1983) (11), Gregory *et al.*, (1955) (16), Paul Gorham (1979) (12), Heise, H.A. (1951) 970, have been encountered. This was the first attempt made for studying the presence of aero algal form from Guhagar beach in konkan. It also indicates the presence of potential allergents in the air. Further sampling of this type round the year should be carried out to find out the aero algal diversity and important health hazards related with visitor's health.

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