

Genus Cosmarium and Closterium (Chlorococcales)from Waghur Dam of Jalgaon district of Maharashtra

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ABSTRACT:

The Waghur Dam is an earthfill dam on the Waghur River . The present communication deals with the study of Chlorococcales . The sample of Algae was collected weekly/monthly from 5 stations of Waghur dam during the period of investigation . The taxonomic enumerations has been recorded as 10 and 13 species of genus cosmarium and Closterium respectively.

Keywords = Cosmarium , Closterium , Chlorococcales , Waghur Dam .

INTRODUCTION:

Algae are the potential colonizers of water bodies . The geographically details are being repeated to facilitate the location of the points of collections of various taxa and floristic distribution of green algae in the dam .The dam is situated on the Waghur river , a major southern tributary of the Tapi River near Kandari and Varadism in Jalgaon district , Maharashtra .The Waghur Dam is a vital water source for the region , supplying drinking water and irrigation drought -prone fields.

Cosmerium and Closterium is an interesting genus of green algae identified by its size, shape and curvedness .

METHODOLOGY:

Early in the morning I have taken these algal samples from different places of waghur dam .The names of 5 different stations are as follows :-

- 1. Chinchkhede .
- 2. Neri Waghur – Neri Jalgaon Road.
- 3. Satara Pool – Neri Jamner Road
- 4. Gangapuri – Jamner Bhusawal Road
- 5. Kandari – Bhusawal Raod .

- The sampling sites will be selected carefully , so as to get maximum number of algal forms growing in varied habitat. Another important aim is to preserve the material into 4% formalin and 96% distilled water in bottle. Take the sample in lab, and observe it carefully under microscope .

DESCRIPTION:

1. *Cosmarium awadhense*

(Pl.1, fig 1)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P.153 [Pl 21,fig 17]

Cells small ,slightly longer than broad, constriction deep ,sinus narrowly linear towards apex and slightly open outwards; semicells sub-semicircular, sides 4-5 crenate, apex truncate with more or less straight margin; cell wall smooth ; each semicell with one massive chloroplast, containing one pyrenoid.

Long. Cell.29-31.4 μm ,lat.cell. 25.5 -28 μm ,lat. Isthmus 7 -8.5 μm

2. *Cosmarium awadhense* var.minus var.nov

(Pl 1, fig 2)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P. 154 [Pl 21, fig 16]

Cell small ,slightly longer than broad, deeply constricted , sinus narrowly linear with a dilated extremity semi cells sub-circular ,cell apices truncate and flat with straight margin, sides with 3-4 crenations without granules; cell wall smooth.

Long.cell 16.4 μm ,lat.cell.13.4 μm ,lat isthmus 5 μm .

3. *Cosmarium depressum* var. *apertum* (W.B. Turner) M. Hirano

(Pl. 1, fig 3)

S.B. Andhale 2009 P. 4 [Pl. 1, fig 8]

Cells length and breadth almost equal , cells 23.1 μm long and 20.3 μm wide , isthmus 5 μm , construction very deep , semicells sub – semicircular , sinus open and acuminate ends ;

margins and apices convex , chloroplast one in each of the sub cells lateral angles rounded ;
cell wall minutely punctate .

4. *Cosmarium deppresum* var. *minutum* Heimerl

(Pl. 1, fig 4)

S.B. Andhale 2009 P. 4 [Pl.1 , fig 9]

Cells 20.1µm long and 23.1 µm wide , isthmus 9 µm ; length almost like breadth ; deeply constricted in middle, sinus open , acute angled ; semi cells sub elliptic with convexed dorsal margin , cell wall smooth , angles thickened , obtusely angled.

5. *Cosmarium medioglabrum* Tum .

(Pl. 1, fig 5)

S.B. Andhale 2009 P. 7 [Pl. 2, fig.23]

Cells small , slightly longer than broad , 20.2µm long and 18.2 µm wide, deeply constricted semi cells sub hexagonal angles sub – rotundate , sinus narrow and open outwards , isthmus 5 µm ; sides faintly converging to slightly narrowed with truncate apex , cell wall finely punctate ; margin slightly undulate with 14-16 undulations ; single axile chloroplast in each semicell with single pyrenoid .

6. *Cosmarium pygmaeum* Archer

(Pl. 1, fig 6)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P.177 [Pl 21 ,fig 10]

Cell very small , a little longer than broad , deeply constricted ,sinus narrowly linear ; semicells oblong – hexagonal , basal and apical angles sharp , apex widely truncate with straight margins , centre of each semicell with a faint protuberance ; cell wall smooth .

Long .cell . 13.1 µm ,lat.cell. 10.6µm , lat.isthmus 3.5 µm

7. *Cosmarium subimperssulum*

(Pl. 1, fig 7)

S.B. Andhale 2009 P. 12 [Pl. 3, fig.42]

Cells small , longer than broad , deeply constricted , sinus linear, narrow , cell wall smooth , semicells transversely rectangular in lower part , pyramidate -truncate above , with 4 crenulations on each side , lateral view of semicells ovate , apices truncate , tumid in the middle portion on both sides , cells 25.8 μm ; lat cells 18.4 μm ; isthmus 5.5 μm .

8. *Cosmarium subimperssulum* Borge.

(Pl. 1, fig 8)

Prashant C. Shahare And K.J. Cherian 2012 P.264 [Plate.1-fig.7]

Cells 25-30 μm long, 16-20 μm broad. Isthmus 6.3-7 μm .

9. *Cosmarium subprotumidum* Nordst. var. *gregorii* Roy et Biss.

(Pl 1,fig 9)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P.186 [Pl,24 ,fig 23]

Cell small , a little longer than broad , sinus narrowly linear , semicell trapiziform , upper half narrowed to broadly truncate apex , sides with 3 faintly bigranulate crenations and apex with 3 or 4 slight undulations; cell wall with somewhat radially arranged granules within the margin , generally in pair above but single further away , centre with a tumour above the isthmus , consisting of relatively larger granules disposed in irregular vertical series ; chloroplast axile with one pyrenoid in each semicell .

Long cell 32.4 μm , lat. Cell. 23 μm isthmus 6 μm .

10. *Cosmarium undulatum* f. *reductum* Croasdale

(Pl. 1, fig 10)

S.B. Andhale 2009 P. 13 [Pl. 3, fig 45]

Cell medium sized , 1.3- 1.5 times longer than broad , 41. 6 μm long and 23.3 μm wide , isthmus 10 μm wide, median constriction deep , semicells pyramidal , lateral walls convex , sinus closed , linear , margin entire with apex undulate regularly , 8 undulations per semicell ; cell wall smooth .

11. *Closterium acerosum* var. *tumidum*

(Pl. 1, fig 11)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P. 99 [Pl 16,fig 23]

Cells with slightly tumid middle portion and deeply curved outer margin , gradually tapering from mid – region towards truncately rounded apices ; cell wall smooth ; chloroplast ridged , with 10-12 large pyrenoids in central series .

Long cell. 225 – 236 μm , lat.cells 27.4 – 30 μm , lat. Apex.4.1-5.5 μm .

12. *Closterium acutum* (Lyngb.) Breb.

(Pl. 1, fig 12)

S.B. Andhale 2008 P. 87 [Pl. 5.11, fig 1]

Cells small, somewhat curved , 18-21 times longer than broad , outer margin 55-70 degrees of arc , inner margin not tumid ; gradually attenuated to acute apices ; cell wall smooth ; chloroplast with 6-8 pyrenoids in a central series . Long cell 72- 83 μm , lat. Cell 3.75 – 4.5 μm .

13. *Closterium calosporum* Witt.

(Pl. 1, fig 13)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P. 101/111 [Pl 16,fig 6]

Cells small , 8-9 times longer than broad , outer margin strongly curved with 120-126 degrees of arc inner margin parallel to outer near apices and somewhat straight in the middle , cell

gradually attenuated to sub acute apices ; cell wall amooth ; chloroplast with single series of 10-12 pyrenoids .

Long . cell. 73- 75.5 μm , lat cell. 8.5- 10.1 μm .

14. Closterium cynthia De Not

(Pl. 2, fig 14)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P.103 [Pl 16 ,fig 25]

Cells rather small and stout , strongly curved , outer margin 124- 130 degrees of arc , inner margin parallel to outer near apices but more or less straight in the middle , cell gradually attenuated towards obtusely rounded apices ; cell wall finely striate ; chloroplast with 6 pyrenoids , arranged in a row .

Long . cell 94.1 – 97.5 μm , lat.cell 13 – 15.2 μm , lat.apex 2.5-3.5 μm

15. Closterium ehrenbergii Menegh .

(Pl.2, fig 15)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P. 106 [Pl 17,fig 2]

Cells large , stout 6-8 times longer than broad , moderately curved , outer margin 92-110 degrees of arc , inner margin concave but inflated in the middle , cell gradually attenuate towards obtusely rounded apices ; cell wall smooth ; chloroplast wit 6-8 bands and numerous scattered pyrenoids .

Long . cell . 484 -527 μm , lat.cell. 69.1- 81.1 μm ,lat.apex. 10.4- 12 μm .

16. Closterium jenneri Ralfs var. jenneri

(Pl. 2, fig 16)

J.S. Dhande 2007 P. 103 (Pl. 23 , fig. 2)

Cells some what flat in the center while slightly or moderately curved at the apices , inner side straight at mid region ; cell wall smooth ; chloroplast lamellate , 3 pyrenoids in each semicell , apical vacuoles with moving granules ; cells 110.7 – 112.8 μ m long , 17.7 μ m broad.

17. *Closterium leiblenii* Kuetz.

(Pl. 2, fig 17)

S.B. Andhale 2008 P. 88(Pl. 5.11 , fig 3)

Cells of medium size , 7-8 times longer than broad , strongly curved , outer margin with 154-180 degrees of arc , inner margin concave and slightly tumid in the middle , cell gradually attenuated to the acutely rounded apices , cell wall smooth , chloroplast with 4-5 ridges and a median row of 8-9 pyrenoids , long cell 229 – 235 μ m , lat. Cell 31-37 μ m . lat. Apex 7 μ m.

18. *Closterium leiblenii* var. *recurvatum*

(Pl. 2, fig 18)

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P.109 (Pl, 17, fig 3)

Cells of medium size , 6-7 times longer than broad , strongly curved , outer margin with 115-120 degrees of arc , inner margin deeply concave with inflated middle part , cell gradually attenuated towards rotundo -truncate and slightly recovered apices; cell wall smooth ; chloroplast with 4 ridges and 7-10 pyrenoids , arranged in a row .

Long. cell . 191.4 – 198 μ m , lat.cell. 31-33.3 μ m , lat.apex. 6-7.5 μ m .

19. *Closterium moniliferum*(Bory)Ehrenb. var. *moniliferum*

(Pl. 2, fig 19)

J.S. Dhande 2007 P. 106 (Pl. 24, fig. 1)

Cells curved towards the apex, inner margin plane , gradually attenuated towards the apices ; apex obtuse ; cell wall smooth , colorless ; chloroplast striated with 4-5 pyrenoids in each semicell ; cell 198.4 μ m long, 29.2 μ m broad , apex 4.6 μ m wide .

20. *Closterium nasutum* Nordst .

(Pl. 2, fig 20)

S.B. Patil and J.S. Dhande 2020 P. 70 (Pl. 21, fig 5)

Cell large fusiform slightly curve ; as long as broad gradually tapering from the middle to near the ends ; apex abruptly attenuated , being rounded or slightly truncated ; cell wall smooth , numerous pyrenoids dispersed in the chloroplast . Cell 533.5 μm long 60 μm broad , apex 11.2 μ wide .

21. *Closterium parvulum* Naeg.

(Pl. 2, fig. 21)

J.S.Dhande 2007 P. 106 (Pl. 23, fig. 7)

Cells 102.3-138.4 μm long, 15.4-21.5 μm broad , cells moderately to strongly curved , inner margin concave , gradually attenuated to apices ; acutely rounded to bluntly pointed apices; cell wall smooth colourless ; chloroplast lamellate with single series of 2-6 pyrenoids ; apical vacuoles with several moving granules .

22. . *Closterium pritchardianum* Arch.

[Pl. 2, fig 22]

Braj Nandan Prasad And Pradeep Kumar Misra 1992 P.115/116 [Pl 17,fig 13]

Cells of median size or large , faintly curved to more or less straight , 7-14 times longer than broad , outer margin 24-40 degrees of arc , inner margins straight or slightly concave , cell gradually attenuated to narrow , truncate and faintly recurved apices; cell wall striated , striations composed of fine punctae , punctations more prominent on longer specimens ; chloroplast with 5-7 ridges and 6-8 pyrenoids arranged in a row.

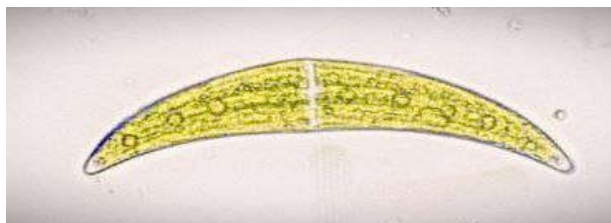
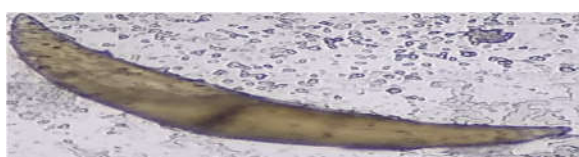
Long . cell 284-760 μm , lat. Cell. 38.4- 51 μm , lat.apex 8.4 -12 μm .

23. *Closterium tumidum* Johns.

(Pl. 2, fig 23)

J.S. Dhande 2007 P. 108 (Pl. 55, fig 3)

Cell about 8 times longer than broad , outer margin slightly curved or straight , cell gradually attenuated towards truncately rounded apices ; cell wall smooth ; chloroplast with 6-8 ridges and 5-6 pyrenoids , arranged in row ; cell 86. 1µm long , 10.8 µm broad , apex 4.6 µm wide .

1. *Cosmarium awadhense*2. *Cosmarium awadhense* v. Minus3. *Cosmarium depressum* v. apertum4. *Cosmarium depressum*5. *Cosmarium medioglabrum* Tum.6. *Cosmarium pygmaeum*7. *Cosmarium subimperssum*8. *Cosmarium subimperssum* Borge.9. *Cosmarium subprotumidum*10. *Cosmarium undulatum* f. reductum11. *Closterium acerosum* var. tumidum12. *Closterium acutum* (Lyngb.) Breb13. *Closterium calosporum*



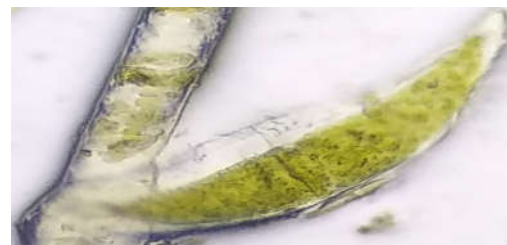
14. Closterium Cynthia



15. Closterium ehrenbergii



16. Closterium jenneri Ralfs. V. jenneri



17. Closterium leiblenii Kuetz.



18. Closterium leiblenii var. recurvatum



19. Closterium moniliferum V. moniliferum



20. Closterium nasutum Nordst



21. Closterium parvulum Naeg



22. Closterium pritchardianum



23. Closterium tumidum Johns

RESULT / DISCUSSION / CONCLUSION;

A total 23 Species belonged to 2 genera which were identified during the period of investigation . Genus Cosmarium awadense , C. depressum , C. mediaglabrum , etc... Genus Closterium acutum , Cl. Cynthia , Cl. jenneri etc...

Hence it is concluded that The Algal Flora of Waghur Dam is an freshwater dam which is been used for drinking and irrigation purposes.

REFERENCE:

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