



Contribution to some freshwater myxophycean members from Bhusawal city 1.

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Abstract

Algae are natural inhabitants of water and serves as indicators of water quality in various ways. Sewage water contains 1-6 times more of organic matter which enhance the growth of algae. 48 members of Myxophytes collected from sewage water, moist soil near to sewage pools/puddles / nallies of Bhusawal city. Present communication includes genera like *Aphanocapsa* Naeg., *Rhabdoderma* Schmidle *et* Lautb. *Synechocystis* Sauv. *Merismopedia* Meyen, *Myxosarcina* Printz, *Arthrospira* Stizenb. And *Spirulina* Turpin em. Gardner,

Keywords: Algae, sewage, Bhusawal, and myxophyceae

Introduction

Bhusawal city is located on a small tributary of river Tapi at latitude 21° 00' 20.56" north and longitudes 76° 01' 31.31" east. Bhusawal is a city as well as a municipal council in the Jalgaon district in the Indian state of Maharashtra and is the second biggest town in the district. Situated on river Tapi and National Highway 6 passes through it. The population of Bhusawal in 2011 is 1,87,421 While in end of 2018 would be 2,15,948. There is no proper drainage facility in certain specifically in new area. The temperature ranges 18 -46° sometimes it lowest up to 9.5°, humidity 52-82 %, while rain fall is ranges 10mm-310mm.

Cyanophytes diverse group of prokaryotic phototrophs that are to be found in all possible aquatic habitats of the world. From available literature it is seems that vast amount of work has been carried out on Cyanobacteria from Maharashtra. Kamat (1963) [10], Thomas and Gonzalves (1965) [19], Vasishta (1968) [21], Ashtekar and Kamat (1980) [1], Sardespande and Goyal (1981) [18], Barhate and Tarar (1983) [2], Bhoge and Ragothaman (1986) [3] Mahajan and Mahajan (1988) [15], Kumawat and Jawale (2001) [14], Kumawat and Patil (2010) [14], Kumawat and Borse (2011) [12], Patil (2013) [17], Kamble and Karande (2014) [11], Jain (2015) [6], Jaiswal (2017) [7], Valvi and Gautam (2017) [20], Jaiswal and Gavitt (2019) [8], Patil *et. al.* (2021) [16].

Materials and Methods

The collections were made early in the morning between 7.00 to 9.00 am during July 2017- June 2019 from Bhusawal city and neighbourhood community (M.S.). All the collected samples were studied fresh as far as possible and later preserved in 4 % formalin for further studies. Camera Lucida drawings were made with the help of mirror type of camera Lucida. The identification of taxa is based on the monograph Desikachary (1959 [4]) and relevant research paper publications. The material is deposited in the Department of Botany, Smt.P.K.Kotecha Mahila Mahavidyalaya Bhusawal, district Jalgaon, (M.S.).

Observations and Results

Genus *Aphanocapsa* Naeg., 1849

Aphanocapsa grevillei (Hass.) Rabenh.

Fig. 1

T.V. Desikachary, *Cyanophyta*, pp.134-135, Pl. 21, Fig. 9, 1959 [4]

Thallus spherical mucilaginous, blue green, colony 111.4 µm in diameter, cells spherical, 3.8-4.6 µm in diameter, with finely granular contents, closely arranged in mucilaginous sheath, individual sheath indistinct. (Coll. No. JSD265).

Aphanocapsa roeseana de Bary

Fig. 2

T. V. Desikachary, *Cyanophyta*, pp.131-132, 1959

Thallus broad, irregularly spherical, yellowish green, mucilaginous; cells 5.0 µm broad, nearly oval to spherical, loosely arranged, individual sheath indistinct. (Coll. No. JSD320).

Genus *Synechocystis* Sauv. 1892

Synechocystis pevalekii Ercegovic

Fig. 3

T.V. Desikachary, *Cyanophyta*, p.145, Pl. 25, Fig. 11, 1959 [4]

Thallus indefinite, cells spherical, after division hemispherical, 1.9-2.2 µm broad, single or twos, blue green, homogeneous. (Coll. No. JSD169).

Genus *Rhabdoderma* Schmidle *et* Lautb., 1900

Rhabdoderma lineare Schmidle *et* Lautb.var. *spirale* Schmidle

Fig. 4

L. Hajdu, *Studia Bot. Hung.*, **11**: 19, Fig. 1976 [5].

Cells two to many in rows, long ellipsoidal to cylindrical, slightly bent with rounded ends, constricted at cross walls, 2.5-3.1 µm broad, 4.7-6.6 µm long; arranged in circle. (Coll. No. JSD164).

Cells slightly larger and broader in the present material.

Genus *Merismopedia* Meyen, 1839

Merismopedia glauca (Ehr.) Naeg.

Fig. 7

T.V.Desikachary, *Cyanophyta*, pp.155-156, Pl.29, Fig.5, 1959 [4].

Colonies 16-64-128 celled; cells oval or spherical, closely arranged, 3.2-4.4 µm broad, light blue green. (Coll. No. JSD217).

***Merismopedia marssonii* Lemm. Fig. 5**
T.V. Desikachary, *Cyanophyta*, p.154, Pl. 29, Fig. 15, 1959^[4].

Cells spherical to subspherical, 2.2-3.7 µm broad, colony 4-8 celled, gas vacuoles are present (Coll. No. JSD 287).

***Merismopedia minima* Beck Fig. 6**
T.V. Desikachary, *Cyanophyta*, p.154, Pl. 29, Fig. 11, 1959^[4].

Cells pale blue green, 4 to 16 cells in many small colonies, 0.6-0.7 µm broad, free swimming. (Coll. No. JSD330).

***Merismopedia punctata* Meyen Fig. 8**
T.V. Desikachary, *Cyanophyta*, p.155, Pl. 23, Fig. 5, Pl. 29, Fig. 6, 1959^[4].

Colonies small 4-64 cells; cells not closely packed, spherical or ovoid, 2.5-3.4 µm broad, pale blue green. (Coll. Nos. JSD138, JSD170, JSD180).

***Merismopedia tenuissima* Lemm. Fig. 9**
T.V. Desikachary, *Cyanophyta*, pp.154-155, Pl. 29, Fig. 7 & Pl. 30, Fig. 8,9, 1959^[4].

Cells pale blue green, subspherical, oblong, closely packed, in groups of 16 to many, 1.6-2.5 µm broad. (Coll. Nos. JSD126, JSD170, JSD176).

Order – Pleurocapsales
Family - Pleurocapsaceae
Genus *Myxosarcina* Printz, 1921

***Myxosarcina spectabilis* Geitler Fig.10**
T.V. Desikachary, *Cyanophyta*, p.178, Pl. 30, Figs. 1-5 & Pl. 31, Figs. 17-22, 1959^[4].

Colonies rounded in outline, three dimensional, colonial sheath thin, distinct, hyaline, very young colonies of 4 cells; cells closely arranged, blue green in colour, with slightly angular corners, 6.1-7.8 µm broad. (Coll. Nos. JSD287, JSD320).

Order – Nostocales
Family - Oscillatoriaceae
Genus *Arthrospira* Stizenb., 1852

***Arthrospira platensis* (Nordst.) Gom. Fig.11**
T.V. Desikachary, *Cyanophyta*, p.190, Pl. 35, Fig. 2, 1959.

Thallus blue green, trichomes constricted at cross walls, 4.6-5.4 µm broad, regularly spirally coiled, spirals 20-28.5 µm broad, distances between the spirals 26.1 µm; cells shorter than the broad, 2.3-3.1 µm long. (Coll. No. JSD331)

The plant agrees well in all respects with that of Desikachary (1959)^[4] except narrow distance between the spirals.

***Arthrospira platensis* (Nordst.) Gom. var. *tenuis* (Rao, C.B) Desikachary Fig.12**
T.V. Desikachary, *Cyanophyta*, pp.190-191, Pl. 35, Figs. 4, 11, 1959^[4].

Trichomes pale green, uniform width, 5.4 µm broad, spirals regular, spirals 19.2-22.3 µm broad, distances between the spirals 36.1 µm, not constricted of joints; cells disc-shaped, end cells with rounded apices (Coll No. JSD331).

The plant agrees well in all respects with that of Desikachary (1959)^[4] except having narrower spiral and less distant in the present taxon.

Genus *Spirulina* Turpin em. Gardner, 1827

***Spirulina major* Kuetz. ex Gomont Fig.13**
T.V. Desikachary, *Cyanophyta*, pp.196-197, Pl. 36, Fig. 13, 1959^[4].

Trichome 0.9-1.2 µm broad, regularly spirally coiled, blue-green, spirals 3.1-3.4 µm broad and distant 3.7-4.1 µm distant. (Coll. Nos. JSD138, JSD179).

***Spirulina meneghiniana* Zanard. ex Gomont Fig.14**
T.V. Desikachary, *Cyanophyta*, p.195, Pl. 36, Fig. 8, 1959^[4].

Trichome 1.2-1.6 µm broad, blue green, spirals regular, coiled, spirals 2.8-3.1 µm broad and 3.1 µm distant from each other. (Coll. No. JSD138).

Legends to Figures

1. *Aphanocapsa grevillei* (Hass.) Rabenh.
2. *Aphanocapsa roeseana* de Bary
3. *Synechocystis pevalekii* Ercegovic
4. *Rhabdoderma lineare* Schmidle et Lautb. var. *spirale* Schmidle
5. *Merismopedia marssonii* Lemm.
6. *Merismopedia minima* Beck
7. *Merismopedia glauca* (Ehr.) Naeg.
8. *Merismopedia punctata* Meyen
9. *Merismopedia tenuissima* Lemm.
10. *Myxosarcina spectabilis* Geitler
11. *Arthrospira platensis* (Nordst.) Gom.
12. *Arthrospira platensis* (Nordst.) Gom. var. *tenuis* (Rao, C.B) Desikachary
13. *Spirulina major* Kuetz. ex Gomont
14. *Spirulina meneghiniana* Zanard. ex Gomont

Scale bar A: 25 µm

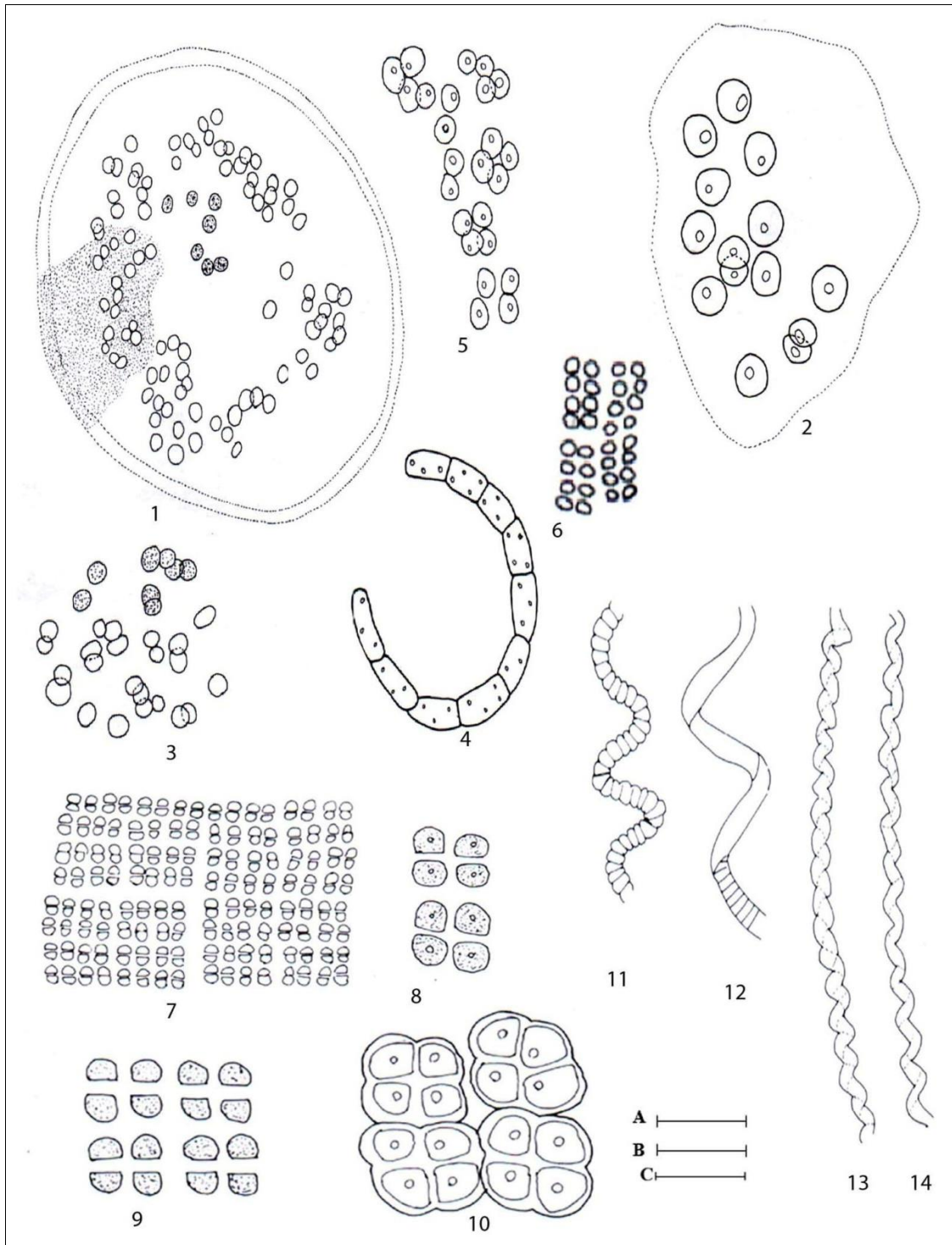
Scale bar B: 25 µm

Scale bar C: 10 µm

Scale A : Fig. 1,7

Scale B : Fig. 2 to 6,10 to 12

Scale C : Fig. 8,9, 13,14



Conclusion

There are 02 species of *Aphanocapsa* Naeg 01 species of *Synechocystis* Sauv., 01 variety of *Rhabdoderma* Schmidle et Lautb., 05 species of *Merismopedia* Meyen, 01 species of *Myxosarcina* Printz, 01 species and 01 variety of *Arthrospira* Stizenb. and 02 species of *Spirulina* Turpin em. Gardner has been recorded for the first time from the study area.

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