

# Biodiversity Study of Algal Communities from Effluents of Certain Factories of North Maharashtra

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Article Info	Abstract
<b>Article History</b> <i>Received</i> : 18-03-2011 <i>Revised</i> : 29-04-2011 <i>Accepted</i> : 29-04-2011	There are numerous reports dealing with floristic and ecology of lentic and lotic algae but the algal flora of waste water systems have been little investigated. The present investigation comprises chemical and biological assessment of the effluents from five sites of North Maharashtra region viz. i) Maharashtra Oil factory, MIDC Dhule ii) Deesan Agro Product, MIDC, Dhule. iii) Shradha Paper Mills, Warkhedi, Tal. Dist. Dhule, iv) Belganga Sahakari Sugar Factory, Ltd Bhoras Tal Chalisgaon, Dist. Jalgaon v) Siddharth Carbo-Chem Product Ltd. E3, MIDC, Jalgaon. Biodiversity of four groups of algae was made for two years. In present paper, 36 algal taxa were reported belonging to four groups of algae viz. Cyanophyceae (9), Chlorophyceae (8), Bacillariophyceae (11), and Euglenophyceae (6) from five factories of study area. Among four groups of algae the class Bacillariophyceae is dominant as compared to other groups in the present study.
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## Introduction

In India, it is reported that 70% of the available water is polluted. The chief source of the pollution is identified to be sewage constituting 84% to 92% of the waste water. Algae are involved in water pollution in number of significant ways. pollution may bring about on environment of algal nutrient in water. Some workers have emphasized the relationship of whole group of algae to pollution studies (palmer, 1969; Gunale and Balkrishnan, 1981; Jagdale et.al, 1987, Mahajan and Nandan, 2004).

## Materials and Methods

Algal and water samples were collected from study areas of Belganga Sahakari Sugar Factory Ltd. Bhoras Tal. Chalisgaon and Siddharth Carbo-Chem. Product Ltd. MIDC Jalgaon, Shradha Paper Mill Ltd. Warkhedi Tal. Dist. Dhule, Deesan Agro MIDC, Maharashtra Oil MIDC, Dhule during (2003-04 and 2004-05) for quantitative and qualitative study of algae, algal samples were preserved in 4% formalin for further taxonomic study. The algal taxa were sketched by the line drawing with the help of camera lucida method. The algal taxa of four groups of algae are identified with the help of standard monographs and recent available literature (Hustedt, 1930; Pochman, 1942; Pringsheim, 1956; Randhava, 1959; Desikachary, 1959; Philipose, 1959; Ramanathan, 1964; Sarode and Kamat, 1984)

## Taxonomical study

### I. *Cyanophyceae* (Blue green Algae)

1. *Chroococcus tenax* (Kirchn) Hieron (Plate 1, Fig 1)  
T.V. Desikachary, Cyanophyta, 103, PL. 26, Fig. 7, 16, 1959

Habitat- Siddharth Carbo Chem Product L.t.d, E3 MIDC, Jalgaon

2. *Gluocapsa nigrescens* Nag

T.V. Desikachary, Cyanophyta, 1959, P.117, PL.24, F17

Habitat- Siddharth Carbo Chem Product L.t.d, E3 MIDC, Jalgaon

3. *Dermocarpa clavata* Geitler

T.V. Desikachary, Cyanophyta, P.175, PL. 32, Fig. 1-4

Habitat- Deesan Agro Product, MIDC, Dhule

4. *Oscillatoria sancta*

T.V. Desikachary, Cyanophyta, 1959, P. 203, PL. 42, Fig. 10

Habitat- Deesan Agro Product, MIDC, Dhule

5. *Nodularia spumigena*

T.V. Desikachary, Cyanophyta, 423, PL. 80, Fig. 13, 14, 1959

Habitat- Maharashtra Oil Factory, MIDC, Dhule

6. *Lyngbya hieronymusilem*

T.V. Desikachary, Cyanophyta, 297, PL. 48, Fig. 4, 1959

Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras, Tal. Chalisgaon, Dist. Jalgaon

7. *Scytonema hofmannii*

T.V. Desikachary, Cyanophyta, 1959, P.476, PL.91, Fig. 2

Habitat- Maharashtra Oil Factory, MIDC, Dhule

8. *Synechococcus elongatus* Nag.

T.V. Desikachary, Cyanophyta, P. 143, PL. 25, Fig. 7, 8, 1959

Habitat- Siddharth Carbo Chem Product L.t.d, E3 MIDC, Jalgaon

9. *Oscillatoria brevis* (Kutz) Gomant.

T.V. Desikachary, Cyanophyta, 1959, P. 241, PL. 31, Fig. 9-10

Habitat- Shradha Paper Mill, Warkhedi, Tal. Dist. Dhule

### II. *Chlorophyceae* (Green algae):-

1. *Gonium pectorale* Muller

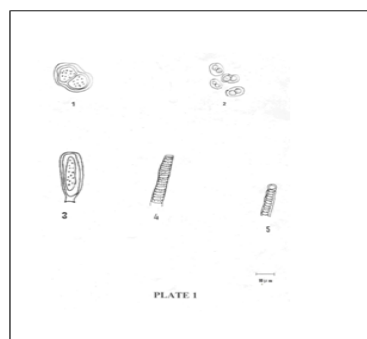
Pestalozzi G., 1961, 16(5): 624. F.877.

- Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras  
Tal. Chalisgaon, Dist. Jalgaon
2. *Pediastrum simplex* mayen  
F.I.F. Meyen 1829, P. 772, Pl. 43, Fl. 5.  
Habitat- Dessan Agro Product, MIDC Dhule
  3. *Westella botryoides* (W. West) De-wildenan  
Dewildeman, 1897, P. 532  
Habitat- - Shradha Paper Mill, Warkhedi, Tal. Dist. Dhule
  4. *Oedogonium pringsheimii* Gram  
E.A. Gonzalves, 1981, P. 347, Fig. 9.232 A  
Habitat- Maharashtra Oil Factory, MIDC, Dhule
  5. *Spirogyra elliptica* Jao  
Randhawa, 1959, P. 322, Fig. 302  
Habitat- Belganga Sahakari Sugar Factory, Ltd.  
Bhoras, Tal. Chalisgaon, Dist. Jalgaon
  6. *Ulothrix aqualis* Kuetzing  
Ramanathan, 1964, P. 36, plate-9, I-L  
Habitat- Dessan Agro Product, MIDC Dhule
  7. *Tetradedron simmeriv-minus schmidle*  
W. Schmidle, 1901 b, P. 41.  
Habitat- Belganga Sahakari Sugar Factory, Ltd.  
Bhoras, Tal. Chalisgaon, Dist. Jalgaon
  8. *Staurastrum ambigaum* Turn  
Ch. Bernard, 1908, 2, P. 153, F. 130  
Habitat- Maharashtra Oil Factory, MIDC, Dhule

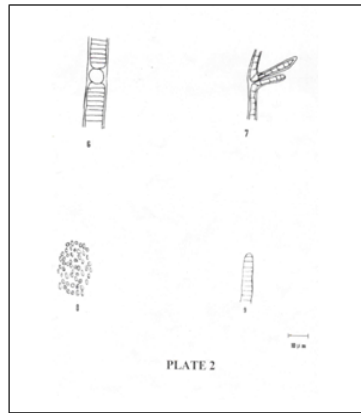
**III. Bacillariophyceae (Diatoms):-**

1. *Cyclotella meneghiniana* Kuetz  
Hustedt 1930, P. 100, F. 67  
Habitat- Shradha Paper Mill, Warkhedi, Tal. Dist. Dhule
2. *Eunotia pectinalis* (Kuetz) Rabh.  
Hustedt, 1930, P. 182, F.237  
Habitat- Shradha Paper Mill, Warkhedi, Tal. Dist. Dhule
3. *Fragillaria intermedia* Grun  
Hustedt, 1930, P. 139, F. 130  
Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras,  
Tal. Chalisgaon, Dist. Jalgaon
4. *Synedra ulna* (Nitz) Her.  
Hustedt, 1930, P. 151, F. 159 a  
Habitat- Dessan Agro Product, MIDC, Dhule
5. *Gyrosigma accuminatum* (Kuetz) Rabh.  
Husted, 1930, P. 222, F. 329  
Habitat- Dessan Agro Product, MIDC, Dhule

6. *Nitzschia paradoxa* (Gmelin) Grun  
Cleve-Euler 1952, P. 69, F. 1457 a-d  
Habitat- Shradha Paper Mill, Warkhedi, Tal. Dist. Dhule
  7. *Nitzschia vitrea* Norman  
Hustedt. 1930, P. 4711, F. 787  
Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras,  
Tal. Chalisgaon, Dist. Jalgaon
  8. *Surirella robusta* Ehr.  
Van. Hjeurck 1896, P. 371, Pl. 12, F. 577  
Habitat- Dessan Agro Product, MIDC, Dhule
  9. *Navicula papula* Kuetz. V. *Rostrata* Husted  
Husted, 1930, P. 282, F. 4676  
Habitat- Maharashtra Oil Factory, MIDC, Dhule
  10. *Cymbella cymbiformis* (Ag.) Kuetz.V.  
Cleve-Euler, 1955, P. 161, F. 1246 m.  
Habitat- Dessan Agro Product, MIDC, Dhule
  11. *Rhopalodia gibba* (Her. O. Muell)  
Hustedt, 1930, P. 930, F. 740  
Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras,  
Tal. Chalisgaon, Dist. Jalgaon
- IV. Euglenineae (Euglenoids):-**
1. *Euglena anabaena* mainx  
Huber-Pestalozzi, 1955, P. 86, Pl. 14, F. 65  
Habitat- Shradha Paper Mill, Warkhedi, Tal. Dist. Dhule
  2. *Euglena clavata* Skuja  
Huber-Pestalozzi, 1955, P. 84, Pl. 13, F. 61  
Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras,  
Tal. Chalisgaon, Dist. Jalgaon
  3. *Euglena capula* Schiller  
Huber-Pestalozzi, 1955, P-117, Pl. 22, F. 106  
Habitat- Maharashtra Oil Factory, MIDC, Dhule
  4. *Phacus acuminatus* stokes  
Pochman, A. 1942  
Habitat- Siddharth Carbo Chem Product L.t.d, E3 MIDC,  
Jalgaon
  5. *Phacus parvulus* Klebs  
Pochman, A. 1942  
Habitat- Dessan Agro Product, MIDC, Dhule
  6. *Trachelomonas intermedia* Dangeard  
Asaul, 1975. P. 66, Pl. 26, F. 1-5  
Habitat- Belganga Sahakari Sugar Factory, Ltd. Bhoras,  
Tal. Chalisgaon, Dist. Jalgaon

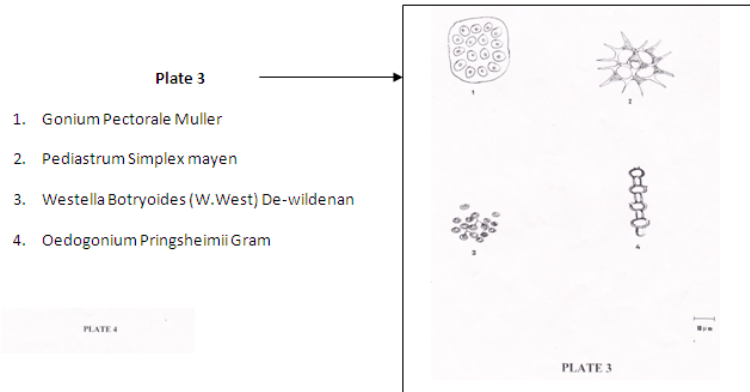


1. Chroococcus tenax (Kirchn) Hireon
2. Gluocapsa nigrescens Nag
3. Dermocarpa clavata Geitler
4. Oscillatoria Sancta
5. Nodularia Spumigena



**Plate 2**

6. *Lyngbya Hireonysii* Lemm
7. *Scytonema hofmannii*
8. *Synechococcus Elongatus* Nag
9. *Oscillatoria brevis* (Kutz) Gomant



**Plate 3**

1. *Gonium Pectorale* Muller
2. *Pediastrum Simplex* mayen
3. *Westella Botryoides* (W.West) De-wildenan
4. *Oedogonium Pringsheimii* Gram



**Plate 4**

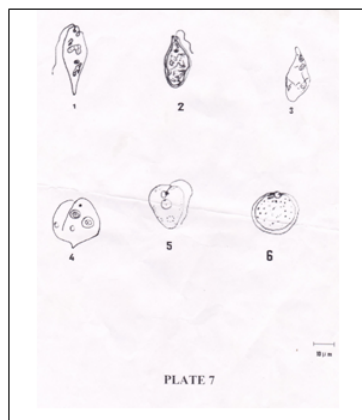
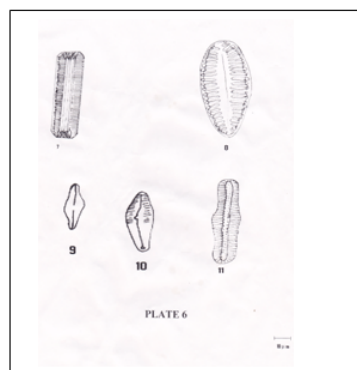
5. *Spirogyra elliptica* Jao
6. *Ulothrix aqualis* Kuetzing
7. *Tetradron simmeriv-minus* schmidle
8. *Staurastrum ambigaum* Turn



**Plate 5**

1. *Cyclotella meneghiniana* Kuetz
2. *Eunotia Pectinalis* (Kuetz) Rabh
3. *Fragillaria Intermedia* Grun
4. *Synedra Ulna* (Nitz) Her
5. *Gyrosigma Accuminatum* (Kuetz) Rabh
6. *Nitzschia Paradoxa* (Gmelin) Grun

- Plate 6**
7. Nizschia Vitrea Norman
  8. Surirella robusta Ehr.
  9. Navicula papula Kuetz. V. Rostrata Husted
  10. Cymbella Cymbiformis (Ag.) kuetz.V.
  11. Rhopalodia gibba (Her. O. Muell)



- Plate 7**
1. Euglena anabaena mainx
  2. Euglena Clavata Skuja
  3. Euglena Capula Schiller
  4. Phacus acuminatus stokes
  5. Phacus parvulus Klebs
  6. Trachelomonas intermedia Dangeard

In present investigation, 34 Algal taxa belonging to 4 groups of algae were recorded from study areas. In present study algal taxa of blue green and diatoms were dominant as compared to other groups of algae. Out of 34 taxa 9 pollution tolerant genera, viz. Euglena, Phacus, Oscillatoria, Lyngbya, Phormidium, Scytonema, Fragillaria, Navicula and Cymbella, were observed from study area.

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