

# Taxonomical investigation of Cyanophyta From Nandurbar District MS, India

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## ABSTRACT

The term Biodiversity refers to the totality of Genus, Species and Ecosystem of the region. The group Cyanophyta is an extremely diverse group of prokaryotic organisms which make valuable contribution to soil fertility by fixing atmospheric nitrogen. These have tremendous potential in environment management, A number of "floras" summarizing the known species of cyanophyta in particular regions have been published during the 20<sup>th</sup> centuries. For comparative account with previous work the present investigation was done. Systematic account and statistical analysis of genus and species of group cyanophyta was explored in present work. District Nandurbar selected for the investigation. The work was also done for seasonal variation, and addition of any new finding of species in light of biodiversity and various distribution of group Cyanophyta. In the present taxonomic survey total 52 species of group cyanophyta are reported, total 14 genera, 52 species, 05 varieties have been identified spread over the class Chroococcales of Cyanophyta. Based on the number of taxa the dominance of algal Genera is *Oscillatoria* with 06 species, and Genus *Lynbya* with 5 species. *Microcystis* with 06 species, and Genus *Aphanocapsa* with 5 species. Based on the number of taxa the dominance of algal order is as Chroococcales with 27 taxa, Nostocales with 24 taxa, stigonematales 01 taxon, are recorded.

**Key words :-** Taxonomy, Biodiversity, Cyanophyta, Nandurbar, *Oscillatoria*

## INTRODUCTION

The group Cyanophyta is an extremely diverse group of prokaryotic organisms which make valuable contribution to soil fertility by fixing atmospheric nitrogen. These have tremendous potential in environment management, as soil conditioners, bio-fertilizers, feed for animals and protein supplements etc. A number of "floras" summarizing the known species of cyanophyta in particular regions have been published during the 20<sup>th</sup> centuries. Several of these provide a lot of information about species occurring elsewhere in the world. In any case it is clear that many species have a very wide distribution. Once the importance of BGA was realized, several taxonomic studies were undertaken by various workers to explore the

algal flora from different parts of the country. (Dixit 1936, Rao 1937, Desikachary 1959, Kamat 1963, Nandan & Patel 1985). Sahay et. al. (1992) Bhoge (1984); Bhoge and Ragothaman (1986); Nandan and Kumavat, (2003), Kamble, Priydarshani *et. al*, (2014) reported 127 species from 36 genera belongs to 4 order of blue green alga. Jain D. (2015) 19 taxa of *Oscillatoria* from Devbhane dam of Dhule district. Jaiswal (1993); Jaiswal and Ragothaman (1993); While studying algal flora of the Nandurbar reported 14 taxa of Cyanophyceae. There is no information exist on the Algal flora of Cyanophyta of District Nandurbar. For comparative account with previous work the present investigation is done. Systematic account and statistical analysis of genus and species of group cyanophyta. District Nandurbar is selected for present investigation. The present work is done for seasonal variation, periodicity and addition of any new finding of species in light of biodiversity and various distribution of group Cyanophyta. In the present taxonomic survey total 52 species of group cyanophyta are reported, total 14 genera, 52 species, 05 varieties have been identified spread over the class Chroococcales of Cyanophyta. Based on the number of taxa the dominance of algal Genera is *Oscillatoria* with 06 species, and Genus *Lynbya* with 5 species. *Microcystis* with 06 species, and Genus *Aphanocapsa* with 5 species Based on the number of taxa the dominance of algal order is as Chroococcales with 27 taxa, Nostocales with 24 taxa, stigonematales 01 taxon, are recorded.

## MATERIAL METHODS

The taluka Navapur and Nandurbar from District Nandurbar is selected for Systematic account of Cyanophyta. Navapur taluka lies near the boundary of Gujarat state. Navapur Taluka is in Nandurbar District of Maharashtra, India. The algal collection were made at monthly interval from different places of taluka Navapur and Nandurbar The sampling sites were select carefully, so as to get maximum number of algal forms growing in the varied habitats .Another important aim of this method of selection is to correlate the species identification to the changes taking place in the habitats. All collections was preserved in 4% formalin for further Taxonomical investigation. Temporary and permanent preparations of slides were done during this work. Line drawings of different forms of algae were made by camera Lucida. The algae were identified by relevant monographs and recent available literature (Desikachary, 1959).

## Preparation of Semi-permanent Slides for Blue Green Algae:

A drop of glycerin formalin mountant (6 ml glycerin 10 ml of 40% formaldehyde + 84 ml of distilled water) was taken on slide, to which a drop of concentrated preserved sample was added and was covered by a cover slip of suitable size.

## MORPHOLOGICAL DESCRIPTION

### 1. *Microcystis elabens* (Breb) Kuetz. var. *minor* Nygaard

Desikachary T.V. 1959, P.97, Pl.20, F.8 [Pl.1, Fig.1]

Colony spherical and expanding, blue-green, cells oblong 1.1  $\mu$  broad and 2.2 $\mu$  long.

Habitat : Planktonic

Locality : Dhanarat ( Paddy field) Nawapur .June 2017

### 2. *Microcystis holsatica* Lemmermann

Desikachary T.V. 1959, P.96 [Pl.1, Fig.2]

Colonies spherical Clathrate, margins of colonial mucilage, well defined cells closely arranged 1.6  $\mu$  in diam. with gas vacuoles blue-green.

Habitat : Planktonic

Locality : Dhanarat, Nawapur. June 2017

### 3. *Microcystis pulverea* (Wood.) Forti

Desikachary T.V. 1959, P.96 [Pl.1, Fig.3]

Colonies rounded to ellipsoidal often many together limits of colonial mucilage distinct. Cells spherical, closely arranged 2.2  $\mu$  broad, blue-green without gas vacuoles.

Habitat : Planktonic

Locality : Dhanarat , Nawapur .June 2017

### 4. *Microcystis robusta* (Clark) Nygaard

Desikachary T.V. 1959, P.85, F.86. [Pl.1, Fig.4]

Colonies rounded and clathrate; sheath distinct; gelatinizing. Cells 5.9  $\mu$  diam. spherical, without gas-vacuoles.

Habitat : Planktonic in standing water.

Locality : Dhanarat, Nawapur .June 2017

### 5. *Microcystis stagnalis* Lemm.

Desikachary T.V. 1959, P.95. [Pl.1, Fig.5]

Colonies very long and small sometimes expanding and clathrate, colonial mucilage indistinct cells. Very closely arranged spherical 1.6 $\mu$  in diam. Pale blue-green without gas-vacuole.

Habitat : Planktonic

Locality : Chauki, Nawapur .June 2017

**6. *Microcystis viridis* (A.Br.) Lemm.**

Desikachary T.V. 1959, P.87, F.88. [Pl.1, Fig.6]  
Colonies round consisting of a large number of daughter colonies surrounded by a common mucilaginous sheath, margins of colonial mucilage definite and highly refractive cells 3.3  $\mu$  in diam. spherical.  
Habitat : Free floating on a water.  
Locality : Dhanarat ,Nawapur .June 2017.

**7. *Chroococcus indicus* Zeller**

Desikachary T.V. 1959, P.109. [Pl.1, Fig.7]  
Thallus gelatinous thin a pale brownish cell single oblong to sub-spherical 6.10  $\mu$  in diam. Greenish sheath hyaline conspicuous contents granular.  
Habitat : Occuring on the rock.

**8. *Chroococcus limneticus* Lemm.**

Desikachary T.V. 1959, P.107, F.129. [Pl.1, Fig.8]  
Cells spherical, free floating in tubular gelatinous layer, without sheath cells 9.5  $\mu$  in diam. Sheath distinct unlamellatd, colourless, colonial mucilage broad blue-green.  
Habitat : on Moist soil  
Locality : Chauki,Nawapur .June 2017

**9. *Chroococcus turgidus* (Kuetz.) Nag.**

Desikachary T.V. 1959, P.101, 102, F.129. [Pl.1, Fig.9]  
Cell spherical, ellipsoidal single very seldom many blue-green, olive green without sheath, 9.4  $\mu$  in diam. With sheath 12.21  $\mu$  in diam. sheath colourless not distinctly lamellated.  
Habitat : Planktonic  
Locality Dhanarat ,Nawapur .June 2017

**10. *Gloeocapsa calcarea* Tilden**

Desikachary T.V. 1959, P.115, F.122. [Pl.1, Fig.10]  
Thallus with calcium incrustation cells with or without individual sheath 8.3 in diam., blue-green sheath colourless often thin.  
Habitat : On a bank of river.  
Locality : Dhanarat ,Nawapur .June 2017

**11. *Gloeocapsa polydermatica* Kuetz.**

Desikachary T.V. 1959, P.114, F.139. [Pl.1, Fig.11]  
Thallus mucilaginous, compact; cell spherical, without sheath 3.3 $\mu$  in diam., blue-green; sheath colourles very thick as protoplast, very distinct.  
Habitat : On wet rocks.  
Locality : Dhanarat ,Nawapur .June 2017.

**12. *Gloeocapsa stegophila* (Itzings) Rabenh. var.*crasa* Rao. C.B.**

Desikachary T.V. 1959, P.119-20, F.126. [Pl.1, Fig.12]  
Thallus soft yellowish brown cells, spherical elongated cell without sheath 5.9  $\mu$  broad, 9.5  $\mu$  long with sheath 7.8 $\mu$  broad, 10.7 $\mu$  long cell single or in colonies of 2-4 sheath golden yellow sheath up to 3.2  $\mu$  thick.  
Habitat : On moist soil bank of river.  
Locality : Dhanarat ,Nawapur .June 2017

**13. *Aphanocapsa banaresensis* Bharadwaja**

Desikachary T.V. 1959, P.133, F.104. [Pl.1, Fig.13]  
Plant mass soft spherical, hollow, cream coloured cells. Oval to spherical 6.1  $\mu$  in diam. Sheath thick unstratified hyaline closely adpressed to the cells upto 1  $\mu$  thick..  
Habitat : In stagnant pond near the river.  
Locality : Dhanarat ,Nawapur .June 2017

**14. *Aphanocapsa biformis* A.Br.**

Desikachary T.V. 1959, P.134, F.100. [Pl.1, Fig.14]  
Thallus olive green, gelatinous, often expanding cells 4.9 $\mu$  diam., spherical mostly with a special envelope, loosely arranged 2-4 together in common mucilaginous envelope.  
Habitat : On moist ground.  
Locality : Dhanarat ,Nawapur .June 2017

**15. *Aphanocapsa grevillei* (Hass.) Rabenh.**

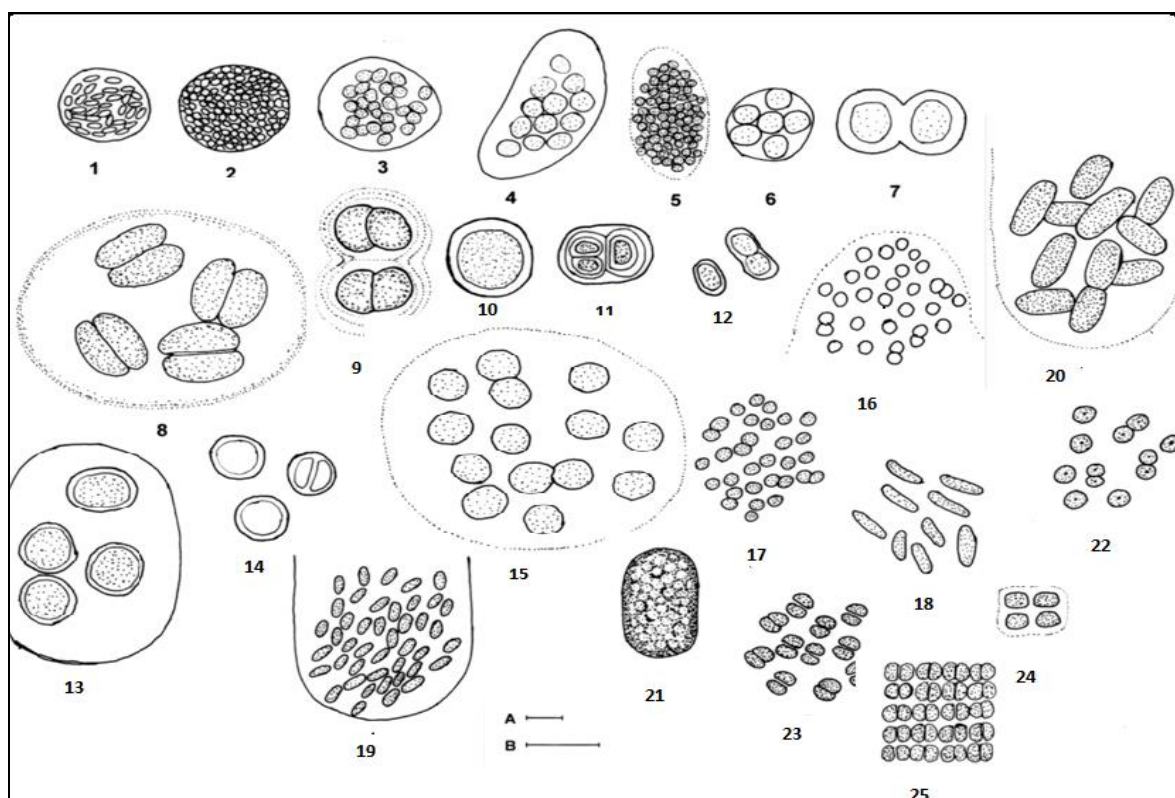
Desikachary T.V. 1959, P.134, F.100. [Pl.1, Fig.15]  
Thallus gelatinous, spherical light blue green cells. Spherical 4.9 $\mu$  in diam. Contents finely granular closely arranged in a homogenous mucilage.  
Habitat : Planktonic in river.  
Locality : Dhanarat ,Nawapur .June 2017

**16. *Aphanocapsa koordersi* Strom.**

Desikachary T.V. 1959, P.132, F.110. [Pl.1, Fig.16]  
Colonies spherical, dull green 2-3 in diam. cells loosely arranged in group spherical, 2.2  $\mu$  in diam.  
Habitat : Planktonic in stagnant water.  
Locality : Dhanara, Nawapur .June 2017

**17. *Aphanocapsa montana* Cramer**

Desikachary T.V. 1959, P.135, F.92. [Pl.1, Fig.17]  
Thallus of no definite shape gelatinous blue-green in colour, cells 2.22  $\mu$  in diam. Spherical light. Blue-green single and in pairs mucilage colourless.  
Habitat : On submerged object.  
Locality : Rangawali River S-V, December, 2006.



**18. *Aphanothece castagnei* (Breb.) Robenh.**

Desikachary T.V. 1959, P.140, F.100. [Pl.1, Fig.18]  
Thallus gelatinous, without any definite shape, slimy blue-green, cells ellipsoidal to cylindrical 2.2 $\mu$  broad, 5.5 $\mu$  long densely arranged; sheath diffluent colourless.  
Habitat : Free floating  
Locality : Dhanarat ,Nawapur .June 2017

**19. *Aphanothece nidulans* Richter. P.**

Desikachary T.V. 1959, P.138, F.104. [Pl 1, Fig.19]  
Thallus irregularly expanded often found between other algae, plankton form more or less round cells cylindrical, straight 1.6  $\mu$  broad upto 3.3 $\mu$  long blue-green, most densely arranged; mucilage sheath diffluent brownish yellow.  
Habitat : On moist soil.  
Locality : Rangawali River S-I, S-II, S-V, January, 2018.

**20. *Aphanothece stagnina* (Spreng.) A.Br.**

Desikachary T.V. 1959, P.137, F.100. [Pl.1, Fig.20]  
Thallus gelatinous, spherical, ellipsoidal upto many cm in diam. Pale blue-green, in the inside often with calcareous crystals; cells oblong. 3.8  $\mu$  broad, 8.3 $\mu$  long, sparsely arranged, inside of the colony, without individual envelopes, homogenous mucilage.  
Habitat : Free-floating.  
Locality : Dhanarat ,Nawapur .June 2017

**21. *Synechococcus aeruginosus* Nag.**

Desikachary T.V. 1959, P.143, F.126. [Pl.1, Fig.21]  
Cells cylindrical 8.8  $\mu$  broad single pale, blue-green.  
Habitat : on moist soil in stream near the river.  
Locality : Dhanarat ,Nawapur .June 2017

**22. *Synechocystis aquatilis* Sauv.**

Desikachary T.V. 1959, P.144, F.126. [Pl.1, Fig.22]  
Cells spherical, single 5.9  $\mu$  broad, pale blue-green.  
Habitat : Planktonic  
Locality : Rangawali River S-I, S-II, S-III April, 2018.

**23. *Synechocystis pevalekii* Erecgovic**

Desikachary T.V. 1959, P.145, F.126. [Pl.1, Fig.23]  
Thallus indefinite among other algae, cells spherical 2.7 $\mu$  broad 2 together contents blue-green homogenous.  
Habitat : Planktonic  
Locality : Dhanarat ,Nawapur .June 2017

**24. *Merismopedia aeruginea* Breb.**

Desikachary T.V. 1959, P.156, F.92. [Pl.1, Fig.24]  
Thallus limited, 4-64 cells in a colony, colonies 3.5 $\mu$  broad cells, spherical 5.9  $\mu$  broad, blue-green in colour.  
Habitat : on the bank of river  
Locality : Dhanarat ,Nawapur .June 2017

**25. *Merismopedia glauca* (Ehrenb) Nag.**

Desikachary T.V. 1959, P.155, F.151. [Pl.1, Fig.25]  
Colonies mostly small with 16-64 cells 45-150  $\mu$  in diam, cells oval, closely arranged 4.4 $\mu$  broad, pale blue-green in colour.

Habitat : Planktonic in Stagnant water.  
Locality : Dhanarat, Nawapur. June 2017.

**26 *Merismopedia minima* Beek**

Desikachary T.V. 1959, P.154, F.151. [Pl.2, Fig.26]  
Cells pale blue-green 4-many in small colonies 0.5  $\mu$  broad, free swimming of 4 cells 2x3 $\mu$ .

Habitat : Planktonic  
Locality : Dhanarat, Nawapur. June 2017

**27. *Merismopedia punctata* Meyen**

Desikachary T.V. 1959, P.155, F.151. [Pl.2, Fig.27]  
Colonies small, 4-64 cells, cells not closely packed spherical 2.5  $\mu$  broad pale blue-green.

Habitat : Planktonic in stagnant water.  
Locality : Dhanarat, Nawapur. June 2017

**28. *Spirulina meneghiniana* Zanard ex. Gomont**

Desikachary T.V. 1959, P.197, F.194. [Pl.2, Fig.28]  
Trichome 1.1 $\mu$  broad flexible, irregularly spirally coiled bright blue-green, forming a thick blue green thallus spirals 4.4 $\mu$  broad and 3.8 $\mu$  distant from each other.

Habitat : Planktonic  
Locality : Dhudipada, Nawapur. June 2018

**29. *Oscillatoria amoena* (Kuetz.) Gomont**

Desikachary T.V. 1959, P.230, F.214. [Pl.2, Fig.29]  
Thallus blue-green trichomes straight, slightly constricted at the cross walls end gradually attenuated, 3.3 $\mu$  broad and 2.2 $\mu$  long septa granulated, end cells capitates broadly conical with calyptras.

Habitat : In running soiled trench water.  
Locality : Wasarwel, Nawapur. June 2017.

**30. *Oscillatoria curviceps* Ag. ex Gomont**

Desikachary T.V. 1959, P.209, F.208. [Pl.2, Fig.30]  
Thallus light blue-green; trichomes straight, very little attenuated, not constricted at the cross-walls, 16.6 $\mu$  broad, 2.7 $\mu$  long end-cells flat rounded, not capitates.

Habitat : Planktonic  
Locality : Dhanarat, Nawapur. June 2017

**31. *Oscillatoria formosa* Bory ex Gomont**

Desikachary T.V. 1959, P.232, F.214. [Pl.2, Fig.31]  
Thallus blue-green trichome; straight slightly constricted at the cross wall 3.3 $\mu$  broad bright blue-green attenuated at the end and bent, cells nearly quadrate

2.7 $\mu$  long septa slightly granulated, end-cells nearly obtuse, calyptras absent not capitates.

Habitat : In Phytoplankton of rivers.  
Locality : Dhanarat, Nawapur. June 2017

**32. *Oscillatoria laete-virens* (Crouan) Gomont**

Desikachary T.V. 1959, P.213, F.212. [Pl.2, Fig.32]  
Thallus thin, membranous, green, trichome yellowish, green, straight, fragile, slightly constricted at the cross-walls, 3.3  $\mu$  broad, apices attenuated slightly bent cells nearly as long as broad 2.7  $\mu$  long end cell not capitates without calyptras.

Habitat : Planktonic  
Locality : Dhanarat, Nawapur. August 2017

**33. *Oscillatoria laete-virens* var. *minimus* Biswas**

Desikachary T.V. 1959, P.213, F.212. [Pl.2, Fig.33]  
Trichomes 2.2 $\mu$  in diam. Slightly constricted at the cross walls, apex of the trichome slightly tapering, slightly covered, not distinctly hooked; cells 1.6 $\mu$  in length cross-wall granulated cells contents uniformly granular, blue-green.

Habitat : Planktonic  
Locality Dhanarat, Nawapur. June 2017

**34. *Oscillatoria perornata* Skuja**

Desikachary T.V. 1959, P.205, F.220. [Pl.2, Fig.34]  
Trichomes erect and flexuous, apices briefly attenuated and bent well constricted at the cross walls, 15.1 $\mu$  broad single cells 2.7 $\mu$  long contents pallid tenerumgue, aeruginius, finely granular, end cell humilis depressed, hemispherical.

Habitat : Planktonic  
Locality : Dhanarat, Nawapur. May 2018

**35. *Oscillatoria princeps* Voucher ex Gomont**

Desikachary T.V. 1959, P.210, F.204. [Pl.2, Fig.35]  
Trichomes blue-green, brownish, straight not constricted at the cross-walls 30.9  $\mu$  broad slightly attenuated at the apices and bent 4.7 $\mu$  long end cells flatly rounded slightly capitates, without thickened membrane blue-green.

Habitat : Floating on the water  
Locality Dhanarat, Nawapur. June 2017.

**36. *Oscillatoria princeps* var. *pseudolimosa* Ghose**

Desikachary T.V. 1959, P.210, F.212. [Pl.2, Fig.36]  
Thallus blue green, trichome straight rigid and fragile cross-walls not granulated 34.5  $\mu$  broad cells short apices straight apical slightly convex, 4.7  $\mu$  long, calyptra absent.

Habitat : Free floating  
Locality : Chauki May, 2018.

**37. *Oscillaoria pseudogeminata* G.Schmid. var. *unigranulata* Biswas**

Desikachary T.V. 1959, P.229, F.212. [Pl.2, Fig.37]  
 Trichomes 3.8  $\mu$  in diam, tenuous straight slightly curved not constricted at the cross walls not attenuated at the apices obtusely rounded not capitates cells, 2.7  $\mu$  in length, cell-wall distinct with one large granule situated at the centre of the partition walls on either side blue-green.  
 Habitat : In stagnant water.  
 Locality : Dhanarat ,Nawapur .June 2017

**38 *Oscillatoria rubescens* DC. ex. Gomont**

Desikachary T.V. 1959, P.235, F.204. [Pl.2, Fig.38]  
 Trichome straight at the ends gradually attenuated. According to Rao, C.B. trichomes 8.3 $\mu$  broad and cells 2.3 $\mu$  long blue-green in colour often granulated at the septa end cells capitates with convex calyptras.  
 Habitat : Planktonic  
 Locality : Dhanarat ,Nawapur .June 2017

**39. *Oscillatoria subbrevis* Schmidle**

Desikachary T.V. 1959, P.207, F.204. [Pl.2, Fig.39]  
 Trichomes singles, 5.5 $\mu$  broad, straight not attenuated at the apices; cells 1.6  $\mu$  long not granulated at the cross-walls end-cell rounded calyptras absent.  
 Habitat : On the moist bank of River.  
 Locality :Wasarwel, Nawapur .June 2017

**40. *Oscillatoria subtilissima* Kuetz.**

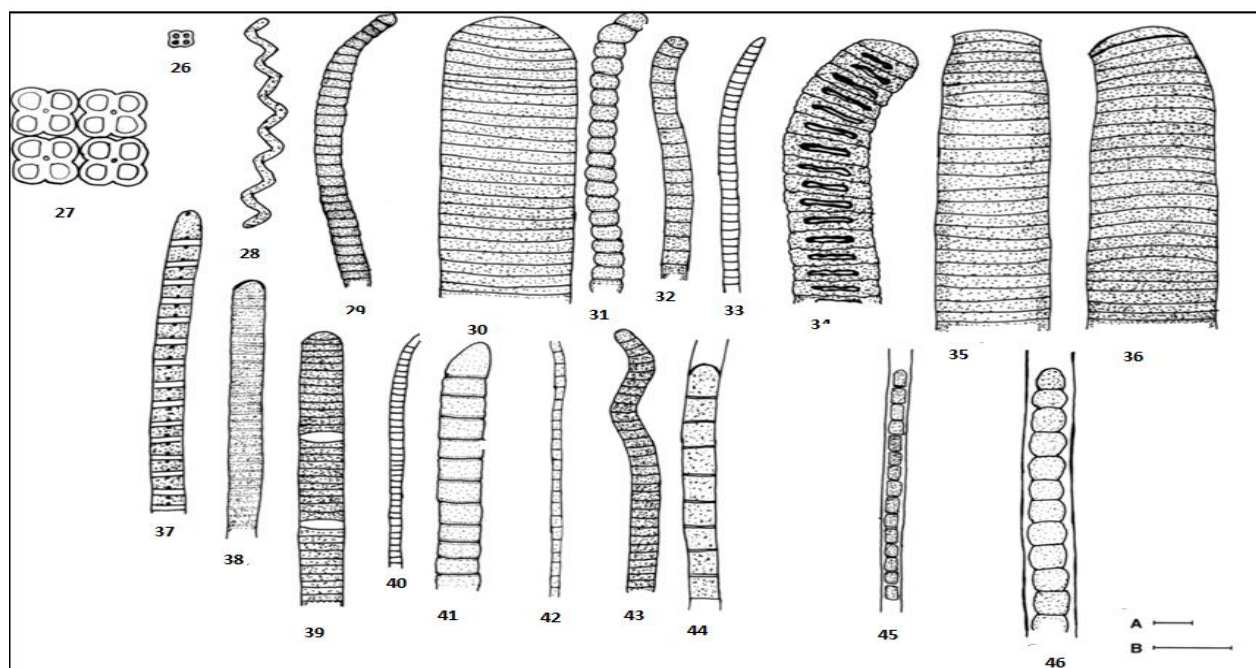
Desikachary T.V. 1959, P.215. [Pl.2, Fig.40]  
 Trichomes single seldom forming a thallus yellowish green, 1.6 $\mu$  broad curved septa indistinct without gas-vacuoles.  
 Habitat : Planktonic in fresh water  
 Locality : Dhanarat ,Nawapur .June 2017

**41. *Oscillatoria tenuis* Ag. ex.Gomont**

Desikachary T.V. 1959, P.222. [Pl.2, Fig.41]  
 Thallus thin blue-green, slimy trichome, straight, fragile slightly constricted at the cross-walls, 5.5 $\mu$  broad slightly bent at the ends not capitates 3.3 $\mu$  long at the septa granulated.  
 Habitat : Stragglng portion of river.  
 Locality : Dhanarat , Nawapur. June 2017

**42. *Oscillatoria trichoides* Szafer**

Desikachary T.V. 1959, P.228, F.220. [Pl.2, Fig.42]  
 Trichome straight not constricted at the cross-walls. According to Skuja (1949 Pl.8 Fig.23), filaments 1.1  $\mu$  broad slightly curved ends not markedly tapering and not bent little constricted at the cross-walls, cells 2.2 $\mu$  long greenish yellow.  
 Habitat : In Running water  
 Locality :Raipur, Nawapur .June 2017



**43. *Oscillatoria willei* Gardner em.Drouet**

Desikachary T.V. 1959, P.217, F.208. [Pl.2, Fig.43]  
 Trichome pale blue-green bend at the ends i.e. screw like 3.3 $\mu$  broad unconstructed at the cross-walls ends not attenuated, not capitates, cells 1.6 $\mu$  long cell rounded without a thickened membrane.  
 Habitat : Found on wet soil Paddy field  
 Locality : Dhanarat, Nawapur .August 2017

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

Desikachary T.V. 1959, P.269-70, F.264. [Pl.2, Fig.44]  
 Thallus expanded, membranous, lathery, brownish green, filament long, more flexuous, densely entangled; sheath thin, gelatinizing trichome blue-green, not constricted at the cross walls, end straight, not capitates, 3.8 $\mu$  broad, cell nearly quadrate, up to twice as long as broad 4.4  $\mu$  long, not granulated at the cross-walls, end cell obtuse conical, calyptras absent.  
 Habitat : On moist soil Paddy field  
 Locality : Dhanarat, Nawapur. June 2017

**45. *Phormidium purpurascens* (Kuetz.) Gomont**

Desikachary T.V. 1959, P.262, F.264. [Pl.2, Fig.45]  
 Thallus compact, leathery, purple violet, trichome strongly bent entangled, not constricted at the cross-walls, end not attenuated, according to Rao, C.B. filament

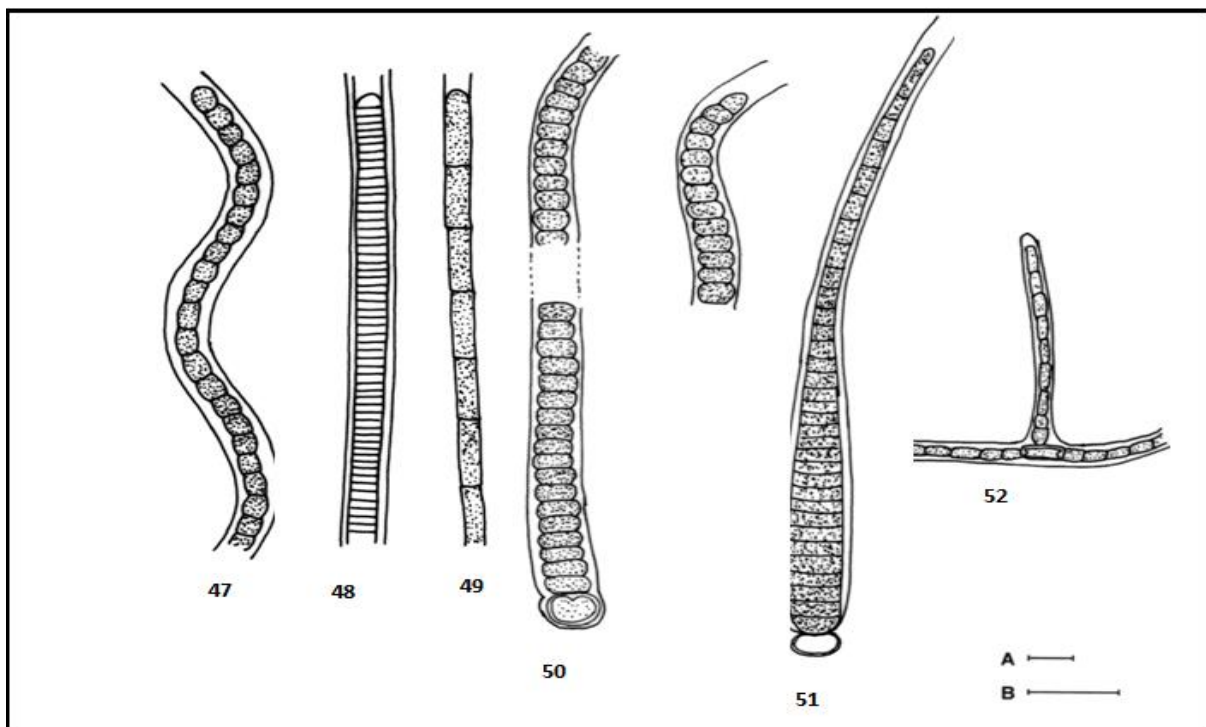
1.6 $\mu$  broad, sheath 0.5 $\mu$  thick cells 2.2 $\mu$  long cells nearly quadrate cross-walls marked by two granules on either side end-cell rounded calyptras absent.  
 Habitat : Submerged in water, attached to rock.  
 Locality : Nagazari, Nawapur .June 2017

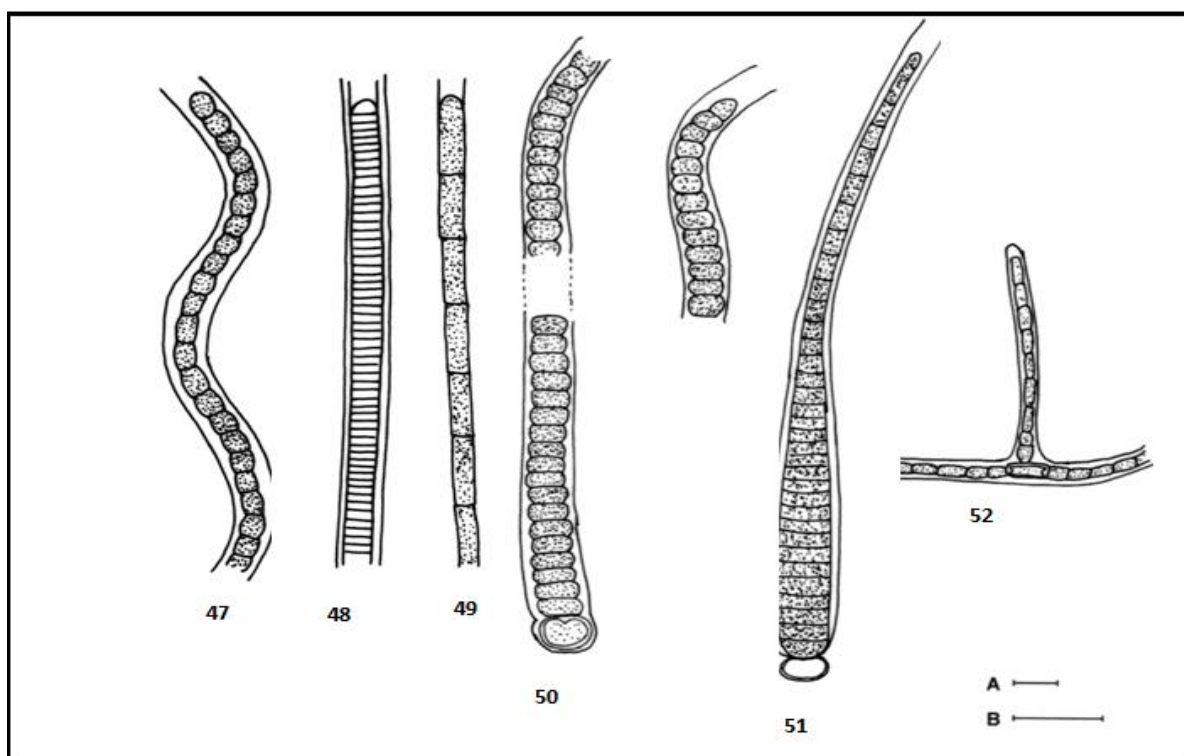
**46. *Lyngbya holdenii* Forti.**

Desikachary T.V. 1959, P.286, F.292. [Pl.2, Fig.46]  
 Filament attached to other algae by their middle ends free, about 80 $\mu$  broad; sheath thin, delicate; trichome, pale green, distinctly constricted at the cross-walls, 4.4 $\mu$  broad; cells sub quadrate 3.8 $\mu$  long; end cell rounded.  
 Habitat: On other alga growing on chunks in deep-water.  
 Locality : Nagazari ,Nawapur .June 2017.

**47. *Lyngbya lagerheimii* (Mob.) Gomont**

Desikachary T.V. 1959, P.290, F.288. [Pl.3, Fig.47]  
 Filament single, irregularly spirally coiled; sheath thin, colourless; trichome about 2.2  $\mu$  broad; cells 3.3  $\mu$  long, not constricted at the cross walls, without single granules on either side, pale blue-green; end cell rounded.  
 Habitat : Free floating  
 Locality : Nagazari ,Nawapur .August 2017





**48. *Lyngbya lutea* (Ag.) Gom.**

Desikachary T.V. 1959, P.310, F.304. [Pl.3, Fig.48]  
Thallus gelatinous, leathery, olive-green, filament coiled and densely entangled; sheath colourless, smooth, thin, 8.3 $\mu$  broad cross-walls granulated cells quadrate. 1.6  $\mu$  long end cell with rounded calyptras.  
Habitat : Planktonic  
Locality : Dhanarat ,Nawapur .June 2017

**49. *Lyngbya perelegans* Lemm.**

Desikachary T.V. 1959, P.309, F.306. [Pl.3, Fig.49]  
Thallus with many elongated straight filament, filament 2.2 $\mu$  broad sheath thin hyaline, not constricted at the cross-walls, cross-walls with a single granule on either sides, cells 8.3 $\mu$  long, pale-blue-green end cell rounded, not attenuated.  
Habitat : Attached to submerged aquatic plants.  
Locality : Dhanarat ,Nawapur .June 2017

**50. *Calothrix marchica* Lemm var. *crassa* Rao.C.B.**

Desikachary T.V. 1959, P.543-44, F.539. [Pl.3, Fig.50]  
Filament in groups, irregularly bend and closely entangled 14.2 $\mu$  broad, up to 450  $\mu$  long; sheath thin, firm, yellowish; trichomes 11.9  $\mu$  broad, constricted at the septa, ends tapering but without a hair, end cell conical with a rounded apex, cells quadratic, 3.5 $\mu$  long, at the apices up to 4.8 $\mu$  long, heterocyst single, basal, spherical, 10.7 $\mu$  broad and 5.9 $\mu$  long.

Habitat : On a moist rock.  
Locality : Raipur , Nawapur . July 2017

**51. *Calothrix viguieri* Frey**

Desikachary T.V. 1959, P.538, F.520. [Pl.3, Fig.51]  
Thallus irregular, thin, flake like, maculiform, grey-green, filament entangled, nearly straight, falcate up to 200  $\mu$  long, slightly broader at the base, above sub-cylindrical, and 16.6 $\mu$  broad, gradually attenuated, sheath thin, firm, colourless, paryraceous, irregularly lamellated, trichome 11.9 $\mu$  broad above the base, filament 16.6 $\mu$  broad at the base, at the top 7.14 $\mu$  broad; trichome 11.9 $\mu$  broad at the top 2.3 $\mu$  broad; cells 3 $\mu$  long at the base, cross wall with granules; heterocysts 10.7 $\mu$  broad, 5.9 $\mu$  long, basal, enclosed by the sheath.  
Habitat : In a small pond near the river.  
Locality: Wasarwel, Nawapur .June 2017

**52. *Hapalosiphon intricatus* W.et. G.S.West**

Desikachary T.V. 1959, P.291-92, F.587. [Pl.3, Fig.52]  
Thallus caespitose, blue-green, small, filamently densely, interwoven, sparsely branched, 4.7 $\mu$  broad; sheath close to the trichome, colourless often indistinct; cells spherical, to cylindrical, heterocysts intercalary, sub quadrate; 4.7 $\mu$  broad.  
Habitat : Epiphytic on plants in a stream.  
Locality : Wasarwel, Nawapur. June 2017.



## CONCLUSION

In the present taxonomic survey total 14 genera, 52 species, 02 varieties have been identified spread over the classes Chroococcales of Cyanophyta. Based on the number of taxa the dominance of algal Genera is *Microcystis* with 06 species, and Genus *Aphanocapsa* with 5 species, *Oscillatoria* with 06 species, and Genus *Lynbya* with 5 species.

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