

RESEARCH ARTICLE

Diversity of algae from tahsil Parola, district Jalgaon, Maharashtra

■ RUPALI PATIL, MANISHA SANER AND NEELIMA PATIL

SUMMARY

Biodiversity maintains the ecological balance necessary for human survival. The term biodiversity is commonly used to describe the number, variety and variability of living organism. It forms the foundation for the environmental health of our planet. The present study was undertaken to explore the unexplored area of tahsil Parola, district Jalgaon. Samples were collected from different localities of Parola and analyzed. In the paper an account of diversity of Chlorophyceae and Cyanophyceae was recorded. Fifteen members of Chlorophyceae and fourteen members of Cyanophyceae were observed.

Key Words : Diversity, Algae, Cyanophyceae, Chlorophyceae

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Jalgaon district is eastern part of Khandesh. Parola is one of the Tahsil of Jalgaon. Parola tahsil is having many large and small projects like Bori dam, Mhaswa lake, Bhokarbari, Bhamarkheda, Karanji, Kankraj, Kholsar, Shirasmani, Savarkheda, Bhilali etc. There is almost no attention has been paid to systematic study and ecology of algae of this area.

MATERIAL AND METHODS

Algal samples were collected during July 2013 – April 2014 from different sites of Parola. The samples

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were brought to the laboratory. Important morphological and reproductive features were noted in fresh materials and then it is preserved in 4 per cent formalin for further taxonomic investigation. The algae were identified under microscope by referring to the standard literature and recent research publication.

RESULTS AND DISCUSSION

Fifteen members of Chlorophyceae and fourteen members of Cyanophyceae have been recorded. The description of these taxa is given below.

Division : Algae

Class : Chlorophyceae F.E. Fritsch.

Order : Volvocales F.E. Fritsch.

Family: Chlamydomonaceae Fritsch.

***Chlamydomonas acuta* :**

G.M. Smith 1930: 44, Plate 1, Fig. 1

Cells elongated, ellipsoidal, ovate or short spindle shaped, anterior end rounded and sometime slightly narrowing, posterior end narrowing and pointed. Cell wall thin, anterior end with a very small distinct papillae, flagella as long as the body; chloroplast laminate, bowl shaped, pyrenoid lateral, median, eye spot small, nearly median, nucleus central, often towards one side. Cells 18-20 μ long, 6.8 μ diameter.

Habitat : Bori river, canals of Bori dam

***Chlamydomonas cylindrocystiformis* Iyengare :**

G.M. Smith 1930: 44, Plate 1, Fig. 2

Cells ellipsoidal with the anterior end suddenly narrowing, posterior end broadly round. Flagella two, appearing one over the other. Contractile vacuoles two, in front view only one is seen. Chloroplast two, one at the anterior end and the other at the posterior end of the cell, each with a single pyrenoid in the centre. Nucleus single median placed axially between the two chloroplasts; eyespot ellipsoid, median. cells 8-14 μ long, and 3-3.5 μ broad.

Habitat: Bori river

***Chlamydomonas media* Smith :**

G.M. Smith 1930: 44, Plate 1, Fig. 3

Cells oval in shape, long with broadly rounded posterior end. Flagella 1-1.5 μ to the body, eye spot is at the top. Pyrenoid are also present.

Habitat: Planktonic in Bori dam.

Order: Chlorococcales F.E. Fritsch.

Family: Chlorellaceae, F.E. Fritsch

***Chlorella vulgaris* Beijerinck**

Philipose 1959: 173, Plate 1, Fig. 4

Cell 7.5-10 μ in diameter, solitary or in small colonies spherical and with thin cell wall, chloroplast parietal, cup shaped and with a pyrenoid.

Habitat: In ponds, Bori River

Order: Chlorococcales

Family: Hydrodictyaceae (S.F. Gray) Dumortier.

***Pediastrum simplex* var. *duodenarium* (Bailey) Robenhorst, 1868 :**

Philipose, 1967; 115-114, Plate 1, Fig. 5

Coenobium perforate, circular of 4, 8, 16, 32 celled. 21-43.7 μ diameter, having large intercellular spaces or a single central space with the cells arranged in a ring at the periphery. Inner space of peripheral cells concave,

outer face prolonged into a single delicately tapering process. Side of peripheral cells concave or straight. Interior cells similar to peripheral cells but with shorter processes. Cells 7.2-15.3 μ broad, 24- 30 μ long.

Habitat: Planktonic in Bori River, outlet of Bori dam, Mhaswa Lake

***Pediastrum simplex* var. *echinulatum* Wittrock n Wittrock and Nordstedt, 1883 :**

Philipose 1959: Plate 1, Fig. 6

Colonies 8-16 celled circular or slightly irregular, without perforations or space, with one or more interior cells and a number of marginal cells. 16 celled colonies upto 17-38.5 μ diameter, 55.4-61.8 μ long. Cells 15.2-21.6 μ long, 7.8-10.7 μ diameter. Marginal cells with a single, long, horn like process, cell wall densely covered with small spines.

Habitat: Outlet of Bori dam, Bhokarbari Planktonic in Bori River.

***Pediastrum tetras* (Ehr.) Rolfs :**

Philipose 1959: 129 Plate 1, Fig. 7

Colony 8 celled, 20-33 μ in diameter, Circular in shape, marginal cells divided by a deep cuneate incision on the outer side reaching to the middle. Each lobe further divided into two lobes, Cells 8-18 μ in diameter.

Habitat: Planktonic in Bori dam, Mhaswa lake.

Order: Chlorococcales

Family: Scenedesmaceae Oltman us.

Sub family : Scenedesmoidae,

***Scenedesmus*, Meyen :**

Scenedesmus serrata, Patel and Esabella,

Patel R.J. 1981: 37 Plate 1, Fig. 8

Colony 4 celled cells sub quadrate with capitate ends, cells arranged in a single regular series, outer side of terminal cells in slightly convex and inner side concave, cells 16.8 μ long and 6.3 μ broad.

The taxa differs in cell size than the type, being larger.

Habitat: Planktonic in Bori River.

Order: Ulotrichales

Family: Ulotrichaceae

***Ulothrix variabilis* Kutzing 1849 :**

Ramanathan-1964; Plate 1, Fig. 9

Pale green thick masses in flowing or stagnant water filaments with a pointed basal cell. Cells 6.9-9.2 μ broad,

17.9-18.6 μ long. Cylindrical with a thin cell wall. Chloroplast girdle or parietal plate, not filling more than half the circumference of the cell and appearing as a plate covering one side of the cell with a small pyrenoid. common in occurrence.

Habitat: Planktonic in Bori river. Kankaraj dam.

***Cosmarium biculatum* var. *depressum* (Schaarschmidt):**

Schmidle, 1883; Plate 1, Fig. 10

Cells small in size, rectangular, each corner rounded, width as equal as length, 18-24.2 μ long, 20.2-23.4 μ width, isthmus 7-9.2 μ width, nearly rectangular corners. Semi cells elongated, ellipsoid, apex flattened, side view nearly circular, cell wall smooth, transparent.

Habitat: Planktonic in Bori river. Kankaraj dam Mhaswa Lake.

***Cosmarium subprotumidum* Nordstedt, 1876 :**

Plate 1, Fig. 11

Cell small, a little longer than broad. 22.8-27 μ long, 17.6-21.8 μ in diameter. Isthmus 7.1 μ in diameter. Semi cells trapiziform, upper half narrowed to broadly truncate apex, sides with three faintly bigranulatum cremations and apex with 3 or 4 slight undulations. Granulate cell wall and a crenate cell outline. Chloroplast axial with one pyrenoid in each semi cell.

Habitat : Planktonic in Bori river, Mhaswa lake, Pond near Bori dam.

Order: Conjugales F.E.Fritsch.

Sub order: Euconjugatae F.E.Fritsch.

Family: Zygnemaceae F.E.Fritsch.

***Zygnema oudhense* Randhawa :**

Randhawa 1938:249, Plate 1, Fig. 12

Filaments free floating, unbranched with short cylindrical cells, several times as long as broad, with two stellate chloroplast and prominent central pyrenoids, vegetative cells are long 25 μ broad and 67.2 μ long

Habitat : In ponds, puddles near Bori dam, Bori river, Bhokarbari.

***Spirogyra brunnea*, Czurda :**

Randhawa 1932, 337: Plate 1, Fig. 13

Cells cylindrical with spiral ribbon like chloroplast, pyrenoids prominent and many vegetative cells 67 to 88 μ with plane end walls. 3-5 Chloroplast making 2-3 turns.

Habitat : water bodies in Bori River.

***Spirogyra communis* (HASSAL) Kuetzing, 1849 :**

Randhawa 1959, 293. Plate 1, Fig. 14

Vegetative cell cylindrical, cross wall plane, chloroplast consist two turn cells 89.5-99.4 μ long, 8.6-9.5 μ in diameter. Gametangium cell cylindrical, swollen at both sides, conjugation scalariform and lateral. Conjugation canal formed by both gametangium. Gametangium 19.6-31.5 μ in diameter, 64-97 μ long. Zygospore ellipsoid, smooth, thick spore wall. Reddish brown at maturity. 25.6-32 μ in dia. and 42-77.9 μ long.

Habitat: Outlet of Bori dam, Bori river, Shirasmani, Kankaraj dam.

***Phacus curvicauda* Swirenko, 1915:**

Philipose-1967, Plate 1, Fig. 15

Cells broadly ovoid or nearly spherical, sub-orbicular in outline, dorso-ventrally grooved. The anterior end slightly narrow, the hind end slightly broadened and bearing at its tip a short tail which is turned slightly towards one side, apical groove of variable length ranging from about 1/3 to nearly full length of cell. Peculiar striae

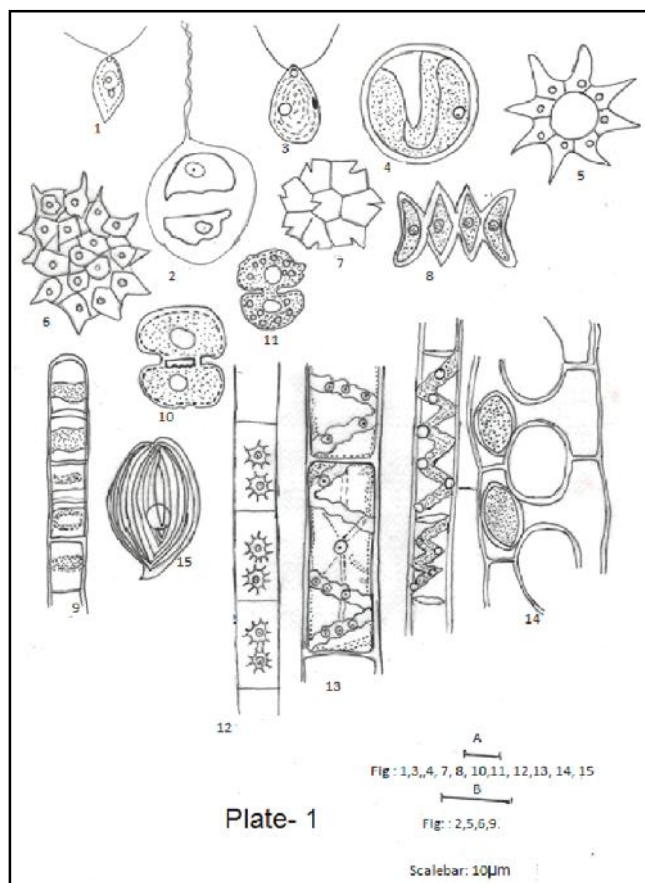


Plate 1 : Algae : Chlorophyceae

longitudinal, a flagellum two times longer than the body length. Chloroplast numerous and discoid, two disc shaped paramylon cells with tail 37—42 long, 23-27.5 in dia. and tail 1.9-5.2 long.

Habitat: Shrasmani, Kankaraj, Bhokarbari
Class: Myxophyceae F.E.Fritsch.

***Microcystis robusta* (Clark) Nygaard:**

Desikachary 1959: 85, Plate 2, Fig. 16

Colonies rounded or spherical to cells ellipsoidal, free swimming sheath distinct, later on gelatinizing, cells 5- 6 μ diameter, spherical without gas vacuoles, cells homogenous and colourless.

Habitat: Found in free swimming condition in common fresh water reservoir Bori dam. Bori river.

Order: Chroococcales Wettstein.

Family: Chroococcaceae Naegeli.

***Chroococcus macrococcus* Rabenh:**

Desikachary 1959: 101, Plate 2, Fig. 17

Thallus is in mucilaginous matrix, yellowish brown in colour, spherical or sub-spherical, sheath or individual cell distinct, 2-4 cells together, individual sheath of cell is distinct colony is 26 μ in diameter, colonies are comparatively smaller in size than the type.

Habitat: Planktonic in common water reservoir ponds, pools, Bori river, Mhaswa lake.

***Gleotheca samoensis* wile:**

Desikachary 1959: 128, Plate 2, Fig. 18

Cells cylindrical to ellipsoidal, straight or bent, without sheath 4.2 μ broad and 8 μ long, yellowish or bluish green, in round colonies, mostly 2-4 in common envelop, envelope is colourless.

Habitat : In Mhaswa Lake, ponds and common water reservoirs

***Aphanocapsa pulchra* (Kutz) Rabenh:**

Desikachary 1959: 132, Plate 2, Fig. 19

The thallus gelatinous, homogenous, blue green, tuberculate, attached, cells are spherical 3.5-4.5 μ diameter, loosely arranged, individual sheet of cells indistinct.

Habitat : Planktonic in Mhaswa lake, Bori dam, Bori river, Ponds, Puddles.

***Merismopedia g/auca* (Ehrenb) Nag:**

Desikachary 1959: 153, Plate 2 Fig. 20

Colonies small with 8-16 cells, cells spherical, closely arranged 3-6 μ broad, kidney shaped, pale blue green.

Habitat : Planktonic in standing water of outlets of Bori dam, in fast running channels (streams).

***Merismopedia punctata*, Meyen :**

Desikachary, 1959 :155 Plate 2, Fig. 21

Colonies small; 4-16 cells about 16 μ broad, cells loosely arranged spherical or ovoid, 2.5-3 μ broad pale blue-green in colour.

Habitat: Planktonic in Bori river, Mhaswa lake .

Order: Pleurocapsales Geitler

Family: Pleurocapsaceae Geitler.

***Spirulina major*, kutz ex. Gomont :**

Desikachary 1959: 196 Plate 2. Fig. 22

Trichomes unicellular to multicellular, cylindrical, sheath absent, loosely or tightly coiled blue green in colour spirals 2.5-4 μ broad and 2.7-5 μ long.

Habitat: In Bori river, Mhaswa lake.

***Oscillatoria subbrevis*, Schmidle :**

Desikachary, 1959: 207 Plate 2, Fig. 23

Trichomes single, 5-6 μ broad. cells 1-2 μ long not granulated at the cross walls, end cells rounded.

Habitat: In fresh water, floating, on moist soil of Bori dam.

***Phormidium corium* (Ag.) Gomont :**

Desikachary, 1959; 269. Plate 2, Fig. 24

Thallus expanded, membranous, leathery, blackish green, filamentous, long, flexous, sheath thin, diffluent, trichomes blue green, not constricted at the cross walls, ends straight, attenuated, 3.4-4 μ broad, cells 7-7.8 μ long, not granulated t the cross walls, end cell conical.

Habitat: In stagnant water near outlet of Bori dam, Bhokarbari.

***Phormidium mucosum* Gardner :**

Desikachary, 1959: 265 Plate 2, Fig.-25

Filaments 7.8-8.3 μ broad, curved, trichomes 2.9-4 μ broad, sheath thick and colourless, not constricted at the cross walls, trichomes pale blue green; cells 6-7 μ long, end cell rounded.

Habitat: Planktonic in Mhaswa lake, Bhokarbari

Family: Nostocaceae Kuetzing.

***Nostoc calcicola* Brebisson ex bornet. Hah:**

Desikachary 1959: 384, Plate 2, Fig. 26

Thallus is mucilaginous, expanded, olive green in colour, cells barrel shaped, sub spherical, trichome 2.5 μ broad.

Habitat: Found in stagnant water channels of Shirasmani.

***Nostoc ellipso sporum* (Desm.) Rabenh.ex.Born.et Flah :**

Desikachary, 1959:383. Plate 2, Fig. 27

Thallus brownish, filaments flexuous, trichomes 3-4 μ broad, light blue green; cells cylindrical; heterocysts oblong, 6-10 μ long, 4-6 μ broad, spores ellipsoidal, 6-7 μ broad, 9-12 μ long.

Habitat: in the stream near Bori river.

Sub family: Anabaenae Bornet and filahault.

***Anabaena anomala* Fritsch:**

Plate 2, Fig. 28

Thallus thin, gelatinous blue green in trichomes commonly aggregated apical cells rounded apex obtuse. Cells 2-3 μ broad and 4-5 μ long cells spherical and barrel shaped.

Habitat: found in stagnant water ponds of Shirasmani.

***Gloeotrichia echinulata* (J.E.) Smith P. Richter :**

Desikachary, 1959:556 Plate 2, Fig. 29

Thallus soft, spherical filaments loosely arranged radial, sheath distinct, smooth, hyaline; trichomes 8-10 μ

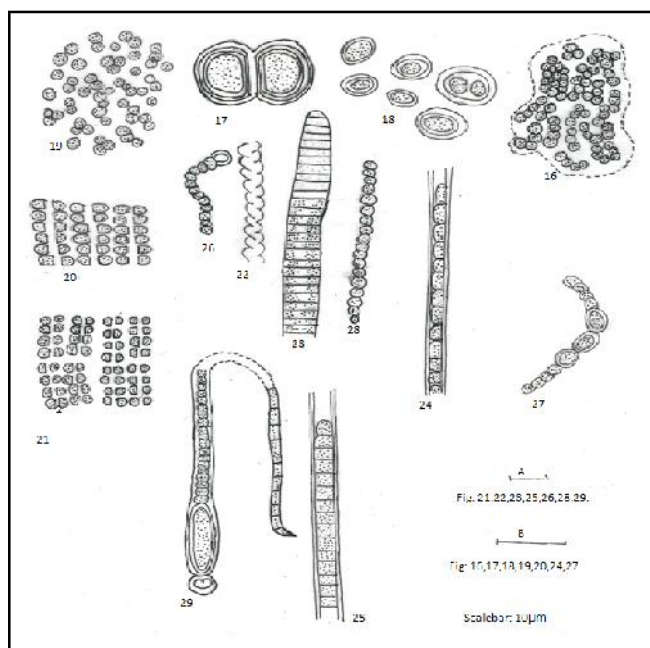


Plate 2 : Algae : Cyanophyceae

broad, at the base attenuated in a long hair, 1-2 μ broad; cells spherical at the base, elongated above; heterocyst spherical, 7-9 μ broad; spores single, cylindrical, straight, 6-15 μ broad, 40-45 μ long. Habitat: Planktonic in stagnant pond, near Bori dam, Mhaswa lake.

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Legends:

- *Chlamydomonas acuta* Smith.
- *Chlamydomonas cylindrocystiformis* Iyengar.
- *Chlamydomonas media* Smith.
- *Chlorella vulgaris* Beijerinck
- *Pediastrum simplex* var. *duodenarium* (Bailey) Robenhorst.

- *Pediastrum simplex* var. *echinulatum* Wittrock n Wittrock and Nordstedt

- *Pediastrum tetras* (Ehr.) Ralfs.
- *Scenedesmus serrata*, patel and esabell
- *Ulothrix variabilis* kutzing.
- *Cosmarium biculatum* var. *depressum* (schaarschmidt)

- *Cosmarium subprotumidum* Nordstedt.
- *Zygnema oudhense* Randhawa
- *Spirogyra brunnea*, Czurda.
- *Spirogyra communis* (HASSAL).
- *Phacus curvicauda* swirenko.
- *Microcystis robusta* (clark) Nygaard.
- *Chroococcus*, *macrococcus* Rabenh.
- *Gleotheca samoensis* Wile.
- *Aphanocapsa pulchra* (Kut) Rabenh.
- *Merismopedia glauca* (Ehrenb) Nag.
- *Merismopedia punctata*.
- *Spirulina major* kutz ex Gomont.
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- *Nostoc ellipso sporum* (Desm) Rabenh e x

Born.et Flah.C.B.

- *Anabaena anomala* Fritsch.
- *Gloeotrichia echinulata* (J.E.) Smith.

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