



ORIGINAL ARTICLE

An updated checklist of algae from Himachal Pradesh, India

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Abstract

This checklist of algae has been compiled by critical reviewing all available literature and provides a consolidated, up-to-date account of the diversity of algae in Himachal Pradesh state of India. According to the compiled data the algal flora of the state is represented by a total of 629 algal species of 158 genera belonging to 53 families of 31 orders of the 8 algal classes. The maximum number reported species are belongs to class Cyanophyceae (320 species) followed by Chlorophyceae (139 species), Bacillariophyceae (117 species), Euglenophyceae (25 species), Xanthophyceae (6 species), Dinophyceae (3 species), Coscinodisophyceae (3 species) and Chrysophyceae (2 species) from different habitats of the state. This checklist with taxonomically updated/accepted name of genera/species of algal species reported so far will be helpful for future floristic studies from the region.

Keywords: Algae, Checklist, Diversity, Flora, Himachal Pradesh.

Introduction

Algae represent ubiquitous group of oxygen-evolving photosynthetic autotrophs including both prokaryotic and eukaryotic cell structure and single cell to complex multi-cellular body organizations (Paul *et al.* 2017, Agarwal 2018). As a primary producer, the members of this group are important components of aquatic based food chains (Parmar *et al.* 2016, Kumar *et al.* 2020). Algae play an important role in maintaining water-column oxygen dynamics through respiration and photosynthesis processes, which is responsible for nutrient cycling to stabilize substrata in aquatic ecosystem (Effendi *et al.* 2016, Lohbeck *et al.* 2016). The community structure of algae is influenced by various factors such as nutrient concentration, type of substratum,

water quality and light regime that directly affect the development and growth of algae (Breuer *et al.* 2017, Burrows *et al.* 2021). Algae can act as an indicator of degree of alterations in water quality resulted from anthropogenic stress because of having specific ecological requirements (Omar 2010, Dell *et al.* 2017). Many algal indicators are increasingly been used in bio-monitoring and conservation of water bodies around the world (Wu *et al.* 2017, Komal *et al.* 2021). Therefore, availability of information on the distribution and diversity of algae is very important as they represent an ecologically important group of organisms.

Himachal Pradesh is one of the Northern hilly state of India located between latitude 30°22' to 33°13' North and longitude 75°45' to 79°04' East with geographical area of 55,673 km² (Figure 1). The state has three distinct regions on the basis of altitudes including the Shivaliks, with altitudes up to 1,500 m, Middle Himalayan regions between 1,500 m to 3,000 m and the Himadris, higher than 3,000 m. The average annual rainfall is about 1,800 mm and the temperature varies from sub zero to 35°C. The state is surrounded by Jammu and Kashmir on the north, Punjab on the west and south-west, Haryana and Uttar Pradesh on the south, Uttarakhand on the south-east and by the Tibet Autonomous Region on the east (Arora *et al.* 2012; Balasubramanian 2017). About one third of the state is permanently under snow, glaciers and cold deserts, where tree growth is minimal due to extreme environmental

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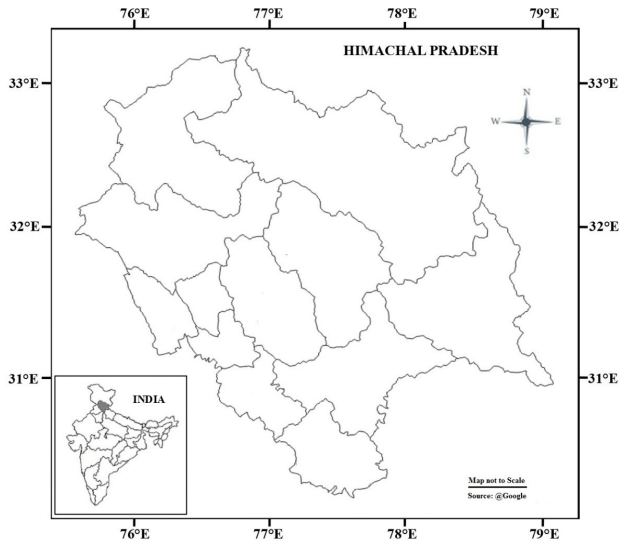


Figure 1: Location map of Himachal Pradesh state of India

conditions (Mahar *et al.* 2011). The major rivers are Sutlej, Beas, Ravi, Chenab and Yamuna (Mahar *et al.* 2011). It has a deeply explored topography, complex geological structure and a rich temperate flora in the sub-tropical latitudes. The diverse habitat of this Western Himalayan state supports rich floral and faunal diversity, nearly 18,440 species of plants with 25 to 30 per cent of endemics and 27,298 species of mammals, birds, reptiles, amphibians and fishes are reported from this region (Samant *et al.* 1998; Nowak 1999; Myers *et al.* 2000; Dar & Sundarapandian 2016).

Algal diversity of Himachal Pradesh from various diverse habitats including lakes, freshwater streams, paddy field, cold and hot water springs etc. have been explored by various workers (Vashista 1968, Shukla *et al.* 1970; Misra *et al.* 2006; Bhusan *et al.* 2018; Dwivedi *et al.* 2008; Arora *et al.* 2011; Gupta 2012 a,b; Gupta & Das 2012; Thakur *et al.* 2013; Mongra 2014; Singh *et al.* 2014; Jindal *et al.* 2014; Bhushan & Kumar 2018). Despite these efforts, the knowledge about the algal diversity of the state is still inconsistent. Therefore, there is a need for an updated checklist of algae to provide a consolidated, up-to-date account of the diversity of algae in of Himachal Pradesh. Although, Gupta (2012a,b) published checklists of cyanoprokaryota, chlorophyceae, xanthophyceae, chrysophyceae and xanthophyceae and diatoms from India, which include 371 taxa reported from Himachal Pradesh. The present work with addition of 258 more algal taxa is helpful in increasing the number of known algae from state to 629 taxa. Since, algae represent tremendously diverse group of aquatic organisms, which need to be exploited for their diverse ecological and economical benefits by collecting and culturing at large scale.

The objective of present work was to review all the available information and to prepare a list having currently acceptable name of algal species reported so far from

Himachal Pradesh state of India. Checklist preparation is the most basic taxonomic work on a group of organisms arranged in systematic or alphabetical order. The checklist prepared during present work is in a systematic order by reviewing the available literature up to July, 2022. This is the first complete checklist of algae from Himachal Pradesh covering all currently accepted species names and their synonyms. This updated checklist will provide baseline information for future floristic, ecological, biogeographic distributional studies on algae from the region.

Materials and Methods

The current checklist has been prepared by consulting the available literature from 1907 to 2022. The list has been prepared from collected data, which includes, 1) the species name listed as it is appeared in the original publications, 2) the species current, valid and accepted names. The study area includes the whole current geographical area of the Himachal Pradesh. The species have been taxonomically arranged by adopting the classification system proposed by Komárek (2014), Fritsch (1945) and Bellinger & Sigee (2010). The taxonomic identity including the authority and current accepted name has been verified from an online database AlgaeBase (Guiry & Guiry 2020).

Results and Discussion

As per the current literature survey, Algal diversity in Himachal Pradesh state of India is represented by 629 algal species of 158 genera belonging to 53 families of 31 orders of the 8 algal classes (Table 1). From the collected data it is observed that in terms of the number of species, class Cyanophyceae dominate with (329 species, 54 genera) followed by Chlorophyceae (143 species, 50 genera), Bacillariophyceae (118 species, 38 genera), Euglenophyceae (25 species, 5 genera), Xanthophyceae (6 species, 5 genera), Dinophyceae (3 species, 3 genera), Coscinodisophyceae (3 species, 2 genera) and Chrysophyceae (2 species, 1 genera) (Table 2).

Table 1: Number of orders, families, genera and species of algae reported from Himachal Pradesh, India

Class	Order	Family	Genera	Species
Cyanophyceae	7	19	54	329
Chlorophyceae	10	17	50	143
Xanthophyceae	3	3	5	6
Chrysophyceae	1	1	1	2
Coscinodisophyceae	1	2	2	3
Bacillariophyceae	7	9	38	118
Dinophyceae	1	1	3	3
Euglenophyceae	1	1	5	25
Total	31	53	158	629

Table 2: List of algal species reported from Himachal Pradesh, India

S. No.	Currently Accepted Name	References
	Class: Cyanophyceae	
	Order: Synechococcales	
	Family: Synechococcaceae	
1	<i>Romeria minima</i> (Lemmermann) Komárek * <i>Synechococcus minimus</i> (Lemmermann) Komárek	Mongra 2012 [15], Singh <i>et al.</i> 2018 [21]
2	<i>Synechococcus bigranulatus</i> Skuja * <i>Synechococcus elongatus</i> var. <i>amphigranulatus</i> J.J.Copeland	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
3	<i>Synechococcus vulcanus</i> J.J.Copeland	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
4	<i>Synechococcus vulcanus</i> var. <i>bacillarioides</i> J.J.Copeland	Singh <i>et al.</i> 2014 [20], Misra <i>et al.</i> 2006 [14]
5	<i>Coelosphaerium kutzingianum</i> Nägeli	Singh <i>et al.</i> 2014 [20], Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
6	<i>Limnococcus limneticus</i> (Lemmermann) Komárková, Jezberová, O.Komárek & Zapomelová * <i>Chroococcus limneticus</i> Lemmermann	Mongra 2012 [15], Singh <i>et al.</i> 2018 [21], Novarino 1991 [17]
7	<i>Chroococcus minor</i> (Kutzing) Nägeli	Mongra 2012 [15], Singh <i>et al.</i> 2014 [19], Singh <i>et al.</i> 2018 [21], Novarino 1991 [17]
8	<i>Chroococcus minutus</i> (Kutzing) Nägeli	Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Singh <i>et al.</i> 2018 [21], Gupta 2012a [8]
9	<i>Synechococcus elongatus</i> (Nägeli) Nägeli * <i>Synechococcus lividus</i> J.J.Copeland	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
10	<i>Eucapsis alpine</i> F.E.Clements & H.L.Schantz	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
11	<i>Synechocystis minuscula</i> Woronichin	Singh <i>et al.</i> 2014 [20]
12	<i>Microcystis smithii</i> Komárek & Anagnostidis * <i>Aphanocapsa pulchra</i> (Kutzing)	Singh <i>et al.</i> 2014 [20]
13	<i>Microcystis litoralis</i> (Hansgirg) Aboal, nom. illeg.	Jindal & Thakur 2013 [11], Gupta 2012a [8]
14	<i>Aphanocapsa biformis</i> A.Braun	Singh <i>et al.</i> 2014 [20]
15	<i>Komvophoron schmidlei</i> (Jaag) Anagnostidis & Komárek * <i>Pseudanabaena schmidlei</i> Jaag	Singh <i>et al.</i> 2014 [20]
16	<i>Cyanobium parvum</i> Komárek, J.Kopecký & Cepák	Singh <i>et al.</i> 2014 [20]
17	<i>Leptolyngbya Antarctica</i> Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20]
18	<i>Leptolyngbya benthonica</i> Anagnostidis	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
19	<i>Planktolyngbya limnetica</i> (Lemmermann) Komárková-Legnerová & Cronberg	Singh <i>et al.</i> 2014 [20]
20	<i>Leptolyngbya foveolarum</i> Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20], Gupta 2012a [8]
21	<i>Leptolyngbya frigida</i> Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
22	<i>Drouetiella lurida</i> (Gomont) Mai, J.R.Johansen & Pietrasiak * <i>Leptolyngbya lurida</i> Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20], Suseela & Topoo 2009 [25], Mongra 2012 [15], Singh <i>et al.</i> 2018 [21], Singh <i>et al.</i> 2018 [22]
23	<i>Leptolyngbya valderiana</i> Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20]
24	<i>Limnothrix redekei</i> (Goor) Meffert	Singh <i>et al.</i> 2014 [20], Gupta 2012a [8], Mongra 2014 [16]
25	<i>Stenomitos frigidus</i> (F.E.Fritsch) Miscoe & J.R.Johansen * <i>Pseudanabaena frigida</i> Anagnostidis	Singh <i>et al.</i> 2014 [20]
26	<i>Merismopedia tranquilla</i> (Ehrenberg) Trevisan * <i>Merismopedia punctata</i> Meyen, nom. illeg.	Singh <i>et al.</i> 2014 [20]
27	<i>Merismopedia elegans</i> A.Braun ex Kutzing	Singh <i>et al.</i> 2014 [20]
28	<i>Aphanocapsa incerta</i> (Lemmermann) G.Cronberg & Komárek * <i>Microcystis incerta</i> (Lemmermann) Lemmermann	Singh <i>et al.</i> 2014 [20], Novarino 1991 [17]
29	<i>Aphanocapsa grevillei</i> (Berkeley) Rabenhorst	Novarino 1991 [17], Gupta 2012a [8]
30	<i>Aphanocapsa thermalis</i> Bruggen	Singh <i>et al.</i> 2014 [20]

31	<i>Synechocystis aquatilis</i> Sauvageau	Singh <i>et al.</i> 2014 [20] ,Mongra 2012 [15], Singh <i>et al.</i> 2018 [21],Novarino 1991 [17]
32	<i>Coelosphaerium dubium</i> Grunow	Mongra 2012 [15], Singh <i>et al.</i> 2018 [21], Novarino 1991 [17]
33	<i>Coelosphaerium kuetzingianum</i> Nägeli	Singh <i>et al.</i> 2014 [20]
34	<i>Coelosphaerium aerugineum</i> Grunow	Singh <i>et al.</i> 2014 [20]
35	<i>Leptolyngbya carnea</i> (Kutzing ex Lemmermann) Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20]
36	<i>Leptolyngbya thermarum</i> (Woronichin) Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20] , Singh <i>et al.</i> 2014 [20]
37	<i>Leptolyngbya orientalis</i> (G.S.West) Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20] , Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
38	<i>Leptolyngbya amphibian</i> (Gomont ex Gomont) Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [20]
39	<i>Pseudanabaena limnetica</i> (Lemmermann) Komárek	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12]
40	<i>Leptolyngbya gelatinosa</i> (Woronichin) Anagnostidis & Komárek	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12], Gupta 2012a [8]
41	<i>Leptolyngbya thermobia</i> Anagnostidis	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Misra <i>et al.</i> 2006 [14], Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
42	<i>Nodosilinea epilithica</i> Perkerson et Casamatta	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12] ,Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
43	<i>Leptolyngbya cebennensis</i> (Gomont)	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12]
44	<i>Aphanocapsa koordersi</i> Storm	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12] , Dwivedi <i>et al.</i> 2008 [6], Gupta 2012a [8]
45	<i>Merismopedia minima</i> Beck	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12] ,Misra <i>et al.</i> 2006 [14],Dwivedi <i>et al.</i> 2008 [6],Singh <i>et al.</i> 2018 [21]
46	<i>Anathece clathrata</i> (West & G.S.West) Komárek, Kastovsky & Jezberova	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
47	<i>Synechococcus elongates</i> (Nägeli) Nägeli	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Gupta 2012a [8]
	Family: Merismopediaceae	
48	<i>Stichosiphon sansibaricus</i> (Hieronymus) F.E.Drouet & W.A.Daily	Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Gupta 2012a [8]
49	<i>Merismopedia glauca</i> (Ehrenberg) Kutzing	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Gupta 2012a [8]
50	<i>Aphanocapsa grevillei</i> (Berkeley) Rabenhorst	Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Gupta 2012a [8]
51	<i>Synechocystis thermalis</i> J.J Copeland	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
52	<i>Aphanocapsa thermalis</i> Brugger	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
53	<i>Synechocystis pevalekii</i> Ercegovic	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
54	<i>Eucapsis himalayensis</i> (Kutzing) Rabenhorst	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
55	<i>Pseudanabaena catenata</i> Lauterborn	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Gupta 2012a [8]
56	<i>Dermocarpa olivacea</i> var. <i>amphibian</i> Rao, CB	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Gupta 2012a [8]
	Family:Coelosphaeriaceae	
57	<i>Spirulina subsalsa</i> Oerst. Ex Gomont	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [22]
	Order: Spirulinales	
58	<i>Spirulina gomontii</i> Guwinski	Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Singh <i>et al.</i> 2018 [22]
59	<i>Spirulina meneghiniana</i> Zanardini ex Gomont	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Suseela & Topoo 2009 [25], Thakur <i>et al.</i> 2013 [26], Singh <i>et al.</i> 2018 [22]
60	<i>Arthrospira</i> amphibian (Schmidle) Anagnostidis * <i>Spirulina</i> amphibian Schmidle	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [22]
61	<i>Spirulina major</i> Kutzing ex Gomont	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Gupta 2012a [8]

62	<i>Spirulina major</i> (Kutzing ex Gomont)	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [22]
	Order:Chroococcales	
63	<i>Microcystis aeruginosa</i> (Meneghini) Elenkin	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
64	<i>Aphanothece castagnei</i> (Kutzing) Rabenhorst	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [21]
65	<i>Microcystis pulvereae</i> (H.C.Wood) Forti	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Novarino 1991 [17], Singh <i>et al.</i> 2018 [21]
66	<i>Chroococcus varius</i> A.Braun	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Gupta 2012a [8]
67	<i>Gloeocapsa atrata</i> Kutzing	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [22]
68	<i>Gloeocapsa coracina</i> Kutzing	Novarino 1991 [17]
69	<i>Chroococcus minor</i> (Kutzing) Nägeli	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
70	<i>Microcystis flos-aquae</i> (Wittrock) Kirchner	Fritch 1907 [7], Gupta 2012a [8]
71	<i>Chroococcus minutes</i> (Kutzing)	Fritch 1907 [7], Gupta 2012a [8]
72	<i>Chroococcus yellowstonensis</i> J.J.Copeland	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Gupta 2012a [8]
73	<i>Gleocapsa calcarea</i> Tilden	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
74	<i>Gloeocapsa rupestris</i> Kutzing	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
75	<i>Gloeocapsa conglomerata</i> Kutzing	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
76	<i>Gleocapsa punctata</i> Nägeli	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
77	<i>Microcystis lamelliformis</i> Holsinger	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
78	<i>Chroococcus tenax</i> (Kirchner) Hieronymus	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Singh <i>et al.</i> 2014 [20], Singh <i>et al.</i> 2018 [22]
79	<i>Aphanocapsa pulchra</i> (Kutzing)	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
80	<i>Gloeocapsopsis pleurocapsoides</i> Komárek & Anagnostidis ex Komárek	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Mongra 2012 [15], Singh <i>et al.</i> 2018 [22]
81	<i>Chroococcus amphibi</i> (Kutzing) Nägeli	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Mongra 2012 [15], Singh <i>et al.</i> 2018 [22]
82	<i>Chroococcus turgidus</i> (Kutzing) Nägeli	Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Gupta 2012a [8]
83	<i>Entophysalis amphibian</i> Kutzing	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
84	<i>Chroococcus yellowstonensis</i> J.J.Copeland	Singh <i>et al.</i> 2014 [20]
85	<i>Leptolyngbya amphibia</i> (Lemmermann) Anagnostidis & Komárek * <i>Phormidium africanum</i> Lemmermann	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
86	<i>Leptolyngbya tenuis</i> (Gomont) Anagnostidis & Komárek * <i>Phormidium tenue</i> Gomont	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
87	<i>Aphanothece nageli</i> W.West & G.S.West	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
88	<i>Aphanothece pallida</i> (Kutzing) Rabenhorst	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Mongra 2012 [15], Singh <i>et al.</i> 2018 [22]
89	<i>Gomphosphaeria natans</i> Komárek & Hindák	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Gupta 2012a [8]
90	<i>Gomphosphaeria aponina</i> Kutzing	Novarino 1991 [17], Gupta 2012a [8]
91	<i>Kamptonema cortianum</i> (Meneghini ex Gomont) Strunecký, Komárek & J.Smarda	Novarino 1991 [17]
92	<i>Jaaginema filiforme</i> (J.Copeland) Anagnostidis	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14], Bhushan & Kumar 2018 [2]
93	<i>Microcystis viridis</i> (A.Braun) Lemmermann	Novarino 1991 [17], Misra <i>et al.</i> , 2006, Bhushan & Kumar 2018 [2]
94	<i>Microcystis pulvereae</i> (H.C.Wood) Forti	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14], Bhushan & Kumar 2018 [2]

- 95 *Microcystis flosaquae* (Wittrock) Kirchner Novarino 1991 [17], Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 96 *Microcystis marginata* (Meneghini) Kutzing Novarino 1991 [17], Misra *et al.* , 2006, Bhushan & Kumar 2018 [2]
- 97 *Microcystis robusta* (H.W.Clark) Nygaard Novarino 1991 [17]
- 98 *Microcystis wesenbergii* (Komárek) Komárek ex Komárek Novarino 1991 [17], Srivastava & Gupta 2004 [23], Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Gupta 2012a [8]
- 99 *Chlorogloea simplex* M.Watanabe & Komárek Novarino 1991 [17]
- 100 *Gloeocapsa gelatinosa* Kutzing Novarino 1991 [17]
- 101 *Gloeocapsopsis thermalis* (Nováček) Komárek & Anagnostidis ex Komárek Novarino 1991 [17], Misra *et al.* 2006 [14], Suseela & Topoo 2009 [25], Bhushan & Kumar 2018 [2], Singh *et al.* 2018 [22]
- 102 *Gloeocapsa gelatinosa* (Meneghini) Kutzing Novarino 1991 [17]
- 103 *Microcystis protocystis* Crow Novarino 1991 [17], Misra *et al.* , 2006, Bhushan & Kumar 2018 [2]
- 104 *Microcystis amphiba* Bharadwaja Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur *et al.* 2013 [26], Singh *et al.* 2018 [21]
- 105 *Microcystis orissica* West, W. Srivastava & Gupta 2004 [23], Dwivedi *et al.* , 2008, Mongra 2014 [16]
- 106 *Aphanothece elabens* (Brebisson ex Meneghini) Elenkin
**Microcystis elabens* (Breb.) Kutz Srivastava & Gupta 2004 [23], Gupta 2012a [8]
- 107 *Chroococcus micrococcus* (Kutz) Rabenh. Srivastava & Gupta 2004 [23]
- 108 *Chroococcus rufescens* (Kutzing) Nägeli
**Chroococcus minimus* (Kutzing) Srivastava & Gupta 2004 [23]
- 109 *Gloeocapsa gelatinosa* Kutz Misra *et al.* 2006 [14], Vashista 1968 [27], Thakur *et al.* 2013 [26], Bhushan & Kumar 2018 [2]
- 110 *Gloeocapsa livida* (Carm.) Kutz Shukla *et al.* , 1970, Vashista 1968 [27], Thakur *et al.* 2013 [26]
- Family: Aphanothecaceae**
- 111 *Aphanothece nidulans* P.Richter Misra *et al.* 2006 [14], Gupta 2012a [8], Bhushan & Kumar 2018 [2]
- 112 *Aphanothece stagnina* (Sprengel) A.Braun Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- Family: Chroococcaceae**
- 113 *Chroococcus amphibia* (Kutzing) Nägeli Mongra 2012 [15], Singh *et al.* 2018 [21], Mongra 2014 [16]
- 114 *Chroococcus schizodermatics* West Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 115 *Chroococcus endophyticus* J.J.Copeland Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Mongra 2014 [16]
- 116 *Oscillatoria cortiana* Meneghini ex Gomont Misra *et al.* 2006 [14], Singh *et al.* 2014 [20] , Bhushan & Kumar 2018 [2]
- 117 *Cyanosarcina burmensis* (Skuja) Kováčik Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 118 *Gloeocapsopsis thermalis* (Nováček) Komárek & Anagnostidis ex Komárek Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Gupta 2012a [8]
- Family: Entophysalidaceae**
- 119 *Entophysalis granulosa* Kutzing Vashista 1968 [27], Thakur *et al.* 2013 [26], Misra *et al.* 2006 [14], Singh *et al.* 2014 [20] , Bhushan & Kumar 2018 [2]
- Family: Coleofasciculaceae**
- 120 *Anagnostidinema acutissimum* (Kufferath) Strunecký, Bohunická, J.R.Johansen & J.Komárek
**Geitlerinema acutissimum* (Kufferath) Anagnostidis Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Gupta 2012a [8]
- 121 *Coleofasciculus chthonoplastes* (Thuret ex Gomont) M.Siegesmund, J.R.Johansen & T.Friedl
**Microcoleus chthonoplastes* Thuret ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]

- 122 *Anagnostidinema acutissimum* (Kufferath) Strunecký, Bohunická, J.R.Johansen & J.Komárek
**Geitlerinema acutissimum* (Kufferath) Anagnostidis Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Mongra 2014 [16]
- 123 *Geitlerinema sulphureum* (Strzeszewski) Anagnostidis Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- Family: Microcoleaceae**
- 124 *Microcoleus autumnalis* (Gomont) Strunecky, Komárek & J.R.Johansen
**Phormidium autumnale* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Singh *et al.* 2014 [20]
- 125 *Microcoleus lacustris* Farlow ex Gomont Misra *et al.* 2006 [14], Suseela & Topoo 2009 [25], Bhushan & Kumar 2018 [2], Singh *et al.* 2018 [22], Gupta 2012a [8]
- 126 *Planktothrix agardhii* Anagnostidis & Komárek Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 127 *Planktothrix clathrata* Anagnostidis & Komárek Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 128 *Arthrospira jenniferi* Stizenberger ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 129 *Arthrospira khannae* Drouet & Strickland Suseela & Topoo 2009 [25], Singh *et al.* 2018 [22]
- 130 *Microcoleus amoenus* (Gomont) Strunecky, Komárek & J.R.Johansen
**Oscillatoria amoena* Gomont Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Mongra 2014 [16]
- 131 *Arthrospira platensis* Desikachary Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 132 *Spirulina argentina* Frenguelli
**Arthrospira argentina* Guarrera & Kuhnemann Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 133 *Limnospira fusiformis* (Voronichin) Nowicka-Krawczyk, Muhlsteinová & Hauer
**Arthrospira fusiformis* (Voronichin) Komárek & J.W.G.Lund Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 134 *Planktothrix isothrix* (Skuja) Komárek & Komárková Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 135 *Microcoleus acremanii* Gomont ex Gomont Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 136 *Microcoleus vaginatus* Gomont ex Gomont Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- Family: Oscillatoriaceae**
- 137 *Jaaginema pseudogeminatum* (G.Schmid) Anagnostidis & Komárek
**Oscillatoria pseudogeminata* G.Schmid Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Dwivedi & Misra 2015 [5]
- 138 *Geitlerinema calcuttense* (Biswas) Anagnostidis
**Oscillatoria calcuttensis* Biswas Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Mongra 2014 [16]
- 139 *Phormidium chalybeum* (Mertens ex Gomont) Anagnostidis & Komárek
**Oscillatoria chalybea* Mertens ex Gomont Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Singh *et al.* 2014 [20]
- 140 *Oscillatoria chilkinsis* Biswas Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 141 *Kamptonema chlorinum* (Kutzing ex Gomont) Strunecký, Komárek & J.Smarda
**Oscillatoria chlorina* Kutzing ex Gomont Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 142 *Oscillatoria curviceps* C.Agardh ex Gomont Mongra 2012 [15], Singh *et al.* 2018 [21]
- 143 *Oscillatoria corallinae* Gomont ex Gomont Singh *et al.* 2014 [20]
- 144 *Kamptonema formosum* (Bory ex Gomont) Strunecký, Komárek & J.Smarda
**Oscillatoria formosa* Bory ex Gomont Mongra 2012 [15], Singh *et al.* 2018 [21], Singh *et al.* 2018 [22], Mongra 2014 [16]
- 145 *Kamptonema laetevirens* (H.M.Crouan & P.L.Crouan ex Gomont) Strunecký, Komárek & J.Smarda
**Oscillatoria laetevirens* P.Crouan & H.Crouan ex Gomont Suseela & Topoo 2009 [25], Singh *et al.* 2018 [21]
- 146 *Oscillatoria limosa* C.Agardh ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 147 *Kamptonema okenii* (C.Agardh ex Gomont) Strunecký, Komárek & J.Smarda
**Oscillatoria okenii* C.Agardh ex Gomont Misra *et al.* 2006 [14], Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Bhushan & Kumar 2018 [2]
- 148 *Oscillatoria princeps* Vaucher ex Gomont Vashista 1968 [27], Thakur *et al.* 2013 [26]

- 149 *Jaaginema pseudogeminatum* (G.Schmid) Anagnostidis & Komárek
**Oscillatoria pseudogeminata* G.Schmid Misra *et al.* 2006 [14], Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Bhushan & Kumar 2018 [2], Mongra 2014 [16]
- 150 *Oscillatoria subbrevis* Schmidle Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 151 *Leptolyngbya fritschii* Anagnostidis
**Plectonema notatum* var. *africanum* F.E.Fritsch & M.F.Rich Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 152 *Lyngbya truncicola* Ghose Vashista 1968 [27], Thakur *et al.* 2013 [26], Mongra 2012 [15], Singh *et al.* 2018 [22]
- 153 *Potamolinea aerugineocaerulea* (Gomont) M.D.Martins & L.H.Z.Branco
**Lyngbya aerugineocaerulea* Gomont Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 154 *Leptolyngbya fragilis* (Gomont) Anagnostidis & Komárek
**Phormidium fragile* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 155 *Oscillatoria sancta* Gomont Vashista 1968 [27], Thakur *et al.* 2013 [26], Singh *et al.* 2014 [19]
- 156 *Lyngbya martensiana* (Meneghini ex Gomont) Misra *et al.* 2006 [14], Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Bhushan & Kumar 2018 [2]
- 157 *Phormidium allorgei* (Fremy) Anagnostidis & Komárek
**Lyngbya allorgei* Fremy Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2], Mongra 2014 [16]
- 158 *Limnoraphis birgei* (G.M.Smith) J.Komárek, E.Zapomelová, J.Smarda, J.Kopecký, E.Rejmánková, J.Woodhouse, B.A.Neilan & J.Komárková
* *Lyngbya birgei* G.M.Smith Misra *et al.* 2006 [14], Suseela & Topoo 2009 [25], Bhushan & Kumar 2018 [2], Singh *et al.* 2018 [21]
- 159 *Lyngbya martensiana* Meneghini ex Gomont Misra *et al.* 2006 [14], Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur *et al.* 2013 [26], Bhushan & Kumar 2018 [2], Singh *et al.* 2018 [22]
- 160 *Leibleinia epiphytica* (Hieronymus) Compère Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 161 *Phormidium kuetzingianum* (Kirchner ex Hansgirg) Anagnostidis & Komárek Misra *et al.* 2006 [14], Suseela & Topoo 2009 [25], Bhushan & Kumar 2018 [2], Singh *et al.* 2018 [21], Mongra 2014 [16]
- 162 *Heteroleibleinia kuetzingii* (Schmidle) Compère
**Lyngbya kuetzigii* Schmidle Vashista 1968 [27], Thakur *et al.* 2013 [26], Dwivedi & Misra 2015 [5]
- 163 *Lyngbya major* Meneghini ex Gomont Misra *et al.* 2006 [14], Srivastava PN 1967 [24], Jindal & Thakur 2013 [11], Singh *et al.* 2014 [20], Bhushan & Kumar 2018 [2]
- 164 *Phormidium nigrum* (Vaucher ex Gomont) Anagnostidis & Komárek
**Lyngbya nigra* Hangir Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 165 *Phormidium puteale* (Montagne ex Gomont) Anagnostidis & Komárek
**Lyngbya putealis* Montagne ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 166 *Oscillatoria perornata* Skuja Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 167 *Oscillatoria princeps* Vaucher ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 168 *Phormidium terebriforme* (C.Agardh ex Gomont) Anagnostidis & Komárek
**Oscillatoria terebriformis* C.Agardh ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 169 *Phormidium chalybeum* Gomont Misra *et al.* 2006 [14], Mongra 2012 [15], Singh *et al.* 2018 [22], Novarino 1991 [17], Bhushan & Kumar 2018 [2]
- 170 *Oscillatoria limosa* C.Agardh ex Gomont Mongra 2012 [15], Singh *et al.* 2018 [22]
- 171 *Phormidium willei* (N.L.Gardner) Anagnostidis & Komárek Misra *et al.* 2006 [14], Mongra 2012 [15], Singh *et al.* 2018 [22], Novarino 1991 [17], Bhushan & Kumar 2018 [2]
- 172 *Oscillatoria tenuis* Gomont Misra *et al.* 2006 [14], Mongra 2012 [15], Singh *et al.* 2018 [21], Bhushan & Kumar 2018 [2]
- 173 *Oscillatoria amphibia* Lauterborn Misra *et al.* 2006 [14], Mongra 2012 [15], Singh *et al.* 2018 [21], Bhushan & Kumar 2018 [2]

- 174 *Phormidium subfuscum* Kutzing ex Gomont Misra *et al.* 2006 [14], Vashista 1968 [27], Thakur *et al.* 2013 [26], Bhushan & Kumar 2018 [2]
- 175 *Lyngbya lutea* Gomont ex Gomont Mongra 2012 [15], Singh *et al.* 2018 [21]
- 176 *Oscillatoria stigonema* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 177 *Potamolinea aerugineocaerulea* Gomont
**Lyngbya aerugineocaerulea* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 178 *Lyngbya diqueti* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 179 *Lyngbya calcicola* (C.Agardh) Hansgirg Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 180 *Lyngbya niqra* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 181 *Oscillatoria brevis* Schröter Misra *et al.* 2006 [14], Vashista 1968 [27], Thakur *et al.* 2013 [26], Bhushan & Kumar 2018 [2]
- 182 *Oscillatoria laetevirens* Hofman-Bang ex Forti Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 183 *Oscillatoria proboscidea* Gomont Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 184 *Oscillatoria proboscidea* var. *westii* Forti Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 185 *Oscillatoria tenuis* Gomont Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 186 *Limnoraphis hieronymusii* (Lemmermann) J.Komárek,
E.Zapomelová, J.Smarda, J.Kopecký, E.Rejmánková, J.Woodhouse,
B.A.Neilan & J.Komárková
**Lyngbya hieronymusi* Lemmermann Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 187 *Phormidium limnetica* (Vaucher ex Gomont) Anagnostidis & Komárek Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 188 *Kamptonema chlorinum* (Kutzing ex Gomont) Strunecký, Komárek & J.Smarda
**Phormidium chlorinum* (Kutzing ex Gomont) Umezaki & Watanabe Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 189 *Kamptonema animale* (C.Agardh ex Gomont) Strunecký, Komárek & J.Smarda
**Phormidium animale* (Vaucher ex Gomont) Anagnostidis & Komárek Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 190 *Phormidium ambiguum* Thuret ex Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 191 *Phormidium nigrum* (Vaucher ex Gomont) Anagnostidis & Komárek Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 192 *Phormidium desikacharyiense* Vasishta Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 193 *Phormidium jenkelianum* G.Schmid Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 194 *Phormidesmis molle* (Gomont) Turicchia, Ventura, Komárková & Komárek
**Phormidium molle* Gomont Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- 195 *Phormidium molle* f. *tenuior* West & West Dwivedi *et al.* 2008 [6]
- 196 *Leptolyngbya valderiana* (Gomont) Anagnostidis & Komárek
**Phormidium valderianum* Gomont Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- 197 *Phormidium chalybeum* (Mertens ex Gomont) Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 198 *Oscillatoria obscura* Bruhl et Biswas Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- 199 *Oscillatoria chilensis* Biswas Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- 200 *Phormidium irriguum* (Kutzing ex Gomont) Anagnostidis & Komárek
**Oscillatoria irrigua* (Kutz) Gomont Dwivedi *et al.* 2008 [6], Suseela & Topoo 2009 [25], Mongra 2012 [15], Singh *et al.* 2018 [22], Singh *et al.* 2018 [21]
- 201 *Oscillatoria agardhii* Gomont Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- 202 *Phormidium corium* Gomont Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- 203 *Phormidium baculum* (Gomont ex Gomont) Anagnostidis
**Lyngbya baculum* Gomont Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- Family: Stigonemataceae**
- 204 *Stigonema ocellatum* Frey Suseela & Topoo 2009 [25], Singh *et al.* 2018 [22]
- Family: Hapalosiphonaceae**

205	<i>Hapalosiphon pumilus</i> Kirchner ex Bornet & Flahault * <i>Hapalosiphon fontinalis</i> Kirchner ex Bornet & Flahault	Suseela & Topoo 2009 [25], Singh <i>et al.</i> 2018 [22]
206	<i>Halosiphon intricatus</i> West & G.S.West	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
207	<i>Fischerella epiphytica</i> S.L.Ghose	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
208	<i>Fischerella thermalis</i> Gomont	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
209	<i>Mastigocladus laminosus</i> Cohn ex Kirchner	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
	Family: Gloeotrichiaceae	
210	<i>Gloeotrichia echinulata</i> Gonzalves & Kamat	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
211	<i>Gloeotrichia intermedia</i> (Lemmermann) Geitler	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
	Family: Pseudanabaenaceae	
212	<i>Pseudanabaena thermalis</i> Anagnostidis	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
213	<i>Leptolyngbya copelandii</i> Anagnostidis	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
	Family: Leptolyngbyaceae	
214	<i>Planktolyngbya contorta</i> (Lemmermann) Anagnostidis & Komárek	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
215	<i>Leptolyngbya margaretheana</i> (G.Schmid) Anagnostidis & Komárek	Suseela & Topoo 2009 [25], Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26], Singh <i>et al.</i> 2018 [22]
216	<i>Leptolyngbya boryana</i> (Gomont) Anagnostidis & Komárek	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
	Family: Entophysalidaceae	
217	<i>Chlorogloea simplex</i> M.Watanabe & Komárek	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
218	<i>Entophysalis amphibian</i> Kutzing	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
	Order: Pleurocapsales	
219	<i>Cyanosarcina spectabilis</i> (Geitler) Kováčik * <i>Myxosarcina spectabilis</i> Geitler	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
	Family: Hydrococcaceae	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
220	<i>Hydrococcus rivularis</i> Kutzing	Dwivedi <i>et al.</i> 2008 [6], Singh <i>et al.</i> 2018 [21]
	Order: Chroococciopsidales	
221	<i>Chroococciopsis cubana</i> Komárek et Hindák	Dwivedi <i>et al.</i> 2008 [6]
	Order: Oscillatoriales	
222	<i>Oscillatoria tenuis</i> Vaucher ex Gomont	Dwivedi <i>et al.</i> 2008 [6]
223	<i>Geitlerinema splendium</i> (Greville ex Gomont) Anagnostidis	Dwivedi <i>et al.</i> 2008 [6]
224	<i>Oscillatoria curviceps</i> C.Agardh ex Gomont	Dwivedi <i>et al.</i> 2008 [6]
225	<i>Kamptonema jasorvense</i> (Vouk) Strunecký, Komárek & J.Smarda * <i>Oscillatoria jasorvensis</i> Vouk	Dwivedi <i>et al.</i> 2008 [6]
226	<i>Kamptonema laetevirens</i> (H.M.Crouan & P.L.Crouan ex Gomont) Strunecký, Komárek & J.Smarda * <i>Oscillatoria laetevirens</i> P.Crouan & H.Crouan ex Gomont	Dwivedi <i>et al.</i> 2008 [6]
227	<i>Jaaginema angustissimum</i> (West & G.S.West) Anagnostidis & Komárek * <i>Oscillatoria angustissima</i> West & G.S.West	Vashista 1968 [27], Thakur <i>et al.</i> 2013 [26]
228	<i>Anagnostidinema amphibium</i> (C.Agardh ex Gomont) Strunecký, Bohunická, J.R.Johansen & J.Komárek * <i>Oscillatoria amphibian</i> C.Agardh ex Gomont	Mongra 2012 [15], Singh <i>et al.</i> 2018 [22], Novarino 1991 [17]
229	<i>Phormidium minnesotense</i> (Tilden) Drouet * <i>Oscillatoria minnesotensis</i> Tilden	Dwivedi <i>et al.</i> 2008 [6], Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
230	<i>Anagnostidinema exile</i> (Skuja) Strunecký <i>et al.</i> * <i>Geitlerinema exile</i> (Skuja) Anagnostidis	Dwivedi <i>et al.</i> 2008 [6]
231	<i>Oscillatoria curviceps</i> C.Agardh ex Gomont	Dwivedi <i>et al.</i> 2008 [6]
232	<i>Lyngbya semiplena</i> Hansgirg	Dwivedi <i>et al.</i> 2008 [6]
233	<i>Phormidium minima</i> Thuret ex Gomont	Dwivedi <i>et al.</i> 2008 [6]

- 234 *Kamptonema animale* (C.Agardh ex Gomont) Strunecký, Komárek & J.Smarda
**Phormidium animale* (Vaucher ex Gomont) Anagnostidis & Komárek Dwivedi *et al.* 2008 [6]
- 235 *Phormidium ambigum* Thuret ex Gomont Arora *et al.* 2012 [1],
- 236 *Phormidium nigrum* (Vaucher ex Gomont) Anagnostidis & Komárek Arora *et al.* 2012 [1],
- 237 *Oscillatoria obscura* Bruhl et Biswas Arora *et al.* 2012 [1],, Singh *et al.* 2014 [20]
- 238 *Oscillatoria sancta* (Kutz). Gomont. Arora *et al.* 2012 [1],
- 239 *Oscillatoria chilensis* Biswas Arora *et al.* 2012 [1],
- 240 *Phormidium irriguum* (Kutzing ex Gomont) Anagnostidis & Komárek Arora *et al.* 2012 [1],
**Oscillatoria irrigua* (Kutz) Gomont
- 241 *Oscillatoria agardhii* Gomont Arora *et al.* 2012 [1],
- 242 *Phormidium corium* Gomont Arora *et al.* 2012 [1],
- 243 *Phormidium baculum* (Gomont ex Gomont) Anagnostidis Arora *et al.* 2012 [1],, Mongra 2012 [15], Singh *et al.* 2018 [22], Novarino 1991 [17]
**Lyngbya baculum* Gomont
- Order: Nostocales**
- 244 *Nostoc carneum* C.Agardh ex Bornet & Flahault Arora *et al.* 2012 [1], Singh *et al.* 2014 [19]
**Nostoc spongiaforme* C.Agardh ex Bornet & Flahault
- 245 *Calothrix marchica* Lemmermann Arora *et al.* 2012 [1],
- 246 *Calothrix parietina* Thuret ex Bornet & Flahault Arora *et al.* 2012 [1],
- 247 *Anabaenopsis circularis* (G.S.West) Woloszynska & V.V.Miller Arora *et al.* 2012 [1],
- 248 *Dolichospermum macrosporum* (Klebhan) Wacklin, L.Hoffmann & Komárek Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
**Anabaena macrospora* Klebahn
- 249 *Trichormus fertilissimus* (C.B.Rao) Komárek & Anagnostidis Arora *et al.* 2012 [1],
**Anabaena fertilissima* C.B.Rao
- 250 *Anabaena laxa* A.Braun Arora *et al.* 2012 [1],
- 251 *Dolichospermum helicoideum* (C.Bernard) Wacklin, L.Hoffmann & Komárek Arora *et al.* 2012 [1],
**Anabaena helicoidea* C.Bernard
- 252 *Anabaena torulosa* Lagerheim ex Bornet & Flahault Arora *et al.* 2012 [1],
- 253 *Cylindrospermum stagnale* Bornet & Flahault Arora *et al.* 2012 [1],
- 254 *Nostoc carneum* C.Agardh ex Bornet & Flahault Arora *et al.* 2012 [1],
- 255 *Desmonostoc muscorum* C.Agardh ex Bornet & Flahault Arora *et al.* 2012 [1],
**Nostoc muscorum* C.Agardh ex Bornet & Flahault
- 256 *Nostoc passerifianum* C.Agardh ex Bornet & Flahault Arora *et al.* 2012 [1],
- 257 *Dolichospermum circinale* (Rabenhorst ex Bornet & Flahault) Arora *et al.* 2012 [1],
P.Wacklin, L.Hoffmann & J.Komárek
**Anabaena circinalis* Rabenhorst ex Bornet & Flahault
- 258 *Nodularia spumigena* Mertens ex Bornet & Flahault Arora *et al.* 2012 [1],
- 259 *Fortiea bossei* (Fremy) Desikachary Arora *et al.* 2012 [1],
- 260 *Calothrix braunii* Bornet & Flahault Arora *et al.* 2012 [1],
- 261 *Calothrix brevissima* G.S.West Arora *et al.* 2012 [1],
- 262 *Nostoc linckia* Bornet & Flahault Arora *et al.* 2012 [1],
- 263 *Nostoc punctiforme* (Hariot) Elenkin Arora *et al.* 2012 [1],
- 264 *Nostoc carneum* C.Agardh ex Bornet & Flahault Arora *et al.* 2012 [1],
**Nostoc spongiaeforme* C.Agardh ex Bornet & Flahault
- 265 *Nodularia sphaerocarpa* Bornet & Flahault Arora *et al.* 2012 [1],
- 266 *Aulosira prolifica* Bharadwaja Arora *et al.* 2012 [1],

- 267 *Aulosira fertilissima* S.L.Ghose Arora *et al.* 2012 [1],
- 268 *Calothrix castelli* Bornet & Flahault Singh *et al.* 2014 [20]
- 269 *Cylindrospermum majus* A.M.Bendre & M.S.Agarkar Fritch 1907 [7], Misra *et al.* 2006 [14]
- 270 *Cylindrospermum musicola* A.M.Bendre & M.S.Agarkar Singh *et al.* 2014 [20]
- 271 *Anabaena iyengarii* Bharadwaja Singh *et al.* 2014 [20]
- 272 *Anabaenopsis arnoldii* Aptekar Singh *et al.* 2014 [20]
- 273 *Nostoc commune* Elenkin Singh *et al.* 2014 [20]
- 274 *Desmonostoc muscorum* (C.Agardh ex Bornet & Flahault) Hrouzek & Ventura Singh *et al.* 2014 [20]
**Nostoc muscorum* C.Agardh ex Bornet & Flahault
- 275 *Trichormus variabilis* Komárek & Anagnostidis Singh *et al.* 2014 [20]
- 276 *Scytonema leptobasis* S.L.Ghose Singh *et al.* 2014 [20]
- 277 *Scytonema ocellatum* Ghose Singh *et al.* 2014 [20]
- 278 *Scytonema simplex* Vasishta Singh *et al.* 2014 [20]
- 279 *Tolypothrix distorta* C.-C.Jao Singh *et al.* 2014 [20]
- 280 *Calothrix castelli* Bornet & Flahault Singh *et al.* 2014 [20]
- 281 *Rivularia minuta* C.B.Rao Singh *et al.* 2014 [20]
- 282 *Gloeotrichia echinulata* Gonzalves & Kamat Singh *et al.* 2014 [20]
- 283 *Gloeotrichia intermedia* (Lemmermann) Geitler Singh *et al.* 2014 [20]
- 284 *Hapalosiphon pumilus* Kirchner ex Bornet & Flahault Singh *et al.* 2014 [20]
- 285 *Fischerella epiphytica* S.L.Ghose Singh *et al.* 2014 [20]
- 286 *Stigonema ocellatum* Frey Singh *et al.* 2014 [20]
- 287 *Nostochopsis lobatus* Hansgirg Singh *et al.* 2014 [20]
- 288 *Chlorogloeopsis fritschii* (A.K.Mitra) A.K.Mitra & D.C.Pandey Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
- 289 *Fischerella thermalis* Gomont Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 290 *Mastigocladus laminosus* Cohn ex Kirchner Singh *et al.* 2014 [20], Suseela & Topoo 2009 [25], Singh *et al.* 2018 [22]
- 291 *Tolypothrix fragilis* (Gardner) Geitler Singh *et al.* 2014 [20]
- 292 *Nostoc edaphicum* (Roth) Bornet ex Bornet et Flahault Suseela & Topoo 2009 [25], Singh *et al.* 2018 [22]
- 293 *Nostoc linckia* (Roth) Bornet ex Bornet et Flahault Suseela & Topoo 2009 [25], Singh *et al.* 2018 [22]
- Family: Tolypothrichaceae**
- 294 *Tolypothrix distorta* C.-C.Jao Suseela & Topoo 2009 [25], Singh *et al.* 2018 [22]
- 295 *Tolypothrix fragilis* (Gardner) Geitler Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12],
- Family: Chlorogloeopsidaceae**
- 296 *Chlorogloeopsis fritschii* (A.K.Mitra) A.K.Mitra & D.C.Pandey Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12], Misra *et al.* 2006 [14], Bhushan & Kumar 2018 [2]
- Family: Aphanizomenonaceae**
- 297 *Anabaenopsis circularis* (G.S.West) Woloszynska & V.V.Miller Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12], Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 298 *Dolichospermum macrosporum* (Klebahn) Wacklin, L.Hoffmann & Komárek Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12]
**Anabaena macrospora* Klebahn
- 299 *Trichormus fertilissimus* Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12], Dwivedi *et al.* 2008 [6]
(C.B.Rao) Komárek & Anagnostidis
**Anabaena fertilissima* C.B.Rao
- 300 *Anabaena laxa* A.Braun Carter 1926 [3], Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21]
- 301 *Dolichospermum helicoideum* (C.Bernard) Wacklin, L.Hoffmann & Komárek **Anabaena helicoidea* C.Bernard Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12], Dwivedi *et al.* 2008 [6]

- 302 *Anabaena torulosa* Lagerheim ex Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 303 *Nodularia spumigena* Mertens ex Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26], Singh *et al.* 2014 [19], Jindal *et al.* 2014 [12], Misra *et al.* 2006 [14], Dwivedi *et al.* 2008 [6], Singh *et al.* 2018 [21], Bhushan & Kumar 2018 [2]
- 304 *Nodularia sphaerocarpa* Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 305 *Anabaenopsis arnoldii* Aptekar Vashista 1968 [27], Thakur *et al.* 2013 [26]
- Family: Nostocaceae**
- 306 *Nostoc carneum* C. Agardh ex Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26]
**Nostoc spongiaforme* C. Agardh ex Bornet & Flahault
- 307 *Johanseninema constrictum* (Szafer) Hasler, Dvorák & Pouličková Vashista 1968 [27], Thakur *et al.* 2013 [26]
**Anabaena constricta* (Szafer) Geitler
- 308 *Nostoc paludosum* Kutzing ex Bornet & Flahault Arora *et al.* 2012 [1],
- 309 *Cylindrospermum stagnale* Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26], Arora *et al.* 2012 [1], , Arora *et al.* 2012 [1],
- 310 *Desmonostoc muscorum* C. Agardh ex Bornet & Flahault Arora *et al.* 2012 [1],
**Nostoc muscorum* C. Agardh ex Bornet & Flahault
- 311 *Nostoc oryzae* (F.E. Fritsch) J. Komárek & K. Anagnostidis Arora *et al.* 2012 [1],
**Anabaena oryzae* F.E. Fritsch
- 312 *Anabaena perturbata* H. Hill Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 313 *Anabaena sphaerica* Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 314 *Anabaena echinospora* Skuja Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 315 *Nostoc passerifianum* Bornet & Flahault Arora *et al.* 2012 [1],
**Nostoc passerifianum* Bornet & Flahault
- 316 *Dolichospermum circinale* Arora *et al.* 2012 [1],
(Rabenhorst ex Bornet & Flahault) P. Wacklin, L. Hoffmann & J. Komárek
**Anabaena circinalis* Rabenhorst ex Bornet & Flahault
- 317 *Nostoc linckia* Bornet & Flahault Arora *et al.* 2012 [1],
- 318 *Nostoc punctiforme* (Hariot) Elenkin Arora *et al.* 2012 [1],
- 319 *Nostoc carneum* C. Agardh ex Bornet & Flahault Vashista 1968 [27], Thakur *et al.* 2013 [26], Arora *et al.* 2012 [1],
**Nostoc spongiaeforme* C. Agardh ex Bornet & Flahault
- 320 *Aulosira prolific* Bharadwaja Arora *et al.* 2012 [1],
- 321 *Cylindrospermum majus* A.M. Bendre & M.S. Agarkar Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 322 *Cylindrospermum musicola* A.M. Bendre & M.S. Agarkar Vashista 1968 [27], Thakur *et al.* 2013 [26], Arora *et al.* 2012 [1], , Arora *et al.* 2012 [1],
- 323 *Anabaena iyengarii* Bharadwaja Arora *et al.* 2012 [1],
- 324 *Nostoc commune* Elenkin Vashista 1968 [27], Thakur *et al.* 2013 [26]
- 325 *Desmonostoc muscorum* (C. Agardh ex Bornet & Flahault) Hrouzek & Ventura Vashista 1968 [27], Thakur *et al.* 2013 [26], Dwivedi *et al.* 2008 [6]
**Nostoc muscorum* C. Agardh ex Bornet & Flahault
- 326 *Trichormus variabilis* Komárek & Anagnostidis Vashista 1968 [27], Thakur *et al.* 2013 [26], Dwivedi *et al.* 2008 [6] [6], Singh *et al.* 2018 [21]
- 327 *Rivularia minuta* C.B. Rao Vashista 1968 [27], Thakur *et al.* 2013 [26], Arora *et al.* 2012 [1], , Arora *et al.* 2012 [1],
- 328 *Nostoc edaphicum* (Roth) Bornet ex Bornet et Flahault Arora *et al.* 2012 [1],
- Class: Chlorophyceae**
Order: Volvocales
Sub Order: Chlamydomonadineae
Famliy: Chlamydomonadaceae
- 329 *Chlamydomonas reinhardi* P.A. Dangeard Vashista 1968 [27], Thakur *et al.* 2013 [26], Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]

- 330 *Carteria pseudoglobosa* Korshikov Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 331 *Chlamydomonas globosa* J.W.Snow Arora et al. 2012 [1], Kumar et al. 2012 [13]
- Order: Chlorococcales**
- Family: Chlorococcaceae**
- 332 *Chlorella vulgaris* Clemençon & Fott Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 333 *Cystococcus humicola* Nägeli Vashista 1968 [27], Thakur et al. 2013 [26], Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Chlorococcum humicola* (Nägeli) Rabenhorst
- 334 *Auxenochlorella pyrenoidosa* (H.Chick) Molinari & Calvo-Perez Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Chlorella pyrenoidosa* H.Chick
- 335 *Lepocyclis fusiformis* (H.J.Carter) Lemmermann Vashista 1968 [27], Thakur et al. 2013 [26], Thakur et al. 2013 [26]
- 336 *Micractinium pusillum* Fresenius Vashista 1968 [27], Thakur et al. 2013 [26]
- Family: Oocystaceae**
- 337 *Neglectella solitaria* (Wittrock) Stenclová & Kastovsky Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Oocystis solitaria* Wittrock
- 338 *Oocystis elliptica* West Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 339 *Trochiscia zachariasii* Lemmermann Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Trochiscia zachariasii* Lemmermann
- 340 *Oocystis noval-semiae* Wille Arora et al. 2012 [1], Kumar et al. 2012 [13]
- Family: Chlorellaceae**
- 341 *Dictyosphaerium ehrenbergianum* Nägeli Novarino 1991 [17]
- Family: Selenastraceae**
- 342 *Ankistrodesmus falcatus* (Corda) Ralfs Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 343 *Selenastrum bibrainum* Reinsch Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Ankistrodesmus bibrainus* (Reinsch) Korshikov
- 344 *Pandorina morum* (O.F.Muller) Bory Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 345 *Ankistrodesmus spiralis* (W.B.Turner) Lemmermann Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 346 *Messastrum gracile* (Reinsch) T.S.Garcia Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Ankistrodesmus gracilis* (Reinsch) Korshikov
- 347 *Kirchneriella lunaris* (Kirchner) Möbius Arora et al. 2012 [1], Kumar et al. 2012 [13]
- 348 *Messastrum gracile* (Reinsch) T.S.Garcia Arora et al. 2012 [1], Kumar et al. 2012 [13]
**Selenastrum gracile* Reinsch
- 349 *Pyrobotrys gracilis* Reinsch Novarino 1991 [17]
- Family: Hydrodictyceae**
- 350 *Conferva reticulate* Linnaeus Arora et al. 2012 [1], Singh et al. 2014 [19]
**Hydrodictyon reticulatum* (Linnaeus) Bory
- 351 *Tetraëdron gracile* (Reinsch) Hansgirg Arora et al. 2012 [1],
- 352 *Stauridium tetras* var. *tetraodon* (Corda) J.D.Hall & Karol Arora et al. 2012 [1],
**Pediastrum tetras* var. *tetraodon* (Corda) Hansgirg
- 353 *Monactinus simplex* (Meyen) Corda Arora et al. 2012 [1], Singh et al. 2014 [19]
**Pediastrum simplex* (Meyen) Corda
- 354 *Pediastrum tetras* (Ehrenberg) Ralfs Arora et al. 2012 [1],
**Pediastrum tetras* var. *excisum* (A.Braun) Hansgirg
- 355 *Stauridium tetras* var. *tetraodon* (Corda) J.D.Hall & Karol Arora et al. 2012 [1],
**Pediastrum tetras* var. *tetraodon* (Corda) Hansgirg
- 356 *Pediastrum tetras* (Ehrenberg) Ralfs Arora et al. 2012 [1],
- 357 *Parapediastrum biradiatum* (Meyen) E.Hegewald Arora et al. 2012 [1],
- 358 *Pediastrum duplex* Meyen Arora et al. 2012 [1],
- 359 *Pediastrum ovatum* (Ehrenberg) A.Braun Arora et al. 2012 [1],
- 360 *Sorastrum spinulosum* Nägeli Arora et al. 2012 [1],

361	<i>Tetraedron minimum</i> (A.Braun) Hansgirg	Arora <i>et al.</i> 2012 [1],
362	<i>Volvox glabator</i> Linnaeus	Arora <i>et al.</i> 2012 [1],
	Order:Ulotrichales	
	Family: Ulotrichaceae	
363	<i>Klebsormidium subtile</i> (Kutzing) Mikhailyuk, Glaser, Holzinger & Karsten * <i>Ulothrix subtilissima</i> Rabenhorst	Arora <i>et al.</i> 2012 [1],
364	<i>Ulothrix tenerrima</i> (Kutzing) Kutzing * <i>Ulothrix variabilis</i> Kutzing	Arora <i>et al.</i> 2012 [1],
365	<i>Ulothrix zonata</i> (F.Weber & Mohr) Kutzing	Arora <i>et al.</i> 2012 [1],
	Family: Microsporaceae	
366	<i>Microspora floccose</i> (Vaucher) Thuret	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
367	<i>Microspora willeana</i> Lagerheim	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
368	<i>Microspora indica</i> Randhawa	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Family: Sphaeropleaceae	
369	<i>Sphaeroplea annulina</i> (Roth) C.Agardh	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Order: Cladophorales	
	Family: Cladophoraceae	
370	<i>Cladophora glomerata</i> (Linnaeus) Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
371	<i>Cladophora glomerata</i> (Linnaeus) Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
372	<i>Pithophora roettleri</i> (Roth) Wittrock * <i>Pithophora mooreana</i> Collins	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
373	<i>Pseudorhizoclonium africanum</i> (Kutzing) Boedeker * <i>Rhizoclonium hookeri</i> Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Order: Chaetophorales	
	Family: Chaetophoraceae	
374	<i>Stigeoclonium tenue</i> Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
375	<i>Chaetophora flagellifera</i> Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Order: Oedogoniales	
	Family: Oedogoniaceae	
376	<i>Oedogonium crispum</i> Wittrock ex Hirn	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
377	<i>Oedogonium terrestre</i> Randhawa	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
378	<i>Oedogonium figuratum</i> Tiffany	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
379	<i>Oedogonium tapeinosporum</i> Wittrock ex Hirn	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
380	<i>Oedogonium nanum</i> Wittrock ex Hirn	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Order: Conjugales	
	Sub Order: Euconjugatae	
	Family: Mesotoniaceae	
381	<i>Cylindrocystis brebissonii</i> (Ralfs) De Bary	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Family: Zygnemataceae	
382	<i>Spirogyra cylindrical</i> Czurda	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
383	<i>Spirogyra weberi</i> var. <i>grevilleana</i> (Hassal) O.Kirchner * <i>Spirogyra grevilleana</i> (Hassall) Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
384	<i>Zygnema mirabile</i> Hassall * <i>Spirogyra mirabilis</i> (Hassall) Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
385	<i>Spirogyra schmidtii</i> West & G.S.West	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
386	<i>Spirogyra sinensis</i> L.-C.Li	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
387	<i>Spirogyra tumida</i> C.-C.Jao	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
388	<i>Zygnema cruciatum</i> (Vaucher) C.Agardh * <i>Zygnema insigne</i> (Hassall) Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]

389	<i>Zygnemopsis mysorensis</i> M.O.P.Iyengar	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
390	<i>Mougeotia thylespora</i> Skuja	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
391	<i>Zygogonium ericetorum</i> Kutzing	Srivastava PN 1967 [24], Jindal & Thakur 2013 [11]
	Order: Desmidioidae	
	Family: Desmidiaceae	
392	<i>Cosmarium subtumidium</i> Nordstedt	Shukla <i>et al.</i> 2008 [18]
393	<i>Micrasterias zeylanica</i> F.E.Fritsch	Shukla <i>et al.</i> 2008 [18]
394	<i>Cosmarium awadhense</i> B.N.Prasad & R.K.Mehrotra	Shukla <i>et al.</i> 2008 [18]
395	<i>Cosmarium botrytis</i> Meneghini ex Ralfs	Shukla <i>et al.</i> 2008 [18]
396	<i>Cosmarium granatum</i> Brebisson ex Ralfs	Shukla <i>et al.</i> 2008 [18]
397	<i>Cosmarium lundelli</i> var. <i>corruptum</i> (W.B.Turner) West & G.S.West	Shukla <i>et al.</i> 2008 [18]
398	<i>Cosmarium moniliforme</i> var. <i>lamneticum</i> West & G.S.West	Shukla <i>et al.</i> 2008 [18]
399	<i>Cosmarium norimbergense</i> var. <i>depressum</i> (West & G.S.West) Willi Krieger & Gerloff	Shukla <i>et al.</i> 2008 [18]
400	<i>Cosmarium pyramidatum</i> Brebisson ex Ralfs	Shukla <i>et al.</i> 2008 [18]
401	<i>Cosmarium radiosum</i> Wolle	Shukla <i>et al.</i> 2008 [18]
402	<i>Cosmarium subcrenatum</i> Hantzsch	Shukla <i>et al.</i> 2008 [18]
403	<i>Cosmarium supraspeciosum</i> Wolle	Shukla <i>et al.</i> 2008 [18]
404	<i>Cosmarium turpinii</i> Brebisson	Shukla <i>et al.</i> 2008 [18]
405	<i>Cosmarium abbreviatum</i> var. <i>germanicum</i> (Raciborski) Willi Krieger & Gerloff	Shukla <i>et al.</i> 2008 [18]
406	<i>Cosmarium punctulatum</i> var. <i>rotundatum</i> Klebs	Shukla <i>et al.</i> 2008 [18]
407	<i>Cosmarium quadrum</i> P.Lundell	Shukla <i>et al.</i> 2008 [18]
408	<i>Cosmarium regnellii</i> Wille	Shukla <i>et al.</i> 2008 [18]
409	<i>Cosmarium regnesii</i> Reinsch	Shukla <i>et al.</i> 2008 [18]
410	<i>Cosmarium succisum</i> var. <i>hyalinum</i> Skvortsov	Shukla <i>et al.</i> 2008 [18]
411	<i>Euastrum crassangulatum</i> Borgesen	Shukla <i>et al.</i> 2008 [18]
412	<i>Euastrum subvalidum</i> Ehrenberg ex Ralfs	Shukla <i>et al.</i> 2008 [18]
413	<i>Euastrum platycerum</i> Reinsch	Shukla <i>et al.</i> 2008 [18]
414	<i>Euastrum spinulosum</i> Delponte	Shukla <i>et al.</i> 2008 [18]
415	<i>Euastrum verrucosum</i> Ehrenberg ex Ralfs	Shukla <i>et al.</i> 2008 [18]
416	<i>Pleurotaenium ehrenbergii</i> (Ralfs) De Bary	Shukla <i>et al.</i> 2008 [18]
417	<i>Teilingia granulata</i> (J.Roy & Bisset) Bourrelly * <i>Sphaerozosma granulatum</i> J.Roy & Bisset	Shukla <i>et al.</i> 2008 [18]
418	<i>Staurastrum coarctatum</i> var. <i>subcurtum</i> Nordstedt	Shukla <i>et al.</i> 2008 [18]
419	<i>Staurodesmus dickiei</i> (Ralfs) S.Lillieroth	Shukla <i>et al.</i> 2008 [18]
420	<i>Staurastrum avicula</i> var. <i>lunatum</i> (Ralfs) Coesel & Meesters * <i>Staurastrum lunatum</i> Ralfs	Shukla <i>et al.</i> 2008 [18]
421	<i>Pseudostaurastrum enorme</i> (Ralfs) Chodat * <i>Staurastrum muticum</i> (A.Braun) Bourrelly	Shukla <i>et al.</i> 2008 [18]
422	<i>Staurastrum pachyrhynchum</i> Nordstedt	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
423	<i>Staurastrum perundulatum</i> West & West	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13], Gupta 2012b [9]
424	<i>Staurastrum pseudotetracerum</i> (Nordstedt) West & G.S.West	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
425	<i>Staurastrum punctulatum</i> Brebisson	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
426	<i>Pleurotaenium ehrenbergii</i> (Ralfs) De Bary	Jindal & Thakur 2013 [11]
427	<i>Staurastrum unguiferum</i> W.B.Turner	Jindal & Thakur 2013 [11]
428	<i>Lepocynclis fusiformis</i> (H.J.Carter) Lemmermann	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
429	<i>Closterium acerosum</i> De Notaris	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]

- 430 *Closterium acerosum* var. *elongatum* West Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 431 *Cosmarium calcareum* Wittrock Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 432 *Cosmarium contractum* var. *pachydermum* A.M.Scott & Prescott Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 433 *Cosmarium cucumis* Corda ex Ralfs Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 434 *Cosmarium depressum* var. *apertum* (W.B.Turner) M.Hirano Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 435 *Cosmarium circulare* var. *messikommeri* Krieger & Gerloff Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 436 *Cosmarium dubium* O.Borge Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 437 *Cosmarium furcatospermum* var. *maius* Prescott Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 438 *Closterium acerosum* var. *angolense* West & G.S.West Novarino 1991 [17]
- 439 *Cosmarium granatum* Brebisson ex Ralfs
**Cosmarium granatum* Brebisson ex Ralfs Novarino 1991 [17]
- 440 *Cosmarium lundellii* var. *subellipticum* B.N.Prasad & R.K.Mehrotra Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 441 *Cosmarium quadrum* var. *sublatum* (Nordstedt) Krieger
**Cosmarium margaritatum* var. *sublatum* (Nordstedt) Krieger Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 442 *Cosmarium nitidulum* De Notaris Gupta 2012b [9], Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 443 *Cosmarium nymannianum* Grunow Gupta 2012b [9]
- 444 *Closterium acerosum* f. *rectum* A.M.Scott & Prescott Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 445 *Closterium acutum* var. *linea* (Perty) West & G.S.West Kumar *et al.* 2012 [13]
- 446 *Cosmarium obsoletum* (Hantzsch) Reinsch Kumar *et al.* 2012 [13]
- 447 *Cosmarium pachydermum* P.Lundell Jindal & Thakur 2013 [11]
- 448 *Cosmarium granatum* var. *rotundatum* Willi Krieger Jindal & Thakur 2013 [11], Gupta 2012b [9], Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Misra *et al.* 2006 [14]
- 449 *Cosmarium pseudopyramidatum* var. *oculatum* Willi Krieger Jindal & Thakur 2013 [11]
- 450 *Cosmarium pyramidatum* Brebisson ex Ralfs Jindal & Thakur 2013 [11]
- 451 *Cosmarium quadrum* P.Lundell Jindal & Thakur 2013 [11]
- 452 *Cosmarium radiosum* Wolle Misra *et al.* 2006 [14]
- 453 *Cosmarium reniforme* var. *elevatum* West & G.S.West Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 454 *Cosmarium subalatum* West & G.S.West Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 455 *Cosmarium scabrum* W.B.Turner Misra *et al.* 2006 [14]
- 456 *Cosmarium sexnotatum* Gutwinski Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Misra *et al.* 2006 [14]
- 457 *Cosmarium speciosum* P.Lundell Jindal & Thakur 2013 [11], Misra *et al.* 2006 [14]
- 458 *Cosmarium subprotumidum* var. *gregoryi* West & G.S.West Jindal & Thakur 2013 [11]
- 459 *Pleurotaenium trabecula* Nägeli Srivastava & Gupta 2004 [23], Misra *et al.* 2006 [14], Gupta 2012b [9]
- 460 *Closterium diana* Ehrenberg ex Ralfs Srivastava & Gupta 2004 [23]
- 461 *Closterium leibleinii* Kutzing ex Ralfs Srivastava & Gupta 2004 [23]
- 462 *Closterium rectimarginatum* var. *majus* N.D.Kamat Srivastava & Gupta 2004 [23], Misra *et al.* 2006 [14], Misra *et al.* 2006 [14]
- 463 *Clostrium venus* Kutzing ex Ralfs Misra *et al.* 2006 [14]
- 464 *Closterium diana* var. *pseudodiana* (J.Roy) Willi Krieger Misra *et al.* 2006 [14]
- 465 *Closterium tumidium* L.N.Johnson Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- Order: Siphonales**
- Family: Protosiphonaceae**
- 466 *Ditchotomisiphon tuberosus* (A.Braun ex Kutzing) A.Ernst Misra *et al.* 2006 [14], Gupta 2012b [9]
- Family: Vaucheriaceae**
- 467 *Vaucheria bursata* (O.F.Muller) C.Agardh Misra *et al.* 2006 [14]

	Order: Charales	
	Family: Characeae	
468	<i>Chara corallina</i> Klein ex C.L.Willdenow	Misra <i>et al.</i> 2006 [14]
469	<i>Chara braunii</i> C.C.Gmelin	Misra <i>et al.</i> 2006 [14], Gupta 2012b [9]
470	<i>Chara wallichii</i> A.Braun	Misra <i>et al.</i> 2006 [14]
471	<i>Nitella acuminata</i> A.Braun ex Wallman	Srivastava & Gupta 2004 [23]
	Class: Xanthophyceae	
	Order: Heterochloridales	
	Family: Heterochloridaceae	
472	<i>Stipitococcus urceolatus</i> West & G.S.West	Misra <i>et al.</i> 2006 [14]
	Order: Heterotrichales	
	Family: Tribonemaceae	
473	<i>Xanthonema exile</i> (Klebs) P.C.Silva * <i>Bumilleria exilis</i> Klebs	Misra <i>et al.</i> 2006 [14]
474	<i>Tribonema bombycinum</i> (C.Agardh) Derbes & Solier	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12]
475	<i>Heterodendron squarrosum</i> Pascher	Srivastava & Gupta 2004 [23]
	Order: Heterosiphonales	
	Family: Botrydiaceae	
476	<i>Botrydium tuberosum</i> M.O.P.Iyengar	Gupta 2012b [9]
477	<i>Botrydium divisum</i> M.O.P.Iyengar	Kumar <i>et al.</i> 2012 [13]
	Class: Chrysophyceae	
	Order: Chrysomonadales	
	Family: Chromulinaceae	
478	<i>Chrysosphaerella coronacircumspina</i> Wujek & Kristiansen	Misra <i>et al.</i> 2006 [14], Srivastava & Gupta 2004 [23], Gupta 2012b [9]
479	<i>Chrysosphaerella septisina</i> (K.H.Nicholls) J.Kristiansen & D.Tong	Misra <i>et al.</i> 2006 [14], Gupta 2012b [9], Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Class: Coscinodisophyceae	
	Order: Melosirales	
	Family: Melosiraceae	
480	<i>Melosira Varians</i> C.Agardh	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
481	<i>Melosira granulata</i> (Ehrenberg) Ralfs * <i>Aulacoseira granulata</i> (Ehrenberg) Simonsen	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Family: Stephanodiscaceae	
482	<i>Cyclotella meneghiniana</i> Kutzing	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
	Class: Bacillariophyceae	
	Order: Eunotiales	
	Family: Eunotiaceae	
483	<i>Eunotia diadema</i> Ehrenberg * <i>Eunotia serra</i> var. <i>diadema</i> (Ehrenberg) R.M.Patrick	Misra <i>et al.</i> 2006 [14]
484	<i>Eunotia valida</i> Hustedt	Misra <i>et al.</i> 2006 [14]
485	<i>Leplochlamys ampullaceal</i> (Ehrenberg) Rabenhorst	Misra <i>et al.</i> 2006 [14]
486	<i>Cymbella affinis</i> (Krammer) W.Silva	Misra <i>et al.</i> 2006 [14], Dwivedi and Misra 2015
487	<i>Cymbella cymbiformis</i> Longa Cleve	Gupta & Das 2012c [10], Dwivedi and Misra 2015
488	<i>Cymbella reinhardti</i> Grunow	Arora <i>et al.</i> 2011, Dwivedi and Misra 2015
489	<i>Cymbella rupicola</i> Grunow	Arora <i>et al.</i> 2012 [1], Dwivedi and Misra 2015
490	<i>Cymbella tumidula</i> Grunow	Arora <i>et al.</i> 2012 [1]
491	<i>Cymbella cistula</i> (Ehrenberg) O.Kirchner	Arora <i>et al.</i> 2012 [1]
492	<i>Cymbella curvata</i> Rabenhorst	Gupta 2012b [9]
493	<i>Cymbella tumescens</i> A.Cleve	Novarino 1991 [17], Arora <i>et al.</i> 2012 [1]

494	<i>Epithemia turgida</i> (Ehrenberg) Kutzin * <i>Cymbella turgid</i> (Ehrenberg) Hassall	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14], Gupta 2012b [9], Gupta & Das 2012c [10]
495	<i>Cymbella tumida</i> (Brebisson) Van Heurck	Jindal & Thakur 2013 [11]
496	<i>Encyonema subalpinum</i> D.G.Mann	Jindal & Thakur 2013 [11], Gupta & Das 2012c [10], Dwivedi and Misra 2015
497	<i>Gyrosigma acuminatum</i> (Kutzing) Rabenhorst	Jindal & Thakur 2013 [11]
498	<i>Gyrosigma scalproides</i> (Rabenhorst) Cleve	Jindal & Thakur 2013 [11]
499	<i>Cocconeis placentula</i> Ehrenberg	Jindal & Thakur 2013 [11]
500	<i>Cymbella ventricosa</i> Kutzing	Jindal & Thakur 2013 [11]
501	<i>Cymbopleura amphicephala</i> (Nageli ex Kutzing) Krammer	Novarino 1991 [17]
502	<i>Cymbopleura cuspidate</i> (Kutzing) Krammer	Novarino 1991 [17]
503	<i>Cymbopleura inaequalis</i> (Ehrenberg) Krammer	Srivastava & Gupta 2004 [23], Gupta & Das 2012c [10]
504	<i>Cymbopleura reinhardtii</i> (Grunow) Krammer	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14]
505	<i>Diatoma vulgare</i> Grunow	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14]
506	<i>Fragilaria capucina</i> Desmazières	Novarino 1991 [17]
507	<i>Gomphonema gracile</i> Ehrenberg	Novarino 1991 [17]
508	<i>Gyrosigma acuminatum</i> (Kutzing) Rabenhorst	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14], Gupta & Das 2012c [10]
509	<i>Aulacoseira granulata</i> (Ehrenberg) Simonsen * <i>Melosira granulata</i> (Ehrenberg) Grunow	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14], Dwivedi <i>et al.</i> 2008 [6]
510	<i>Craticula cuspidata</i> (Kutzing) D.G.Mann * <i>Navicula cuspidate</i> (Kutzing) Hustedt	Novarino 1991 [17], Gupta & Das 2012c [10]
511	<i>Navicula laterostrata</i> Hustedt	Novarino 1991 [17], Srivastava & Gupta 2004 [23], Misra <i>et al.</i> 2006 [14]
512	<i>Navicula cryptocephala</i> Kutzing	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14]
513	<i>Navicula laterostrata</i> Hustedt	Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12]
514	<i>Navicula phyllepta</i> Kutzing	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14], Gupta 2012b [9], Arora <i>et al.</i> 2012 [1], Carter 1926 [3], Srivastava & Gupta 2004 [23]
515	<i>Navicula radiosa</i> Kutzing	Novarino 1991 [17]
516	<i>Navicula veneta</i> Kutzing * <i>Navicula cryptocephala</i> var. <i>veneta</i> (Kutzing) Rabenhorst	Novarino 1991 [17], Gupta & Das 2012c [10]
517	<i>Diademsis confervacea</i> Kutzing * <i>Navicula confervacea</i> (Kutzing) Grunow	Novarino 1991 [17]
518	<i>Sellaphora bacillum</i> (Ehrenberg) D.G.Mann * <i>Navicula bacillum</i> Ehrenberg	Novarino 1991 [17]
519	<i>Pinnularia brebissonii</i> (Kutzing) Rabenhorst * <i>Navicula brebissonii</i> Kutzing	Novarino 1991 [17], Misra <i>et al.</i> 2006 [14]
520	<i>Pinnularia interrupta</i> W.Smith	Srivastava & Gupta 2004 [23], Dwivedi <i>et al.</i> 2008 [6]
521	<i>Pinnularia tabellaria</i> Ehrenberg * <i>Pinnularia luculenta</i> (A.W.F.Schmidt) Cleve	Srivastava & Gupta 2004 [23], Gupta 2012b [9]
522	<i>Navicula radiosa</i> Kutzing	Srivastava & Gupta 2004 [23], Misra <i>et al.</i> 2006 [14], Arora <i>et al.</i> 2012 [1]
523	<i>Navicula viridula</i> Grunow	Srivastava & Gupta 2004 [23], Gupta & Das 2012c [10], Singh <i>et al.</i> 2014 [19]
524	<i>Pinnularia gibba</i> (Ehrenberg) Ehrenberg	Srivastava & Gupta 2004 [23]
525	<i>Pinnularia burkei</i> R.M.Patrick	Srivastava & Gupta 2004 [23], Misra <i>et al.</i> 2006 [14]
526	<i>Pinnularia viridis</i> (Nitzsch) Ehrenberg	Dwivedi & Misra 2014, Gupta & Das 2012c [10]
527	<i>Caloneis alpestris</i> (Grunow) Cleve	Dwivedi & Misra 2014 [4]
528	<i>Cocconema affine</i> (Kutzing) West & G.S.West	Dwivedi & Misra 2014 [4]

529	<i>Navicula andium</i> Frenguelli	Dwivedi & Misra 2014 [4]
530	<i>Pinnularia interrupta</i> W.Smith	Dwivedi & Misra 2014 [4]
531	<i>Pinnularia interrupta</i> (Ehrenberg) O.Muller	Dwivedi & Misra 2014 [4]
532	<i>Surirella robusta</i> Ehrenberg	Dwivedi & Misra 2014 [4]
533	<i>Synedra affinis</i> Kutzing	Gupta 2012b [9]
534	<i>Actinastrum hantzchii</i> Lagerheim	Misra <i>et al.</i> 2006 [14], Gupta 2012b [9]
	Family: Gomphonemataceae	
535	<i>Gomphoneis elegans</i> (Grunow) Cleve	Gupta 2012b [9], Gupta & Das 2012c [10]
536	<i>Gomphonema acuminatum</i> Ehrenberg	Arora <i>et al.</i> 2012 [1]
537	<i>Gomphonema angustatum</i> (Kutzing) Rabenhorst	Suseela & Topoo 2009 [25]
538	<i>Gomphonema ghosei</i> Abdul-Majeed	Arora <i>et al.</i> 2012 [1]
539	<i>Gomphonema gracile</i> Ehrenberg	Dwivedi & Misra 2014 [4]
540	<i>Gomphonella olivacea</i> (Hornemann) Rabenhorst * <i>Gomphonema olivaceum</i> (Kutzing) Grunow	Gupta 2012b [9], Arora <i>et al.</i> 2012 [1], Dwivedi & Misra 2014, Dwivedi & Misra 2015 [5]
541	<i>Gomphonema parvulum</i> A.Mayer	Dwivedi & Misra 2014 [4]
542	<i>Gomphoneis clevei</i> (Fricke) Gil	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13], Dwivedi & Misra 2015 [5]
543	<i>Gomphonema constrictum</i> (Ehr.) var. <i>capitatum</i> (Ehr.) Grunow f. <i>turgidum</i> H.P.Gandhi	Arora <i>et al.</i> 2012 [1], Dwivedi & Misra 2015 [5]
544	<i>Gomphonema coronatum</i> Ehrenberg * <i>Gomphonema acuminatum</i> var. <i>coronatum</i> (Ehrenberg) Rabenhorst	Dwivedi & Misra 2014, Dwivedi & Misra 2015 [5]
545	<i>Gomphonema constrictum</i> (Ehr.) var. <i>capitatum</i> (Ehr.) H.P.Gandhi	Dwivedi & Misra 2014, Dwivedi & Misra 2015 [5]
546	<i>Gomphonema gracile</i> Ehr. var. <i>dichotomum</i> H.P.Gandhi	Dwivedi & Misra 2014, Singh <i>et al.</i> 2014 [19], Jindal <i>et al.</i> 2014 [12], Dwivedi & Misra 2015 [5]
547	<i>Gomphonema lacus-rankala</i> H.P.Gandhi	Dwivedi & Misra 2014 [4], Dwivedi & Misra 2015 [5]
548	<i>Brebbissonia lanceolata</i> (C.Agardh) R.K.Mahoney & Reimer * <i>Gomphonema lanceolatum</i> (Grunow) A.Cleve	Dwivedi & Misra 2014, Dwivedi & Misra 2015 [5]
549	<i>Gomphonema acuminatum</i> var. <i>montanum</i> Schumann * <i>Gomphonema montanum</i> (J.Schumann) Grunow	Arora <i>et al.</i> 2012 [1], Gupta & Das 2012c [10], Dwivedi & Misra 2015 [5]
550	<i>Gomphonema constrictum</i> Ehrenberg	Dwivedi & Misra 2014 [4]
551	<i>Gomphonema sphaeroporium</i> Ehrenberg	Gupta 2012b [9], Dwivedi & Misra 2015 [5]
552	<i>Gomphonema subcapitatum</i> (Grunow) E.Reichardt & Levkov	Dwivedi & Misra 2014 [4]
553	<i>Gomphonema subtile</i> Ehrenberg	Misra <i>et al.</i> 2006 [14]
554	<i>Gomphonema tenellum</i> W.Smith	Misra <i>et al.</i> 2006 [14], Dwivedi & Misra 2015 [5]
555	<i>Gomphonema towutense</i> Hustedt	Misra <i>et al.</i> 2006 [14], Dwivedi & Misra 2015 [5]
556	<i>Didymosphenia geminate</i> Skvortzow & K.I.Meyer	Novarino 1991 [17]
557	<i>Pleurosigma chandolensis</i> H.P.Gandhi	Arora <i>et al.</i> 2012 [1], Gupta & Das 2012c [10]
558	<i>Gyrosigma scalproides</i> (Thwaites) Cleve	Srivastava & Gupta 2004 [23]
559	<i>Navicula viridula</i> Grunow	Misra <i>et al.</i> 2006 [14]
560	<i>Pinnularia acrosphaeria</i> var. <i>parva</i> Krammer * <i>Navicula acrosphaeria</i> A.W.F.Schmidt	Misra <i>et al.</i> 2006 [14]
561	<i>Ulnaria danica</i> (Kutzing) Compère & Bukhtiyarova * <i>Synedra ulna</i> (Kutzing) Hustedt	Misra <i>et al.</i> 2006 [14]
562	<i>Gyrosigma kuetzingii</i> (Grunow) Cleve	Misra <i>et al.</i> 2006 [14]
563	<i>Navicula accommodata</i> Hustedt	Misra <i>et al.</i> 2006 [14], Dwivedi & Misra 2015 [5]
564	<i>Navicula exigua</i> W.Gregory, nom. illeg.	Arora <i>et al.</i> 2012 [1], Dwivedi & Misra 2015 [5]
565	<i>Nitzschia palea</i> Grunow	Arora <i>et al.</i> 2012 [1]
566	<i>Nitzschia acicularis</i> W.Smith	Arora <i>et al.</i> 2012 [1]

- 567 *Navicula cryptocephala* (Kutzing) Hustedt Arora *et al.* 2012 [1]
- 568 *Gomphonema parvulum* A.Mayer Arora *et al.* 2012 [1], Gupta & Das 2012c [10]
- 569 *Craticula cuspidata* (Kutzing) D.G.Mann Arora *et al.* 2012 [1]
**Navicula cuspidata* Foged
- 570 *Cocconeis placentula* Ehrenberg Arora *et al.* 2012 [1]
- 571 *Fragilaria capucina* Desmazières Arora *et al.* 2012 [1]
- 572 *Gomphonema gracile* Ehrenberg Arora *et al.* 2012 [1]
- Order:Acanthales**
Family:Achnantheaceae
- 573 *Achnanthes crenulata* Grunow Arora *et al.* 2012 [1]
- 574 *Achnanthes inflata* (Kutzing) Grunow Arora *et al.* 2012 [1]
- 575 *Planothidium lanceolatum* (Brebisson ex Kutzing) Lange-Bertalot Arora *et al.* 2012 [1]
**Achnanthes lanceolata* (Brebisson ex Kutzing) Grunow
- 576 *Achnantheidium exile* (Kutzing) Heiberg Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
- 577 *Planothidium hauckianum* (Grunow) Bukhtiyarova Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 578 *Achnantheidium nodosum* (Cleve) Tseplik & Chudaev Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
**Rossithidium nodosum* (Cleve) Aboal
- Order: Bacillariales**
Family:Bacillariaceae
- 579 *Fragilariopsis doliolus* (Wallich) Medlin & P.A.Sims Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 580 *Nitzschia acicularis* (Kutzing) W.Smith Gupta 2012b [9]
- 581 *Nitzschia frustulum* Hustedt Misra *et al.* 2006 [14], Gupta 2012b [9]
- 582 *Nitzschia irresoluta* Hustedt Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 583 *Nitzschia palea* (Kutzing) W.Smith Gupta 2012b [9], Gupta & Das 2012c [10]
- Order:Rhopalodiales**
Family: Rhopalodiaceae
- 584 *Epithemia gibba* (Ehrenberg) Kutzing Suseela & Topoo 2009 [25]
**Rhopalodia gibba* (Ehrenberg) O.Muller
- 585 *Rhopalodia gibba* var. *ventricosa* (Kutzing) H.Peragallo & M.Peragallo Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 586 *Epithemia sores* Kutzing Dwivedi & Misra 2014 [4]
- Order: Rhabdonematales**
Family: Cocconeidaceae
- 587 *Cocconeis pediculus* Ehrenberg Dwivedi & Misra 2014 [4]
- 588 *Cocconeis placentula* Ehrenberg Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- 589 *Cocconeis lineata* Ehrenberg Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
**Cocconeis placentula* var. *lineata* (Ehrenberg) Van Heurck
- Order: Naviculales**
Family:Amphipleuraceae
- 590 *Halamphora veneta* (Kutzing) Levkov Dwivedi & Misra 2014 [4]
- Family:Stauroneidaceae**
Dwivedi & Misra 2014 [4]
- 591 *Stauroneis anceps* Ehrenberg Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
- Order: Surirellales**
Family:Surirellaceae
- 592 *Cymatopleura elliptica* (Brebisson) W.Smith Dwivedi & Misra 2014 [4]
- 593 *Surirella librile* (Ehrenberg) Ehrenberg Gupta 2012b [9]
**Cymatopleura solea* (Brebisson) W.Smith
- 594 *Surirella apiculata* W.Smith Dwivedi & Misra 2014 [4]

- 595 *Iconella biseriata* (Brebisson) Ruck & Nakov Misra *et al.* 2006 [14]
 596 *Iconella celebesiana* (Hustedt) D.Kapustin & Kulikovskiy Misra *et al.* 2006 [14]
 597 *Surirella ovalis* Brebisson Misra *et al.* 2006 [14]
 598 *Surirella patella* Kutzing Novarino 1991 [17]
 599 *Surirella robusta* Ehrenberg Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 600 *Surirella robusta* Ehrenberg Misra *et al.* 2006 [14]
 **Surirella saxonica* Auerswald ex Rabenhorst
- Class: Dinophyceae**
Order: Dinophysiales
Family: Ceratiaceae
- 601 *Ceratium hirundinella* (O.F.Muller) Dujardin Misra *et al.* 2006 [14], Gupta & Das 2012c [10]
 602 *Lepocynclis ovum* (Ehrenberg) Lemmermann Misra *et al.* 2006 [14], Gupta & Das 2012c [10]
 **Euglena ovum* Ehrenberg
- Family: Peridiniaceae**
- 603 *Peridinium inconspicuum* Lemmermann Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
- Class: Euglenophyceae**
Order: Euglenida
Family: Euglenidae
- 604 *Euglena gracilis* G.A.Klebs Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 605 *Euglena proxima* P.A.Dangeard Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 606 *Euglena acus* (O.F.Muller) Ehrenberg Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 607 *Euglena tuba* H.J.Carter Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 608 *Phacus pleuronectes* (Ehrenberg) Dujardin Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 609 *Strombomonas verrucosa* (E.Daday) Deflandre Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 610 *Trachelomonas armata* (Ehrenberg) F.Stein Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 611 *Trachelomonas hispida* (Perty) F.Stein Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 612 *Phacus caudatus* Hubner Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 613 *Phacus curvicauda* Svirenko Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 614 *Phacus orbicularis* Hubner Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 615 *Phacus orbicularis* var. *caudate* Skvortsov Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 616 *Phacus pleuronectes* (O.F.Muller) Nitzsch ex Dujardin Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 617 *Phacus polytrophos* Pochmann Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 618 *Monomorphina pyrum* (Ehrenberg) Mereschkowsky Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 619 *Phacus quinquemarginatus* T.L.Jahn & Shawhan Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 620 *Phacus triqueter* (Ehrenberg) Dujardin Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 621 *Phacus unguis* Pochmann Gupta 2012b [9]
 622 *Trachelomonas armata* (Ehrenberg) F.Stein Misra *et al.* 2006 [14], Gupta 2012b [9]
 623 *Trachelomonas bulla* F.Stein Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13]
 624 *Trachelomonas dybowski* Drezepolski Gupta 2012b [9]
 625 *Trachelomonas hispida* (Perty) F.Stein Arora *et al.* 2012 [1], Kumar *et al.* 2012 [13], Gupta & Das 2012c [10]
 626 *Trachelomonas oblonga* var. *pulcherrima* (Playfair) T.G.Popova Suseela & Topoo 2009 [25]
 **Trachelomonas pulcherrima* Playfair

627	<i>Strombomonas scabra</i> (Playfair) Tell & Conforti * <i>Trachelomonas scabra</i> Playfair	Arora <i>et al.</i> 2012 [1], Kumar <i>et al.</i> 2012 [13]
628	<i>Trachelomonas subverrucosa</i> Deflandre	Dwivedi & Misra 2014 [4]
629	<i>Trachelomonas volvocina</i> (Ehrenberg) Ehrenberg	Dwivedi & Misra 2014 [4]

*Previously accepted name

1. Arora *et al.* 2012; 2. Bhushan & Kumar 2018; 3. Carter 1926; 4. Dwivedi & Misra 2014; 5. Dwivedi & Misra 2015; 6. Dwivedi *et al.* 2008; 7. Fritch 1907; 8. Gupta 2012a; 9. Gupta 2012b; 10. Gupta & Das 2012; 11. Jindal and Thakur 2013; 12. Jindal *et al.* 2014; 13. Kumar *et al.* 2012; 14. Misra *et al.* 2006; 15. Mongra 2012; 16. Mongra 2014; 17. Novarino 1991; 18. Shukla *et al.* 2008; 19. Singh *et al.* 2014; 20. Singh *et al.* 2014; 21. Singh *et al.* 2018; 22. Singh *et al.* 2018; 23. Srivastava & Gupta 2004; 24. Srivastava PN 1967; 25. Suseela & Topoo 2009; 26. Thakur *et al.* 2013; 27. Vashista 1968

The present checklist is helpful in adding 258 algal taxa to the list of 371 previously known taxa of algae from Himachal Pradesh. The large area including extreme varied habitats of the state is still remained unexplored for algal diversity. Thus, there is need to explore every possible habitat which further leads to increase our knowledge in algal diversity and document all the algal species. In future, checklist prepared during this work will play an important role as a base line data for floristic studies from the state.

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