Chapter IV

RESULTS

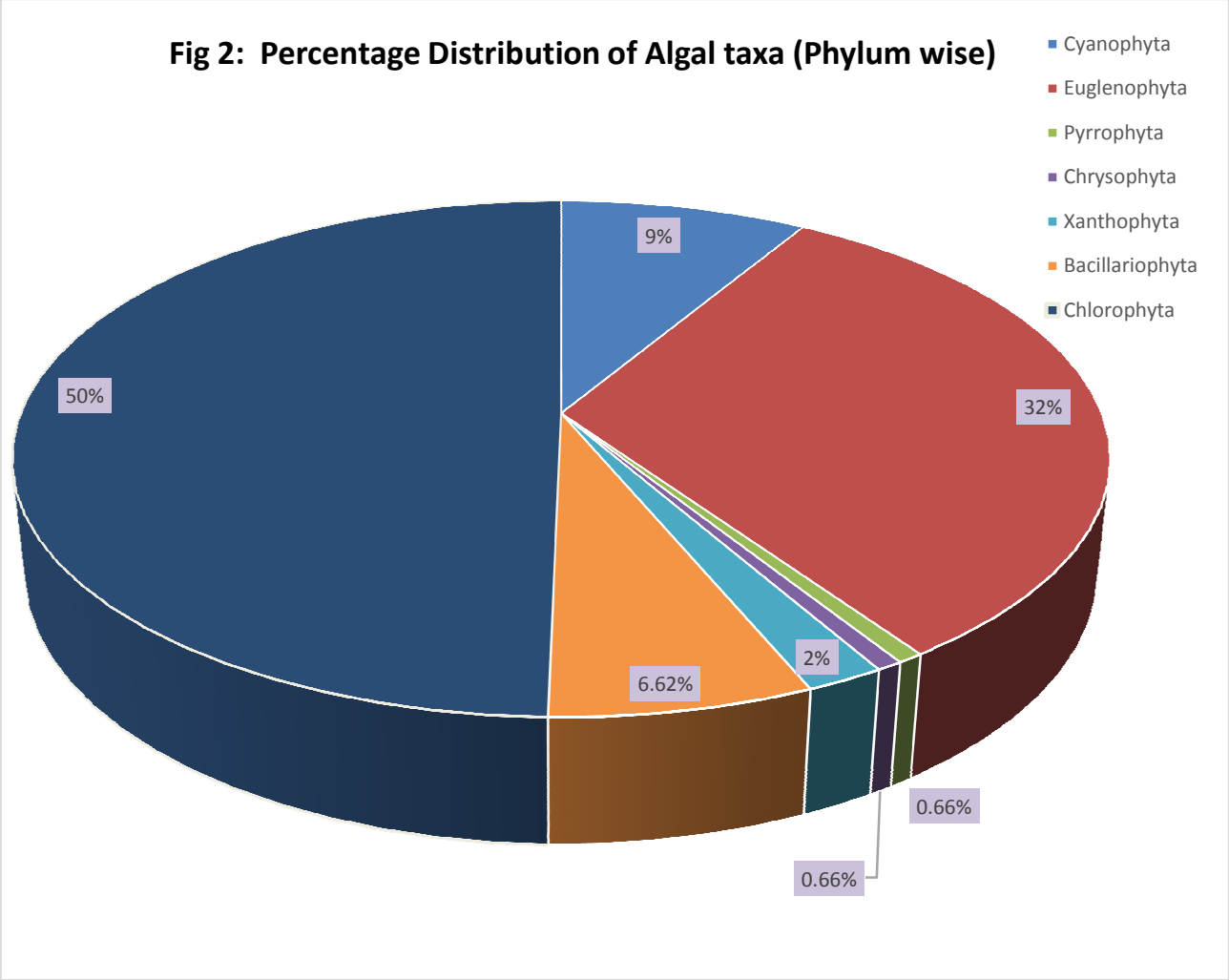
A total of 151 algal taxa belonging to seven phyla (Table **3**) were collected and documented during the study period from the four different selected fish ponds of North Guwahati area. The nomenclature was updated followingAlgaebase, an online taxonomic database of algae which is a worldwide electronic publication of national university of Ireland (Guiry&Guiry, 2012) and the species were arranged following John *et al.* (2005).

Table 2: Algal Taxa recorded in the studied ponds:

Sl. No	Phylum	Families	Genera	Species
1	Cyanophyta	5	9	13
2	Euglenophyta	3	6	48
3	Pyrrophyta	1	1	1
4	Chrysophyta	1	1	1
5	Xanthophyta	2	3	3
6	Bacillariophyta	6	6	10
7	Chlorophyta	15	29	75
	TOTAL	**33**	**55**	**151**

During the investigation, it is revealed to occur a number of 75 members under Chlorophyta followed by 48 members of Euglenophyta, 13 members of Cyanophyta, 10 members of Bacillariophyta, 3 members of Xanthophyta and 1 member each for Pyrrophyta and Chrysophyta

(Table **2**). The most dominated group was Chlorophyta with 5 orders, 15 families and 29 genera and the second most dominating algal group are the members of Euglenophyta with 1 order, 3 families and 6 genera.



The percentage distribution of each Phylum depicted in the figure 2 showed that with about 50% of its contribution, Phylum Chlorophyta was outnumbered followed by Euglenophyta with 32%, Cyanophyta with 9%, Bacillariophyta with 6.62%, Xanthophyta with 2%, Pyrrophyta and Chrysophyta with 0.66% each respectively from the entire study sites.

Table 3: Algal enumeration in the four studied fish ponds of North Guwahati

Sl. No	CYANOPHYTA	S1	S2	S3	S4
1	*Aphanocapsalittoralis*Hansgirg	-	+	-	-
2	*Merismopediatenuissima*Lemmermann	-	-	+	+
3	*Merismopediapunctata*Meyen	+	+	-	+
4	*Chroococcusdispersus*(Keissler) Lemmermann	-	+	+	-
5	*Chroococcusturgidus*(Kutzing) Nageli	-	-	+	-
6	*Chroococcuscohaerens*(Breb.) Nag.	-	-	+	-
7	*Cyanosarcinaburmensis*(Skuja) Kovacik	-	-	-	+
8	*Geminocystis*sp.	-	-	-	+
9	*Merismoarcustabulatus*Hindak	+	-	-	-
10	*Gloeocapsapolydermatica*Kutz.	+	-	-	-
11	*Gloeocapsanigrescens*Nag.	-	-	-	+
12	*Spirulina corakiana*Playfair	+	-	-	-
13	*Scytonemahofmanni*(C. Agardh) Bornet et Flahault	+	+	-	-
	EUGLENOPHYTA				
14	*Euglena acus*Ehrenberg var.*acus*	+	-	-	+
15	*Euglena acus*Ehrenberg var. *minor* Hansgirg	+	-	-	+
16	*Euglena spirogyra* Ehrenberg var. *spirogyra*	+	-	-	-
17	*Euglena viridis*Ehrenberg	+	-	-	-
18	*Euglena limnophila*Lemmermann	+	-	-	-
19	*Euglena caudata*K. Hubner	+	-	+	-
20	*Strombomonasacuminatus*(Schmarda) Deflandre	-	-	+	-

21	*Strombomonasborystheniensis*(Roll) Papova	+	-	-	-
22	*Trachelomonashispida*(Perty) Steinvar. *granulata*Playfair	-	-	+	-
23	*Trachelomonasoblonga*Lemmermann var. *oblonga*	-	-	-	+
24	*Trachelomonasdubia*Swirenko emend. Deflandre var. *dubia*	-	-	+	-
25	*Trachelomonasplanktonica*Swirenko var.*oblonga*Drezepolski	-	-	+	-
26	*Trachelomonasvolvocina*Ehrenberg var.*punctata*Playfair	-	-	+	-
27	*Trachelomonasabrupta*Swirenko emend. Deflandre var.*arcuata*(Playfair) Deflandre	-	-	+	-
28	*Trachelomonascordata*(Drezepolski) Deflandref. *minor* Deflandre	-	-	-	+
29	*Trachelomonasvolvocina*Deflandre	-	-	+	-
30	*Trachelomonas intermedia* Dangeard var. *intermedia*	-	-	+	-
31	*Trachelomonascylindrica*(Ehrenberg) Playfair var.*cylindrica*	-	-	-	+
32	*Trachelomonaspavlovskoensis*(Poljanski) Popova var.*ellipsoidea*Popova	+	-	-	-
33	*Trachelomonasreinhardii*Swirenko	+	-	-	-
34	*Trachelomonascurta*Da Chunha var. *curta*	+	-	-	-
35	*Phacusagilis*Skuja	-	-	-	+
36	*Phacusnordstedtii*Lemmermann	-	-	+	-
37	*Phacusacuminatus*Stokes var.*acuminatus*	+	-	-	-
38	*Phacuscirculatus*Pochmann	-	-	-	+
39	*PhacusPleuronectes*(Mueller) Dujardin	-	-	-	+
40	*Phacuscaudatus*Huebner var. *major* Philipose	+	-	-	-
41	*Phacuslongicauda*(Ehrenberg) Dujardin var. *rotunda* (Pochmann) Huber-Pestalozzi	+	-	-	-
42	*Phacusmariae*Deflandre	+	-	-	-
43	*Phacus ovalis* (Woronichin) popova	+	-	-	-
44	*Phacus ranula* Pochmann var. *ranula*	+	-	-	-
45	*Phacuscaudatus*Huebner var. *minor* Drezepolski	-	-	-	+

46	*Phacuscaudatus*Huebner var. *caudatus*	+	-	-	-
47	*Phacusanomalus*F.E. Fritsch et M.F.Rich	+	-	-	-
48	*Phacussubspiralis*Shi	+	-	-	-
49	*Phacusdangeardii*Lemmermann	+	-	-	-
50	*Phacusacuminatus*Stokes var.*iowensis*Allegre& Jahn	+	-	-	-
51	*Phacuspseudonordstedtii*Pochmann var.*miniscula*(Conrad) Huber- Pestalozzi	-	-	+	-
52	*Phacuspseudonordstedtii*Pochmann	-	+	-	-
53	*Phacusacuminatus*Stokes	-	-	-	+
54	*Lepocinclis fusiformis* (Carter) Lemmermann var.*amphirhynchus*Nygarrd	+	-	-	-
55	*Lepocinclissalina*Fritsch var.*papulosa*Conrad	+	-	-	-
56	*Lepocinclissalina*Fritsch var.*pachyderma*(Deflandre) Conrad	-	-	+	-
57	*Lepocinclishungpanchiaoensis*Chu	+	-	-	-
58	*Lepocinclis teres* (Schmitz) France var. *teres*	+	-	-	-
59	*Lepocincliscaudata*A.M. Cunha	+	-	-	-
60	*Lepocinclissteinii*Lemmermann	+	-	-	-
61	*Gyropaignegranulata*Yamagishi	+	-	-	-
	PYRROPHYTA				
62	*Peridiniumcunningtonii*(Lemmermann) Lemmermann subsp. *Remotum*Lefevre	-	-	+	-
	CHRYSOPHYTA				
63	*Mallomonastranssylvanica*Peterfi&Momeu	-	-	+	-
	XANTHOPHYTA				
64	*Goniochlorismutica*(A. Braun) Fott	-	-	-	+
65	*Tetraedriellalaevis*Bourrelly	-	-	+	-
66	*Nephrodiellalunaris*Pascher	-	+	-	-
	BACILLARIOPHYTA				

67	*Cyclotella* sp.	-	-	-	+
68	*Synedra* sp.	+	-	+	-
69	*Cymbella*sp.	+	-	-	-
70	*Naviculas*p.	-	-	-	+
71	*Naviculas*p.	-	-	-	+
72	*Naviculas*p.	-	-	-	+
73	*Naviculas*p.	-	-	-	+
74	*Naviculas*p.	-	-	-	+
75	*Nitzschia*sp.	+	-	-	+
76	*Pinnularia*sp.	+	-	-	-
	CHLOROPHYTA				
77	*Asterococcussuperbus*(Cienkowski) Scherffel	-	-	-	+
78	*Carteriaglobosa*Korshikov	-	-	+	-
79	*Chlamydomonas ehrenbergii*Gorozhankin	+	-	+	-
80	*Chlamydomonas reinhardtii*P.A.Dangeard	-	-	+	-
81	*Chlamydomonas lundii*H.*et* O.Ettl	-	-	-	+
82	*Chlamydomonas* sp.	-	-	+	-
83	*Dysmorphococcuscocciferi*Korshikov	-	-	-	+
84	*Gonium pectorale*O.F.Muller	+	-	-	-
85	*Gonium pectrale*Mueller	+	-	-	-
86	*Pandorina morum*(Mueller) Bory St. Vincent	+	-	-	-
87	*Actinastrumhantzschii*Lagerheim var.*hantzschii*	-	+	-	-
88	*Actinastrumhantzschii*Lagerheim	-	+	-	-
89	*Actinastrumgracillimum*Smith	-	-	+	-
90	*Catena viridis*Chodat	-	+	-	-

91	*Chlorella vulgaris* var. *vulgaris* Beijernick	-	+	-	-
92	*Chlorella vulgaris* Beijernick	-	+	-	-
93	*Dictyosphaeriumchlorelloides*(Naumann) Komarek et Perman	+	-	-	-
94	*Muriellaterrestris*J.B.Petersen	-	-	+	-
95	*Bracteacoccusanomalus*(E.J. James) R.C. Starr	-	+	-	-
96	*Chlorolobionbraunii*(Nageli) Komarek	-	-	-	+
97	*Kirchneriellaroseata*Hindak	-	-	-	+
98	*Keratococcusdispar*(West et G.S. West)Tsarenko et D.M.John	-	-	-	+
99	*Keratococcusbicaudatus*(Hansgirg) Boye-Petersen	-	-	-	+
100	*Monoraphidiumcircinale*(Nageli) Nageli	-	-	+	-
101	*Monoraphidiumminutum*(Nageli) Komarek – Legnerova	-	-	+	-
102	*Monoraphidiumcontortum*(Thuret) Komarkova-Legnerova	-	-	-	+
103	*Monoraphidiumpusillum*(Printz) Komarkova- Legnerova	-	-	-	+
104	*Crucigeniatetrapedia*(Kirchner) W. et G.S. West	-	-	+	-
105	*Crucigeniacrucifera*(Wolle) Collins	-	-	+	-
106	*Dictyochlorisfragrans*Vischer	-	-	+	-
107	*Nephrochlamys rotunda* Korsikov	-	-	-	+
108	*Oocystislacustris*Chodat	-	+	-	-
109	*Didymocystisfina*Komarek	-	-	+	-
110	*Didymocystisbicellularis*(Chodat) Komarek	-	+	-	-
111	*Pediastrum tetras* var. *tetraeodon*(Corda) Hansg	-	+	-	-
112	*Pediastrum tetras* (Ehrenberg) Ralfs var. *tetras*	-	-	+	-
113	*Pediastrum asymmetricum*Yamagishi &Hegewald	-	+	-	-
114	*Pediastrum simplex* (Meyen) Lemmermann	-	+	-	-
115	*Pediastrum simplex* Meyen var.*echinulatum*Wittrock	-	+	-	-

116	*Pediastrum simplex* Meyen var. *simplex* Komárek	-	+	-	-
117	*Pediastrum duplex* Meyen var. *duplex*	+	-	-	-
118	*Pediastrum tetras* var. *excisum*(Rabenh.) Hansg.	+	-	+	-
119	*Tetraedrontumidulum*(Reinsch) Hansgirg	+	-	-	-
120	*Scenedesmus dimorphus*(Turp.) Kuetz**.**	-	+	-	-
121	*Scenedesmus quadricauda*(Turp) Breb.var.*quadrispina*G.M.Smith	+	-	-	-
122	*Scenedesmus quadricauda*(Turpin) Brebisson var. *quadricauda*	-	-	-	+
123	*Scenedesmus quadricauda*(Turp.) Breb.	-	-	-	+
124	*Scenedesmus abundans*(Kirchner) Chodat	-	-	+	+
125	*Scenedesmus acuminatus*(Lagerheim) Chodat.	+	-	-	-
126	*Scenedesmus disciformis*(Chodat) Fott&Komarek f.*disciformis*	-	-	+	-
127	*Scenedesmus armatus*(Chodat) G.M. Smith var.*bicaudatus*(Guglielmetti) Chodat	-	-	-	+
128	*Scenedesmus pseudopoliensis*Hortobagyi	-	-	-	+
129	*Scenedesmus quadricauda*(Turpin) Brebisson var. *bicaudatus*Hansgirg	-	-	-	+
130	*Sceendesmusquadricauda*f.*granulatus*Hortobagyi	-	-	+	-
131	*Scenedesmus similagineus*Hortobagyi	-	-	+	-
132	*Scenedesmus verrucosus*Roll	-	-	+	-
133	*Scenedesmus bijugatus*var. *alternans* f.*parvus*(G.SVL Smith) Chodat	-	-	+	-
134	*Sceendesmus intermedius* Chodat	-	-	-	+
135	*Scenedesmus acutus*var.*acutus*Komarek&Fott	-	-	-	+
136	*Scenedesmus hunanensis*Jao	-	-	-	+
137	*Scenedesmus flavescens*Chodat	-	+	-	-
138	*Tetrastrumkomarekii*Hindak	+	-	-	-
139	*Tetrastrumstaurogeniaeforme*(Schroeder) Lemmermann	+	-	-	-
140	*Tetrastrumheteracanthum*(Nordstedt) Chodat	+	-	-	-

141	*Spirogyra oblata* Jao	+	-	+	-
142	*Cosmariumsubcucumis*Schmidle var.*subcucumis*	-	-	-	+
143	*Cosmarium quadratum* Ralfs ex. Ralfs var. *quadratum* f. *willei*(Schmidle)	-	-	-	+
144	*Onychonema uncinatum* Wallich	+	-	-	-
145	*Staurodesmusvalidus*(W. & G.S. West) Thom**.**	-	-	-	+
146	*Staurodesmusbulnheimii*(Raciborski) Round et Brook	-	-	-	+
147	*Staurastrum gracile* Ralfs	+	-	-	+
148	*Staurastrumegregium*West & GS West	-	-	-	+
149	*Staurastrumorbiculare*Meneghini ex Ralfs	-	-	+	-
150	*Staurastrumstriolatum*(Naeg.) Archer var. *striolatum* f. *brasiliense*	-	-	+	-
151	*Euastrum* sp. Ehrenberg ex Ralfs	-	-	+	-

Key: '+' = present, '-'= absent; **S1**= Study site 1; **S2**= Study site 2; **S3**= Study site 3; **S4**= Study site 4

Systematic enumeration:

Phylum: Cyanophyta

Order: Chroococcales

Family: Merismopediaceae

Genus: *Aphanocapsa*Nageli

Colonial forms, colonies are composed of several cells, irregular in shape; cells spherical, ovoid to broadly ellipsoidal, organized in one or two in pairs, enclosed by a homogeneous gelatinous envelope, individual cells have indistinct envelope.

1. *Aphanocapsalittoralis*Hansgirg (Pl. I, Fig. 1)

   Desikachary1959, p.131, pl.21, fig.1

   Indefinite shaped amorphous thallus, thalli mucilaginous; blue-green or yellowish in colour; spherical to sub spherical type cells, found singly or in double (twos), aggregated may be densely or sometimes sparsely; cells diameter 4-6 µm.

   Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

   pH: 7.8, Temperature: 23ºC, Conductivity: 139µs/cm, date of collection: 09-01-2019

   First reported taxon from Assam.

Genus:*Merismopedia*Meyen

Tabular colonies, one layer of cells arranged densely or loosely, rectangular or square in shape, cells spherical- ovoid, perpendicularly arranged in rows, distantly or closely placed together, hyaline within, mucilaginous envelopes thin colonial, individual cell envelopes found in several species.

2. *Merismopediapunctata*Meyen(Pl. I, Fig. 2)

Desikachary1959, p.155, pl.29, fig.6; Das and Keshri 2016, p. 105, pl. 2, f. 23

Rectangular plate colony of 32-128 ovate cells, usually arranged loosely, cells breadth 2.2 – 2.8 µm and length 4.31 – 5.34 µm, cells colour blue green and the contents are homogeneous.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S2: 26º15'23" N 91º41'35" E

S4: 26º15'29" N 91º41'41" E

pH: S1: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

S2: 7.8, Temperature: 23ºC, Conductivity: 139 µs/cm,

S4: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

Date of collection: 26-03-2019

Previously reported from Assam: Kachopukhuri, Kamrup District (Kakati, 2011);

Tinsukia District (Bordoloi, 2016).

3. *Merismopediatenuissima*Lemmermann (Pl. I, Fig. 3)

Komarek & Anagnostidis 1998, p. 174, fig. 219; Das and Adhikary 2014, p. 79, pl. 1, f. 15

Flat colonies, rectangular in shape and aggregation of 32 cells, colourless mucilage, diffluent, cells oval to spherical, after division hemispherical, pale blue green content in the cells, cells 1.8 µm in diameter.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36"E

S4: 26º15'29" N 91º41'41" E

pH: S3: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

S4: 7.8, Temperature: 23ºC, Conductivity: 139 µs/cm,

Date of collection: S1: 26-03-2019, S2: 26-04-2018

Previously reported from Assam: Kachopukhuri and Dighalipukhuri, Kamrup District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

Family: Chroococcaceae

Genus: *Chroococcus*Naegeli

Cells in solitary or small colonies with several cells, surrounded by mucilaginous sheath, colonial envelope present, thin, hyaline- thick, lamellated concentrically, distinct individual cell envelope present, cells spherical- subspherical, just after cell division ovoid or hemispherical,

homogenous or granulate cell contents, yellowish, grey-green or violet in colour, cell divided by cruciate or cubical – division, binary, 2-4-8 celled colony.

4. *Chroococcuscohaerens*(Breb.) Nag. (Pl. I, Fig. 4)

   Desikachary1959, p.111, pl.26, fig.3,9

   Slimy or gelatinous thallus; blue or dark-green colour cells; cells may be found in single or up to 2-8 in groups; thin, colourless and unlamellated sheath; cells diameter without envelope or sheath 2-5 (-7) µm and with sheath 2.5-7 µm, colony size 7-15 µm.

   Place of collection: North Guwahati; S3: 26º15'34"N 91º41'36"E

   pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

   First reported taxon from Assam.

5. *Chroococcusdispersus*(Keissler) Lemmermann (Pl. I, Fig. 5)

   Prescott 1961, p. 447, pl. 100, fig. 7; Das and Adhikary 2014, p. 79, pl. 1, f. 22

   Free floating and flattened, colonies of 8 spherical cells irregularly shaped, arranged in a small cluster, distributed evenly from one another at some distance, individual cell sheath absent, cell contents bright blue green, 3.5 - 4.5 µm in diameter.

   Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

S3: 26º15'34" N 91º41'36" E

pH: S2: 7.8,Temperature: 23ºC, Conductivity: 139 µs/cm,

S4: 7.9, Temperature: 22ºC, Conductivity: 150 µs/cm.

Date of collection: S2: 26-03-2018, S4: 09-01-2019

First reported taxon from Assam.

6. *Chroococcusturgidus*(Kutzing) Nageli (Pl. I, Fig. 6)

Komarek & Anagnostidis 1998, p. 306, fig. 407; Das and Adhikary 2014, p. 79, pl. 1, f. 29

Colonies four celled, mucilage firm and colourless, blue green cells, hemispherical, with granular content, 12.5 -14 µm in diameter.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Kaziranga National park (Yasmin *et al.*, 2015)

Genus: *Cyanosarcina*L. Kovacik

Packet like colonies, subspherical, more or less round in shape, with densely aggregated cells, mucilaginous envelope thin and firm, spherical cells, subspherical, ovoid to irregularly spherical, more or less regularly arranged, packets three dimensional.

7. *Cyanosarcinaburmensis*(Skuja) Kovacik (Pl. I, Fig. 7)

Komarek & Anagnostidis, Suesswasserflora 19(1):314, 1999. Syn. *Myxosarcina burmensis* Skuja. Yamagishi, Plankton Alg. Taiwan 12, 1992.

Spherical to irregular massive colonies, surrounded by a thin gelatinous envelope, spherical to ovoid cells, colony densely composed of 4 celled group, diameter 2-3 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Tinsukia District (Bordoloi, 2016).

Genus: *Geminocystis*J. Korelusova, J. Kastovsky& J. Komarek

Small, free aggregated colonies, rarely solitary cells, mucilage wide without enveloping, usually around cells very narrow mucilaginous layer, colourless, spherical or hemispherical cells pale to bright blue-green or greyish colour, sometimes content with slightly keritomic or homogeneous, diameter 6-15 (30) µm.

8. *Geminocystis*sp. (Pl. I, Fig. 8)

Place of collection: North Guwahati; S4: 26º15'29"(N) 91º41'41"(E)

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Genus: *Merismoarcus*Hindak

One layered colony; flat and tabular, cells 4-16 and 32 rarely in perpendicular rows; cells compact and semi-circular with ends rounded, arrangement in pairs or tetrad, cell faces opposite to each other by their ends forming 2-4-8 rows respectively in 4 or 16 celled colonies ut rarely in 32 celled colonies; contents pale yellow green or pale green in colour; cells divide by transverse bipartition at cell center into 2 equal halves.

9. *Merismoarcustabulatus*Hindak (Pl. I, Fig. 9)

Biologia. Bratislava 43: 750, 1988; Yamagishi 2010, p.8, pl. 2, f. 2

Cells breadth 1-1.2 µm and length 3-5 µm; arc diameter length of the cell 2.2-2.6 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.1, Temperature: 25 ºC, Conductivity: 380 µs/cm, date of collection: 06-09-2018

First reported taxon from Assam.

Family: Microcystaceae

Genus: *Gloeocapsa*Kutzing

Spherical to ovoid colonies, mucilaginous amorphous or compact, 2 paired cells sub colony or 4 cells arranged cruciately, many sub colonies together form amorphous gelatinous mass, spherical cells, just after division hemispherical in 2-4 celled group, gelatinous envelope usually surrounds

cells and sub colonies, lamellated concentrically and yellow, brown, orange or red in colour, usually pale blue-green and homogenous protoplast, binary or cruciate cell division.

10. *Gloeocapsanigrescens*Nag. (Pl. I, Fig. 10)

Desikachary 1959, p. 117, pl. 24, f. 15, 17

Crustaceous, thin, blackish thallus; spherical cells; sheath less diameter 3.3-6.8 µm and with sheath diameter 12-13.5 µm; colonies diameter 30-125 µm; laterally uniting; broad, non-lamellated sheath, blue-green contents; homogenous sheath present.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.9, Temperature: 22 ºC, Conductivity: 150µs/cm, date of collection: 09-01-2019

Previously reported from Assam: Assam University, Silchar campus (Deb *et al.*, 2013).

11. *Gloeocapsapolydermatica*Kutz. (Pl. I, Fig. 11)

Desikachary 1959, p. 114, pl. 25, f. 1

Mucilaginous, compact thallus; spherical cells; sheath less diameter 3-4.5 µm; blue-green in colour; thick as protoplast and colourless sheath; distinct and lamellated many times.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25 ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: SobhagyaKunda, Kamrup District (Kakati, 2016).

Order: Oscillatoriales

Family:Spirulinaceae

Genus: *Spirulina* Turpin ex Gomont

Solitary trichomes, coiled regularly helicoidally, gelatinous sheath rarely present but fine, thin, colourless and usually not found, dish- like cells plane, cross wall invisible by light microscope, rounded or conical end terminal cells found.

12. *Spirulina corakiana*Playfair (Pl. I, Fig. 12)

Komárek and Anagnostidis 2005, p. 146, f. 169

Solitary trichomes, pale blue-green in colour, width (0.5)0.7-0.8 µm; regularly spirally coiled, loose and short; no constriction at cross-walls; at the ends slightly attenuated; rotation left handed; length 25-70 µm and coils width 1.5-2.5 µm with height (2.8-3.5) 4-10 µm; rounded apical cells.

Place of collection: North Guwahati; S4: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Order:Nostocales

Family:Scytonemataceae

Genus: *Scytonema*Agardh ex Bornet et Flahault

Falsely branched filaments with single or geminate branches; the diagnostic feature of the genus is the occurrence of geminate branches but sometimes it occurs in many species with only some branches, lateral branches, generally in between heterocysts; single, straight trichome in each sheath, at the apex hormogonia formed under certain favourable condition.

13. *Scytonemahofmanni*(C. Agardh) Bornet et Flahault (Pl. I, Fig. 13)

John, Whitton and Brook, 2003, 2005, p.114, pl. 20, f. J

Cushion like colony, expanded widely; 1-2 mm high, blackish blue-green in colour, wider sometimes; sparse false branches; cells width 3-4 µm; older parts of trichome mostly longer than wide; shorter meristem region; thin, firm, colourless or yellow to yellow brown sheath; single or paired heterocysts, rounded cylindrical in shape.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S2: 26º15'23" N 91º41'35" E

pH: S1: 7.8, Temperature: 23 ºC, Conductivity: 139 µs/cm,

S2: 7.8, Temperature: 25 ºC, Conductivity: 437 µs/cm

Date of collection: 26-04-2018

Previously reported from Assam: Assam University, Silchar campus (Deb *et al*., 2013).

Phylum: Euglenophyta

Order: Euglenales

Family: Euglenaceae

Genus: *Euglena* Ehrenberg

Cells solitary, uniflagellate, fusiform- acicular- cylindric, anterior end rounded, posterior end with more or less pointed cauda, changes shape continuously by euglenoid movement while moving, rigid or metamorphose periplast, with delicate striae or row of punctate, numerous discoid chloroplasts, ribbon-like or stellate, each with pyrenoid, numerous paramylon bodies, rod-like small or discoid.

14. *Euglena acus*var.*acus*Ehrenberg(Pl. I, Fig. 14)

Wolowski&Hindak 2005, p. 28, fig. 5-8; Das and Adhikary 2014, p. 179, pl. 12, f. 2

Cells green in colour, long and thin in size, 77 - 81 µm long and 15.4 -17.3 µm broad, elongated, apex of anterior end truncate, tapering gradually and passing into a long, hyaline, sharp tail piece, numerous chloroplasts, small, discoid, parietal, pyrenoids absent.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S4: 26º15'29" N 91º41'41" E

pH: S1: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

S4: 7.7, Temperature: 25ºC, Conductivity: 380 µs/cm.

Date of collection: 26-03-2019

First reported taxon from Assam.

15. *Euglena acus*Ehrenberg var. *minor* Hansgirg(Pl. I, Fig. 15)

ProdromousAlgalfloraBohemen 2: 173, 1892. Yamagishi, Plankton Alg. Taiwan 26, 1992; Yamagishi 2010, p.37, pl. 15, f. 2

Smaller cells than the typical one, diameter 5-6.5 µm and length with the cauda 65-70-75 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S4: 26º15'29" N 91º41'41" E

pH: S1: 7.8, Temperature: 23 ºC, Conductivity: 139 µs/cm,

S4: 8, Temperature: 24ºC, Conductivity: 437 µs/cm,

Date of collection: 26-04-2018

First reported taxon from Assam.

16. *Euglena caudata*K. Hubner(Pl. I, Fig. 16)

John, Whitton and Brook, 2003, 2005, p.150, pl. 36, f. B

Cells spindle shaped or broadly spindle shaped; slightly extended anterior ends with apex truncate; a hyaline tail piece at the posterior end; slightly diagonally striated pellicle; flagellum same as size of cell or shorter; large visible eyespot; numerous saucer-shaped chloroplasts; pyrenoid present, small, numerous, rod-like paramylon bodies, have euglenoid movement; cells width (16-)28-38(-45) µm and length 64-120 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S2: 26º15'34" N 91º41'36" E

pH: S1: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

S2: 7.8, Temperature: 23ºC, Conductivity: 138 µs/cm,date of collection: 26-03-2019

First reported taxon from Assam.

17. *Euglena limnophila* Lemmermann(Pl. I, Fig. 17)

John, Whitton and Brook, 2003, 2005, p.153, pl. 34, f. B

Cells spindle to cylindrical shaped; anterior end slightly truncate and a sharp tail piece at the posterior end; slightly striated pellicle; numerous, small, disc-shaped chloroplasts; large, few, elongated rings or rod-like paramylon bodies, shorter flagellum, small eyespot; cells width 7.5-12(-13.6) µm and length 40-90 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

18. *Euglena spirogyra* Ehrenberg var. *spirogyra* (Pl. I, Fig. 18)

Arch. K. Akad. Wiss. Berlin Physik. Kl. 1830: 83. 1832. Pringsheim, Nova Acta Leopoldina 18: 53, 1958; Yamagishi 2010, p.37, pl. 15, f. 2

Large fusiform to cylindrical cells, flattened more or less and twisted; slightly oblique and rounded anterior ends; a tapering long spine at the posterior end; spirally striated periplast with row of brown warts; 2 paramylon bodies, ring-like plates, large; cells diameter 10-15(-20) µm and length with the cauda 80-125(-150) µm.

Place of collection: North Guwahati;S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

19. *Euglena viridis*Ehrenberg (Pl. I, Fig. 19)

Wofowski and Hindak 2005, p. 32, figs. 154-159; John, Whitton and Brook, 2003, 2005, p.158, pl. 37, f. A, B

Cell broad and spindle shaped, anterior end broadly rounded, middle portion broader and posterior end tapering and narrow, cells 34 - 39 µm long and 16.2 - 18.6 µm broad at middle, ovoid paramylon bodies.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: DighaliPukhuri and Rani Pukhuri, Kamrup District (Kakati, 2016); Tinsukia District (Bordoloi, 2016).

Genus: *Strombomonas*Deflandre

Cells solitary, uniflagellate and usually ovoid or ellipsoidal in shape surrounded by a test, ellipsoid, ovoid, quadrate or rhomboid shaped test and in top view radiately symmetric, rarely slightly compressed; anterior ends gradually narrowed into a more or less long neck, mouth at apical apex, distinct collar absent and without clear demarcation between the body of test and neck; mostly posterior ends narrowly produced into a long cauda, rarely broadly rounded; test wall rough, irregular verrucae or granules present and regular ornamentation by punctures or spines absent; rod-like or circular paramylon bodies, several chloroplasts, discoid parietal.

20. *Strombomonasacuminatus*(Schmarda) Deflandre(Pl. I, Fig. 20)

John, Whitton and Brook, 2003, 2005, p.169, pl. 41, f. A-H

Lorica triangular or trapezoidal; distinctly narrowed anterior ends, obliquely truncate collar of height 3-4(-5) µm and width 5-7 µm; a prominent straight or slightly curved extension at the posterior end, sometimes extension absent and rounded posterior ends; smooth, pointed or irregularly warty walls, colourless or brown in colour; numerous chloroplasts, pyrenoids absent, small, rod-like

paramylon bodies, flagellum longer than cell length; lorica width 18-27(-30) µm and length (27-)35-48(-51) µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

21. *Strombomonasborystheniensis*(Roll) Papova(Pl. II, Fig. 1)

Popova &Safonova, Fl. Plant. Crypt. URSS 8(1): 206, 1966. Yamagishi, Plankton Alg. Taiwan 56, 1992. Syn. Strombomonas verrucose (Roll) Deflandre var. borystheniensis (Roll) Deflandre, Arch. Protistenkd. 69: 568. 1930; Yamagishi 2010, p.65, pl. 31, f. 2

Broad ellipsoidal test, anterior ends conical and narrowed with short neck; posterior ends rounded and slightly produced; nearly straight lateral sides and parallel at median; low verrucae wall; tests diameter 19-22 µm, length 26-32 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Trachelomonas* Ehrenberg emend. Deflandre

Cells solitary, uniflagellate, ovoid or ellipsoidal usually, surrounded by a test; globose test, in face view ovoid, ellipsoid or cylindric, in top view radially symmetric, anterior end with circular pore (flagellum aperture), with or without a clear, cylindric collar around the pore; distinct demarcation between body of test and collar distinct; flagellum project far through the collar; tests wall smooth, but usually ornamented with puncts, granules, verrucae or spines regularly; several chloroplasts, discoid parietal; several paramylon bodies, small rod-like or circular plate.

22. *Trachelomonasabrupta*Swirenko emend. Deflandre var.*arcuata*(Playfair) Deflandre(Pl. II, Fig. 7)

Rev. Gen. Bot. 38:695, 1926. Shi, Euglenophyta, Fl. alg. sinica. aqua. dulc. 6:117, 1999; Yamagishi 2010, p.76, pl. 38, f. 1

Broad ellipsoidal test; broadly rounded anterior and posterior ends; straight – slightly swelled lateral sides; collar absent, micro punctate wall without spines; tests diameter 14-18 µm and length 20-30 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

23. *Trachelomonascordata*(Drezepolski) Deflandref. *minor* Deflandre(Pl. II, Fig. 8)

Rev. Gen. Bot. 38: 704, 1926; Yamagishi 2010, p.81, pl. 39, f. 7

Small cordiform tests; with short, cylindric collar in flagellum aperture; smooth wall; 8-12 µm in diameter, 11-14 µm in length.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

24. *Trachelomonascurta*Da Chunha var. *curta*(Pl. II, Fig. 4)

Mem. Inst. Oswald Curz 5: 111, 1918. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 9: 86, 1989; Yamagishi 2010, p.82, pl. 39, f. 12

Compressed-globose tests, in top view circular, in lateral view ellipsoid; flagellum aperture collar absent, but encircled by thickened rim; smooth wall; tests diameter 16-18(-22) µm, length 9-12(-15) µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

25. *Trachelomonascylindrica*(Ehrenberg) Playfair var.*cylindrica*(Pl. II, Fig. 14)

Proc. Linn. Soc. N. S. Wales 40: 13, 1915. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 10: 85, 1989; Yamagishi 2010, p.83, pl. 40, f. 4

Cylindrical tests; broadly rounded anterior and posterior ends; straight and parallel lateral sides; with low, cylindric collar; smooth wall; tests diameter 8-10 µm, length 16-20(-22) µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

26. *Trachelomonasdubia*Swirenko emend. Deflandre var. *dubia*(Pl. II, Fig. 4)

Rev. Gen. Bot. 39: 28, 1927. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 5: 98, 1986; Yamagishi 2010, p.84, pl. 40, f. 12

Cylindrical tests; broad, conically narrowed anterior ends; rounded posterior ends; flagellum aperture with thin cylindric collar; smooth wall; tests diameter 11-14 µm, length with collar 22-26 µm.

Place of collection: North Guwahati; S3: 26º15'34 N 91º41'36" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

27. *Trachelomonashispida*(Perty) Steinvar. *granulata*Playfair (Pl. II, Fig. 2)

Woiowski&Hindak 2005, p. 44, fig. 410, 411; Das and Adhikary 2014, p. 181, pl. 13, f. 15

Ellipsoidal lorica, 22.8 - 23 µm long and 17-18 µm broad, reddish brown, lorica punctate with a small number of granules, collar absent at apical pore.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

28. *Trachelomonas intermedia* Dangeard var. *intermedia* (Pl. II, Fig. 10)

Botaniste 8: 135, 1902. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 6: 92, 1987; Yamagishi 2010, p.88, pl. 41, f. 6

Sub globose to ovoid tests; broadly rounded anterior ends, collar absent; rounded posterior ends; finely punctate wall; tests diameter 15-17 µm and length 18-22 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

29. *Trachelomonasoblonga*Lemmermann var. *oblonga*(Pl. II, Fig. 3)

Abh. Nat. Ver. Bremen 16: 344, 1900.Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 9: 91, 1984; Yamagishi 2010, p.91, pl. 42, f. 14

Oblong to broad-oblong tests; broadly rounded anterior and posterior ends; flagellum aperture collar absent; slightly swelled lateral sides; smooth wall; tests 9-14 µm diameter, length 12-19 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

30. *Trachelomonaspavlovskoensis*(Poljanski) Popova var.*ellipsoidea*Popova (Pl. II, Fig. 12)

Popova &Safonova, Fl. Plant. Crypt. URSS 8(1): 174, 1966. Yamagishi, Plankton Alg. Taiwan 67, 1992; Yamagishi 2010, p.91, pl. 43, f. 1-2

Ellipsoid to oblong ellipsoid tests; narrowly rounded anterior and posterior ends; flagellum apertures with long, cylindric collar; densely punctate walls; tests diameter 20-24 µm and length without collar 29-37 µm, collar 4-6 µm long.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

31. *Trachelomonasplanktonica*Swirenko var.*oblonga*Drezepolski(Pl. II, Fig. 5)

Rosp. Wiad. Mus. Dziedud. Zykich, 7/8: 15, 1921-1922. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 10: 99, 1989; Yamagishi 2010, p.92, pl. 43, f. 4-5

Oblong to broad- ellipsoid tests; broadly rounded anterior and posterior ends, straight and parallel lateral sides; flagellum aperture with short, cylindric collar; densely punctate walls; tests diameter 17-20 µm and length without collar 21-28 µm, collars 3-4 µm long.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

32. *Trachelomonasreinhardii*Swirenko(Pl. II, Fig. 13)

Trav. Soc. Nat. Univ. Imp. Kharkow 48: 90, 1915. Skvortzov, Arbeit. Biol. Sungari-Stat. 1(2): 29, 1925, Yamagishi 2010, p.94, pl. 43, f. 13

Broad- ovoid to globose tests; broadly rounded anterior ends; slightly narrowly rounded posterior ends; truncately flattened sometimes, with a hollow at the centre; flagellum aperture collar broad cylindric with a slightly irregular mouth; wall densely punctate all over; tests diameter 21-22 µm, length without collar 23-25 µm and collars length 2-3µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

33. *Trachelomonasvolvocina*Deflandre(Pl. II, Fig. 9)

Srivastava &Odhwani 1990 a, p. 122, pl. 2, fig. 1; Das and Adhikary 2014, p. 181, pl. 13, f. 21

Lorica spherical and collar depressed, yellowish brown in colour, smooth pellicle, lorica 10.3 - 13.8 µm in diameter.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Lake Baskundianua, Cachar District (Devi *et al.*, 2015).

34. *Trachelomonasvolvocina*Ehrenberg var.*punctata*Playfair (Pl. II, Fig. 6)

Proc. Linn. Soc. N.S. Wales 40: 9, 1915. Yamagishi, plankton Alg. Taiwan 73, 1992; Yamagishi 2010, p.100, pl. 46, f. 4

Globose to sub globose tests; flagellum aperture collar absent, but a ring-like thickening of the wall present; finely punctate wall; tests diameter 16-22 µm (13-15 µm, Playfair, 1915).

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

Family: Phacaceae

Genus: *Phacus* Dujardin

Cells solitary, uniflagellate, flattened conspicuously, somewhat or markedly twisted often, ovoid, in face view circular or fusiform, posterior end with a short or long cauda; in top view flat ellipsoidal and compressed; on dorsal face some species with a high, median longitudinal ridge (flange), entirely extending; euglenoid movement absent and rigid periplast, striated longitudinally or spirally, granules present or serrated; numerous chloroplasts, discoid; 1-2 paramylon bodies, circular or ring-like plate or several discoid in shape.

35. *Phacusacuminatus*Stokes (Pl. III, Fig. 13)

Wofowski&Hindak 2005, p. 34, fig. 219; Das and Adhikary 2014, p. 179, pl. 12, f. 21

Cells broadly ovoid or oval in outline, 21.3 - 24.5 µm long and 17 -19 µm broad, straight lateral margins present, dorsal furrow shallow and extending half to three quarters of the cell length, anterior end incised, short extension at posterior end, longitudinally striated pellicle, chloroplasts parietal, disc shaped, numerous, paramylon bodies ring like, 1 – 2 in number.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Samaguri lake (Buragohain*et al.*, 2012); Tinsukia District (Bordoloi, 2016); JorPukhuri, kamrup District (Kakati, 2011); some oil Refinery Effluent Drains (Baruah *et al.*, 2009).

36. *Phacusacuminatus*Stokes var.*acuminatus*(Pl. II, Fig. 17)

Pochmann, Arch. Protistenkd. 95: 141, 1942. Yamagishi, Plankton Alg. Taiwan 36, 1992; Yamagishi 2010, p.47, pl. 21, f. 1

Sub circular to ovoid cells; narrowly rounded anterior ends; broadly rounded posterior ends with cauda; short, blunt straight caudae; 2 paramylon bodies, circular plate; cells diameter 20-30 µm, length with cauda (23-)30-41 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

37. *Phacusacuminatus*Stokes var.*iowensis*Allegre& Jahn (Pl. III, Fig. 10)

Trans. Am. Microsc, soc, 62: 235, 1943. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 20: 53, 1998; Yamagishi 2010, p.47, pl. 21, f. 2

Long- ovoid to ovoid cells; narrowly rounded and shallowly bilobed anterior ends; conically rounded posterior ends with short, oblique cauda; 2 paramylon bodies, ring-like or circular plate; cells diameter 12-19 µm, length 26-28 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

38. *Phacusagilis*Skuja(Pl. II, Fig. 15)

Acta Horti Bot. Univ. Latv. 1: 39, 1926. Yamagishi, Plankton Alg. Taiwan 37, 1992; Yamagishi 2010, p.48, pl. 21, f. 5

Coffee- bean like cells, ellipsoid to broad-ellipsoid, on dorsal face along the center a longitudinal furrow present; narrowly rounded anterior ends; truncately rounded posterior ends with a small, nipple- like cauda; 2 paramylon bodies, along lateral sides parietal shell-like laying present; cells diameter 8-13(-19) µm and length 13-17 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

39. *Phacusanomalus*F.E. Fritsch et M.F.Rich(Pl. III, Fig. 7)

John, Whitton and Brook, 2003, 2005, p.164, pl. 39, f. G-I

Cells asymmetrical, ovate to pear shaped, cell divide into 2 unequal halves by a deep broad ventral furrow or apical groove of varying length, wing-like, oppositely twisted; sharply bent tail-piece at posterior end; parietal, numerous, disc-shaped chloroplasts; 2 paramylon bodies, flagellum same length as cell; cell width 16-18 µm, thick 19-22 µm and length 23-27 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

40. *Phacuscaudatus*Huebner var. *caudatus*(Pl. III, Fig. 6)

Euglnaceenflora Stralsund 5, 1886. Shi, Euglenophyta, Fl. alg. sinica. aqua. dulc. 6:226, 1999; Yamagishi 2010, p.49, pl. 22, f. 2

Asymmetrically- ellipsoid to oblong cells; one lateral side mostly straight and the other side broadly swelled; narrowly rounded and shallowly bilobed anterior ends; slightly broader posterior ends, asymmetrical and abruptly narrowed into thin cauda, inwardly oblique; 2-3 large circular plate or ring-like paramylon bodies, sometimes rarely several rod-like; cells diameter 15-25 µm and length without the cauda 30-45 µm; caudae length 3-5 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

41. *Phacuscaudatus*Huebner var. *major* Philipose(Pl. II, Fig. 20)

Proc. Indian Acad. Sci. (Plant Sci.) 93: 531, 1984. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 15: 63, 1995; Yamagishi 2010, p.50, pl. 22, f. 3

Larger cells than the typical variety, diameter 27-35 µm, length without cauda 55-72 µm; caudae length 9-14 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

42. *Phacuscaudatus*Huebner var. *minor* Drezepolski(Pl. III, Fig. 5)

Kosmos 50: 266, 1925. Huber- Pestalozzi, Binnengewaesser 16(4): 196, 1955; Yamagishi 2010, p.50, pl. 22, f. 4

Smaller cells than the typical, diameter 10-14(-16) µm and length 21-23 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

43. *Phacuscirculatus*Pochmann(Pl. II, Fig. 18)

Arch. Protistenkd. 45: 177, 1942. Yamagishi, Plankton Alg. Taiwan 39, 1992; Yamagishi 2010, p.50, pl. 22, f. 5

Nearly circular cells; slightly narrowed and rounded anterior ends; broadly rounded posterior ends with a short and curved cauda; 1 or 2 circular plate-like paramylon bodies; cells diameter 25-27 µm, length with the cauda 26-29 µm, caudae 3-4 µm in length.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

First reported taxon from Assam.

44. *Phacusdangeardii*Lemmermann(Pl. III, Fig. 9)

Kryptogamenflora Mark Brandenburg 3, Alg. 1: 513, 1910. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 15: 64, 1995; Yamagishi 2010, p.51, pl. 23, f. 2

Broad-ellipsoidal to ovoid cells; rounded and bilobed anterior ends; rounded but sometimes narrowly rounded posterior ends; posterior ends without a clear cauda; 2 ring-like or circular plate like paramylon bodies; cells diameter 9-13 µm and length 18-20 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

45. *Phacuslongicauda*(Ehrenberg) Dujardin var. *rotunda* (Pochmann) Huber-Pestalozzi (Pl. III, Fig. 1)

Binnengewaesser 16(4): 222, 1955. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 6: 56, 1987; Yamagishi 2010, p.55, pl. 26, f. 2

Broad-ovoid to ellipsoidal asymmetrical cells; broadly rounded and bilobed anterior ends but one side projected; narrowed posterior ends with tapering long,

slender cauda; cells diameter 34-40 µm and length without cauda 50-55 µm, caudae length 30-35 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

46. *Phacusmariae*Deflandre(Pl. III, Fig. 2)

Ann. Protistol. 3:220, 1932. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 17: 65, 1996; Yamagishi 2010, p.56, pl. 26, f. 4

Long- trapezoid cells, rounded corners having high longitudinal ridge on dorsal face; broadly rounded and shallowly bilobed anterior ends; truncately rounded posterior ends with thin, straight cauda; 2 circular-plate like paramylon bodies; cells diameter 22-25 µm and length without cauda 24-28 µm, caudae length 4-9 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

47. *Phacusnordstedtii*Lemmermann(Pl. II, Fig. 16)

Prescott, 1962; Wolowski, 2002; Alves-da-Silva and Menezes, 2010

Cells napiform in shape, nearly spherical but have a cauda which is long, straight and have a sharply pointed end; anterior ends broadly rounded; numerous chloroplasts with spirally striated pellicles; cells diameter18-20µm and length almost 35-40µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

Previously reported from Assam: Gopeswar temple pond, Kamrup District (Baruah and Kakati, 2012).

48. *Phacus ovalis* (Woronichin) popova(Pl. III, Fig 3).

Popova &Safonova, Fl. Plant. Crypt. URSS 9(2): 78, 1976. Yamagishi, Plankton Alg. Taiwan 45, 1992; Yamagishi 2010, p.58, pl. 27, f. 3

Large, long-ovoid cells; gradually narrowed and rounded anterior ends; posterior ends broader than the anterior end, taperi suddenly into thin, long cauda; 1-2 ring-like or circular plate like paramylon bodies; cells diameter 42-46 µm, length with the cauda 87-120 µm; caudae length 20-35 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

49. *PhacusPleuronectes*(Mueller) Dujardin(Pl. II, Fig. 19)

Hist. Nat. Zoophytes, 336, 1841. Yamagishi, Plankton Alg. Taiwan 45, 1992; Yamagishi 2010, p.58, pl. 27, f. 4

Broad ovoid to sub circular cells; slightly, narrowly rounded anterior ends; broadly, abruptly rounded posterior ends, with a obliquely, curved cauda; 2 ring-like or circular plate like paramylon bodies; cells diameter 35-50 µm and length without cauda 40-55 µm; 5-10 µm caudae.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 6.79, Temperature: 27ºC, Conductivity: 280 µs/cm, date of collection: 26-06-2018

Previously reported from Assam: Raja Pukhuri, Rani Pukhuri and Gopeswar temple Pond, Kamrup District (Kakati, 2011).

50. *Phacuspseudonordstedtii*Pochmann(Pl. III, Fig. 12)

Arch. Protistenkd. 95: 219, 1942. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 8: 64, 1988; Yamagishi 2010, p.58, pl. 27, f. 6

Ovoid to broad-ellipsoid cells; truncately rounded or shallowly concaved anterior ends; conically rounded posterior ends, produced into a slender cauda; spirally striated periplast; 2 paramylon bodies, dish-like in shape laying along the lateral margins; cells diameter 13-16(-18) µm, length without cauda 21-24 µm and caudae length 10-18 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

51. *Phacuspseudonordstedtii*Pochmann var.*miniscula*(Conrad) Huber- Pestalozzi

(Pl. III, Fig. 11)

Binnengewaesser 16(4): 230, 1955. Syn. *Phacuspyrum*(Ehrenberg) Stein var. *nordstedtii*Lemmermann f. *miniscula* Conrad. *Phacusminiscula* (Conrad) Pochmann. Yamagishi 2010, p.58, pl. 27, f. 7

Narrow ovoid to ellipsoid cells; narrowly rounded anterior ends; conically produced posterior ends with a slender cauda; spirally striated periplast; 2 dish-like paramylon bodies, laying along the lateral sides; cells diameter 10-12 µm and length without cauda 16-20 µm, 8-10 µm caudae.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

52. *Phacus ranula* Pochmann var. *ranula* (Pl. III, Fig. 4)

Arch. Protistenkd. 95: 212, 1942. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 4: 65, 1985; Yamagishi 2010, p.59, pl. 28, f. 5

Large broad fusiform to ellipsoid cells; slightly narrowed,rounded and shallowly bilobned anterior ends; conically narrowed posterior ends, with a sharp, long

cauda; 2 to several circular plate like paramylon bodies; cells diameter 25-35(-50) µm and length without cauda (65-)70-76(-85) µm; 25-35(-50) µm caudae.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

53. *Phacussubspiralis*Shi (Pl. III, Fig. 8)

Acta Hydrobiol. Sinica 10: 61, 1986. Shi, Euglenophyta, Fl. alg. sinica. aqua. dulc. 6: 224, 1999; Yamagishi 2010, p.61, pl. 29, f. 1

Long-fusiform cells in face view, but twisted slightly at anterior part; narrowed anterior ends produced into a obliquely, truncately rounded and bilobed apex; swelled and conical posterior ends tapered into a thin, long, slightly curved cauda; 2 rod-like paramylon bodies; cells diameter 10-12 µm and length with the cauda 30-32 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E`

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Lepocinclis*Pertyl

Cells green in colour, ovoid, rigid and unflattened, posterior spine with pellicular striations, tapering, pointed, size varies, canal opening apical, flagella, eyespot and flagellar swelling present; chloroplast discoid in shape, small, pyrenoids absent.

54. *Lepocincliscaudata*A.M. Cunha (Pl. III, Fig. 19)

John, Whitton and Brook, 2003, 2005, p.159, pl. 38, f. J

Club-shaped to spindle-shaped cells; anterior ends produced to a shortly elongated knob; a narrowing long tail-piece at the posterior end; disc-shaped chloroplasts; 2 large paramylon bodies; striated pellicle with left hand spiral; cells width 15-20 µm and length 45-60 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

55. *Lepocinclis fusiformis* (Carter) Lemmermann var.*amphirhynchus*Nygarrd(Pl. III, Fig. 14)

K. Dansk. Vidensk. Selsk. Biol. Skr. 7(1): 167, 1949. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 20: 42, 1998; Yamagishi 2010, p.41, pl. 18, f. 9

Broad fusiform cells; conically narrowed anterior cells, with a truncately rounded and shallowly bilobed apex; rounded and conical posterior ends produced into a short caudal process; 2 ring-like paramylon bodies; cells diameter 20-22 µm and length 28-35 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

56. *Lepocinclishungpanchiaoensis*Chu (Pl. III, Fig. 17)

Sinensia 7: 280, 1936. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 14: 32, 1995; Yamagishi 2010, p.42, pl. 19, f. 4

Fusiform cells; narrowly rounded anterior ends and bilobed just at one side below the end; narrowed posterior end with short, thin cauda; 2 ring-like plate paramylon bodies; cells diameter 22-23 µm and length with the cauda (40-)44-47 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

57. *Lepocinclissalina*Fritsch var.*papulosa*Conrad (Pl. III, Fig. 15)

Mem. Mus. Roy. Hist. Nat. Belg. Ser. 2, 1: 61, 1935. Huber-Pestalozzi, Binnengewaesser 16(4): 157, 1955; Yamagishi 2010, p.45, pl. 20, f. 5

Broad ovoid to cylindric ovoid cells; narrowed and shallowly bilobed anterior ends, with one side projected; broadly rounded posterior, without or with a short obtuse, papillate cauda; nearly straight lateral sides and parallel at mid region; numerous rod-like paramylon bodies, cells diameter 30-36 µm and length (45) 48-50 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

58. *Lepocinclissalina*Fritsch var.*pachyderma*(Deflandre) Conrad (Pl. III, Fig. 16)

Ann. Protisol.4: 171, 1934. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 13:27, 1994; Yamagishi 2010, p.45, pl. 20, f. 6

Broad ovoid cells; numerous small granular paramylon bodies (a single circular plate not reported in Yamagishi, 1994); cells diameter 17-19 µm and length 22-25(-27) µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.8, Temperature: 22 ºC, Conductivity: 365µs/cm, date of collection: 16-11-2018

First reported taxon from Assam.

59. *Lepocinclissteinii*Lemmermann(Pl. III, Fig. 20)

John, Whitton and Brook, 2003, 2005, p.159, pl. 38, f. F

Cells width 15-20 µm and length 45-60 µm, cells club-shaped to spindle shaped; elongated knob at the anterior end; narrowing long tail-piece at the posterior end; disc-shaped chloroplasts; 2 large paramylon bodies; striated pellicle with left-handed spiral.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

60. *Lepocinclis teres* (Schmitz) France var. *teres* (Pl. III, Fig. 18)

Result. Wiss. Erforsch. Balatonsees 2(1): 35, 1897. Krienitz in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 13: 28, 1994; Yamagishi 2010, p.45, pl. 20, f. 7

Obovoid or pyriform cells; broadly rounded anterior ends; conically narrowed posterior ends with a short, blunt cauda; numerous small rod-like paramylon bodies; cells diameter 18-24 µm and length 30-38 µmwith the cauda.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Astasiidae

Genus: *Gyropaigne*Skuja

Solitary, uniflagellate cells; cylindric- fusiform shaped, not compressed; broadly rounded anterior ends; rounded or slightly conically produced posterior ends; rigid periplast, some longitudinal, twisted ridges present; in top view circular with several angles of the ridges; granulate cytoplasm, paramylon bodies several large and ellipsoidal.

61. *Gyropaignegranulata*Yamagishi (Pl. IV, Fig. 1)

Yamagishi 2010, p.39, pl. 16, f. 6

Short cylindric cells; rounded anterior and posterior ends, slightly produced center of the posterior end; rigid periplast, with longitudinal ridges 8-10 and have granular row; in top view circular with 8-10 angles of the ridges; cells diameter 22-24 µm and length 32-34 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Phylum: Pyrrophyta

Order: Peridiniales

Family: Peridiniaceae

Genus:*Peridinium* Ehrenberg

Unicellular, biflagellated thalli; asymmetric globose, ovoid, dorsiventrally flattened cells; in front view slightly angular, anterior end produced and posterior end with a small spine; median or slightly spiral singulum (transverse furrow); and sulcus (longitudinal furrow) broad in hypotheca and extending to epitheca; the epitheca equal or larger than hypotheca, spines, teeth or wings may ornament the theca.

62. *Peridiniumcunningtonii*(Lemmermann) Lemmermann subsp. *remotum*Lefevre

(Pl. IV, Fig. 2)

Huber-Pestalozzi, Binnengewaesser 16(3): 242, 1968; Yamagishi 2010, p.34, pl. 14, f. 2

Egg-shaped cells; somewhat dorsoventrally flattened; an apical pore at the top of the epitheca; hypotheca smaller than the hypotheca; slightly spiral singulum, downward to the left; sulcus extends until the end of hypotheca; small spines present at antapicals; cells breadth 18-25 µm and length 22-30 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Phylum: Chrysophyta

Order: Synurales

Family: Mallomonadaceae

Genus:*Mallomonas*Perty

Cells biflagellated, solitary, ovoid, obovoid, fusiform or cylindric, beset overlapping many or closely arranged, scales minute, may bear long slender setae, upon periplast surface, circular scales, ellipsoid, ovoid or polygonal, fine pores or meshes found, setae with finely spiked or simple.

63. *Mallomonastranssylvanica*Peterfi&Momeu(Pl. IV, Fig. 3)

Starmach, Suesswasserflora 1: 328, 1985; Yamagishi 2010, p.26, pl. 10, f. 7

Ovoid to long ovoid cells, narrowly rounded anterior ends and broadly rounded posterior ends, entire face covered with long setae, 10-18 µm broad cells and length 20-40 µm, setae length 24-30 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Phylum: Xanthophyta

Order: Mischococcales

Family: Goniochloridaceae

Genus:*Goniochloris*Geitler

Solitary cells, free floating, in face view flat triangular or tetrahedral, in lateral view narrowly elongated ellipsoidal, obtuse or produced angles, terminal spine found, smooth or regularly scrobiculate cell wall, chloroplasts discoid, parietal and many, pyrenoid absent.

64. *Goniochlorismutica*(A. Braun) Fott(Pl. IV, Fig. 4)

John, Whitton and Brook, 2003, 2005, p.254, pl. 65, f. C

Cells in shape of a equilateral triangle, with concave sides and angles rounded; thin walls, honey-comb like pattern ornamentation od small pits less than 1 µm across and not visible readily; 2-3 disc-shaped chloroplasts; cells size 10-12 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus:*Tetraedriella*Pascher

Cells solitary, free floating, tetrahedral to pyramidal, in top view triangular, obtuse – produce angles, spine short or long, concave or swelled lateral sides in top view, cell wall smooth or finely scrobiculate, numerous chloroplasts, parietal discoid, pyrenoid absent.

65. *Tetraedriellalaevis*Bourrelly(Pl. IV, Fig. 5)

In Bourrelly&Manguin, Algues Guadeloupe 167, 1952. Syn. *Tetraplectronlaevis*(Bourrelly) Ettl, Suesswasserflora 3: 223, 1978. Yamagishi, Plankton Alg. Taiwan 23, 1992; Yamagishi 2010, p.29, pl. 11, f. 6

Cells pyramidal, in top view slightly concave sides, small papillar like or short spined angles, smooth cell wall, cell sides length 23-24 µm with the spines.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Pleurochloridaceae

Genus: *Nephrodiella*Pascher

Normally cells solitary, sometimes temporarily surrounded by mucilage; kidney-shaped to lunate cells, but sometimes in cross section S-shaped, spherical or ellipsoidal; thin walls without ornamented, mostly single parietal disc-shaped or cup-shaped chloroplasts.

66. *Nephrodiellalunaris*Pascher(Pl. IV, Fig. 6)

John, Whitton and Brook, 2003, 2005, p.256, pl. 65, f. G

Except after reproduction cells solitary; cells kidney-shaped to lunate, rounded or tapered at ends; 1 or 2 chloroplasts; cells width 3-6 µm and length 7-18 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Phylum: Bacillariophyta

Order: Stephanodiscales

Family: Stephanodiscaceae

Genus: *Cyclotella* (Kutzing) Brebisson

Solitary or colonial plants, within mucilaginous envelope united in short chains; shape discoid or drum type, circular or somewhat elliptical in valve view, in two concentric regions ornamented; radially striated or punctate outer zone, smooth or have irregular striae or dots inner zone; cylindrical, discoid or rectangular with margins in girdle view.

67. *Cyclotella* sp. (Pl. IV, Fig. 7)

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Order- Fragilariales

Family- Fragilariaceae

Genus- *Synedra* Ehrenberg

Generally free floating or sometimes epiphytic, found single or in colonies of different shapes, stalked or sessile; when in gridle view rectangular, but in valve view, linear or lanceolate, might be straight or sometimes slightly curved; often capitate ends; pseudoraphe present usually; striated valve surface, fine or sometimes coarse striae; plate like, large chromatophores, 2 per cell, pyrenoids present and several.

68. *Synedra* sp. (Pl. IV, Fig. 8)

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S3: 26º15'34" N 91º41'36" E

pH: S1: 8, Temperature: 24ºC, Conductivity: 380 µs/cm,

S3: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

Date of collection: 26-03-2019

Order- Cymbellales

Family- Cymbellaceae

Genus- *Cymbella*Agardh

Solitary; free floating in nature but sometimes remains attached to a kind of gelatinous stalk of a gelatinous branched mass; nearly rectangular with smooth gridles when in gridle view and lunate shaped when in valve view, also sometimes may be elliptical or rhombic shaped; convex dorsal

side, usually concave ventral side; raphe either thick or may be thin, sometimes straight or curved, nodules present; striated valve surface, lineate or punctate striae, placed either parallelly or radially; 1 chromatophores, plate like and expanded in shape.

69. *Cymbella*sp. (Pl. IV, Fig. 9)

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Order- Naviculales

Family- Naviculaceae

Genus- *Navicula*Bory

Free floating, might be solitary but also sometimes may form irregularly radiating colonies of different shapes; in gridle view rectangular in shape, sometimes intercalary bands may be present; elliptic oblong, linear or lanceolate rarely with undulate margins when in valve view; rounded or sometimes capitate ends; raphe might be either thick or thin, generally straight or sometimes becomes undulate; striated valve surface, radial or transverse striae, lineate or punctate sometimes; band like chromatophores, usually 2 but sometimes more with 1 or more pyrenoids.

70. *Navicula* sp. (Pl. IV, Fig. 10)

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

71. *Navicula* sp. (Pl. IV, Fig. 11)

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

72. *Navicula* sp. (Pl. IV, Fig. 12)

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

73. *Navicula* sp. (Pl. IV, Fig. 13)

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

74. *Navicula* sp. (Pl. IV, Fig. 14)

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Family- Pinnulariaceae

Genus-*Pinnularia* Ehrenberg

Free floating and solitary plants; nearly rectangular or aseptate when in gridle view; but linear to lanceolate when in valve view; convex or parallel types lateral margins, but sometimes undulate; broadly rounded or cuneately rounded ends; raphe might be thick or thin, straight or may be undulated; striated or costate valve surface; plate like chromatophores, 2 in number.

75. *Pinnularia* sp. (Pl. IV, Fig. 16)

Place of collection: North Guwahati; S1: 26º15'41" (N) 91º41'52" (E)

pH: .8, Temperature: 23 ºC, Conductivity: 139 µs/cm, date of collection: 26-04-2018

Order- Bacillariales

Family- Bacillariaceae

Genus- *Nitzschia*Hasssall

Solitary, free floating and sometimes might be colonial; linear valves but sometimes sigmoid, rarely with undulate margins; ends acute or sometimes capitate; valve surface striated, striae lineate or might be punctate, organized in transverse; laminated chromatophores.

76. *Nitzschia* sp. (Pl. IV, Fig. 15)

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S4: 26º15'29" N 91º41'41" E

pH: S1: 7.2, Temperature: 28ºC, Conductivity: 465 µs/cm,

S4: 7.4, Temperature: 26ºC, Conductivity: 465 µs/cm,

Date of collection: 21-05-2018

Phylum: Chlorophyta

Order: Tetrasporales

Family: Palmellopsidaceae

Genus: *Asterococcus*Scherffel

Spherical to sub spherical cells, exceeding protoplast diameter enclosed with a hyaline unlaminated or laminated mucilage; in a common mucilage single or 2, 4, 8 or 16 cells; dense, star-shaped chloroplasts, with radiating arms extending sometimes at cell periphery; with central pyrenoid; 2 peripheral contractile vacuoles when present; with or without eyespot.

77. *Asterococcussuperbus*(Cienkowski) Scherffel(Pl. IV, Fig. 17)

John, Whitton and Brook, 2003, 2005, p.299, pl. 76, f. B

Solitary cells or in small colonies of 2-4 cells; broad lamellate and mucilaginous envelope, several times the diameter of protoplast; with eyespot; cells diameter 30-35(-43) µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Order: Volvocales

Family: Chlamydomonadaceae

Genus: *Carteria*Diesing

Spherical, ellipsoidal or pear-shaped cells, with equally sized 4 apical flagella, longer than cells usually; with or without papilla; 2 or 4 contractile vacuoles per cell and near flagellum base; parietal, usually cup-shaped chloroplasts but lateral sometimes and incompletely surrounding cell or H-shaped in optical section; pyrenoids if present 1, rarely more and sometimes absent; usually with an eyespot.

78. *Carteriaglobosa*Korshikov(Pl. IV, Fig. 18)

John, Whitton and Brook, 2003, 2005, p.305, pl. 80, f. G

Spherical or weakly ellipsoidal cells, papilla absent; cup-shaped chloroplasts, basally thickened with large pyrenoid; eyespot present at anterior and small; cells diameter 14-18(-28) µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Chlamydomonas* Ehrenberg

Cells unicellular, biflagellate, ovoid, ellipsoid, globose, cylindric or fusiform, anterior papilla present or absent; smooth cell wall, thin or thick, gelatinous sheath present in some species; flagella arising from each side of the papilla or close to each other; a single, parietal, cup-shaped, H-shaped, stellate or several discoid type chloroplasts; one or more pyrenoids in each.

79. *Chlamydomonasehrenbergii*Gorozhankin(Pl. IV, Fig. 19)

John, Whitton and Brook, 2003, 2005, p.308, pl. 77, f. D

Pear shaped cells, rounded basally and attenuated apically; papilla absent, sometimes protoplast detached from cell wall; cup-shaped chloroplast, thickened irregularly with a basal pyrenoid; median or anterior eyespot; cell width 10-22 µm and length 14-26 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S3: 26º15'34" N 91º41'36" E

pH: S1: 7.7, Temperature: 25ºC, Conductivity: 380 µs/cm,

S3: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

Date of collection: 26-03-2019

First reported taxon from Assam.

80. *Chlamydomonas lundii*H.*et* O.Ettl(Pl. V, Fig. 1)

John, Whitton and Brook, 2003, 2005, p.308, pl. 77, f. N

Ellipsoidal cells, somewhat asymmetrical but rounded basally and apically; papilla absent; parietal chloroplasts, in lateral view either an H-form or sub stellate form; central pyrenoid present; without an eyespot; cells width 5-9 µm and length 11-15 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

81. *Chlamydomonas reinhardtii*P.A.Dangeard(Pl. IV, Fig. 20)

John, Whitton and Brook, 2003, 2005, p.311, pl. 77, f. F

Spherical or sub spherical cells, rounded basally, without papilla; cup-shaped chloroplasts, basally thickened and containing a large basal pyrenoid; median or anterior eyespot; cells width 8-22 µm and length 10-22 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

82. *Chlamydomonas* sp. (Pl. V, Fig. 2)

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Family: Phacotaceae

Genus: *Dysmorphococcus*Takeda

Cells unicellular, biflagellate, with a lorica, globose to ovoid; globose to ovoid and compressed lorica; cells fully removed away from the lorica and two anterior pores of lorica have two emerging flagella.

83. *Dysmorphococcuscoccifer*Korshikov(Pl. V, Fig. 3)

John, Whitton and Brook, 2003, 2005, p.317, pl. 80, f. A

Flattened cell envelope and ovoid in lateral view; finely punctate often; deep brown to black in colour; spherical protoplast; cup-shaped, dense chloroplasts, small and numerous pyrenoids present, with lateral eyespot; numerous contractile and scattered vacuoles, cell diameter about 22 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Goniaceae

Genus: *Gonium* O.F.Muller

Square colonies, rhomboid to octangular with rounded corners in outline, 4,8,16 or 32 biflagellate cells, cell size same; ovoid to pyriform cells, concentrically or radiately, arranged in plate-like gelatinous envelope in one plane, individual cell envelope present or absent; cup-shaped chloroplasts with one or more pyrenoids.

84. *Gonium pectorale*O.F.Muller(Pl. V, Fig. 4)

John, Whitton and Brook, 2003, 2005, p.318, pl. 80, f. Q

Slightly curved plate coenobium; 16-celled usually, at periphery 12 with radially directed flagella and rest remaining at the centre, weakly pear shaped or spherical cells; cup-shaped chloroplasts with pyrenoid at basal end and eyespot at anterior; coenobium width 70-100 µm and cells width 18 µm andlength 15-20 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

85. *Gonium pectrale*Mueller (Pl. V, Fig. 5)

Iyenger&Desikachary, Volvocales 411, 1981. Nozaki in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 2: 43, 1984; Yamagishi 2010, p.110, pl. 48, f. 13

Square or rhomboidal colonies; a central square aperture present, total 16-celled, with 4 central and 12 peripheral cells, gelatinous envelope present; cells almost spherical or angular, diameter 5-14 µm and length 5-17 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Volvocaceae

Genus: *Pandorina* Bory St. Vincent

Colonies of 4, 8, 16 or 32 biflagellate cells, ellipsoidal to spherical, all cell size same; pyriform cells, ovoid to spherical, arranged compactly or loosely on the peripheral of the colonial envelope, indistinct individual cell envelope; cup-shaped chloroplasts, pyrenoids one or more.

86. *Pandorina morum*(Mueller) Bory St. Vincent (Pl. V, Fig. 6)

Iyenger&Desikachary, Volvocales 417, 1981. Nozaki in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 1: 66, 1984; Yamagishi 2010, p.111, pl. 49, f. 2

Ellipsoidal to spherical colonies; diameter up to 60 µm, cells 16 or 8; by mutual compression in closely packed colony cells ovoid to angular, in face view diameter 20 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Pond of Digboi oil field (Bordoloi and Baruah, 2015).

Order: Chlorococcales

Family: Chlorellaceae

Genus: *Actinastrum*Lagerheim

4, 8, 16 celled colonies; colonial envelope absent; fusiform or cylindrical cells, with basal end rounded and outer end acute or obtuse, arranged radially contacting with basal end from a common centre in all planes; a single parietal chloroplasts, plate-like long, pyrenoid present.

87. *Actinastrumgracillimum*Smith (Pl. V, Fig. 9)

Bull. Torrey Bot. Club 43: 480, 1916. Yamagishi, Plankton Alg. Taiwan 117, 1992; Yamagishi 2010, p.143, pl. 51, f. 1

Straight cells, cylindrical and long, basal ends and outer ends truncately rounded, lateral sides nearly straight and parallel; cells breadth 1.5-3(-4) µm and length 8-20 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

88. *Actinastrumhantzschii*Lagerheim(Pl. V, Fig. 8)

Philiposen 1967, p. 216, fig. 125(a-c); Komarek and Fott 1983, p. 742, fig. 207.2; Jena and Adhikary, 2007.

Colonial thalli, sometimes solitary; 2- 8 celled coenobia, cells radiate from center; elongate to linear cells with acute, obtuse or truncate apex; single chloroplast, parietal, pyrenoid present; cells length 7-40 µm and breadth 1-8 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: SobhagyaKunda, Kamrup District (Kakati, 2011).

89. *Actinastrumhantzschii*Lagerheim var.*hantzschii*(Pl. V, Fig. 7)

Oefv. K. Vet. Akad. Foerhandl. 39(2): 70, 1882. Yamagishi, Plankton Alg. Taiwan 117, 1992; Yamagishi 2010, p.143, pl. 51, f. 2

Straight, cylindrical fusiform cells, with both the ends rounded truncately; broad 3-6 µm and long 10-26 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Catena* Chodat

Uniseriate, simple, short filament, of 2, 4, 8 celled usually, mostly unicellular, thick gelatinous envelope present; short cylindrical cells, a thickening ring encircled the ends; a single parietal laminate chloroplasts present, pyrenoid present.

90. *Catena viridis*Chodat(Pl. V, Fig. 10)

Akiyama in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 12: 4, 1994; Yamagishi 2010, p.159, pl. 70, f. 2

Short cylindric cells; breadth 3.5-4.5 µm and length 5-10 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Chlorella* Beijernick

Cells solitary, small and spherical, flagella absent, cells 3-10 µm in diameter, chloroplast parietal with single pyrenoid, placed centrally.

91. *Chlorella vulgaris* Beijernick(Pl. V, Fig. 12)

Komarek and Fott 1983, p. 594, pl. 168, f. 2; Das 2012, p.159, pl. 9, f. 10; Das and Adhikary 2014, p. 159, pl. 9, f. 9

Cells small, unicellular and spherical, chloroplast parietal and cup shaped, pyrenoid single distinct and placed at the center, cells diameter 5-6 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8.2, Temperature: 23ºC, Conductivity -170µs/cm, date of collection: 04-12-2018

Previously reported from Assam: Sobhagyakunda, Gopeswar temple pond, Hajo pond, Kamrup District (Kakati, 2011); Bordoloi, 2016; Oil Refinery Effluent Drains of Assam (Baruah *et al.*, 2009).

92. *Chlorella vulgaris* var. *vulgaris* Beijernick(Pl. V, Fig. 11)

Komarek&Fott 1983, p. 594, pi. 168, fig. 2; Das and Adhikary 2014, p. 159, pl. 9, f. 10

Cells spherical, found scattered among other algae or occurs in almost pure growth sometimes, chloroplast parietal cup shaped, sometimes pyrenoid absent, cells 8.8 -10 µm in diameter.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8.2, Temperature: 23ºC, Conductivity: 170µs/cm, date of collection: 04-04-2018

First reported taxon from Assam.

Genus: *Dictyosphaerium*Nageli

Spherical to ovoid colonies, gelatinous envelope enclosed, colonies of 4, 8, 16 to 32 cells; ovoid, cylindrical to ellipsoid or reniform, spherical, spindle or kidney shaped cells, form colonial center attached to the radially elongated and tetrachotomously branched threads, present on the periphery of the colonial envelope, remains distributed; smooth wall but sometimes granulated; a single, cup-like chloroplasts, pyrenoid present; reproduction done by 4 autospores.

93. *Dictyosphaeriumchlorelloides*(Naumann) Komarek et Perman(Pl. V, Fig. 13)

John, Whitton and Brook, 2003, 2005, p.349, pl. 83, f. P

Tetrahedral to spherical colonies, of 2-4 celled, 16 celled rarely; spherical young cells but older cells spherical to obovoid; thin and smooth wall; cup-shaped and basal chloroplasts; colonies width (10-)25-34(-46) µm and cells (3.5-)4-6.9(-9) µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Muriella*J.B.Petersen

Solitary or grouped and almost spherical or broadly ellipsoidal cells; wall thin but thickened with age; parietal chloroplasts, single initially but dividing soon to two or more disc-cup-lens or trough shaped portions; pyrenoids absent.

94. *Muriellaterrestris*J.B.Petersen(Pl. V, Fig. 14)

John, Whitton and Brook, 2003, 2005, p.370, pl. 82, f. M

Almost spherical cells; two to several plate-shaped chloroplasts; separated distinctly even in young cells; cells width 3-8(-13) µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Bracteacoccaceae

Genus: *Bracteacoccus*Tereg

Solitary or irregular masses forming cells, spherical, thick or thin walls; parietal plate-like to angular or polygonal chloroplasts, one to several, pyrenoids absent, starch or oil present, slightly unequal length flagella.

95. *Bracteacoccusanomalus*(E.J. James) R.C. Starr (Pl. V, Fig. 15)

John, Whitton and Brook, 2003, 2005, p.333, pl. 82, f. C

Yellow-green or pale green cells, thin walled; chloroplasts in pairs, curved and plate-shaped, single; eyespot lateral and streak-like; cells width 7.5- 16 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Selenastraceae

Genus: *Chlorolobion*Korschikoff

At basal end cells remain attached, clear holdfast absent, free-floating sometimes separating from the substrata; asymmetric fusiform to long- fusiform or cylindric cells, bent or straight, apical

end pointed or blunt; smooth cell wall; a single, parietal laminate chloroplasts, pyrenoid present; reproduction done by autospores.

96. *Chlorolobionbraunii*(Nageli) Komarek(Pl. V, Fig. 16)

Arch. Hydrobiol. Suppl. 56 (Algol. Stud. 24): 255, 1979. Syn. *Raphidiumbraunii*Naegeli in Kuetzing, Spec. alg. 891, 1849. *Keratococcusbraunii*(Naegeli) Hindak, Tread. Biol. 23 (4): 121, 1977; Yamagishi 2010, p.124, pl. 53, f. 10

Broad fusiform asymmetric cells; straight or sometimes bent, with inner side nearly straight and outer side swelled, with both ends pointed, breadth 4.5-7.5 µm and length 13-21 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Kirchneriella*Schmidle

Cells colonial, colonies 4-8-16 or more cells, enclosed by hyaline, gelatinous envelope homogeneous, usually curved lunate to crescent shaped cells, sometimes cylindrical with acute or rounded ends, flat or twisted, arranged irregularly in 2-4 cells group, single chloroplast, parietal, with or without pyrenoid.

97. *Kirchneriellaroseata*Hindak(Pl. V, Fig. 17)

Treat. Biol. 30(1): 232, 1984; Yamagishi 2010, p.127, pl. 57, f. 8

Arcuately curved cells, gradually narrowed, with pointed ends blunt, arranged in group by 4 cells adjacently, rosette shape in colony with ends close to each other; cells breadth 1.5-2 µm and length 7.5-12 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019.

First reported taxon from Assam.

Genus: *Keratococcus*Pascher

Solitary, free-floating cells, often epiphytic on the substrata by cell end, holdfast absent, cells fusiform to cylindric-fusiform, spiny projection present at both the ends; smooth cell wall, mucilaginous envelope absent; a single parietal gutter-like chloroplasts; pyrenoid may or may not be present; reproduction done by autospores.

98. *Keratococcusbicaudatus*(Hansgirg) Boye-Petersen (Pl. V, Fig. 19)

Bot. Iceland 2(2): 430, 1928. Hindak, Algol. Stud. (Trebon), 1: 21, 1970, Yamagishi 2010, p.158, pl. 56, f. 7

Broad fusiform to cylindric-fusiform asymmetrical cells, long spiny projection present at both the ends; cells breadth 3-5 µm and length with spiny projection 19-25(-35) µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

99. *Keratococcusdispar*(West et G.S. West)Tsarenko et D.M.John, (Pl. V, Fig. 18)

West et G.S. West, 1897, p. 500. 17500020; John, Whitton and Brook, 2003, 2005, p.360, pl. 91, f. H

Spindle-shaped, oblique and mostly half-moon shaped cells, sub equally apices developed, cells width 2-5 µm and length 8.5-21 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Monoraphidium*Komarkova – Legnerova

Solitary, free-floating cells, affixed to a substratum rarely, cells long-fusiform or lunate with a sharply pointed or obtuse ends, straight or curved crescently, twisted slightly; smooth cell wall; parietal, thin, long plate-like chloroplasts, usually filling in the cell, pyrenoid absent; reproduction by autospores.

100. *Monoraphidiumcircinale*(Nageli) Nageli(Pl. V, Fig. 20)

Komarek&Fott 1983, p. 640, pi. 140, fig. 1; Das and Adhikary 2014, p. 161, pl. 10, f. 24

Cell spindle shaped, spirally twisted, acute tip of the cell, cells 13.6-15 µm in length and 1.5-2 µm in breadth.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Tinsukia District (Bordoloi, 2016).

101. *Monoraphidiumcontortum*(Thuret) Komarkova-Legnerova(Pl. VI, Fig. 2)

Komarek&Fott 1983, p. 638, pi. 178, fig. 4; Das and Adhikary 2014, p. 161, pl. 10, f. 25

Cells fusiform, sigmoidal and bent, length 33 - 35 µm and breadth 3 - 5.5 µm, chloroplast parietal.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Silchar (Jena and Adhikary, 2007); DighaliPukhuri, JorPukhuri and Rani Pukhuri, Kamrup District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

102. *Monoraphidiumminutum*(Nageli) Komarek – Legnerova(Pl. VI, Fig. 1)

Komarek&Fott 1983, p. 641, pi. 180, fig. 2; Das and Adhikary 2014, p. 161, pl. 10, f. 30

Cells solitary, slightly sigmoidal or kidney shaped with an obtuse tip, length 18.5 - 21 µm and breadth 9 - 9.5 µm, broad central area.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

103. *Monoraphidiumpusillum*(Printz) Komarkova- Legnerova(Pl. VI, Fig. 3)

Komarek&Fott 1983, p. 638, pi. 179, fig. 2; Das and Adhikary 2014, p. 161, pl. 10, f. 32

Broad fusiform cells, bent slightly, bluntly pointed, length 22.8 - 41.8 µm and breadth 5.4 - 4.2 µm, chloroplast parietal and absent at the ends.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Trebouxiophyceae

Genus: *Crucigenia*Morren

Colony cells arranged in quadrate fashion with a quadrangular open space in the centre; sometimes a gelatinous mass present; and sometimes 16-32 or more cells joined together to form multiple colonies; flattened, spherical, ovoid, ellipsoidal triangular, trapezoidal or rhomboidal cells in front view, 1-4 chloroplasts, parietal or disc shaped, pyrenoid present or may be absent sometimes.

104. *Crucigeniacrucifera*(Wolle) Collins (Pl. VI, Fig. 5)

Philipose 1967, p. 240, fig. 149; Das and Adhikary 2014, p. 161, pl. 10, f. 18

Colony 4 celled, rhomboidal in shape with slightly concave sides and at the centre a small rectangular space, colonies often join together, elongated cells, with concave outer side convex and inner side, cells length 6.3 - 8.2 µm and breadth 3.1 - 6 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Tinsukia District (Bordoloi, 201

105. *Crucigeniatetrapedia*(Kirchner) W. et G.S. West (Pl. VI, Fig. 4)

Philipose 1967, p. 240, fig. 151; Das and Adhikary 2014, p. 161, pl. 10, f. 19

Four celled colonies, quadrate in shape and at the centre minute rectangular space present, flat cells, triangular and rounded in the ends, concave outer side, colonies 9-12 µm broad, cells breadth 3.7 - 4.5 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Kaziranga National park (Yasmin *et al.,* 2015); KachoPukhuri, Kamrip District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

Family: Dictyochloridaceae

Genus: *Dictyochloris*Vischer

Solitary, spherical cells or sometimes in groups; cell wall smooth; chloroplasts lack pyrenoid; multinucleate cells when matured; with eyespot.

106. *Dictyochlorisfragrans*Vischer(Pl. VI, Fig. 6)

John, Whitton and Brook, 2003, 2005, p.348, pl. 82, f. K

Spherical cells, one side protruding sometimes; in older cells net-like chloroplasts; starch present; eyespot present at opposite pole to the flagella, cells width 5-38(-75) µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Oocystaceae

Genus: *Nephrochlamys*Korsikov

2, 4, 8 celled coenobia; arranged randomly; kidney-shaped or strongly curved cells, apices rounded, wall thin and mucilaginous envelope absent; parietal, plate or trough-shaped chloroplasts; without pyrenoids.

107. *Nephrochlamys rotunda* Korsikov(Pl. VI, Fig. 7)

Hindak 1988, p. 153, pi. 54, fig. 1; Das and Adhikary 2014, p. 159, pl. 9, f. 8

Almost spherical or slightly oval shaped cells, with a small, narrow excision, cell obtuse at the end; cell length 16.5 -17 µm and breadth 4.5 -5 µm.

Place of collection - North Guwahat; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Oocystis* A. Braun

Cells free floating, solitary or enclosed within the expanded mother cells membrane, form temporary colonies; spherical, ovoid, ellipsoid, fusiform or cylindrical cells with rounded or

pointed ends; one or more chloroplast, parietal disc-shaped, laminate, stellate or reticulate irregularly and pyrenoids present or absent.

108. *Oocystislacustris*Chodat(Pl. VI, Fig. 8)

John, Whitton and Brook, 2003, 2005, p.372, pl. 92, f. E

2-4-8 celled coenobia; cells in tiers sometimes; cells narrow to broadly ellipsoidal or spindle-shaped, asymmetrical, rounded to obtuse apices and twice the length of breadth, distinct thickened wall; single, trough-shaped chloroplasts; pyrenoid single, cells width (1.5-)3.2-9.2(-10) µm and length (4)6.4-15 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Didymocystis*Korschikoff

2 celled colonies, contacted closely by inner sides; smooth or granulated cell wall, spine or ridge absent; single parietal laminate chloroplasts, pyrenoid present or absent.

109. *Didymocystisbicellularis*(Chodat) Komarek (Pl. VI, Fig. 10)

Preslia, Praha 45:313, 1973. Yamagishi, Plankton Alg. Taiwan 125, 1992; Yamagishi 2010, p.147, pl. 55, f. 6

Broad ellipsoidal cells with rounded ends and outer side slightly swelled; smooth cell wall; cells breadth 2-5 µm and length 5-10 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

110. *Didymocystisfina*Komarek(Pl. VI, Fig. 9)

Preslia, Praha 47: 276, 1975. Komarek&Fott, Binnengewaesser 16 (7,1): 807, 1983; Yamagishi 2010, p.147, pl. 55, f. 5

Cylindric to oblong cells, ends rounded and nearly straight or outer side slightly swelled; smooth cell wall; cells breadth 1.6-2.8 µm and length 4.3-7 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Hydrodictyaceae

Genus: *Pediastrum* Meyen

Circular or elliptical cells with monostromatic disc, cells 4, 8, 16 or 32 or often more cells; concentrically arranged in a stellate plate; cells connected with perforation between the cells or connected entirely; 1 or 2 lobes or processes may be present or absent at the marginal cells of

the disc; either inner cells are same shape of the marginal cells, but processes absent, or slightly different with or without small incisions; parietal laminate chloroplasts, covering the wall entirely, single, distinct pyrenoid present.

111. *Pediastrum asymmetricum*Yamagishi &Hegewald(Pl. VI, Fig. 13)

Nova Hedwigia 59: 78, 1994. Yamagishi & Hegewald in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 15: 56, 1995; Yamagishi 2010, p.154, pl. 62, f. 1

Perforations present at colonies; asymmetric marginal cells, with long process pointed outward and slightly bent; basal and median parts contacting the marginal cells, perforation present between each other; quadrate to polygonal inner cells, with perforation; marginal cells breadth 5-11 µm and length 15-21 µm; inner cells breadth 4-8 µm and length 8-14 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

112. *Pediastrum duplex* Meyen var. *duplex* (Pl. VI, Fig. 17)

Komarek&Fott, Binnengewaesser 16 (7,1): 298, 1983. Yamagishi, Plankton Alg. Taiwan 144, 1992; Yamagishi 2010, p.155, pl. 60, f. 1

Large perforations colonies; marginal cells basal parts flat, curved or quadrate, two narrow or stout, long horn-like processes with obtuse or truncate ends

present; inner cells similar to marginal cells but long processes absent; smooth cell wall; cells breadth 6-21 µm and length with the process 6-30 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: SobhagyaKunda, Kamrup District (Kakati, 2011).

113. *Pediastrum simplex* Meyen var.*echinulatum*Wittrock (Pl. VI, Fig. 15)

Krienitz et al. 1998, p. 66, fig. 6 a; Das and Adhikary 2014, p. 157, pl. 8, f. 15

4 celled coenobia, cells arranged in a plate, one elongated outward pointing process at outer cells, polygonal inner cells, cells length 15.4 -16.5 µm and breadth 8.4 - 8.8 µm.

Place of collection: North Guwahati; S2: 26º15'23" (N) 91º41'35" (E)

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: SobhagyaKunda and Kacho Pukhuri, Kamrup District (Kakati, 2011).

114. *Pediastrum simplex* (Meyen) Lemmermann(Pl. VI, Fig. 14)

Prescott 1961, p. 227, pi. 50, fig. 2; Das and Adhikary 2014, p. 157, pl. 8, f. 14

Coenobia 4 celled; outer free wall of the cells extended to form a single tapering, horn like process with concave margin, cell length 10.4 -11 µm with projections, and breadth 5 - 6 µm.

Place of collection: North Guwahati; S2: 26º15'23" (N) 91º41'35" (E)

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: KachoPukhuri and Jor Pukhuri, Kamrup District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

115. *Pediastrum simplex* Meyen var. *simplex* Komárek(Pl. VI, Fig. 16)

Komarek&Jankovska 2001, p. 32, fig. 12 A; Das and Adhikary 2014, p. 157, pl. 8, f. 16

16 celled coenobia, diameter 126 - 130 µm; large intercellular spaces or a central space present with the cells, arranged in a ring at the periphery, marginal cells inner side concave, outer surface tapered into a long process, concave or straight marginal cells, internal cells similar to marginal cells but processes shorter, cells length 35 - 37 µm and breadth 16 - 17.5 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

116. *Pediastrum tetras* var. *excisum*(Rabenh.) Hansg. (Pl. VI, Fig. 18)

Brunnthaler, J. 1915, p. 104, figs. 64b-c as *P. tetras var. tetraodon*Rabenh; Philipose, M. T. 1967, p. 129. Fig 45; Prasad and Misra 1992, p. 12, pl. 1, f. 12

Fore celled colonies; smooth cell wall; lobes more or less deeply concave in shape and lies adjacent to incision; colonies diameter 24-27 µm, cell length 12-14 µm and lateral cells 10-11.5 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S3: 26º15'34" N 91º41'36" E

pH: S1:8, Temperature: 24ºC, Conductivity: 380 µs/cm,

S3:7.7, Temperature: 25ºC, Conductivity: 437 µs/cm

Date of collection: 26-03-2019

First reported taxon from Assam.

117. *Pediastrum tetras* var. *tetraedon*(Corda) Hansg. (Pl. VI, Fig. 11)

Prasad and Misra 1992, p. 12, pl. 1, f. 10

Circular to slightly rectangular colonies; cells 8-16, more or less straight; deep incision at outer margins of peripheral cells, projection pronounced; smooth cell wall; cells diameter 32-34 µm (8-celled) and 52-55 µm (16-celled); cell length 10-13.5 µm and 9-11 µm lateral cell.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

118. *Pediastrum tetras* (Ehrenberg) Ralfs var. *tetras* (Pl. VI, Fig. 12)

Ann. Mag. Nat. Hist. ser. 1, 14: 469, 1844. Komarek&Fott, Binnengewaesser 16 (7,1): 303, 1983; Yamagishi 2010, p.157, pl. 62, f. 8

Perforated colonies; triangular or trapezoid marginal cells at basal parts, deep incision formed 2 triangular processes; slightly or deeply concave outer side of the process; 5-7 angled inner cells with a deep incision; smooth cell wall; marginal cells breadth 5-18 µm and length 4-18 µm; inner cells breadth 4-16 µm and length 4-14 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Tetraedron*Kuetzing

Solitary, flat cells, 3, 4, 5 angles or tetrahedral, spine present or absent at the angles; smooth wall; single parietal laminate chloroplast, pyrenoid present or absent.

119. *Tetraedrontumidulum*(Reinsch) Hansgirg(Pl. VI, Fig. 19)

Hedwigia 28: 18, 1889. Yamagishi in Yamagishi & Akiyama, Photomicrog. Freshw. Alg. 2: 91, 1984; Yamagishi 2010, p.121, pl. 68, f. 2

Pyramidal, triangular, rarely quadrangular cells; concave sides; narrowly rounded angles, spine absent; cells diameter 10-18 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Kaziranga National park (Yasmin *et al.,* 2015).

Family: Scenedesmaceae

Genus: *Scenedesmus* Meyen

Cells found in colonies of 2,4, 8, 16, 32 celled; ovoid, elliptical, oblong or crescent shaped cells, with ends rounded or pointed, arranged alternately in series of row single or double; smooth cell wall or sometimes ornamented with spines or teeth; one, parietal chloroplasts, with pyrenoid single and distinct; reproduction by formation of auto colony.

120. *Scenedesmus abundans*(Kirchner) Chodat(Pl. VII, Fig. 4)

Philipose 1967, p. 278, fig. 184 a-d; Das and Adhikary 2014, p. 159, pl. 9, f. 27

2 celled coenobia, oblong-ovoid cells, on the outer face of the cells one median lateral spine present, cells length 7.5 - 8.5 µm and breadth 2.5 - 3 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

S4: 26º15'29" N 91º41'41" E

pH: S3: 6.79, Temperature: 28ºC, Conductivity: 465 µs/cm,

S4: 7.4, Temperature: 26ºC, Conductivity: 465 µs/cm,

Date of collection: 21-05-2018

First reported taxon from Assam.

121. *Scenedesmus acuminatus*(Lagerheim) Chodat(Pl. VII, Fig. 5)

Philipose 1967, p. 231, fig. 161; Das and Adhikary 2014, p. 159, pl. 9, f. 28

4 - 8 celled coenobia, entire cells arranged in the same plane, cells fusiform with tips acute, lunate terminal cells, sometimes lunate or disc like internal cells, cells length 16 - 20 µm and breadth 3 -6 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Tinsukia District (Bordoloi, 2016); Pond of Digboi Oil Field (Bordoloi and Baruah, 2015).

122. *Scenedesmus acutus*var.*acutus*Komarek&Fott(Pl. VII, Fig. 15)

Komarek&Fott 1983, p. 841, pi. 228, fig. 1; Das and Adhikary 2014, p. 159, pl. 9, f. 32

4-8 celled coenobia, fusiform cells with pointed apices, two terminal cells slightly lunate in shape, straight inner cells, cells length 12 -15 µm and breadth 5-6 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

123. *Scenedesmus armatus*(Chodat) G.M.Smith var.*bicaudatus*(Guglielmetti) Chodat(Pl. VII, Fig. 7)

Philipose 1967, p. 262, fig. 171.m; Das and Adhikary 2014, p. 159, pl. 9, f. 36

4 celled colonies, a long spine present from one of the poles of the terminal cell only, the spines alternating with each other of the two terminal cells, cells length 11.2 -12.7 µm and breadth 2 - 3.6 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: KachoPukhuri and Raja Pukhuri, Kamrup District (Kakati, 2011).

124. *Scenedesmus bijugatus*var. *alternans* f.*parvus*(G.SVL Smith) Chodat(Pl. VII, Fig. 13)

Philipose 1967, p. 256, fig. 165; Das and Adhikary 2014, p. 159, pl. 9, f. 40

Coenobia of four cells, cells arranged in a sub alternating series; small, oblong ovoid cells, cells length 5.5 - 7.5 µm and breadth 3-4 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 4ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

125. *Scenedesmus dimorphus*(Turpin) Kutzing(Pl. VI, Fig. 20)

Philipose 1967, p. 249, fig. 160; Das and Adhikary 2014, p. 159, pl. 9, f. 43

7 - 8 celled colonies, with linear arrangement of cells; more or less lunate with the apices attenuated outer cells, cells length 10-11 µm and breadth 2-4 µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.2, Temperature: 28ºC, Conductivity: 465 µs/cm, date of collection: 21-05-2018

Previously reported from Assam: Kaziranga National park (Yasmin *et al.,* 2015); Raja Pukhuri, Gopeswar temple pond and HajoPukhuri, Kamrup District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

126. *Scenedesmus disciformis*(Chodat) Fott& Komarek f.*disciformis*(Pl. VII, Fig. 6)

Preslia, Praha 32: 129, 1960. Yamagishi, Plankton Alg. Taiwan 132, 1992; Yamagishi 2010, p.149, pl. 64, f. 3-4

Reniform to curved long-ovoid cells with rounded ends; arranged in closely contact with the sides, ends in eight celled colony in double series; but sometimes four celled form in linear series or in cruciate series contact; cells breadth 2-4 µm and length 6-12 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

127. *Scenedesmus flavescens*Chodat(Pl. VII, Fig. 17)

John, Whitton and Brook, 2003, 2005, p.393, pl. 94, f. L

2 or 4 (-8) celled coenobia, cells arranged in linear series; cylindrical to ovoid cells; with parallel marginal cells narrowing to slightly curved apices bearing straight or slightly curved spines, equal to cell length; on outer side of each marginal cells 2 equatorial spines, shorter; straight inner cells, rounded apices bearing 1-2 spines; cells width 2-4(-7) µm and length 5-10(-13) µm.

Place of collection: North Guwahati; S2: 26º15'23" N 91º41'35" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

128. *Scenedesmus hunanensis*Jao(Pl. VII, Fig. 16)

Sinensia 11: 292, 1940. Komarek&Fott, Binnengewasesser 16 (7,1): 904, 1983; Yamagishi 2010, p.149, pl. 64, f. 8

Long ellipsoidal to cylindrical cells, have acute ends and ridges on each side longitudinal; arranged in close contact with the side in a linear series; perforation between the cells absent; minute and granulate cell wall; cells breadth 5-7 µm and length 12-15(-22) µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Tinsukia District (Bordoloi, 2016).

129. *Sceendesmus intermedius* Chodat(Pl. VII, Fig. 14)

John, Whitton and Brook, 2003, 2005, p.395, pl. 95, f. G

Coenobium composed of 2-4-8 celled; alternately arranged; cells ovoid, rounded apices and the from outermost edge of marginal cell apices or only on one apex (then diagonally symmetrical) the main spines projects; discontinuous rows of warts; cells width 2-4(-5.5) µm and (3.5-)5-7.5(-10) µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

130. *Scenedesmus pseudopoliensis*Hortobagyi(Pl. VII, Fig. 8)

Komarek&Fott 1983, p. 910, fig. 245.9; Das and Adhikary 2014, p. 161, pl. 10, f. 16

Two celled coenobia, linear series arrangement, oblong, slightly truncate cells at the end; each pole of the terminal cell aroused to long spine; curved spine; cells length 11.8-13 µm and breadth 3.6 - 4.5 µm.

Place of collection: North Guwahati, S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Silchar (Jena and Adhikary, 2007)

131. *Scenedesmus quadricauda*(Turp.) Breb. (Pl. VII, Fig. 3)

Philipose 1967, p. 283, fig. 187 a; Das and Adhikary 2014, p. 161, pl. 10, f. 7

Four celled colonies, linear series arrangement, oblong-cylindrical with rounded ends cells, terminal cells pole with a long, slightly curved, more or less straight spine, a parietal chloroplast of each cell, with one pyrenoid, smooth cell wall, cells length 12.5 - 12.8 µm and breadth 4.2 - 5 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.4, Temperature: 26ºC, Conductivity: 465 µs/cm, date of collection: 21-05-2018

Previously reported from Assam: Kaziranga National park (Yasmin *et al.,* 2015); Assam University, Silchar campus (Deb *et al.,* 2013); SobhagyaKunda, KachoPukhuri, JorPukhuri, Raja Pukhuri, Gopeswar temple pond and HajoPukhuri, Kamrup District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

132. *Scenedesmus quadricauda*(Turpin) Brebisson var. *bicaudatus*Hansgirg(Pl. VII, Fig. 9)

Philipose 1967, p. 284, fig. 187 k; Das and Adhikary 2014, p. 161, pl. 10, f. 9

Four celled colonies, a long spine from one pole of terminal cells, terminal cells one spine present at an angle opposite to the other spine of the terminal cell,

internal cells spine absent, cells length 9.5 -10.7 µm, breadth 2.5 µm and spines length 6 - 6.5 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

133. *Sceendesmusquadricauda*f.*granulatus*Hortobagyi(Pl. VII, Fig. 10)

Komarek&Fott 1983, p. 902, pi. 243, fig. 4; Das and Adhikary 2014, p. 161, pl. 10, f. 8

4-8 celled coenobia, elliptical with obtuse end cells, with spines on each poles of terminal cells, cells slightly convex of the outer margin of two outer cells, cells length 10 -13 µm and breadth 3.5 -5 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

134. *Scenedesmus quadricauda*(Turpin) Brebisson var. *quadricauda*(Pl. VII, Fig.2)

Komarek&Fott, Binnengewasesser 16 (7,1): 928, 1983. Hegewald&Silve, Bibl. Phycol. 80 :428, 1988; Yamagishi 2010, p.151, pl. 65, f. 11

Oblong cylindrical, rounded ends cells; arranged in a linear series with sides closely contact; long, stout outer cell with a slightly curved spine on each side; smooth cell wall; teeth or ridge absent; cells breadth 3-7 µm, length 9-19 µm and spines length 7-15 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.4, Temperature: 26ºC, Conductivity: 465 µs/cm, date of collection: 21-05-2018

First reported taxon from Assam.

135. *Scenedesmus quadricauda*(Turp) Breb. var. *quadrispina* (Chodat) G.M.Smith(Pl. VII, Fig. 1)

Philipose 1967, p. 285, fig. 187 a, j; Das and Adhikary 2014, p. 161, pl. 10, f. 12

4 celled coenobium, cells length 16 -18 µm and breadth 4 - 5.5 µm, cells have obtuse end, both the poles of the terminal cells have short spines, cells cylindrical in shape.

Place of collection: North Guwahati S1: 26º15'41" N 91º41'52" E

pH: 7.2, Temperature: 28ºC, Conductivity: 465 µs/cm, date of collection: 21-05-2018

First reported taxon from Assam.

136. *Scenedesmus similagineus*Hortobagyi(Pl. VII, Fig.11)

Nova Hedwigia 1: 350, 1960. Komarek & Ludvik, Arch. Hydrobiol. Suppl. 41 (Algol. Stud. 6): 13, 1972; Yamagishi 2010, p.152, pl. 65, f. 8

Colonial forms, usually two celled colonies; broad-fusiform cells, on each pole a tubular thickening; cells breadth 6-8 µm and length 14-18 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

137. *Scenedesmus verrucosus*Roll (Pl. VII, Fig.12)

Komarek&Fott, 1983, p. 864, pi. 233, fig. 3; Das and Adhikary 2014, p. 161, pl. 10, f. 14

8 celled coenobia, broadly elliptical, alternately arranged cells; 10.8 - 12.5 µm length and breadth 5.8 µm; parietal chloroplast.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus: *Tetrastrum*Chodat

Colonial forms, with 4 cells, rhomboidal-shaped colonies in outline; spherical, cone-like, closely rhomboid cells, arrangement in one plane; angular sides contact each other; single, parietal laminate chloroplast; pyrenoid present.

138. *Tetrastrumheteracanthum*(Nordstedt) Chodat(Pl. VII, Fig.20)

Tsarenko, P.M. (2011); Tsarenko, P.M., Wasser, S.P. &Nevo, E. Eds, pp. 280-355; Ruggell: A.R.A. Gantner Verlag K. G

Mostly 4 celled coenobia; ovoid, triangular or trapezoidal cells; uninucleate in one plane 5-23 µm; tightly joined cells, in the center of coenobium small empty space may be or may not be present; with 1-2 long, 1 short and 1 short or 3-6 short spines on outer face of the cell; 1-4 chloroplasts, parietal, band or discoid shaped; with or without pyrenoids; the length of the long spines upto 8–24 µm, and that of the short spines 1–9 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

139. *Tetrastrumkomarekii*Hindak(Pl. VII, Fig. 18)

Komarek&Fott, 1983, p. 767, pi. 214, fig. 1; Das and Adhikary 2014, p. 159, pl. 9, f. 20

4 celled flat coenobia, rhombic in the outline; diameter 10-12.5 µm; mucilage structure absent, triangular cells, cells diameter 5 - 6 µm, with the arched outer free side, parietal chloroplasts; pyrenoid absent.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

140. *Tetrastrumstaurogeniaeforme*(Schroeder) Lemmermann(Pl. VII, Fig. 19)

Ber. Deutsch. Bot. Ges. 18: 95, 1900. Yamagishi, Plankton Alg. Taiwan 142, 1992; Yamagishi 2010, p.153, pl. 68, f. 5

Triangular to ovoid cells with basal sides straight; rounded outer sides, short spines 5-6-8 numbers present; cells diameter 3-4-6 µm and spines length 3-5 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Family: Zygnemataceae

Genus: *Spirogyra* Link

Unbranched thallus, with filament or rarely rhizoidal branches; remain attached to substratum; short or long vegetative cells, cylindrical and distinct septa present; 1-16 ribbon like chloroplast, parietal and spirally twisted; reproduction done by aplanospores and zygospores; scalariform or lateral conjugation; globose, oval, ellipsoid or sometimes lenticular shaped zygospores; smooth or ornamented spore wall; occasionally aplanospores formed.

141. *Spirogyra oblata* Jao(Pl. VIII, Fig. 1)

Randhawa 1959, p. 347, fig. 353; Das and Adhikary 2014, p. 149, pl. 4, f. 9

Cylindrical vegetative cells, length 140 - 170 µm and breadth 60 - 70 µm, plane end walls, eight chloroplasts, making 0.5 to 1 turn.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S3: 26º15'34" N 91º41'36" E

pH: S1: 7.9, Temperature: 22ºC, Conductivity: 150µs/cm,

S1: 8, Temperature: 22ºC, Conductivity: 150µs/cm,

Date of collection: 09-01-2019

First reported taxon from Assam.

Family: Desmidiaceae

Genus: *Cosmarium* Corda ex Ralfs

Solitary, small to large sized cells, generally longer than broad, rarely slightly broader than length, at median isthmus or neck region constriction present and form sinus shallow or deep, closed or open; may be elliptical, semi-circular, sub semi-circular, rectangular, pyramidal, cylindrical, traiziform etc. type of semicells; ornamented lateral sides with papillae, verrucae, or conical teeth; smooth or sometimes granulate cell wall, punctate, verrucate or scrobiculate; narrow or broad cell apices, flat, rounded, convex or may be retuse, any notch absent; axial chloroplast, 1-2 per semi cells with pyrenoids 1-2.

142. *Cosmariumsubcucumis*Schmidle var.*subcucumis*(Pl. VIII, Fig. 2)

Das and Keshri 2016, p. 125, pl. V, f. 149-152

Small sized or medium sized cells; length 1.5-2 times than breadth; deep median constriction, linear sinus, dilated toward the extremity usually; semi-elliptic semi cells with sides convex and apex rounded; 2 axial chloroplasts, pyrenoid present,

large in each; smooth cell wall; cells length 12-15 µm breadth 8-10 µm and isthmus 6-8 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

143. *Cosmarium quadratum* Ralfs ex. Ralfs var. *quadratum* f. *willei*(Schmidle) (Pl. VIII, Fig. 3)

Das and Keshri 2016, p. 122, pl. III, f. 77

Medium sized to small cells; length 1.4-1.5 times than breadth; moderate median constriction, narrow sinus, widely opening towards the exterior; sub-quadrate semi cells, narrowly rounded and slightly protruding lower angles, slightly convex lateral margins, broadly rounded apex becomes little broader; smooth cell wall; axial chloroplasts with 2 pyrenoids; cells length 10-11 µm breadth 6-7 µm isthmus 4-6 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus:*OnychonemaWallich*

Small, compressed, rectangular cells, deep median constriction and sinus narrowly linear, loosely attached cells from one another to form a long filament, mucilaginous sheath enclosed; elliptic semicells generally, rarely and sometimes reniform with a lateral spine; smooth cell wall.

144. *Onychonema uncinatum* Wallich(Pl. VIII, Fig. 4)

Turner 1892, p. 138, pl. XVII, f. 14; Das and Adhikary 2014, p. 155, pl. 7, f. 20

Rectangular cells, interlinked and form chains, cylindrical cellular extensions called cornua joined cells, obliquely situated to each other, at the outer thirds of the lateral surfaces, between cornua a row of minute teeth present, cells length 18 - 20 µm, breadth 26 - 38 µm and isthmus breadth 5.5-8 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

pH: 7.8, Temperature: 23 ºC, Conductivity: 139 µs/cm, date of collection: 26-04-2018

First reported taxon from Assam.

Genus:*Staurodesmus*Teiling

Solitary, usually small cells, deep median constriction, widely open sinus with obtuse end; triangular semicells with apical margins slightly curved, apical angles ornamented with spines.

145. *Staurodesmusbulnheimii*(Raciborski) Round et Brook (Pl. VIII, Fig. 6)

John, Whitton and Brook, 2003, 2005, p.578, pl. 145, f. C

Biradiated cells; narrow, linear sinus and constriction deep; isthmus width 7.5-10 µm; transversely rectangular semi cells with sides and apex slightly convex; rounded angles and long, stout, divergent spines at apical cells; cells width without spines 30-40 µm and length 32-42 µm, spines length 18-27 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

146. *Staurodesmusvalidus*(W. & G.S. West) Thom**.** (Pl. VIII, Fig. 5)

Lind and Brook 1980, p. 72, f. 111

Biradiated cells with acute sinus widening outside; cup-shaped semi cells, apex flat, stout divergent spines at the angles; cells length 23-40 µm and breadth 21-36 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus:*Staurastrum*Meyen ex Ralfs

Solitary, very small to large sized cells, may be deep or sometimes shallow median constriction, usually open sinus and closed rarely; cells 2-12 radiate in top view; short or long processes, usually ornamented with several vertical series of granules, denticles or spines and sometimes two or more terminal spinules. Semi cells semi-circular to oval to elliptic or pyramidal in shape with angles rounded; smooth cell wall, granulate or may be verrucate; axial chloroplasts, per semicells 1 and with one or more pryrenoids.

147. *Staurastrumegregium*West & GS West (Pl. VIII, Fig. 8)

Perumal and Anand 2009, p. 79, pl. 15, f. 20; Prasad and Misra 1992, p. 195, pl. 25, f. 6, 10

Dumble shaped cells; in size slightly longer than broader, sinus open and isthmus broad; 4 rings of short, stout and emarginate spines of almost equal size ornamented each semi cell; triangular with sides concave and angles rounded in top view; cells length with spines 31.5 µm and without spines 27.5 µm; with spines lateral cells 22.5 µm and without spines 22 µm, lateral isthmus 8.5 µm.

Place of collection: North Guwahati; S4: 26º15'29" N 91º41'41" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

148. *Staurastrum gracile* Ralfs (Pl. VIII, Fig. 7)

John, Whitton and Brook, 2003, 2005, p.569, pl. 139, f. N

3-radiate cells; constriction moderate with a shallow, sinus open and U-shaped; isthmus width 8-10 µm; broadly basin to cup-shaped semi cells; convex apex and produced angles to moderately long, hollow, tapering and convergent processes with 4 spines; processes furnished with concentric rings which are small granules; 3-evenly spaced pairs of intramarginal granules at the apex; above isthmus granules encircle the body; cells width without processes 23-27 µm and with processes 45-60 µm, length 30-36 µm.

Place of collection: North Guwahati; S1: 26º15'41" N 91º41'52" E

S4: 26º15'29" N 91º41'41" E

pH: S1:8, Temperature: 24ºC, Conductivity: 380 µs/cm,

S4: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm,

Date of collection: 26-03-2019

Previously reported from Assam: Kaziranga National park (Yasmin *et al.,* 2015); Raja Pukhuri, Kamrup District (Kakati, 2011); Tinsukia District (Bordoloi, 2016).

149. *Staurastrumorbiculare*Meneghini ex Ralfs(Pl. VIII, Fig.9)

Das and Keshri 2016, p. 168, pl. VIII, f. 253-254

Medium sized cells; length very slightly broader than breadth; deep constriction, at the apex sinus slightly dilated, linear and closed; rounded basal angles; punctate

cell wall; cell triangular in vertical view, between broadly rounded lobes the margins are concave; cells length 16-17 µm, breadth 17-18 µm and isthmus 6-7 µm

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Previously reported from Assam: Raja Pukhuri, Kamrup District (Kakati, 2011).

150. *Staurastrumstriolatum*(Naeg.) Archer var. *striolatum* f. *brasiliense* Turner (Pl. VIII, Fig. 10)

Das and Keshri 2016, p. 207, pl. VII, f. 219-221

Small sized cells, almost equal length and breadth; narrow median constriction and widely opened sinus; sub elliptic semicells; in vertical view cells appear 4-radiated, profoundly convex margins among the processes, processes with ends blunt and angles round; processes positioned parallelly and equipped with granules; truncate apex, with smooth cell wall, cells length 20-23 µm, breadth 21-25 µm and isthmus breadth 5-6 µm.

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 7.7, Temperature: 25ºC, Conductivity: 437 µs/cm, date of collection: 26-03-2019

First reported taxon from Assam.

Genus- *Euastrum* Ehrenberg ex Ralfs

Solitary, short and oval cells, deep median constriction, a shallow or deep vertical notch at the apex; elliptical, oval or sometimes quadrangular shaped semi cells, three lobbed, two basal and one polar lobe present; smooth cell wall or furnished with punctate, granules, or scrobicles; rarely margins or face of the lobes ornamented with short spines or verrucae; one axial chloroplast with several pyrenoids present.

151. *Euastrum* sp. (Pl. VIII, Fig. 11)

Place of collection: North Guwahati; S3: 26º15'34" N 91º41'36" E

pH: 8, Temperature: 24ºC, Conductivity: 380 µs/cm, date of collection: 26-03-2019

Algal composition in the four studied ponds

During the study of the four fish ponds, the distribution of the algal groups varied from one site to the other. The **figure 3** depicts the distribution and composition of the algal groups in each of the four study sites.

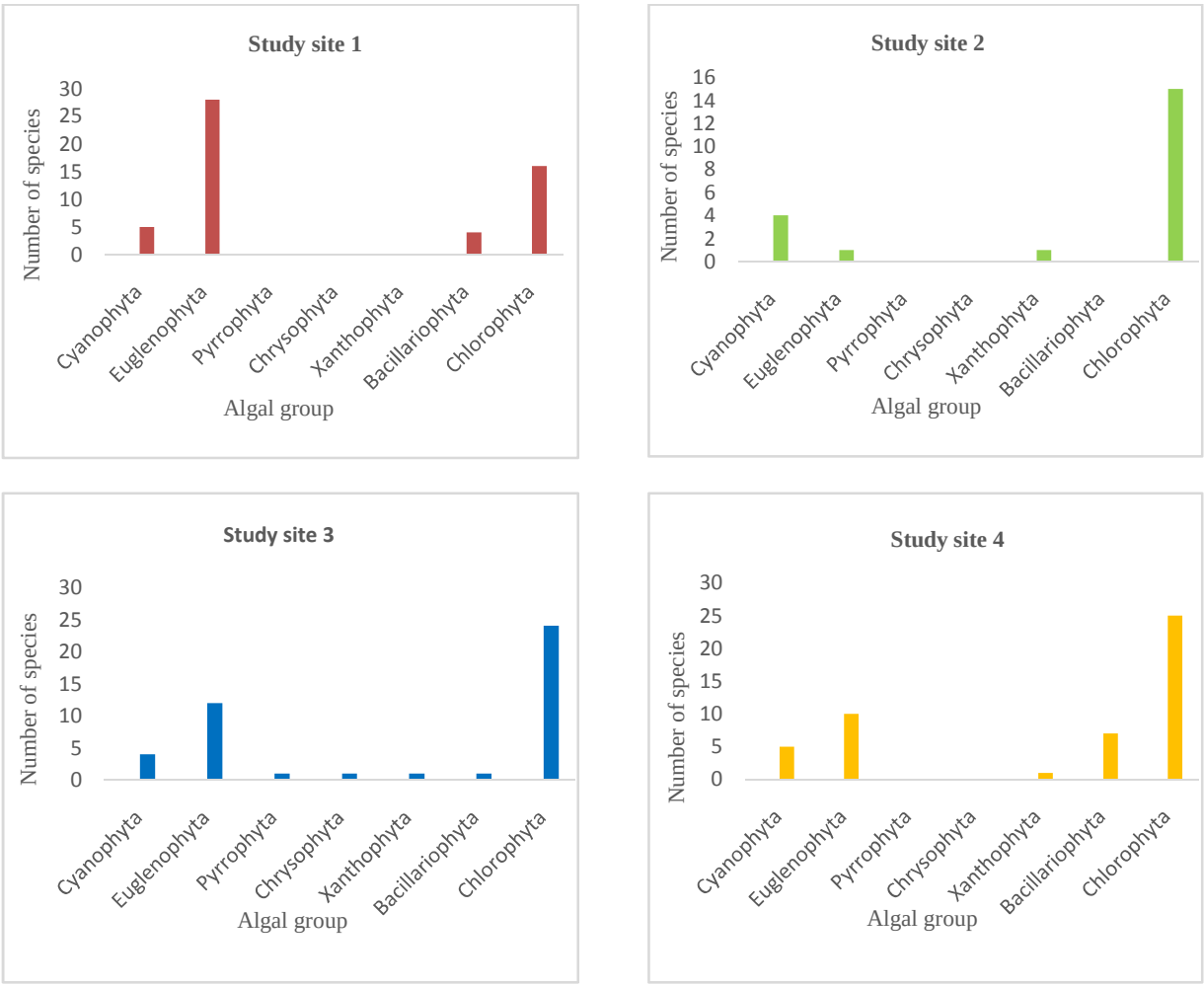


Fig 3: Composition of Algal groups in North Guwahati ponds

Study site S1

In the study site S1, altogether 53 algal species belonging to 4 taxonomic Phyla i.e. Cyanophyta, Euglenophyta, Bacillariophyta and Chlorophyta was recorded. Euglenophyta was the dominant group with 28 number of species under single order with 6 genera belonging to 3

families. Among the members of the group Euglenophyta, *Phacus* was the largest genus with 11 species, followed by *Euglena* (6), *Lepocinclis* (6) and *Trachelomonas* (3) respectively. The other members of the group Euglenophyta were *Strombomonas*and*Gyropaigne*with single species each. The second dominant group was Chlorophyta with 16 species, 3 orders and 11 genera under 8 families. *Tetrastrum*(3) was the dominant member followed by *Gonium, Pediastrum, Scenedesmus* with 2 species each. *Chlamydomonas, Pandorina, Dictyosphaerium,Tetraedron, Spirogyra, Onychonema* and *Staurastrum* comprised of single species each. The group Cyanophyta represented 5 species under 3 orders, 5 genera and 5 families as the third dominant group. Each member of this group i.e. *Merismopedia, Merismoarcus, Gloeocapsa, Scytonema* and *Spirulina* represented with single species each. The group Bacillariophyta was poorly represented with 4 species (one each from *Synedra, Cymbella, Nitzschia* and *Pinnularia*) belonging to 4 family under 4 order.

Study site S2

In study site S2, a total of 21 algal species was reported during the investigation. The site S2 had the least diversity among the four study sites. Cyanophyta, Euglenophyta, Xanthophyta and Chlorophyta were the four taxonomic phyla representing this site. The dominant algal group was Chlorophyta with 15 species under single order, 5 families and 8 genera. Among the members of this group, *Pediastrum* was the dominant genera with 5 species followed by *Actinastrum, Chlorella* and *Scenedesmus* with 2 species each. The other genera *Catena, Bracteacoccus, Oocystis, Didymocystis* were represented by single species each. The second largest algal group Cyanophyta comprised of 4 species under 2 orders, 3 families and 4 genera.

The representative genera of this group were *Aphanocapsa* (1), *Merismopedia*(1), *Chroococcus*(1) and *Scytonema*(1). Only one species of the groups Euglenophyta (*Phacus)* and Xanthophyta (*Nephrodiella*) each were recorded from this site.

Study site S3

Representing 7 taxonomic groups i.e. Cyanophyta, Euglenophyta, Pyrrophyta, Chrysophyta, Xanthophyta, Bacillariophyta and Chlorophyta, a total of 44 algal species and 24 genera were reported in the study site S3 during the study. With 13 genera belonging to 3 orders and 10 families, the group Chlorophyta was the largest algal group in this site. Among them, *Scenedesmus* was the dominant genus with 6 species followed by *Chlamydomonas* (3 species), *Monoraphidium* (2 species), *Crucigenia* (2 species) and *Pediastrum* (2 species). The other genera of this group were *Carteria, Actinastrum, Muriella, Dictyochloris, Didymocystis, Spirogyra, Staurastrum* and *Euastrum* represented single species each.

The second group in terms of number of species was Euglenophyta which comprised of 5 genera under single order Euglenales and 2 families. *Trachelomonas* with 7 species was the dominant genus followed by *Phacus* (2 species), *Euglena* (1 species), *Strombomonas* (1 species) and *Lepocinclis* (1 species) respectively.

Cyanophyta was the third algal group with 2 genera under single order Chroococcales and 2 families. *Chroococcus* (3 species) and *Merismopedia* (1 species) were the represented genera of this group. Only one species of Pyrrophyta (*Peridinium)*, Chrysophyta (*Mallomonas)*, Xanthophyta (*Tetradriella)* and Bacillariophyta (*Synedra)* each respectively were recorded in this site S3.

Study site S4

Belonging to 5 taxonomic groups viz. Cyanophyta, Euglenophyta, Xanthophyta, Bacillariophyta and Chlorophyta, altogether 48 algal species were reported from the site S4, during the investigation. Among the algal groups, Chlorophyta was the largest group with 25 species under 12 genera and 4 order and 7 families. The dominant genera among them was *Scenedesmus* with 9 species followed by *Keratococcus*(2), *Monoraphidium*(2), *Cosmarium*(2), *Staurodesmus*(2) and *Staurastrum*(2) respectively. Other genera like *Asterococcus, Chlamydomonas, Dysmorphococcus, Chlorolobion, Kirchneriella*and *Nephrochalamys* represented with only single species each.

The second largest group was Euglenophyta with 10 species under 3 genera, 2 families and a single order. *Phacus* (5 species) was the most dominant genera followed by *Trachelomonas* (3 species) and *Euglena* (2 species).

The third largest group Bacillariophyta represented 7 species 3 genera, 3 orders and 3 families. *Navicula* with 5 species was the dominant genera of this group followed by *Cyclotella* and *Nitzschia* with single species each.

Cyanophyta was recorded with 5 species belonging to 4 genera under single order Chroococcales and 3 families. Among the members *Merismopedia* represented 2 species followed by *Cyanosarcina, Geminocystis*(1), and *Gloeocapsa* (1). The group Xanthophyta was represented with single genera *Goniochloris* with a single species.

Sorensen's similarity index

The Sorensen index, (discovered by Sorensen, 1948) also known as Sorensen's similarity coefficient measures the similarity between the communities of or different study sites. In our study we compared the algal species composition between the studied ponds based on presence-absence data of the algal species.

Table 4 – Similarity indices between the studied ponds

Study sites	S1	S2	S3	S4
S1	1	0.054	0.103	0.099
S2		1	0.030	0.029
S3			1	0.043
S4				1

The results represented in Table **4** showed that with an index number of 0.103, the maximum or the highest similarity index was observed between S1 & S3. The second highest similarity index (0.099) was observed for study sites S1 & S4 which was followed by study sites S1 & S2 and S3 & S4 having similarity index value 0.054 and 0.043 respectively. The least similarity index value was found between S2 & S4 (0.029) followed by S2 & S3 (0.030).

While calculating similarity index, it was observed that the algal composition in the four different ponds varied although the study sites were contagious in terms of location. Similar findings can be corroborated with Kakati, 2011 where different composition of algal communities were reported from contagious areas when she worked on few historical ponds of Guwahati city.

Palmer’s pollution index:

The Table **5** represented the list of pollution tolerant Algal generathat were revealed from the four different fish ponds of North Guwahati. With an effort of identifying algae tolerant to organic pollution, Palmer (1969) prepared the list of 20 genera and ranked them with a score from 1-5. Assigning to their respective pollution index against the particular pollution tolerant algal genera following Palmer (1969), the total score for Palmer’s Pollution Index for each site were calculated and tabulated accordingly.

Table 5: Palmer's pollution index of the study sites.

Sl. No	Genera	Pollution index	S1	S2	S3	S4
1	*Chlamydomonas*	4	4	0	4	4
2	*Chlorella*	3	0	3	0	0
3	*Cyclotella*	1	0	0	0	1
4	*Euglena*	5	5	0	5	5
5	*Lepocinclis*	1	1	0	1	0
6	*Navicula*	3	0	0	0	3
7	*Nitzschia*	3	0	0	0	3
8	*Pandorina*	1	1	0	0	0
9	*Phacus*	2	2	2	2	2
10	*Scenedesmus*	4	4	4	4	4
11	*Synedra*	2	2	0	2	0
	Total Palmer's Pollution Index		**19**	**9**	**18**	**22**

Of all the four studied ponds, study site S4 exceeds the level of high organic pollution with an index score of 22. The pollution tolerant algal genera like *Chlamydomonas*, *Cyclotella*, *Euglena*, *Navicula*, *Nitzschia*, *Phacus* and *Scenedesmus* were present in this site. The pollution status of the pond may be attributed to its location which is very near to the recently developed township area. The level of organic pollution was observed high in the study site which resulted changes in physico-chemical parameters of the water body. Indicating the status of probable organic pollution, study site S1 (19) and S3 (18) were on the verge of attaining high organic

pollution. With lack of proper care and attention, this pond might soon exceed the level of high organic pollution. However, study site S2 indicated very light organic pollution which may be attributed to less anthropogenic activities and the other external factors in the pond. In terms of location, the pond was located at a distance from the town area, remains mostly clean and rarely witnesses pollution (Bordoloi and Baruah, 2014; Buragohain and Yasmin, 2014).