

# Check List of the Fresh-Water Algae of New Zealand

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## Abstract

THIS check list has been compiled from the published literature, from the exsiccatae of V. W. Lindauer and the Laing Collection†, from the Auckland Institute Collection, the private records of the authors, and from collections made by members of the Auckland University College Field Club. In particular, Mr. K. W. Loach has added materially to our knowledge of Myxophyceae.

No complete list of the fresh-water algae of New Zealand has been published so far. The marine algae have been listed by Laing (1926), the Phaeophyceae revised (Lindauer, 1947) as also the Myxophyceae and Chlorophyceae (Chapman, 1956). Very little work has been carried out on the fresh water algae of New Zealand since the time of Spencer, Maskell and Nordstedt. A recrudescence of interest in these algae seems apparent and this check list may serve as a useful basis for future studies. There is little doubt that many new records have yet to be made in this field. The work of each one of us over short periods has emphasised this, especially that of R. H. T. on the Euglenaceae, Chlorococcales, Dinophyceae, Cryptophyceae and Chrysophyceae and of E. M. S. on the Oedogoniales.

THE arrangement of the genera, orders, and families is based upon Fritsch (1935) whilst the specific taxonomy is based upon De Toni (1885) for the Chlorophyceae (except where otherwise stated), Myxophyceae and Rhodophyceae.

The published literature has been examined very carefully for subsequent changes of names and also for all cases of synonymy.

In the list that follows species now recorded for the first time for New Zealand are preceded by an asterisk. New records for species already known to occur are marked by a dagger. Records from published and unpublished accounts are signified in brackets after each record as follows:—

C = Chapman, 1951

D, D = Drouet and Daily, 1956.

DF = De Toni & Forte, 1923.

F = Flint, 1938

I = Inglis, 1881.

L = Lindsay and Lauder, 1867

KWL = Loach, unpublished.

M = Maskell, 1880.

M<sub>1</sub> = Maskell, 1882

M<sub>2</sub> = Maskell, 1888

Ma = Mather, 1928.

N = Nordstedt, 1888.

S = Spencer, 1881.

S<sub>1</sub> = Spencer, 1882.

T = R. H. Thompson, 1954-55 (unpubl.)

C, T = Collected Chapman, & det. Thompson (unpubl.)

T, T = Collected Miss J. Thomson, & det. Thompson (unpubl.)

Records from other accounts are given in full in the text. In many cases the record occurs under a synonym in the original account.

In order to assist collectors and students artificial keys to genera have been provided. When the fresh-water algal flora is eventually written it will be essential to provide keys to the individual species.

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## FLAGELLATA

*Euglenineae**Euglenaceae*

- |   |                        |   |
|---|------------------------|---|
| 1. Individuals free-swimming  | ..                     | 2 |
| Individuals colonial, epiphytic   | <i>Colacium</i>        |   |
| 2. Naked, without a special envelope  | ...                    | 3 |
| Cells with firm, usually brown-coloured envelope                                | <i>Trachelomonas</i> . |   |
| 3. Cell protoplast not rigid, often elongate, paramylon grains of diverse shape | <i>Euglena</i>         |   |
| Cells with rigid protoplast, paramylon grains large                             |                        | 4 |
| 4. Cells distinctly flattened   |                        | 5 |
| Cells not flattened; usually with 2 ring-shaped paramylon grains                |                        |   |
| 5. Posterior border acute or with caudal appendage                              | <i>Lepocinclis</i>     |   |
| Cell oval   | <i>Phacus</i> .        |   |
|   | <i>Cryptoglena</i>     |   |
- Euglena acus* Ehrenb.**  
Hutt Valley (Ma); Waikato R., Mercer (T)†; Rangiriri Swamp (T).†
- Euglena limosa* Gard.**  
Avon Estuary (Bruce, 1953).
- \**Euglena proxima* Dang.**  
Waikato R., Mercer (T); Dunedin (T, T).
- \**Euglena sanguinea* Ehrenb.**  
Albany (T).
- Euglena spirogyra* Ehrenb.**  
Hutt Valley (Ma); Waikato R., Mercer (T)†; Rangiriri Swamp (T).†
- \**Euglena tripteris* (Duj.) Klebs.**  
Albany (T).
- \**Euglena truncata* Walton**  
Albany (T); Waikato R., Mercer (T).
- Euglena viridis* Ehrenb.**  
Hutt Valley (Ma); Southdown Oxidation Pond (C)†; Rangiriri Swamp (T).†
- \**Lepocinclis fusiformis* (Carter) Lemm.**  
Albany (T); Rangiriri Swamp (T).
- \**Lepocinclis marsonii* Lemm.**  
Waikato R., Mercer (T).
- Lepocinclis ovum* (Ehrenb.) Lemm.**  
Hutt Valley (Ma); Waikato R., Mercer (T).†
- \**Lepocinclis steinii* Lemm.**  
Rangiriri Swamp (T); Dunedin (T, T).
- \**Lepocinclis texta* (Duj.) Lemm.**  
Albany (T); Mercer Swamp (T).
- \**Lepocinclis turbinatum* Da Cunha**  
Waikato R., Mercer (T); Lake Whangape (T).
- \**Phacus hispidula* (Eichw.) Lemm**  
Waikato R., Mercer (T); Rangiriri Swamp (T).
- Phacus longicauda* (Ehrenb.) Duj.**  
Hutt Valley (Ma); Waikato R., Mercer (T)†; Rangiriri Swamp (T).†
- Phacus pleuronectes* (O.F.M.) Duj.**  
Hutt Valley (Ma); Pool in Massey Coll. grounds (C, T)†; Mercer Swamp (T)†.
- \**Phacus pyrum* (Ehrenb.) Stein**  
Albany (T); Rangiriri Swamp (T).
- \**Phacus succica* Lemm.**  
Waikato R., Mercer (T); Mercer Swamp (T); Rangiriri Swamp (T).
- \**Phacus triqueter* (Ehrenb.) Duj.**  
Waikato R., Mercer (T); Rangiriri Swamp (T).
- \**Cryptoglena pigra* Ehrenb.**  
Albany (T).

- \**Trachelomonas armata* (Ehrenb.) Stein  
Mercer Swamp (T); Albany (T).
- Trachelomonas hispida* (Perty) Stein  
Hutt Valley (Ma); Mercer Swamp (T)†; Rangiriri Swamp (T)†; Albany (T)†.
- \**Trachelomonas oblonga* Lemm.  
Mercer Swamp (T); Albany (T).
- \**Trachelomonas ovalis* Daday  
Pool in Massey Coll. grounds (C, T); Mercer Swamp (T).
- \**Trachelomonas raciborskii* Wolozy  
Western Springs (T); Albany (T); Mercer Swamp (T); Rangiriri Swamp (T).
- Trachelomonas volvocina* Ehrenb.  
Hutt Valley (Ma); Cambridge Lake (C, T)†; Albany (T)†; Waikato R., Mercer (T)†; Mercer Swamp (T)†.
- \**Trachelomonas westii* Wolozy  
Mercer Swamp (T); Dunedin (T, T).
- \**Colacium calvum* Stein  
Albany (T); Mercer Swamp (T); Rangiriri Swamp (T).

CHLOROPHYCEAE

- |   |                 |                 |
|---|-----------------|-----------------|
| 1. Vegetative cells ciliate or non-ciliate, single, or aggregated in gelatinous colonies of palmelloid or dendroid type | Volvocales      |                 |
| Vegetative cells non-ciliate, single or filamentous, or if colonial not aggregated in a gelatinous envelope             | .....           | 2               |
| 2. Reproduction by zygospores formed by union of two non-motile cells   | Conjugales      |                 |
| Reproduction by zoospores or motile gametes or both   | .....           | 3               |
| 3. Cells single, or united into short chains, spheres or nets   | Chlorococcales  |                 |
| Cells forming simple or branched filaments or parenchymatous membranes  | .....           | 4               |
| 4. Vegetative division resulting in cells with apical striations  | Oedogoniales    |                 |
| Vegetative division otherwise   | .....           | 5               |
| 5. Cells uninucleate, plastid parietal or band-like   | Siphonocladales | 6               |
| Cells multinucleate, plastid reticulate   | .....           |                 |
| 6. Thallus of simple filaments or a flat membrane or a tube   | Ulothricales.   |                 |
| Thallus of branched filaments or a prostrate disc, frequently bearing hairs   | .....           | Chaetophorales. |

VOLVOCALES

- |  |                                       |   |
|--|---------------------------------------|---|
| 1. Dominant phase motile, unicellular or colonial                            |                                       | 2 |
| Dominant phase non-motile, cells in mucilaginous colonies                    | .....                                 | 6 |
| 2. Cells solitary, naked   | Polyblepharidaceae.                   |   |
| Cells with walls, solitary or in colonies                                    | .....                                 | 3 |
| 3. Cells solitary  |                                       | 4 |
| Cells in colonies  | Volvocaceae                           |   |
| 4. Wall bivalved, cells usually compressed                                   | Phacotaceae                           |   |
| Wall not bivalved, cells not compressed                                      | .....                                 | 5 |
| 5. Cells with radiating protoplasmic strands from wall to protoplast         | Sphaerellaceae ( <i>Sphaerella</i> )  |   |
| Cells without radiating protoplasmic strands                                 | Chlamydomonadaceae                    |   |
| 6. Cells epiphytic, solitary or in dendroid colonies attached by fine stalks | Chlorangiaceae ( <i>Chlorangium</i> ) | 7 |
| Cells free-floating, or if attached not dendroid                             | .....                                 |   |
| 7. Cells ellipsoid or fusiform   | Coccomyxaceae                         |   |
| Cells spherical  | .....                                 | 8 |
| 8. Cells with pseudo-cilia, colonies of definite shape                       | Tetrasporaceae                        |   |
| Cells without pseudo-cilia, colonies indefinite                              | Palmellaceae                          |   |

<i>Chlamydomonadaceae</i>			
1. Cells biciliate	.. .. .	<i>Carteria</i>	2
Cells quadriciliate	.. .. .	<i>Chlorogonium</i>	
2. Cells fusiform, elongate	.. .. .		3
Cells spherical, ovoid or ellipsoid	.. .. .	<i>Sphaerellopsis</i>	
3. Cell wall widely separated from protoplast	.. .. .	<i>Chlamydomonas</i>	
Cell wall not widely separated from protoplast	.. .. .		
<i>Polyblepharidaceae</i>			
1. Cells asymmetric, green	.. .. .	<i>Polytomella</i>	2
Cells symmetric, colourless	.. .. .	<i>Spermatozopsis</i>	
2. Cells bow-like, with 4 cilia	.. .. .	<i>Pedinomonas</i>	
Cells flattened, with a single cilium	.. .. .		
<i>Phacotaceae</i>			
1. Cells compressed	.. .. .	<i>Phacotus</i>	
Cells not compressed	.. .. .	<i>Dysmorphococcus</i>	
<i>Volvocaceae</i>			
1. Colony a flat plate	.. .. .	<i>Gonium</i>	2
Colony spherical or ovoid	.. .. .		3
2. Colony with less than 64 cells	.. .. .	<i>Volvox</i>	
Colony with more than 500 cells	.. .. .		
3. Colony with 8-16-32 ovate, pyriform cells closely packed	.. .. .	<i>Pandorina</i>	
Colony with 16-32-64 oval cells not closely packed	.. .. .	<i>Eudorina</i>	
Colony with 8-16 compressed biconvex cells	.. .. .	<i>Volvulina</i>	
<i>Tetrasporaceae</i>			
1. Frond an expanded membrane or long filament	.. .. .		2
Frond a solid sphere or hollow sac	.. .. .		3
2. Mother cell wall persisting about daughter cells	.. .. .	<i>Schizochlamys</i>	
Mother cell wall not persisting	.. .. .	<i>Tetraspora</i>	
3. Vegetative colony initially of 4 cells arranged tetrahedrally	.. .. .	<i>Paulschulzia</i>	
Vegetative colony of many cells, colony hollow	.. .. .	<i>Apiocystis</i>	
<i>Palmellaceae</i>			
1. Cells borne on stalks	.. .. .	<i>Urococcus</i>	2
Cells not stalked	.. .. .		3
2. Families spherical or irregular	.. .. .	<i>Palmodictyon</i>	
Families united into subcylindrical, branching thalli	.. .. .	<i>Asterococcus</i>	
3. Plastid distinctly stellate	.. .. .		4
Plastid of another form	.. .. .		
4. Families in a spherical gelatinous envelope	.. .. .	<i>Sphaerocystis</i>	
Families with no general envelope	.. .. .	<i>Gloeocystis</i>	
<i>Coccomyxaceae</i>			
1. Cells arranged in a rectangular flat-plate	.. .. .	<i>Dispora</i>	
Cells single or in a sphaeroidal gelatinous matrix	.. .. .	<i>Coccomyxa</i>	

## CHLAMYDOMONADINEAE

*Chlamydomonadaceae*

- \**Carteria globosa* Korsch.  
Western Springs (T); Waikato R., Mercer (T); Dunedin (T, T).
- \**Chlamydomonas cingulata* Pascher  
Whangape Lake (T).
- Chlamydomonas debaryana* Goroschank  
Hutt Valley (Ma).
- \**Chlamydomonas kleinii* Schmidle  
Waikato R., Mercer (T).
- \**Chlamydomonas penium* Pascher  
Whangape Lake (T).
- \**Chlamydomonas steinii* Goroschank  
Mercer swamp (T).

- \***Chlorogonium elongatum** Dang  
Mercer swamp (T).
- \***Chlorogonium euchlorum** Ehrenb.  
Middlemore (T); Western Springs (T); Rangiriri swamp (T); Whangape Lake (T).
- \***Sphaerellopsis fluviatilis** (Stein) Pascher  
Western Springs (T).

*Polyblepharidaceae*

- \***Pedinomonas minor** Korsh.  
Whangape Lake (T); Waikato R., Mercer (T).
- \***Polytomella citri** Kater  
Fountain, Devonport (T).
- \***Spermatozopsis exultans** Korsh.  
Fountain, Devonport (T).

*Phacotaceae*

- \***Dysmorphococcus variabilis** Takeda  
Mercer swamp (T); Pond in Massey College grounds (C, T).
- \***Phacotus lenticularis** Ehrenb.  
Rangiriri swamp (T).

*Sphaerellaceae*

- Sphaerella lacustris** Witttr.  
Auckland (N); Hutt Valley (Ma); Devonport fountain (T)†.

*Volvocaceae*

- Eudorina elegans** Ehrenb.  
Maungaroa (N); Taupo (N); Auckland (C, unpub.)†; Lake Sarah (F); Hutt Valley (Ma); Waikato R., Mercer (T)†; Lake Whangape (T)†.
- Gonium pectorale** Muller  
Napier (S); Auckland (Oxidation pond, Southdown) (C, 1953)†; Lake Sarah (F); Hutt Valley (Ma).
- \***Pandorina charkowiensis** Korsh.  
Waikato R., Mercer (T).
- Pandorina morum** (Muller) Bory  
Auckland (Oxidation Pond, Southdown) (C, 1953)†; Dunedin (N); Wellington (N); Arahura (N); Teremakau (N); Lake Sarah (F); Hutt Valley (Ma); pool in grounds, Massey College (C, T)†; Cambridge Lake (C, T)†; Waikato R., Mercer (T)†.
- Volvox aureus** Ehrenb.  
Lake Sarah (F); M.A.P., 1951); Lake Lyndon; Lake Pearson; Lake Georgina; Waimakariri River; Gordon's pits; Lake Murihaka; lake in Gardens, Queenstown; Lake Brunner; Lake Alexandrina; Lake Ponui; Lake Heaton; Lake Parau (all M.A.P., 1951).
- Volvox barberi** Shaw  
Lake Ponui; Lake Heaton (M.A.P., 1951).
- Volvox globator** (L) Ehrenb.  
Western Springs, Auckland (C, unpub.)†; Lake Lyndon; Lake Georgina; Gordon's pits; Lake Murihaka; Lake Brunner (all M.A.P., 1951).
- Volvox perglobator** Powers  
Lake Brewer; Lake Power (M.A.P., 1951).
- Volvox tertius** Meyer  
Lake Heaton (M.A.P., 1951).
- Volulina steinii** Playfair  
Ponds at Belfast and Flaxton (M.A.P., 1951).

## TETRASPORINEAE

*Tetrasporaceae***\*Paulschulzia pseudovolvox** Skuja

Waikato R., Mercer (T).

**Apiocystis brauniana** Näg.

Hutt Valley (N); Rangiriri swamp (T).†

**Schizochlamys gelatinosa** A. Br.

Hutt Valley (Ma); Tank, roof of Botany Dept., A.U.C. (T).†

**Tetraspora explanata** Ag.

Kororareka (N).

**Tetraspora gelatinosa** Desv.

Hutt Valley (Ma).

**Tetraspora lubrica** (Roth.) Ag.

Castle Hill (N).

*Palmellaceae***Asterococcus superbus** (Cienk.) Scherffel

Hutt Valley (Ma); Mercer swamp (T).†

**\*Gloeocystis ampla** Kütz.

Bayswater (T); Tank, Botany Dept. Roof, A.U.C. (K.W.L.)

**Gloeocystis gigas** Lagerh.

Hutt Valley (Ma); Tank, Botany Dept. roof, A.U.C. (T).†

**Gloeocystis grevillei** (Berk.) Dr. and Daily.

(K.W.L.)†; Greenhouse, A.U.C. (K.W.L.)†

**Gloeocystis planctonica** (W. & G. West) Lemm

Lake Sarah (F).

**Palmodictyon viride** Kütz.

Hutt Valley (Ma); Rangiriri swamp (T).†

**\*Sphaerocystis schroeteri** Chod.

Waikato R., Mercer (T); Western Springs (T).

**Urococcus cryptophilus** (Carm.) Hass.

West Coast Rd. (South Alps). § (Hooker, 1855).

*Chlorangiaceae***\*Chlorangium javanicum** Lemm.

Lake Whangape (T); Rangiriri swamp (T).

**\*Chlorangium stentorium** (Ehrenb.) Stein

Waikato R., Mercer (T).

*Coccomyxaceae***\*Coccomyxa dispar** Schmidle

Bayswater (T).

**\*Dispora crucigenioides** Printz

Dunedin (T, T).

## CHLOROCOCCALES

1. Cells free or united by gelatine into colonies	.. ..		2
Cells united without gelatine into net or disc-shaped colonies	.. ..	Hydrodictyaceae	
Cells parasitic in <i>Lemna</i>	.. ..	Endosphaeraceae	
		( <i>Chlorochytrium</i> )	
2. Cells regularly dividing vegetatively (unicells or colonial)			4
Cell division rare or abnormal (unicells)	.. ..		3
3. Cells attached at base, epiphytic	.. ..	Characiaceae	
		( <i>Characium</i> )	
Cells not attached, free living	.. ..	Chlorococcaceae	
		( <i>Golenkinia</i> )	

§ The identity of this organism is very doubtful. It may well be a member of the Dinocapsales (p. 726) genus *Gloeodinium*.

4	Thallus a hollow, globular coenobium of spherical or pyramidal cells united to each other by processes	Coelastraceae ( <i>Coelastrum</i> )	5
	Thallus otherwise, not forming regular coenobia		
5.	Cells attached by mucilage or at the ends of gelatinous strands	Dictyosphaeraceae ( <i>Dictyosphaerium</i> )	6
	Cells not on gelatinous strands		
6	Cells solitary or in colonies; cells variable in form, not joined to each other; reproduction by autospores Cells in groups of 2-8, joined to form a pattern of definite shape; reproduction by formation of daughter colonies within cells	Oocystaceae  Scenedesmaceae	
<i>Hydrodictyaceae</i>			
1	Coenobium a flat plate, cells not stalked	<i>Pediastrum</i>	
	Coenobium spherical, composed of stalked cells	<i>Sorastrum</i>	
<i>Oocystaceae</i>			
1	Plant unicellular		2
	Plant colonial		14
2.	Cells angular, pyramidal, triangular or polygonal		3
	Cells spherical, ellipsoid, ovoid or acicular		5
3.	Angles bearing spines or bristles		4
	Angles lacking spines or produced to form simple or branched processes	<i>Tetraedron</i> (in part)	
4	Angles with 4-6 fine, hair-like bristles	<i>Polyedriopsis</i>	
	Angles with 1, 2 or 3 short, stout spines	<i>Tetraedron</i> (in part)	
5	Cells spherical		6
	Cells ovate, lunate, or acicular		9
6	Cells with one chloroplast		7
	Cells with several to many chloroplasts		8
7.	Cells single or cohering in small groups	<i>Chlorella</i>	
	Cells arranged tetrahedrally in a mucilage envelope	<i>Radiococcus</i>	
8	Cells enclosed by a wide gelatinous investment	<i>Planktosphaeria</i> (in part)	
	Cells not enclosed by a gelatinous investment	<i>Eremosphaera</i>	
9.	Cells ellipsoid	<i>Oocystis</i> (in part)	
	Cells lunate, fusiform or acicular		10
10.	Cells lunate		11
	Cells straight, acicular or fusiform		12
11.	Cells invested by a gelatinous sheath	<i>Kirchneriella</i> (part)	
	Cells not enclosed in a sheath	<i>Ankistrodesmus</i> (part)	
12	With a single needle-like spine at one or both ends	<i>Schroederia</i>	
	Spine absent, though apices may taper to a fine point		13
13.	Chloroplast with a row of pyrenoids	<i>Closteriopsis</i>	
	Chloroplast lacking pyrenoids or with one only	<i>Ankistrodesmus</i> (part)	
14.	Cells with a gelatinous envelope		15
	Cells without a gelatinous envelope		18
15.	Cells spherical or broadly ovate	<i>Planktosphaeria</i> (part)	
	Cells elongate, at least 2 times as long as wide		16
16.	Cell membrane with a distinct longitudinal ridge	<i>Enallax</i>	
	Cell membrane without any ridge		17
17.	Each individual cell or group of cells in a separate envelope	<i>Nephrocyclicum</i>	
	Gelatinous envelope homogeneous	<i>Kirchneriella</i> (part)	
18.	Cells united by remains of old mother cell walls at centre of colony		19
	Old mother cell walls not present		20
19.	Cells spherical	<i>Westella</i>	
	Cells ovoid or reniform	<i>Dimorphococcus</i>	
20.	Cells spindle-shaped, joined end to end	<i>Dactylococcus</i>	
	Cells not spindle-shaped		21
21	Cells ovate or spherical	<i>Oocystis</i> (part)	
	Cells elongate, acicular, or spindle-shaped		22
22.	Cells lunate or sickle-shaped	<i>Selenastrum</i>	
	Cells straight	<i>Ankistrodesmus</i> (part)	

*Scenedesmaceae*

- |  |                     |   |
|--|---------------------|---|
| 1. Cells ovoid, fusiform, crescent-shaped or oblong, arranged with long axes parallel to form a single or double series in one plane | <i>Scenedesmus</i>  | 2 |
| Cells of another shape or otherwise arranged   |                     |   |
| 2. Cells spherical with long spines, in multiple colonies of 4-  | <i>Micractinium</i> | 3 |
| Cells not spherical, without spines or with short spines   |                     | 5 |
| 3. Cells with only poles adjoined  |                     | 4 |
| Cells forming a flat coenobium with cells adjoined   |                     |   |
| 4. Cells with spines   | <i>Tetrastrum</i>   |   |
| Cells without spines   | <i>Crucigenia</i>   |   |
| 5. Cells cylindrical or fusiform   | <i>Actinastrum</i>  |   |
| Cells sausage or crescent-shaped   | <i>Tetralantos</i>  |   |

*Characiaceae*

- Characium acuminatum** A. Br.  
Hawke's Bay (S).
- Characium ensiforme** Herm.  
Waitati R. (N); Hutt Valley (N); Rotorua (N).
- \***Characium gracilipes** F. D. Lamb  
Mercer swamp (T).
- Characium polymorphum** Printz  
Hutt Valley (Ma).

*Chlorococcaceae*

- \***Golenkinia radiata** Chod.  
Waikato R., Mercer (T); Rangiriri swamp (T).

*Coelastraceae*

- Coelastrum microporum** Näg.  
Outakura (N); Lake Sarah (F); Cambridge Lake (C, T)†
- Coelastrum sphaericum** Näg.  
Teremakau (N); Arahura (N); Dunedin (N); Hutt Valley (N); Auckland (N); Kohukohu (N); Otatau River (N); Waikato R., Mercer (T).†
- \***Coelastrum verrucosum** (Reinsch.) De Toni  
No locality (T).

*Dictyosphaeraceae*

- Dictyosphaerium ehrenbergianum** Näg.  
Lake Sarah (F); Albany (T).†
- \***Dictyosphaerium planctonicum** Tiff. & Ahlst.  
Albany (T).
- \***Dictyosphaerium pulchellum** Wood.  
Waikato R., Mercer (T).

*Endosphaeraceae*

- \***Chlorochytrium lemnae** Cohn  
Western Springs (T).

*Hydrodictyaceae*

- Pediastrum boryanum** (Turp.) Menegh. var. **granulatum** (Kütz.) A. Br.  
Lake Lynden (N); Auckland (N); Teremakau (N); Arahura (N); Omatangi (N); Christchurch (M); Waikato R., Mercer (T)†; pool in Massey Coll. Grounds (C, T).†
- \***Pediastrum clathratum** (Schröt.) Lemm.  
Western Springs (T); pool in Massey College grounds (C, T).
- Pediastrum constrictum** Hass. (**P. ellipticum** Ralfs.)  
Hawke's Bay (S).
- Pediastrum duplex** Meyer  
Hawke's Bay (S).
- Pediastrum integrum** Näg.  
Waimakariri River (N).



- \**Pediastrum simplex* (Meyen.) Lemm.  
Mercer swamp (T).
- Pediastrum tetras* (Ehrenb.) Ralfs  
Auckland (N); Otatau River (N); Taupo (N); Omatangi (N); Christchurch (M); Hutt Valley (Ma); Waikato R., Mercer (T)†; Lake Whangape (T)†; Cambridge Lake (C, T)†; pool in Massey College grounds (C, T)†.
- Sorastrum spinulosum* Näg.  
No locality (N); Cambridge Lake (C, T)†
- Oocystaceae*
- Ankistrodesmus acutissimus* Archer  
Christchurch (M).
- Ankistrodesmus polymorphum* Fresen.  
Christchurch (M); Arthur's Pass (N); Teremakau (N); Arahura (N); Dunedin (N); Hutt Valley (N); Tokano (N).
- Ankistrodesmus polymorphum* Fresen var. *falcatum* (Corda) Rabenh.  
Christchurch (M); Hutt Valley (Ma); Waikato R., Mercer (T)†
- Ankistrodesmus polymorphum* Fresen var. *aciculare* (A. Br.) Rabenh.  
Hutt Valley (Ma).
- Chlorella vulgaris* Beyer  
Auckland (Oxidation Pond), Southdown (C, 1953)†; Hutt Valley (Ma).
- Closteriopsis longissima* Lemm.  
Hutt Valley (Ma).
- \**Dactylococcus bicaudatus* A. Br.  
Cambridge (T).
- \**Dactylococcus infusionum* Näg.  
Western Springs (T).
- \**Dimorphococcus lunatus* A. Br.  
Rangiriri Swamp (T).
- \**Enallax alpinus* Pascher  
Western Springs (T); Green Lake, Mayor Is. (E.M.S.).
- \**Eremosphaera viridis* De By.  
Albany (T).
- \**Kirchneriella contorta* (Schmidle) Bohlin  
Western Springs (T).
- Kirchneriella lunaris* (Kirchn.) Moeb.  
Lake Sarah (F); Western Springs (T)†; Lake Whangape (T)†; Waikato R., Mercer (T)†; Cambridge (T)†.
- Kirchneriella obesa* (West) Schmidle  
Hutt Valley (Ma); Waikato R., Mercer (T)†.
- \**Nephrocytium agardhianum* Näg.  
Tank on Botany Dept. roof, A.U.C. (T); Waikato R., Mercer (T).
- \**Nephrocytium limneticum* G. M. Smith  
Waikato R., Mercer (T).
- Nephrocytium lunatum* W. West  
Lake Sarah (F); Cambridge Lake (C, T)†.
- Oocystis borgei* Snow  
Lake Sarah (F).
- Oocystis elliptica* West  
Hutt Valley (Ma).
- Oocystis naegeli* A. Br.  
Arthur's Pass (N); Omatangi (N).
- \**Oocystis parva* (Ward) G. S. West  
Mercer swamp (T).
- Oocystis solitaria* Wittr var. *apiculata* Printz.  
Lake Sarah (F).

- \***Planktosphaeria gelatinosa** G. M. Smith  
Rangiriri swamp (T); Lake Whangape (T).
- \***Polyedriopsis spinulosa** Schmidle  
Rangiriri swamp (T).
- \***Radiococcus nimbatus** (de Wildm.) Schmidle  
Lake Whangape (T).
- \***Schroederia setigera** (Schroeder) Lemm.  
Waikato R., Mercer (T); Rangiriri swamp (T).
- Selenastrum gracile** Reinsch  
Hutt Valley (Ma); Lake Whangape (T)†; Waikato R., Mercer (T)†; Cambridge Lake (C, T)†.
- Selenastrum westii** Fritsch  
Hutt Valley (Ma).
- Tetraedron (Polyedrium) gigas** (Wittr.) Hansg. f. **tetraedricum** Nordst.  
Tokano (N).
- Tetraedron (Polyedrium) lobulatum** (Näg.) Hansg.  
Otaua R., (N); Omatangi (N); Devonport fountain (T)†.
- Tetraedron (Polyedrium) lobulatum** (Näg.) Hansg. f. **tetragona** Nordst.  
Omatangi (N).
- \***Tetraedron (Polyedrium) minimum** (A Br.) Hansg.  
Rangiriri swamp (T).
- \***Tetraedron (Polyedrium) regulare** Kütz.  
Cambridge Lake (C, T).
- Tetraedron (Polyedrium) tetragonum** (Näg.) Hansg.  
Otaua R. (N).
- \***Westella botryoides** (W. West) de Wildm.  
Waikato R., Mercer (T); Lake Whangape (T).
- \***Westella linearis** G. M. Smith  
Devonport fountain (T).

*Scenedesmaceae*

- Actinastrum hantzschii** Lagerh.  
Hutt Valley (Ma).
- Crucigenia quadrata** Morren  
Hutt Valley (Ma).
- \***Crucigenia rectangularis** (Näg.) Gay  
Waikato R., Mercer (T).
- \***Crucigenia tetrapedia** (Kirchn) W. & G. S. West  
Waikato R., Mercer (T).
- \***Micractinium pusillum** Fres.  
Waikato R., Mercer (T).
- \***Scenedesmus acuminatus** (Lagerh) Chod.  
Waikato R., Mercer (T).
- Scenedesmus acutus** Meyer  
Christchurch (M); Hutt Valley (Ma).
- Scenedesmus bijugatus** (Turp.) Kütz.  
Dunedin (N); Omatangi (N); Christchurch (N); Teremakau (N); Arahura (N); Hutt Valley (Ma); Cambridge Lake (C, T)†; Waikato R., Mercer (T).†
- \***Scenedesmus brasiliensis** Bohlin  
Waikato R., Mercer (T).
- Scenedesmus obliquus** (Turp.) Kütz  
Dunedin (N); Hutt Valley (N); Tokano (N); Omatangi (N); Christchurch (M).
- Scenedesmus obliquus** (Turp.) Kütz var. **dimorphus** (Turp.) Rabenh  
Christchurch (M1); Rangiriri swamp (T)†.

**\*Scenedesmus producto—capitatus** Schmula

Rangiriri swamp (T).

**Scenedesmus quadricauda** (Turp.) Bréb.

Lake Lyndon (N); Hutt Valley; Dunedin (N); Bluff (N); Teremakau (N); Arahura (N); Christchurch (N); Waikato R., Mercer (T)†.

**Scenedesmus quadricauda** (Turp.) Bréb. var. **ecornis** (Ralf.) Chod.

Hutt Valley (Ma.).

**\*Tetrallantos lagerheimii** Teiling

Western Springs (T); Waikato R., Mercer (T).

**\*Tetrastrum divergens** G. M. Smith

Waikato R., Mercer (T); Mercer swamp (T).

ULOTRICHALES

1. Thallus a parenchymatous tube	Ulvaceae	
	( <i>Enteromorpha</i> )	
Thallus a flat leafy monostromatic expanse		2
Thallus filamentous		3
2. Plastid axile, stellate	Prasiolaceae	
	( <i>Prasiola</i> )	
Plastid otherwise	Monostromaceae	
	( <i>Monostroma</i> )	
3. Plastid axile, stellate	Prasiolaceae	
	( <i>Prasiola-Hormidium</i> stage)	
Plastid parietal		4
4. Chloroplast one, parietal, usually with pyrenoids		5
Chloroplasts several, pyrenoids lacking	Microsporaceae	
	( <i>Microspora</i> )	
5. Cell walls thick, gelatinous, sexual reproduction oogamous	Cylindrocapsaceae	
	( <i>Cylindrocapsa</i> )	
Cell walls thin, sexual reproduction not oogamous	Ulotrichaceae	
<i>Ulotrichaceae</i>		
1. Filaments readily fragmenting into individual cylindrical cells	<i>Stichococcus</i>	
Filaments not readily fragmenting		2
2. Filaments without a prominent mucous envelope		3
Filaments with a prominent mucous envelope	<i>Gloetila</i>	
3. Cells in pairs, mature transverse walls very thick	<i>Binuclearia</i>	
Cells not in pairs, walls not thickened		4
4. Filaments elongate, no special apical cell		5
Filaments short with attenuated apical cell	<i>Uronema</i>	
5. Plastid annular, usually occupying entire length of cell	<i>Ulothrix</i>	
Plastid elliptical or circular, usually occupying only half length of cell	<i>Hormidium</i>	

**Binuclearia tatrana** Wittr.

Lake Sarah (F); Hutt Valley (Ma).

**Gloetila capensis** Grün (as *Conferva floccosa*)

Hawke's Bay (S).

**Hormidium crenulatum** Kütz. var. **corticolum** Rabenh. et Westend.

Dunedin (N).

**Hormidium parietinum** (Vauch.) Kütz. var. **crassum** (Kütz.) Hansg.

Dunedin (N).

**\*Stichococcus bacillaris** Näg.

Albany (T).

**\*Stichococcus subtilis** (Kütz.) Klerck

Waitakere Dam (K.W.L.).

**Stichococcus variabilis** W. & G. S. West

Hutt Valley (Ma).

**Ulothrix aequalis** Kütz.

Silica Springs, National Park (C); Hutt Valley (Ma).

**Ulothrix flaccida** Kütz.

Tokano (N); Hutt Valley (Ma).

**Ulothrix flaccida** Kütz. var. *varia* (Kütz.) De Wild

Tokano (N).

**Ulothrix moniliformis** Kütz.

Hutt Valley (Ma).

**Ulothrix subtilis** (Kütz.) De Toni var. *tenerrima* (Kütz.) Kirchn.

Tokano (N); Hawke's Bay (S1); Hutt Valley (Ma).

**\*Ulothrix tenuissima** Kütz.

Le Roys Bush (K.W.L.)

**Ulothrix zonata** (Web. et Mohr) Kütz.

Lake Tarawera (N); Hutt Valley (Ma).

**\*Uronema elongatum** Hodgetts

Dunedin (T, T).

*Microsporaceae***Microspora abbreviata** (Rabenh.) Lagerh. (= *Conferva novae semliae*)Lake Lyndon (N); Hutt Valley (N); Teremakau (N); Arahura (N); Mau-  
ngaroa (N).**Microspora amoena** Rabenh.

Hutt Valley (Ma).

**Microspora floccosa** Thur.

Hutt Valley (Ma).

**Microspora pachyderma** Lagerh.

Stream, National Park (C); Western Springs (T) †; Middlemore (T) †.

**Microspora stagnorum** (Kütz.) Lagerh. (*Conferva stagnorum*)Ohaeawai (N); Le Roys Bush (K.W.L.) †; Rotorua geyser (DF); Ohinemutu  
(DF).*Cylindrocapsaceae***\*Cylindrocapsa geminella** Wolle

Middlemore (T).

*Ulvaceae***Enteromorpha intestinalis** Link.

Hawke's Bay (S); Hutt Valley (Ma).

**\*Enteromorpha nana** (Sommerf.) Bliding var. *minima* (Bliding) Comb. nov. ead  
*rivularis* (Collins) Comb. nov.Piha str.; Lake Karapiro; South Karori str; Lake Tarawera (V.J.C., all  
records unpub.).*Monostromaceae***Monostroma membranaceum** W. & G. S. West

Hutt Valley (Ma).

*Prasiolaceae***Prasiola crispa** (Lightf.) Ag.

No locality (Hooker, 1855).

**Prasiola delicatula** Chapm.

Russell (C); Waiheke Is. (C); Torbay (C).

**Prasiola skottsbergii** Levring

Russell (C).

## CHAETOPHORALES

- |    |   |                         |   |
|----|---|-------------------------|---|
| 1  | Unicellular, occasionally forming short filaments, terrestrial                                    | Pleurococcaceae         |   |
|    |   | ( <i>Pleurococcus</i> ) | 2 |
|    | Multicellular, filaments or discs, terrestrial or aquatic   |                         |   |
| 2. | Thallus a 1-layered disc or convex cushion, many cells with<br>setae arising from a sheathed base | Coleochaetaceae         |   |
|    | Thallus filamentous or disc-like, but if the latter hairless or<br>hairs without sheathed bases   |                         | 3 |
| 3. | Thallus branched, frequently bearing simple hairs, branches<br>sometimes fused into a disc        |                         | 4 |
|    | Thallus branched, without hairs   | Trentepohliaceae        |   |

4. Plant body macroscopic	Chaetophoraceae	
Plant body microscopic, usually epi- or endophytic		5
5. Thallus a well-branched projecting system, without hairs	Erectae	
	( <i>Microthamnion</i> )	
Thallus composed in main of prostrate system	Prostratae	
<i>Prostratae</i>		
1. Thallus bearing hairs		2
Thallus without hairs	<i>Protoderma</i>	
2. Hairs with inflated bulbous base	<i>Aphanochaete</i>	
Hairs without inflated base	<i>Chaetopeltis</i>	
<i>Trentepohliaceae</i>		
1. Thallus richly branched, often brownish	<i>Trentepohlia</i>	
Thallus epiphyllous		2
2. Thallus discoid	<i>Phycopeltis</i>	
Thallus of branched threads	<i>Cephaleuros</i>	
<i>Chaetophoraceae</i>		
1. Filaments not surrounded by a mucilage envelope		2
Filaments surrounded by a mucilage envelope	<i>Chaetophora</i>	
2. Axes and branches not markedly differentiated	<i>Stigeoclonium</i>	
Tufts of short lateral branches borne on wide axis	<i>Draparnaldia</i>	
<i>Coleochaetaceae</i>		
1. Plants multicellular, forming discs or branched filaments	<i>Coleochaete</i>	
Plants one or two-celled	<i>Chaetosphaeridium</i>	

*Chaetophoraceae*

- Chaetophora cornu-damae* (Roth.) Ag. var. *genuina* Kütz.  
Hawke's Bay (S1); stream near Coroglen (V.J.C.) †.
- Chaetophora elegans* Ag.  
Hawke's Bay (S1).
- Chaetophora tuberculosa* (Roth.) Hook.  
Blueskin Bay (N).
- Draparnaldia glomerata* (Vauch.) Ag.  
Warrington (N); Kororareka (N); Tokano (N); Uriti (V.W. Lindauer exsicc.).
- Draparnaldia glomerata* (Vauch.) Ag. var. *acuta* Ag.  
Ohaeawai (N)
- Draparnaldia plumosa* Ag.  
Horokino (V.W.L. exsicc.); Hutt Valley (Ma).
- Stigeoclonium amoenum* Kütz. var. *novizelandicum* Nordst.  
Paihia (V.W.L. exsicc.); Hutt Valley (Ma); Dunedin (N); Auckland (N).
- Stigeoclonium nanum* Kütz.  
Hutt Valley (Ma).
- Stigeoclonium subsecundum* Kütz. var. *tenuis* Nordst  
Coromandel (N).
- Stigeoclonium tenue* Rabenh.  
Hawke's Bay (S1); Hutt Valley (Ma).

*Prostratae*

- Aphanochaete globosa* Wolle  
Lake Pearson (N); Taupo (N); Omatangi (N); Rotorua (DF).
- Aphanochaete polytricha* Nordst.  
Taupo (N).
- Aphanochaete repens* Berth.  
Hutt Valley (N); Western Springs (T) †; Albany (T) †; Dunedin (T, T) †.
- Protoderma viride* Kütz  
Hutt Valley (Ma).

*Chaetopeltidaceae*

- \**Chaetopeltis orbicularis* Berth.  
Dunedin (T, T).

*Erectae***Microthamnion kützingianum** Näg.

Bluff (in Sphagna) (N); Hutt Valley (Mā); Dunedin (T, T)†.

*Trentepohliaceae***\*Cephaleuros virescens** KunzeOn *Magnolia grandiflora*, *Ligustrum japonicum*, Auckland (T).**\*Cephaleuros minimus** KarstenOn *Coprosma australis*, Waitakeres (T).**\*Cephaleuros parasiticus** Karsten.On *Knightia excelsa*, Waitakeres (T); Rangitoto (T).**\*Cephaleuros Lagerheimii** SchmidtOn *Melicytus ramiflorus*, Waitakeres (T); Wellington (T); Massey College grounds (C, T).**\*Phycopeltis aurea**

On various species, Waitakeres (T).

**Phycopeltis expansa** Jennings

Auckland (Jennings, 1896).

**Trentepohlia aurea** (L.) Mart.

Auckland (Kirk, 1871).

**Trentepohlia jolithus** (L.) Wallr.

Auckland (C).

**Trentepohlia jolithus** (L.) Wallr. var. *crassior* Nordst.

Taupo (N); Russell (V.W.L. Exsicc.).

**Trentepohlia jolithus** var. *pulvinatum* (Grünow, 1867).

No locality.

**Trentepohlia odorata** (Lyngb.) Wittr. (Grünow, 1867).

No locality.

(Phycopeltis nigra Jennings appears to be a sooty mildew (R.H.T.) and has therefore been deleted.)

*Coleochaetaceae***\*Chaetosphaeridium globosum** (Nordst.) Klebahn

Dunedin (T, T).

**Coleochaete irregularis** Prings. (near to)

Papakauri (N); Omatangi (N); Lake Pearson (N).

**Coleochaete orbicularis** Prings.

Papakauri (N).

**Coleochaete scutata** Bréb.

Auckland (N); Ohaeawai (N); Papakauri (N); Tokano (N); Omatangi (N); Orakeikorako (N); Western Springs (T)†; Dunedin (T, T)†.

*Pleurococcaceae***\*Pleurococcus vulgaris** Menegh.

Auckland (C, unpub.) widespread

## SIPHONOCLEDALES

*Cladophoraceae*

1. Filaments simple or with occasional rhizoidal branches  
 Filaments extensively branched

*Rhizoclonium*  
*Cladophora*

**Cladophora callicoma** Kütz.

Tapuaeharuru (N).

**Cladophora crispata** (Roth) Kütz.

Rotorua, Ohinemutu (DF)

**Cladophora crispata** (Roth) Kütz. f. *waikatensis* Hauck.

Waikato River (N); Hawke's Bay (S1); Karekare (K.W.L.)†.

- Cladophora flavida** Kütz. f. *curvata* Hauck.  
Taupo (N).
- Cladophora fracta** (Vohl.) Kütz.  
Lake Rotoaira (N); Pontu River (N); Tapuaeharuru (N).
- Cladophora glomerata** (L.) Kütz  
Hutt Valley (Ma); Hawke's Bay (S1); Green Lake, Mayor Is. (T.C. Chambers and I. Bayley) †; Lake Tarawera (C) †.
- Cladophora hochstetteri** Grün.  
Lake Taupo (N); Lake Rotoaira (N).
- Rhizoclonium berggrenianum** Hauck.  
Rotorua (N); Tokano (N).
- \***Rhizoclonium crispum** Kütz.  
Western Springs (T); Milford (T).
- Rhizoclonium fontanum** Kütz.  
Le Roys Bush (K.W.L.).
- Rhizoclonium hieroglyphicum** (C.Ag.) Kütz.  
Swanson (C); Hutt Valley (Ma); Middlemore (T) †.
- Rhizoclonium hieroglyphicum** (C.Ag.) Kütz. f. *kororarekana* Hauck.  
Kororareka (N).
- Rhizoclonium hieroglyphicum** (C.Ag.) Kütz. f. *waikitense* Hauck.  
Bay of Islands (N); Rotorua (N); Waikite (N); Whakarewarewa (DF).
- Rhizoclonium riparium** (Harv.)  
Nihotapu (V.J.C.) †; Hutt Valley (Ma); Tairua River (V.J.C. 1955) †.

## OEDOGONIALES

*Oedogoniaceae*

1. Filaments unbranched, hairless  
Filaments branched, cells bearing a hair with swollen base
- Oedogonium*  
*Bulbochaete*
- The species in this family are named according to the Monograph by Tiffany (1930)
- Oedogonium acrosporum** De Bary  
Omatangi (N)
- Oedogonium borisianum** (Le Cl.) Wittr.  
Rotomahana (N).
- Oedogonium boschii** (Le Cl.) Wittr.  
Ohaeawai (N); Tokano (N).
- Oedogonium calcareum** Cleve  
Hawke's Bay (S1)
- Oedogonium chapmanii** Tiffany  
Auckland (Tiffany, 1948).
- Oedogonium ciliatum** (Hassall) Prings.  
Hawke's Bay (S1); Hutt Valley (Ma).
- Oedogonium crenulatum** Wittr. var. *gracilius* (Nordst.) † Hirn.  
Omatangi (N); Waitakere str., Auckland (E.M.S.).
- Oedogonium crispum** (Hass.) Wittr.  
Ohaeawai (N); Tokano River (N); Tauranga (?) (N); Te Aroha (E.M.S.) †.  
Waitakere Str. (E.M.S.) †
- Oedogonium cryptoporum** Wittr.  
Waimakariri River (N); Waihi (E.M.S.) †
- \***Oedogonium lagerstedtii** Wittr.  
Lake Hayes (E.M.S.).
- \***Oedogonium oelandicum** Wittr.  
Western Springs (E.M.S.).
- Oedogonium platygynum** Wittr.  
Omatangi (N).

- Oedogonium platygynum** Wittr. var. *novae zelandiae* Hirn.  
Ohaeawai (N) (= var. *continuum* Nordst.)
- Oedogonium princeps** (Hass.) Wittr.  
Ruataniwha (S1).
- Oedogonium pringsheimii** Cram.  
Lake Taupo (N).
- Oedogonium pringsheimii** Cram. var. *nordstedtii* Wittr.  
Tokano River (N).
- \***Oedogonium pusillum** Kirchner  
Lake Hayes, Central Otago (E.M.S.).
- Oedogonium stellatum** Wittr.  
Ohaeawai (N).
- \***Oedogonium subsexangulare** (Wille) Tiff.  
Western Springs, Auckl. (E.M.S.).
- Oedogonium suecicum** Wittr.  
Otatau River (N); Waitakere str., Auckland (E.M.S.); Waihi (E.M.S.)†
- \***Oedogonium vulgare** (Wittr.) Tiff.  
Waitakere str., Saddle Hill pond, Dunedin (E.M.S.).
- Bulbochaete angulosa** Wittr. & Lund.  
Papakauri (N); Otatau River (N); Taupo (N); Omatangi (N).
- Bulbochaete anomala** Prings.  
Lake Pearson (N).
- Bulbochaete gigantea** Prings.  
Otatau River (N); Taupo (N).
- Bulbochaete intermedia** De Bary  
Tokano (N).
- Bulbochaete minor** A. Br.  
No locality (Gruntow, 1867).
- Bulbochaete mirabilis** Wittr.  
Lake Pearson (N); Omatangi (N); Otatau River (N).
- Bulbochaete punctulata** (Nordst.) Hirn.  
Papakauri (N); Ruataniwha (S1).
- Bulbochaete repanda** Wittr.  
Omatangi (N).
- Bulbochaete setigera** (Roth) Ag. var. *punctulatum* Nordst.  
Papakauri (N).
- Also specimens near to *B. sessilis* Wittr. (Taupo), *B. crenulata* Prings. (Otatau River), *B. nordstedtii* Wittr. (Taupo). (All recorded by Nordstedt.)

## CONJUGALES

- |   |                       |   |
|---|-----------------------|---|
| 1. Cells solitary, more rarely colonial, with or without median constriction          |                       | 2 |
| Cells in filaments, not divided by constrictions                                      |                       | 3 |
| 2. Cell wall a single piece without obvious pores                                     | Mesotaeniaceae        |   |
| Cell wall of two or more pieces, usually with a median constriction and pores         | Desmidiaceae          |   |
| 3. Cells forming threads that do not dissociate; outer wall smooth                    | Zygnemataceae         |   |
| Cells forming threads which easily dissociate into individual cells; outer wall rough | Gonatozy gonaceae     |   |
| <i>Mesotaeniaceae</i>   |                       |   |
| 1. Cells straight   |                       | 2 |
| Cells slightly curved, chloroplast quite filling cell                                 | <i>Roya</i>           |   |
| 2. Plastid parietal, spiral   | <i>Spirotaenia</i>    |   |
| Plastid not spiral  | .....                 | 3 |
| 3. Plastid a single plate in each semi-cell   | <i>Mesotaenium</i>    |   |
| Plastid or plastids not plate-like  |                       | 4 |
| 4. Plastid stellate   | <i>Cylindrocystis</i> |   |
| Plastid axial with longitudinal radiating plates                                      | <i>Netrium</i>        |   |



- Cylindrocystis brebissonii* Menegh.  
Taupo (N); Harihari (Westland) (C).
- Cylindrocystis brebissonii* Menegh. var. *jenneri* (Ralfs) Reinsch.  
Christchurch (M1) (as *Penium jenneri*)
- Cylindrocystis crassa* De Bary  
National Park (N).
- Cylindrocystis* (?) *diplospora* Lund  
No locality (N).
- Mesotaenium braunii* De Bary (= *Palmogloea protuberans* (Sm. & Sow.) Kütz.)  
Hawke's Bay (S); Hutt Valley (Ma) as *Aphanocapsa grevillei* (Hass.) Rabenh.  
as *Gloeocapsa montana* Kütz., as *G. polydermatica* Kütz. (see D, D).
- Mesotaenium violascens* De Bary  
Omatangi (N).
- Netrium digitus* (Ehrenb.) Itzigs et Rothe  
Lake Sarah (F).
- Netrium lamellosum* (Bréb.) Grönbl.  
Hutt Valley (Ma).
- Roya obtusa* (Bréb.) W. & G. S. West var. *montana* W. & G. S. West.  
Hutt Valley (Ma).
- Spirotaenia condensata* Bréb.  
Christchurch (M); Hutt Valley (Ma); Otaki (M2).
- Spirotaenia obscura* Ralfs  
Christchurch (M1).

*Zygnemataceae*

The species in this family are named according to the Monograph on the Zygnemataceae by Transeau (1951). The determinations are based primarily upon the structure of the zygote, and it is doubtful whether these were seen in the early records. These species are indicated with a question mark.

- |    |   |                   |
|----|---|-------------------|
| 1  | Plastid an axial plate  | 2                 |
|    | Plastid spiral or stellate  | 3                 |
| 2. | Spore ovoid with 3 longitudinal ridges                            |                   |
|    | Spore lentiform or angled, smooth or scrobiculate                 | <i>Debarya</i>    |
| 3. | Plastid 1—more bands, more or less spiral                         | <i>Mougeotia</i>  |
|    | Plastid more or less stellate                                     | <i>Spirogyra</i>  |
| 4  | Spore formed in tube cells cut off from original parent cells     | 4                 |
|    | Spore formed in tube cells not cut off from original parent cells | <i>Zygogonium</i> |
|    |   | <i>Zygnema</i>    |

- Debarya glyptosperma* (De Bary) Wittr.  
Omatangi (N); Hutt Valley (Ma).
- Debarya laevis* (Kütz.) W. & G. S. West  
Hutt Valley (Ma).
- Mougeotia capucina* (De Bary) Ag.  
Omatangi (N).
- Spirogyra braziliensis* (Nordst.) Transeau (as *S. lineata*)  
Warrington (N); Kororareka (N).
- ?*Spirogyra communis* (Hassall) Kütz.  
Hawke's Bay (S1).
- Spirogyra crassa* Kütz.  
Hutt Valley (Ma).
- Spirogyra longata* (Vauch.) Kütz.  
Hutt Valley (Ma).
- ?*Spirogyra nitida* (Dillwyn) Link.  
Hawke's Bay (S1)
- ?*Spirogyra pellucida* (Hass.) Kütz.  
Hawke's Bay (S1).

- Spirogyra porticalis** (Muell.) Cleve (as *S. quinina*).  
Hawke's Bay (S1); Hutt Valley (Ma).
- ?**Spirogyra quadrata** (Hass.) Petit  
Hawke's Bay (S1).
- ?**Spirogyra setiformis** (Roth.) Kütz.  
Hawke's Bay (S1).
- Spirogyra singularis** Nordst.  
Dunedin (N); Warrington (N); Kororareka (N).
- Spirogyra tenuissima** (Hass.) Kütz.  
Waimakariri (N); Hutt Valley (Ma).
- ?**Zygnema bysoideum** (Harv.) De Toni  
Kapiti Is. (fresh water lake). Requires refinding and further study—it may not be a *Zygnema* (Hooker, 1855).
- Zygnema cruciatum** (Vauch.) Ag.  
Hawke's Bay (S1).
- ?**Zygnema pectinatum** (Vauch.) Ag.  
No locality (Colenso).
- Zygnema stellinum** Ag.  
Hutt Valley (Ma).
- Zygogonium ericetorum** Kütz.  
National Park (C); Hutt Valley (Ma).

*Gonatozygonaceae*

- |                                    |    |                    |
|------------------------------------|----|--------------------|
| 1. Plastid axial                   | .. | <i>Gonatozygon</i> |
| Plastid parietal, spirally twisted |    | <i>Genicularia</i> |
- Genicularia spirotaenia** De Bary  
Lake Sarah (F); Hutt Valley (Ma).
- Gonatozygon asperum** (Bréb.) Cleve (as *G. brebissonii*).  
Arthur's Pass (N); Lake Sarah (F); Bluff (N).
- Gonatozygon kinghim** (Arch) Rabenh.  
Pool, Massey Coll. (C, T).
- Gonatozygon ralfsii** De Bary (as *G. monotaenium*).  
Lake Sarah (F).

*Desmidiaceae*

De Toni was not aware of Maskell's papers, and it is therefore possible that some of the new species described by Maskell may be synonymous with others previously described from elsewhere. The genus *Pleurotaeniopsis* has been included in the genus *Cosmarium* in conformity with recent practice.

- |  |    |                      |
|--|----|----------------------|
| 1. Cell solitary   |    | 2                    |
| Cells in filaments   |    | 14                   |
| 2. Slight constriction between semicells                               |    | 3                    |
| Distinct constriction between semicells                                |    | 5                    |
| 3. Cell straight, plastid with entire edges                            |    | 4                    |
| Cell crescent shaped, plastid leaving vacuole in tip                   |    | <i>Closterium</i>    |
| 4. Cell wall granular  |    | <i>Disphinctium</i>  |
| Cell wall smooth   |    | <i>Penium</i>        |
| 5. Semicells several times longer than broad                           |    | 6                    |
| Semicells not much longer than broad                                   | .. | 9                    |
| 6. Semicell with notch at apex   | .. | 7                    |
| Semicell without notch at apex   | .. | 8                    |
| 7. Cell wall smooth  |    | <i>Tetmemorus</i>    |
| Cell wall with furcate processes                                       |    | <i>Triploceras</i>   |
| 8. Bases of semicells plicate  |    | ( <i>Docidium</i> )  |
| Bases of semicells not plicate   |    | <i>Pleurotaenium</i> |
| 9. Cells in vertical view 3 or more angled or with radiate projections |    | <i>Staurastrum</i>   |
| Cells in vertical view oval to fusiform                                | .. | 10                   |
| 10. Cells with spines  |    | 11                   |
| Cells without spines   | .. | 12                   |

11. Semicell with central protuberance No central protuberance	<i>Xanthidium</i> <i>Arthrodesmus</i>	
12. Semicell without deep incision Semicell with distinct, often a deep incision	<i>Cosmarium</i>	13
13. Semicells with conspicuous prominences near base Semicells without conspicuous prominences near base	<i>Euastrum</i> <i>Micrasterias</i>	
14. Cells united by apical processes Cells united directly, without processes		15 16
15. Apical processes short, meeting those of next cell Apical processes long, overlapping those of next cell	<i>Sphaeroszoma</i> <i>Onychonema</i>	
16. Median constriction slight Median constriction marked		17 18
17. Filaments enclosed in wide gelatinous sheath Filaments without gelatinous sheath	<i>Hyalotheca</i> <i>Desmidiium</i> (part)	
18. Cells round or elliptical in vertical view Cells angular or with radiate arms in vertical view		19 20
19. Cells elliptical in vertical view Cells round with two small opposite prominences	<i>Spondylosium</i> <i>Gymnozyga</i>	
20. Semicells symmetrical Semicells asymmetrical	<i>Desmidiium</i> (part) <i>Phymatodocis</i>	

PENIAE

- Penium closterioides** Ralfs  
Blueskin Bay (N); Christchurch (M); Otaki (M2).
- Penium closterioides** Ralfs var. **subcylindricum** Klebs  
Omatangi (N).
- Penium cucurbitinum** Bisset var. **subpolymorphum** Nordst  
Omatangi (N); Christchurch (M1 & M2); Otaki (M2); Hawke's Bay (M2).
- Penium digitus** (Ehrenb.) Bréb.  
Christchurch (M); Hutt Valley (Ma); Otaki (M2).
- Penium incrassatum** Mask. f. **major** and **minor** Mask.  
Hawke's Bay (M2).
- Penium interruptum** Bréb  
Hutt Valley (Ma).
- Penium lamellosum** Bréb.  
Arthur's Pass (N); Otaki (M2).
- Penium margaritaceum** (Ehrenb.) Bréb. var. a, b, c.  
Lyttelton (M1); Cust Valley (M1); Otaki (M2).
- Penium naegelii** Bréb.  
Waimakariri River (N); Arthur's Pass (N); Lake Lyndon (N).
- Penium navicula** Bréb.  
Otaki (M2).
- Penium polymorphum** Perty  
Waikato (N); Omatangi (N); National Park (N); Christchurch (M2);  
Hawke's Bay (M2); Otaki (M2).  
(Specimen near to **P. didymocarpum** Lund.  
Omatangi (N).
- Tetmemorus brebissonii** (Menegh.) Ralfs  
Otaki (M2); Hutt Valley (Ma); Hawke's Bay (M2).
- Tetmemorus brebissonii** (Menegh.) Ralfs var. **attenuatus** Nordst  
Christchurch (N); Papakauri (N); Taupo (N).
- Tetmemorus granulatus** (Bréb.) Ralfs f. **minor** Mask  
Otaki (M2).
- Tetmemorus laevis** (Kütz.) Ralfs  
Hokianga (N); Omatangi (N); Hutt Valley (Ma).

CLOSTERIAE

- Closterium acerosum** (Schrank) Ehrenb.  
Christchurch (M); Waimakariri River (N); Lake Lyndon (N); Hutt Valley  
(Ma); Otaki (M2).

- Closterium acerosum** var. **angolense** W. & G. West  
Lake Sarah (F).
- Closterium aciculare** T. West var. **subpronum** W. & G. S. West  
Lake Sarah (F); Hutt Valley (Ma).
- Closterium acutum** (Lyng.) Bréb.  
Christchurch (M); Dunedin (N); Hutt Valley (Ma); Otaki (M2).
- Closterium acutum** (Lyng.) Bréb. f. **tenuis** Nordst.  
Omatangi (N).
- Closterium attenuatum** Ehrenb.  
Hawke's Bay (S).
- Closterium compactum** Nordst.  
Arthur's Pass (N).
- Closterium complanatum** Delp.  
Hutt Valley (Ma).
- Closterium cornu** Ehrenb.  
Hawke's Bay (S); Lake Sarah (F).
- Closterium costatum** Corda  
Hutt Valley (Ma).
- Closterium cynthia** De Not.  
Christchurch (M2); Otaki (M2); Kaitoke (M2); Blueskin Bay (N); Taupo (N); Hutt Valley (Ma).
- Closterium cynthia** De Not. f. **angustior** Nordst.  
Christchurch (N); Bluff (N); Papakauri (N); Taupo (N).
- Closterium decorum** Bréb.  
Taupo (N); Arthur's Pass (N); Christchurch (N); Kororareka (N); Otaki (M2).
- Closterium decorum** Bréb. f. **gracilior** Mask.  
Christchurch (M2); Kaitoke (M2); Wellington (M2); Otaki (M2).
- Closterium diana**e Ehrenb.  
Christchurch (M); Auckland (N); Rotomahana (N); Hutt Valley (Ma).
- Closterium diana**e Ehrenb. var. **arcuatum** (Bréb.) Rabenh.  
No locality (M2).
- Closterium didymotocum** Corda  
Fernside (M).
- Closterium directum** Archer  
Blueskin Bay (N).
- Closterium ehrenbergii** Menegh.  
Christchurch (M1); Ohaeawai (N); Tokano River (N); Hutt Valley (Ma); Otaki (M2).
- ?**Closterium gracile** Bréb. (not typical, near to **C. lundellii**)  
Winton (N); Arthur's Pass (N); Blueskin Bay (N); Bluff (N); Taupo (N); Otaki (M2).
- Closterium intermedium** Ralfs  
Otaki (M2).
- Closterium jenneri** Ralfs  
Hawke's Bay (M2); Hutt Valley (Ma).
- Closterium juncidum** Ralfs  
Christchurch (M); Hutt Valley (Ma).
- Closterium kutzingii** Bréb.  
Blueskin Bay (N); Winton (N); Taupo (N); Hutt Valley (Ma); Otaki (M2).
- Closterium kutzingii** Bréb. var. **vittatum** Nordst.  
Taupo (N).
- Closterium lanceolatum** Kütz.  
Hawke's Bay (S); Hutt Valley (Ma).

- Closterium leibleinii** Kütz.  
Christchurch (M); Hutt Valley (Ma).
- Closterium linea** Perty  
Hutt Valley (Ma).
- Closterium lineatum** Ehrenb.  
Christchurch (M); Hutt Valley (Ma).
- Closterium lineatum** Ehrenb. var. *sandvicense* Nordst.  
Hawke's Bay (M2); Otaki (M2); Blueskin Bay (N).
- Closterium lunula** (Muell.) Nitzsch.  
Christchurch (M); Arahura (N); Teremakau (N); Bay of Islands (N); Papanui (N); Hutt Valley (Ma).
- Closterium lunula** (Muell.) Nitzsch. var. *coloratum* Klebs.  
Castle Hill (N); Otaki (M2).
- Closterium moniliferum** (Bory) Ehrenb.  
Hawke's Bay (S); Waimakariri River (N); Hutt Valley (Ma).
- Closterium praelongum** Bréb.  
Kaitoke (M2).
- Closterium praelongum** Bréb. f. *brevius* Nordst.  
Lake Lyndon (N); Teremakau (N); Arahura (N); Blueskin Bay (N).
- Closterium rostratum** Ehrenb.  
Christchurch (M); Hawke's Bay (S); Hutt Valley (Ma).
- Closterium selenaeum** Mask.  
Otaki (M2).
- Closterium setaceum** Ehrenb.  
Christchurch (M); Blueskin Bay (N); Lake Sarah (F); Hutt Valley (Ma).
- Closterium striolatum** Ehrenb.  
Christchurch (M); Blueskin Bay (N); Rotomahana (N); Otaki (M2).
- Closterium venus** Kütz.  
Christchurch (M1 and M2).

## COSMARIAE

- Arthrodesmus convergens** Ehrenb.  
Hawke's Bay (M1); Taupo (N); Hutt Valley (Ma).
- Arthrodesmus convergens** Ehrenb. var. *divaricatus* Mask.  
Hawke's Bay (M2); Taupo (N); Otaki (M2).
- Arthrodesmus incus** (Bréb.) Hass. f. *a, b, c* and *d*.  
Hawke's Bay (M1); Omatangi (N); Hutt Valley (Ma); Otaki (M2).
- Arthrodesmus incus** (Bréb.) Hass. var. *intermedius* Wittr.  
Omatangi (N).
- Arthrodesmus phimus** Turn.  
Lake Sarah (F).
- Cosmarium amoenum** Bréb. var. *mediolaeve* Nordst.  
Arthur's Pass (N); Taupo (N); Orakei-korako (N); Otaki (M2).
- Cosmarium amoenum** Bréb. var. *intumescens* Nordst.  
Arthur's Pass (N).
- Cosmarium ? (Pleurotaeniopsis) amplum** Nordst.  
Hawke's Bay (M2); Christchurch (M1); Otaki (M2); Taupo (N); Tokano (N); Omatangi (N); Tauranga (N).
- Cosmarium amplum** Nordst. f. *trigona* Nordst.  
Tarawera Lake (N).
- Cosmarium arctoum** Nordst.  
Maungaroa (N); Wellington (N); Hawke's Bay (M2); Otaki (M2).
- Cosmarium asphaerosporum** Nordst. var. *productum* Nordst.  
Omatangi (N).

- Cosmarium bioculatum** Bréb. var. **omphalum** Schaarschm.  
Taupo (N); Omatangi (N).
- Cosmarium bioculatum** Bréb. var. **omphalum** f. **depressum** Schaarschm.  
Dunedin (N).
- Cosmarium bireme** Nordst.  
Omatangi (N).
- Cosmarium blyttii** Wille  
Omatangi (N); Hawke's Bay (M2).
- Cosmarium botrytis** Menegh.  
Christchurch (M); Cust Valley (M1); Kohukohu (N); Orakei-korako (N);  
Dunedin (N); Otago (N); Hutt Valley (Ma).
- Cosmarium brasiliensis** Nordst. var. **taphrosporium** Nordst.  
Omatangi (N).
- Cosmarium calcareum** Wittr.  
Hutt Valley (Ma).
- Cosmarium capitulum** Roy & Biss.  
Lake Sarah (F).
- Cosmarium clepsydra** Nordst.  
Hawke's Bay (S).
- Cosmarium confusum** Cooke var. **regularis** Nordst.  
Taupo (N).
- Cosmarium contractum** Kirchn.  
Lake Sarah (F).
- Cosmarium (Pleurotaeniopsis) cucumis** Corda  
Hawke's Bay (S).
- Cosmarium depressum** (Naeg.) Lund  
Lake Sarah (F).
- Cosmarium distichum** Nordst.  
Taupo (N); Omatangi (N).
- Cosmarium exiguum** Arch.  
Arthur's Pass (N); Omatangi (N); Otaki (M2).
- Cosmarium exiguum** Arch. f. **trigona** Nordst.  
Arthur's Pass (N).
- Cosmarium genuosum** Nordst.  
Taupo (N); Otaki (M2).
- Cosmarium granatum** Bréb.  
Christchurch (M); Lake Pearson (N); Lake Lyndon (N); Taupo (N);  
Tokano (N); Omatangi (N); Tauranga (N).
- Cosmarium granatum** Bréb. var. **subgranatum** Nordst.  
Omatangi (N).
- Cosmarium hammeri** Reinsch. var. **subbinale** Nordst.  
Arthur's Pass (N).
- Cosmarium heliosporum** Mask.  
Hawke's Bay (M2).
- Cosmarium holmiense** Lundell var. **minus** Hansg.  
Hawke's Bay (M2).
- Cosmarium impressulum** Elfving  
Christchurch (M & M2).
- Cosmarium (Pleurotaeniopsis) magnificum** Nordst.  
Hawke's Bay (M, & M2); Lake Lyndon (N).
- Cosmarium margaritifera** Menegh.  
Hutt Valley (Ma).
- Cosmarium meneghinii** Bréb  
Otatau River (N); Omatangi (N); Christchurch (M).

- Cosmarium meneghinii** Bréb. var. *laeve* Wille  
Rotomahana (N).
- Cosmarium minutum** Delp. f. *novizelandica* Nordst.  
Otatau River (N); Omatangi (N); Orakei-korako (N); Hawke's Bay (M2).
- Cosmarium moniliforme** (Turp.) Ralfs  
Christchurch (M).
- Cosmarium moniliforme** (Turp.) Ralfs var. *panduriformis* West  
Lake Sarah (F).
- Cosmarium naegelianum** Bréb var. *latum* Mask.  
Christchurch (M & M2); Hawke's Bay (M2); Otaki (M2); (also two forms from Orakei-korako, N?).
- Cosmarium nasutum** Nordst var. *subnasutum* (Rac.) Nordst.  
Arthur's Pass (N).
- Cosmarium nitidulum** De Not.  
Taupo (N); Rotomahana (N); Otaki (M2); (also possibly from Lake Lyndon, Tokano, Omatangi, Orakei-korako (N)).
- Cosmarium norimbergense** Reinsch.  
Tokano (N).
- Cosmarium obliquum** Nordst.  
Arthur's Pass (N); Omatangi (N); National Park (N).
- Cosmarium obsolete** Hantsch var. *punctatum* Jask  
Hawke's Bay (M1); Arthur's Pass (N); Waimakariri River (N); Blueskin Bay (N); Papakauri (N); Otaki (M2).
- Cosmarium ornatum** Ralfs  
Christchurch (M).
- Cosmarium pachydermum** Lund f. *intermedia* Mask.  
Christchurch (M2); Hawke's Bay (M2); Otaki (M2); Kaitoke (M2); Hutt Valley (Ma).
- Cosmarium phaseolus** Bréb.  
Christchurch (M).
- Cosmarium phaseolus** Bréb. var. *stigmatosum* Nordst.  
Omatangi (N).
- Cosmarium pseudoamoenum** Wille var. *basilare* Nordst.  
Omatangi (N).
- Cosmarium (Pleurotaeniopsis) pseudopachydermum** Nordst. (and rec. of *C. Ralfsii* (M))  
Waimakariri River (N); Arthur's Pass (N); Christchurch (N & M2); Lake Lyndon (N); Teremakau (N); Arahura (N); Orakei-korako (N); Hutt Valley (Ma); Otaki (M2)
- Cosmarium pseudopyramidatum** Lund  
Waikato River (N); Omatangi (N); Tauranga (N); Taupo (N); Arthur's Pass (N); Hawke's Bay (M2); Otaki (M2)
- Cosmarium pseudopyramidatum** Lund f. *umbonulatum* Nordst.  
Tokano (N); Rotomahana (N).
- Cosmarium pseudotuberans** Kirchn. var. *angustius* Nordst.  
Omatangi (N).
- Cosmarium punctulatum** Bréb.  
Christchurch (M1); Hawke's Bay (M1); Otaki (M2).
- Cosmarium pusillum** Bréb.  
Christchurch (M1).
- Cosmarium pyramidatum** Bréb.  
Christchurch (M)
- Cosmarium pyramidatum** Bréb f. *major* Nordst.  
Taupo (N); Omatangi (N).

- Cosmarium pyramidatum** Bréb. f. *minor* Nordst.  
 Taupo (N); Omatangi (N); Tauranga (N); Papakauri (N); Blueskin Bay (N); Arthur's Pass (N); Waimakariri River (N).
- Cosmarium quadrifarium** Lundell f. *hexasticha* Nordst. and  
**Cosmarium quadrifarium** Lundell f. *octosticha* Nordst.  
 Waimakariri River (N); Arthur's Pass (N); Blueskin Bay (N); Papakauri (N); Taupo (N); Omatangi (N); Tauranga (N).
- Cosmarium quadrifarium** Lundell var. *gemmulatum* Mask.  
 Otaki (M2).
- Cosmarium (Pleurotaeniopsis) quaternarium** Nordst. var. *tumefactum* Nordst.  
 Christchurch (M2); Omatangi (N).
- Cosmarium rectangulare** Grün.  
 Lake Sarah (F).
- Cosmarium regnesi** Reinsch. var. *ornatum* Mask.  
 Christchurch (M2).
- Cosmarium reniforme** (Ralfs) Archer var. *compressum* Nordst.  
 Christchurch (M2); Arthur's Pass (N); Lake Lyndon (N); Omatangi (N).
- Cosmarium repandum** Nordst.  
 Maungaroa (N); Omatangi (N); Hawke's Bay (M2).
- Cosmarium retusum** Rabenh. var. *laeve* Roy & Biss.  
 Hawke's Bay (M2); Otaki (M2).
- Cosmarium scenedesmus** Delp. var. *dorsitruncatum* Nordst.  
 Omatangi (N).
- Cosmarium sexangulare** Lund f. *minimum* Nordst.  
 Taupo (N); Omatangi (N); Hawke's Bay (M2); Otaki (M2).
- Cosmarium sportella** Bréb.  
 Hutt Valley (Ma).
- Cosmarium sublatum** Nordst.  
 Christchurch (M2); Lake Pearson (N); Lake Lyndon (N); Auckland (N);  
 Teremakau (N); Arahura (N); Otaki (M2).
- Cosmarium subcyclicum** Mask.  
 Lyttelton (M1 & M2).
- Cosmarium sublobatum** (Bréb.) Archer  
 Hawke's Bay (M2).
- Cosmarium sublatum** (Bréb.) Archer var. *brevisinuosum* Nordst.  
 Omatangi (N); Otaki (M2).
- Cosmarium subjunctulatum** Nordst.  
 Omatangi (N); Tauranga (N); Orakei-korako (N); Lyttelton (M1 & M2);  
 Otaki (M2).
- Cosmarium subspeciosum** Nordst. var. *validius* Nordst. (= *inflatum* Mask.)  
 Waimakariri River (N); Arthur's Pass (N); Lake Lyndon (N); Auckland  
 (N); Omatangi (N); Christchurch (M1 & M2).
- Cosmarium tatricum** Racit. var. *novizelandicum* Nordst.  
 Waikato River (N); Omatangi (N).
- Cosmarium tenue** Mask.  
 Christchurch (M1).
- Cosmarium tetraophthalmum** Bréb.  
 Hawke's Bay (M1).
- Cosmarium tinctum** Ralfs  
 Waimakariri River (N); Bluff (N); Taupo (N).
- Cosmarium tinctum** Ralfs var. *intermedium* Nordst.  
 Omatangi (N).
- Cosmarium tinctum** Ralfs f. *trigonum* Nordst.  
 Arthur's Pass (N).



- Cosmarium trilobulatum** Reinsch. var. **basichondrum** Nordst.  
Otaki (M2); Omatangi (N).
- Cosmarium (Pleurotaeniopsis) turgidum** Bréb.  
Orakei-korako (N); Hutt Valley (Ma); Otaki (M2).
- Cosmarium (Pleurotaeniopsis) turgidum** Bréb. var. **ovatulum** Nordst.  
Kororareka (N).
- Cosmarium turnerianum** Mask.  
Hawke's Bay (M2).
- Cosmarium variabile** Mask.  
Hawke's Bay (M2); Otaki (M2).
- Cosmarium variolatum** Lund. var. **extensum** Nordst.  
Omatangi (N); Waikato (N); National Park (N).
- Cosmarium venustum** (Bréb.) Arch. var. **induratum** Nordst.  
Arthur's Pass (N); Otaki (M2).
- Desmidium aptogonium** Bréb.  
Hawke's Bay (M1).
- Desmidium baileyi** (Ralfs) De Bary var. **undulatum** Mask.  
Christchurch (M); Papakauri (N); Omatangi (N); Otaki (M2).
- Desmidium coarctatum** Nordst.  
Taupo (N).
- Desmidium swartzii** Ag. var. **ralfsii** Raben.  
Hawke's Bay (M1); Blueskin Bay (N); Hutt Valley (N); Papakauri (N);  
Taupo (N); Omatangi (N).
- Disphinctium annulatum** Näg. var. **elegans** Nordst.  
Arthur's Pass (N); Taupo (N); Waikato River (N); Omatangi (N); Ruapehu  
(N); Tongariro (N).
- Disphinctium cruciferum** (De Bary) Hansg.  
Invercargill (N).
- Disphinctium cucurbita** Reinsch.  
Hutt Valley (Ma)
- Disphinctium curtum** Reinsch. var. **attenuatum** Bréb.  
Otaki (M2).
- Disphinctium cylindrus** (Ehrenb.) Näg.  
Taupo (N).
- Disphinctium excavatum** (Nordst.) De Toni  
Omatangi (N).
- Disphinctium quadratum** Hansg.  
Dunedin (N); Otaki (M2)
- Disphinctium pseudoarctoum** (Nordst.) De Toni  
Lake Sarah (F).
- Disphinctium speciosum** Hansg. f. **genuina** Mask.  
Hawke's Bay (M2); Christchurch (M1).
- Disphinctium speciosum** Hansg. var. **simplex** Nordst.  
Hawke's Bay (M2).
- Disphinctium viride** (Corda) De Toni f. **minor** Nordst.  
Otaki (M2) (as *Cos. cordanum* f. *minor*).
- Euastrum ansatum** Ralfs  
Taupo (N); Hawke's Bay (M1); Otaki (M2).
- Euastrum ansatum** Ralfs var. **suprapositum** Nordst.  
Teremakau (N); Arahura (N); Blueskin Bay (N); Kororareka (N); Taupo  
(N); Hokianga (N); Papakauri (N); Waikato River (N); Omatangi (N).
- Euastrum binale** Turp  
Christchurch (M & M2); Taupo (N); Tokano (N)

- Euastrum cuneatum** Jennor var. **solum** Nordst.  
Omatangi (N); Otaki (M2).
- Euastrum denticulatum** Gay  
Hawke's Bay (M2); Christchurch (M & M2); Taupo (N); Tokano (N);  
Omatangi (N).
- Euastrum elegans** Kütz. var. **medianum** Nordst.  
Waikato R. (N).
- Euastrum expansum** Mask.  
Christchurch (M2).
- Euastrum holocystoides** Nordst.  
Omatangi (N).
- Euastrum incrassatum** Nordst.  
Waikato R. (N); Omatangi (N).
- Euastrum irregulare** Mask.  
Kaitoke (M2); Otaki (M2); Masterton (M2).
- Euastrum longicolle** Nordst.  
Otaki (M2); Taupo (N); Omatangi (N).
- Euastrum mammatum** Mask. f. **major** Mask.  
Hawke's Bay (M2).
- Euastrum mammatum** Mask. f. **minor** Mask.  
Otaki (M2).
- Euastrum multigibberum** Nordst.  
Ohaeawai (N); Taupo (N); Omatangi (N).
- Euastrum rostratum** Ralfs var. **praemorsum** Nordst.  
Taupo (N).
- Euastrum rotundum** Mask.  
Otaki (M2).
- Euastrum sinuosum** Lenorm.  
Teremakau (N); Arahura (N); Kelly's Range (N); Omatangi (N).
- Euastrum sinuosum** Lenorm. f. **major** Mask.  
Otaki (M2); Hawke's Bay (M2).
- Euastrum sinuosum** Lenorm. f. **minor** Mask.  
Otaki (M2).
- Euastrum sphyroides** Nordst.  
Taupo (N); Omatangi (N); Otaki (M2).
- Euastrum undulosum** Mask.  
Hawke's Bay (M2).
- Gymnozyga moniliformis** Ehrenb.  
Teremakau (N); Arahura (N); Papakauri (N); Taupo (N); Tauranga (N);  
Otaki (M2).
- Hyalotheca dissiliens** Bréb.  
Christchurch (M); Dunedin (N); Bluff (N); Winton (N); Maungaroa (N);  
Ohaeawai (N); Kororareka (N); Kohukohu (N); Papakauri (N); Taupo (N);  
Hutt Valley (Ma); Otaki (M2); Mercer swamp (T) †; Cambridge Lake (C, T.) †.
- Hyalotheca dissiliens** Bréb. f. **bidentula minor** Nordst.  
Waimakariri River (N); Omatangi (N).
- Hyalotheca dissiliens** Bréb. f. **bidentula major** Nordst.  
Waimakariri R. (N); Arthur's Pass (N); Teremakau (N); Arahura (N);  
Waitati River (N); Bluff (N); Invercargill (N); Hutt Valley (N); Wellington (N).
- Hyalotheca dissiliens** Bréb. f. **tridentula** Nordst.  
Invercargill (N); Hutt Valley (N).
- Hyalotheca dubia** Kütz.  
Hawke's Bay (S).

- Hyalotheca hians** Nordst.  
Omatangi (N); Otako (N2).
- Micrasterias angulosa** Hantsch.  
Teremakau (N); Arahura (N).
- Micrasterias decemdentata** Näg. var. **upsaliensis** Lund. (as **Holocystis incisa**)  
Christchurch (M); Otaki (M2).
- ?**Micrasterias denticulata** Bréb.  
Christchurch (M).
- Micrasterias denticulata** Bréb. var. **notata** Nordst.  
Arthur's Pass (N); Christchurch (M); Omatangi (N); Waimakariri R. (N).
- Micrasterias euastroides** Josh var. **indivisa** Nordst.  
Omatangi (N).
- Micrasterias jenneri** Ralfs var. **subdenticulata** Nordst.  
Taupo (N).
- Micrasterias mahabuleshwariensis** Hobs. var. **ampullacea** Mask.  
Christchurch (M); Teremakau (N); Arahura (N); Auckland (N); Tokano (N).
- Micrasterias papillifera** Bréb. var. **evoluta** Nordst.  
Papakauri (N); Taupo (N); Otaki (M2)
- Micrasterias oscitans** Ralfs var. **pinnatifida** (Kütz.) Rabenh.  
Hawke's Bay (S).
- Micrasterias rotata** Ralfs  
Hutt Valley (Ma).
- Micrasterias schweinfurthii** Cohn (as **M. rotata**)  
Kororareka (N); Christchurch (M1 and M2).
- Micrasterias thomasiana** Archer  
Christchurch (M).
- Onychonema filiforme** (Ehrenb.) Roy et Biss  
Hawke's Bay (M2); Christchurch (M2); Otaki (M2); Omatangi (N).
- Phymatodocis nordstetianum** Wolle var. **novizelandicum** Nordst.  
Papakauri (N); Otaki (M2).
- Pleurotaenium clavatum** De Bary  
Christchurch (M).
- Pleurotaenium ehrenbergii** (Ralfs) Delp.  
Lake Lyndon (N); Teremakau (N); Arahura (N); Outakura (N); Kohukohu (N); Blueskin Bay (N); Hokianga (N); Taupo (N); Omatangi (N); Hutt Valley (Ma); Otaki (M2)
- Pleurotaenium indicum** (Grün.) Lund. var. **caracasianum** Nordst.  
Invercargill (N).
- Pleurotaenium nodosum** (Bail.) Lund.  
Papakauri (N); Taupo (N); Omatangi (N); Otaki (M2).
- Pleurotaenium ovatum** Nordst.  
Bay of Islands (N); Paeroa (N); Kororareka (N); Orakei-korako (N); Christchurch (M and M2).
- Pleurotaenium ovatum** Nordst. var. **tumidum** Mask.  
Otaki (M2).
- Pleurotaenium rectum** Delp. f. **minus** Wille  
Arthur's Pass (N); Taupo (N); Tauranga (N); Otaki (M2)
- Pleurotaenium trabecula** (Ehrenb) Näg.  
Christchurch (M)
- Pleurotaenium truncatum** (Bréb) Näg  
Blueskin Bay (N); Hutt Valley (Ma)
- Sphaeroszoma compressum** Mask.  
Otaki (M2)

**Sphaeroszoma excavatum** Ralfs

Christchurch (M); Hawke's Bay (M2); Otaki (M2); Western Springs (T).†

**Sphaeroszoma formosum** Mask.

Hawke's Bay (M2).

**Sphaeroszoma granulatum** Roy et Biss.

Dunedin (N); Otaua R. (N).

**Sphaeroszoma pulchellum** (Arch.) Raben.

Hutt Valley (Ma).

**Sphaeroszoma pulchrum** (Arch.) Raben. var. *bambusinoides* (Wittr.) Lund.

Omatangi (N); Otaki (M2).

**Sphaeroszoma pulchrum** Bailey

Hawke's Bay (M1).

**Sphaeroszoma vertebratum** (Bréb.) Ralfs

Christchurch (M).

**Spondylosium papillosum** W. & G. S. West

Hutt Valley (Ma).

**Staurastrum alternans** Bréb.

Christchurch (M1); Dunedin (N).

**Staurastrum alternans** Bréb. var. *subalternans* Mask.

Christchurch (M2); Hawke's Bay (M1 and M2).

**Staurastrum amoenum** Hilse var. *tumidiusculum* Nordst.

Waikato (N).

**Staurastrum anatinum** Cooke & Wills var. *lagerheimii* (Schmidle) W. & G. S.

West

Lake Sarah (F).

**Staurastrum assurgens** Nordst.

Lake Pearson (N).

**Staurastrum avicula** Bréb. var. *subarctuum* West

Lake Sarah (F).

**Staurastrum bieneanum** Rabenh. f. *minor* Mask.

Hawke's Bay (M2); Wellington (M2); Otaki (M2).

**Staurastrum brachiatum** Ralfs var. *gracilius* Mask

Otaki (M2).

**Staurastrum clepsydra** Nordst.

Lake Sarah (F).

**Staurastrum coarctatum** Bréb. var. *subcurtum* Nordst.

Kohukohu (N); Omatangi (N).

**Staurastrum connatum** (Lund.) Roy & Biss.

Lake Sarah (F).

**Staurastrum connatum** (Lund.) Roy & Biss. var. *spencerianum* Nordst.

Hawke's Bay (M1 and M2); Omatangi (N); Tauranga (N); Otaki (M2).

**Staurastrum contortum** Delp. var. *pseudotetracerum* Nordst.

Dunedin (N).

**Staurastrum corniculatum** Lund. var. *variabile* Nordst.

No locality (N); Otaki (M2).

**Staurastrum cuspidatum** Bréb.

Christchurch (M1); Hawke's Bay (M1); Lake Pearson (N).

**Staurastrum dejectum** Bréb.

Christchurch (M); Hutt Valley (Ma).

**Staurastrum dejectum** Bréb. var. *patens* Nordst.

Dunedin (N); Otaki (M2).

**Staurastrum dickiei** Ralfs

Lake Sarah (F); Hutt Valley (Ma).

- Staurastrum dickiei** Ralfs var. **parallelum** Nordst.  
Dunedin (N); Auckland (N).
- Staurastrum dilatatum** Ehrenb.  
Christchurch (M1 and M2); Hawke's Bay (M1 and M2); Otaki (M2); Wellington (M2).
- Staurastrum dilatatum** Ehrenb. var. **obtusilobum** De Not.  
Omatangi (N); Waimakariri R. (N).
- Staurastrum dorsuosum** Nordst.  
Waikato (N); Omatangi (N); National Park (N).
- Staurastrum eustephanum** (Ehrenb.) Ralfs var. **emarginatum** Mask.  
Christchurch (M1); Hutt Valley (Ma).
- Staurastrum furcatum** (Ehrenb.) Bréb. forma.  
Hawke's Bay (M2).
- Staurastrum furcigerum** Bréb.  
Hawke's Bay (M1).
- Staurastrum gracile** Ralfs  
Christchurch (M); Hutt Valley (Ma).
- Staurastrum hexacerum** (Ehrenb.) Wittr. (= **S. tricornis** Menegh.)  
Hawke's Bay (S); Hutt Valley (N); Maungaroa (N); Wellington (N).
- Staurastrum inconspicuum** Nordst.—f. **gracilior** Mask.  
Otaki (M2).
- Staurastrum lanceolatum** Archer  
Hutt Valley (Ma).
- Staurastrum lunatum** Ralfs  
Lake Sarah (F).
- Staurastrum manfeldtii** Delp. var. **annulatum** West  
Lake Sarah (F).
- Staurastrum muricatum** Bréb.  
No locality (Grünow, 1867).
- Staurastrum muticum** Bréb.  
Christchurch (M); Hutt Valley (Ma); Otaki (M2).
- Staurastrum orbiculare** (Ehrenb.) Ralfs  
Christchurch (M); Lake Sarah (F).
- Staurastrum orbiculare** (Ehrenb.) Ralfs var. **depressum** Roy et Biss.  
Taupo (N).
- Staurastrum paradoxum** Meyer  
Dunedin (N).
- Staurastrum pileatum** Delp. var. **inflatum** Mask.  
Otaki (M2).
- Staurastrum polymorphum** Bréb.  
Christchurch (M).
- Staurastrum proboscidium** (Bréb.) Archer var. **altum** Boldt.  
Omatangi (N); Hutt Valley (Ma).
- Staurastrum pseudoassurgens** Mask.  
Otaki (M2).
- Staurastrum pseudoligacanthum** Mask.  
Otaki (M2).
- Staurastrum pseudosebaldi** Wille var. **tonsum** Nordst.  
Taupo (N); Omatangi (N); Tauranga (N); Otaki (M2).
- Staurastrum pterosporum** Lund  
Omatangi (N).
- Staurastrum punctulatum** Bréb.  
Christchurch (M1); Lake Pearson (N); Hutt Valley (Ma).

- Staurastrum renardi** Reinsch  
Dunedin (N); Hawke's Bay (M2).
- Staurastrum sagittarium** Nordst.  
No locality (N); Hawke's Bay (M2); Otaki (M2).
- Staurastrum sebaldi** Reinsch  
Lake Sarah (F).
- Staurastrum sebaldi** Reinsch var. **ornatum** Nordst. f. **novi-zelandica** Nordst.  
Taupo (N); Omatangi (N); Tauranga (N); Hawke's Bay (M2); Otaki (M2).
- Staurastrum sexangulare** (Bulnh.) Lund.  
Lake Sarah (F).
- Staurastrum sexangulare** (Bulnh.) Lund. var. **productum** Nordst.  
Omatangi (N); Otaki (M2).
- Staurastrum spinuliferum** Mask.  
Hawke's Bay (M2).
- Staurastrum splendidum** Mask.  
Christchurch (M2); Hawke's Bay (M2); Bryndwr (M1).
- Staurastrum striolatum** (Näg.) Archer var. **acutius** Mask.  
Hawke's Bay (M2).
- Staurastrum subamoenum** Mask.  
Hawke's Bay (M2).
- Staurastrum subdenticulatum** Nordst.  
Christchurch (M1); Auckland (N); Hawke's Bay (M2); Otaki (M2).
- Staurastrum tetracerum** (Kütz.) Ralfs  
Christchurch (M); Otaki (M2).
- Staurastrum tohopekaligense** Wille var. **trifurcatum** West  
Lake Sarah (F).
- Staurastrum tumidum** Bréb.  
Lake Sarah (F).
- Staurastrum ventricosum** Delp  
Christchurch (M2); Wellington (M2); Kaitoke (M2); Hawke's Bay (M2).
- Triploceras gracile** Bail.  
Taupo (N); Omatangi (N); Tauranga (N).
- Triploceras gracile** Bail. var. **aculeatum** Nordst.  
Taupo (N); Omatangi (N); Otaki (M2).
- Triploceras gracile** Bail. var. **bidentatum** Nordst. f. **laticeps** Nordst.  
Taupo (N); Otaki (M2).
- Triploceras gracile** Bail. var. **bidentatum** Nordst. f. **intermedium** Nordst.  
Papakauri (N); Omatangi (N).
- Triploceras tridentatum** Mask.  
Christchurch (M and M2).
- Triploceras tridentatum** Mask. var. **cylindricum** Mask.  
Bryndwr (M1); Hawke's Bay (M1 and M2).
- Triploceras verticillatum** Bail var. **superbum** (Mask.) Nordst.  
Paeroa (N); Wainui-o-mata (M1); Orakei-korako (N); Otaki (M2).
- Xanthidium aculeatum** Ehrenb.  
Hawke's Bay (M1).
- Xanthidium armatum** Bréb. var. **basidentatum** Nordst.  
Taupo (N); Omatangi (N); National Park (N); Otaki (M2)
- Xanthidium cristatum** Bréb.  
Hawke's Bay (M1).
- Xanthidium dilatatum** Nordst.  
Kelly's Range (N); Otaki (M2)
- Xanthidium fasciculatum** Ehrenb. var. **perornatum** Nordst.  
Omatangi (N); Hawkes Bay (M).

**Xanthidium fasciculatum** Ehrenb. var. **perornatum** Nordst. f. **supernumeraria** Nordst.

Taupo (N); Omatangi (N); Tauranga (N); Otaki (M2).

**Xanthidium hastiferum** Turner var. **inevolutum** Nordst.

Taupo (N).

**Xanthidium inchoatum** Nordst.

Taupo (N); Omatangi (N).

**Xanthidium intermedium** Mask.

Otaki (M2).

**Xanthidium octonarium** Nordst.

Omatangi (N); Otaki (M2).

**Xanthidium simplicius** Nordst.

Taupo (N); Omatangi (N); Otaki (M2).

**Xanthidium smithii** Arch. var. **variabile** Nordst.

Arthur's Pass (N); Teremakau (N); Arahura (N); Otaki (M2).

## CHARALES

*Characeae*

This list is primarily based upon Nordstet (1880) and Mason (1956).

- |  |    |                       |   |
|--|----|-----------------------|---|
| 1. Oogonium with corona of 5 bicellular rays | .. | <i>Nitella</i>        | 2 |
| Oogonium with corona of 5 unicellular rays   |    |                       |   |
| 2. Dioecious                                 |    | <i>Chara</i> spp.     | 3 |
| Monoecious                                   |    |                       |   |
| 3. Oogonium above antheridium                |    | <i>Chara</i> spp.     |   |
| Oogonium below antheridium                   |    | <i>Lamprothamnion</i> |   |

**Chara australis** A. Br. v. **australis** Mason

Whatipu; widespread in North Island.

**Chara australis** A. Br. var. **veillardii** Braun

Possibly widespread.

**Chara braunii** Gmelin

No locality (Mason, 1956).

**Chara contraria** Br. ex Kütz. var. **behriana** A. Br. (= *C. contraria* Hook.)

No locality, North Island.

**Chara fibrosa** Ag. ex Bruzelius subsp. **gymnopitys** (A. Br.) Zaneveld var. **acanthopitys** (A. Br.) Zaneveld

Lake Tarawera to Mongonui; Lake Ianthe; Lake Sarah; Bruce Bay (Mason, 1956).

**Chara globularis** Thuillier var. **capillacea** (Thuillier) Zaneveld (= *C. fragilis* Desv.)

Whatipu; Tarawera (N); widespread.

**Chara vulgaris** Vaillant ex Linn. (= *C. foetida* A. Br. in Hooker, 1867).

North Island (Mason, 1956).

**Lamprothamnion macropogon** (A. Br.) Ophel (= *Chara macropogon* A. Br.)

Wellington to Timaru, in coastal lagoons.

**Nitella conformis** Nordst.

Lake Pearson (N).

**Nitella hookeri** A. Br.

Widespread

**Nitella hookeri** A. Br. var. **attenuata** Nordst.

Tauranga; Winton; Ohacawai and elsewhere.

**Nitella hookeri** A. Br. var. **microcephala** Nordst.

Otau R (N).

**Nitella hyalina** (DC) Ag var. **novae-zeelandiae** A Br

Okataina; Karekare; Tarawera; Lake Pupuke and elsewhere

**Nitella leonhardii** Wood (= *N. interrupta* A. Br.)

Waikato, North of lat. 39° S; Westport district (Mason)

**Nitella leptosoma** Nordst.

Omatangi; Taupo (N).

**Nitella mucosa** (Nordst.) I. Groves (= *N. pseudoflabellata* A. Br. f. *mucosa* Nordst.)

Waitangi R (N); Tauranga (N); North of latitude 38° S (Mason, 1956).

**Nitella stuartii** A. Br.

Thames; near Kaitaia (Mason, 1956).

**Nitella tricellularis** Nordst.

Lake Pearson (N); lakes in middle region, Waimakariri R. (Mason, 1956).

## DINOPHYCEAE\*

- |  |       |                      |   |
|--|-------|----------------------|---|
| 1. Motile  | ...   | ...                  | 2 |
| Non-motile   | ..... | .....                |   |
| 2. Cells without walls; membrane not divided into plates |       | <i>Dinococcales</i>  |   |
| Cells with walls; membrane with plates                   | ...   | <i>Gymnodiniales</i> |   |
|  |       | <i>Perediniales</i>  |   |

## GYMNODINIALES

- |   |                    |
|---|--------------------|
| 1. Horizontal furrow near median part of cell | <i>Gymnodinium</i> |
| Horizontal furrow near hinder end of cell     | <i>Massartia</i>   |

**Gymnodinium aeruginosum** Stein

Waikato R., Mercer (T)†; Mercer swamps (T)†; Hutt Valley (Ma).

\***Gymnodinium bohemicum** Fott

Mercer swamp (T).

\* No member of the Dinocapsales has so far been recorded from New Zealand unless *Urococcus cryptophilus* (p. 700) belongs here.\***Massartia vorticella** (Stein) Schiller

Western Springs (T); Milford (T); Albany (T).

\***Massartia hyperxanthoides** Harris

Rangiriri swamp (T); Western Springs (T).

## PEREDINIALES

- |   |  |   |
|---|--|---|
| 1. Cell wall generally firm, polygonal plates not obvious | <i>Glenodiniaceae</i>                  | 2 |
| Cell wall with armoured plates                            |  |   |
| 2. Cells without large protuberances                      |  | 3 |
| Cells with large protuberances                            | <i>Ceratiaceae</i> ( <i>Ceratium</i> ) |   |
| 3. Cells mostly rounded-oval                              | <i>Glenodiniopsidaceae</i>             |   |
| Cells mostly spherical or ellipsoidal, strongly armoured  | <i>Perediniaceae</i>                   |   |
|   | ( <i>Peredinium</i> )                  |   |

*Glenodiniopsidaceae*

- |   |                       |   |
|---|-----------------------|---|
| 1. Horizontal furrow surrounds entire cell  |                       | 2 |
| Horizontal furrow goes around half the cell | <i>Hemidinium</i>     |   |
| 2. Thecal plates less than 50               | <i>Glenodiniopsis</i> |   |
| Thecal plates more than 50                  | <i>Woloszynskia</i> . |   |

*Glenodiniaceae*

- |                    |                      |
|--------------------|----------------------|
| 1. Plates distinct | <i>Sphaerodinium</i> |
| Plates indistinct  | <i>Glenodinium</i>   |

*Glenodiniopsidaceae*\***Woloszynskia ordinata** (Skuja) Thompson

Rangiriri swamp (T).

\***Hemidinium nasutum** Stein

Albert Park fountain (T); Mercer swamp (T).

\***Glenodiniopsis uliginosa** (Schilling) Wolosz.

Mercer swamp (T).

*Glenodiniaceae*\***Glenodinium penardii** Lemm.

Pool in grounds, Massey College (C, T); Devonport (T).



- \**Glenodinium pygmaeum* (Lindem.) Schiller  
Devonport fountain (T).
- \**Glenodinium quadridens* (Stein) Schiller  
Western Springs (T); Mercer swamp (T); Devonport (T).
- \**Sphaerodinium cinctum* (Ehrenb.) Wolosz.  
Lake Whangape (T); Mercer swamp (T); Western Springs (T).

*Perediniaceae*

- Peridinium cinctum* (O.F.M.) Ehrenb.  
Lake Sarah (F); Hutt Valley (Ma); Pool in grounds, Massey College (C, T)†;  
Mercer swamp (T)†; Dunedin (T, T)†.
- Peridinium elpatiewsky* (Ostenf.) Lemm.  
Lake Sarah (F).
- \**Peridinium inconspicuum* Lemm.  
Cambridge Lake (C, T).
- \**Peridinium umbonatum* Stein  
Pool in grounds, Massey College (C, T).
- \**Peridinium valzii* Lemm.  
Rangiriri swamp (T).
- \**Peridinium wierjeskii* Wolosz.  
Waikato R., Mercer (T).
- \**Peridinium willei* Huitf.-Kaas.  
Mercer swamp (T).

*Ceratiaceae*

- \**Ceratium hirundinella* (O.F.M.) Schrank.  
Mercer, Waikato R., (T); Pupuke Lake (T).

## DINOCOCCALES

- |  |                      |   |
|--|----------------------|---|
| 1. Cells free-floating or loose-lying, ellipsoidal, lunate or arcuate        |                      | 4 |
| Cells attached, transversely ellipsoid or inversely triangular in front view |                      | 2 |
| 2. Cells oval, attached by a long stalk                                      | <i>Stylodinium</i>   | 3 |
| Cells tetrahedral or ellipsoid, attached by a short stalk                    |                      |   |
| 3. Cells triangular or tetrahedral   | <i>Tetradinium</i>   |   |
| Cells ellipsoid  | <i>Raciborskia</i>   |   |
| 4. Cells with horns at the ends  | <i>Cystodinium</i>   |   |
| Cells without horns, ends rounded  |                      | 5 |
| 5. Cells asymmetrical  | <i>Cystodinedria</i> |   |
| Cells symmetrical  | <i>Phytodinium</i>   |   |

*Cystodiniaceae*

- \**Cystodinedria brunnea* Pascher  
Lake Whangape (T).
- \**Cystodinium iners* Geitler  
Rangiriri Swamp (T); Mercer swamp (T); Western Springs (T).
- \**Stylodinium longipes* Thompson  
Western Springs (T); Rangiriri (T).
- \**Tetradinium javanicum* Klebs  
Western Springs (T).
- \**Raciborskia oedogonii* (P. Richter) Pascher  
Mercer swamp (T); Western Springs (T); Middlemore (T).

*Phytodiniaceae*

- \**Phytodinium simplex* Klebs  
Massey (C, T).

## XANTHOPHYCEAE

(Based upon Pascher, 1939, except that *Vaucheria* is added)

- |   |                   |   |
|---|-------------------|---|
| 1. Cells motile or in dendroid or palmelloid colonies | Heterochloridales | 2 |
| Cells attached  |                   |   |
| 2. Attached unicells                                  | Heterococcales    | 3 |
| Thallus filamentous or coenocytic                     |                   |   |
| 3. Filamentous  | Heterotrichales   |   |
| Coenocytic, siphonaceous                              | Heterosiphonales  |   |

## HETEROCHLORIDALES

- |                                      |                      |
|--------------------------------------|----------------------|
| 1. Unicells, epiphytic, stalked      | <i>Stipitococcus</i> |
| Colonial, cells embedded in mucilage | <i>Botryococcus</i>  |

*Heterocapsaceae***Botryococcus braunii** Kütz.

Lake Sarah (F); Mercer swamp (T) †; Cambridge Lake (C, T) †; Albany (T) †.

*Heterorhizidaceae***Stipitococcus urceolatus** G. S. West

Hutt Valley (Ma).

## HETEROCOCCALES

- |  |                         |   |
|--|-------------------------|---|
| 1. Free-living unicells without growth in length                             | Pleurochloridaceae      |   |
| Free-living cells, rectangular or cylindrical, with growth in length         | ( <i>Chlorobotrys</i> ) |   |
| Cells attached, with or without growth in length                             | Centritractaceae        | 2 |
| 2. Two or four celled groups in gelatinous tubes without growth in length    | Mischococcaceae         |   |
| Attached unicells with or without growth in length                           | ( <i>Mischococcus</i> ) | 3 |
| 3. Cells elongate, cylindrical or clavate, wall composed of two pieces       | Chlorotheciaceae        |   |
| Cells elongate, ovoid, pyriform or sickle-shaped, wall composed of one piece | ( <i>Ophiocytium</i> )  |   |
|  | Characiopsidaceae       |   |
|  | ( <i>Characiopsis</i> ) |   |

*Pleurochloridaceae*

- \***Chlorobotrys regularis** (West) Bohlin  
Hospital pond, Middlemore (T).

*Mischococcaceae*

- \***Mischococcus confervicola** Näg.  
Middlemore (T); Dunedin (T, T).

*Chlorotheciaceae*

- Ophiocytium arbuscula** Rabenh.  
Hutt Valley (Ma); Western Springs (T) †.
- Ophiocytium bicuspidatum** Lemm.  
Hutt Valley (Ma).
- Ophiocytium cochleare** (Eichw.) A. Br.  
Blueskin Bay (N); Hutt Valley (N); Kohukohu (N); Taupo (N); Rangiriri (T) †; Dunedin (T, T) †; Western Springs (T) †.
- Ophiocytium majus** Näg.  
Hutt Valley (N); Mercer (T) †.
- Ophiocytium parvulum** Perty.  
Waimakariri R. (N); Teremakau (N); Arahura (N); Bluff (N); Ohaeawai (N).

*Centrtractaceae*

1. Cells with terminal bristles .. *Bumilleropsis*  
 Cells without terminal bristles *Centrtractus*
- \**Centrtractus belonophorus* (Schmidle) Lemm.  
 Western Springs (T); Rangiriri (T).
- \**Bumillariopsis brevis* Printz  
 Western Springs (T).

*Characiopsidaceae*

- \**Characiopsis longipes* (Rab.) Borzi  
 Mercer swamp (T).

## HETEROTRICHIALES

1. Cell walls firm, splitting into H pieces *Tribonema*  
 Cell walls hyaline, H pieces not evident *Neonema*

*Tribonemaceae*

*Neonema pumila* Pascher (= *Bumilleria pumila*)  
 Hutt Valley (Ma).

*Tribonema viride* Pascher (= *T. bombycinum* Derb. & Sol.)

Hawke's Bay (S); Auckland (C, unpub.) †; Hutt Valley (Ma); Le Roys Bush (KWL) †. These records make no reference to any particular form. They probably refer to f. *genuina*.

*Tribonema viride* Pascher f. *genuina* Wille

Waimakariri R. (N); Warrington (N); Ohaeawai (N).

*Tribonema viride* Pascher var. *minor* (Wille) G. S West  
 Hutt Valley (Ma).

*Tribonema viride* Pascher var. *sordida* Kütz.

Lake Lyndon (N)

(According to Pascher, 1939, this may be a species of *Microspora*.)

## HETEROSIPHONALES

1. No special organs of reproduction *Botrydium*  
 Reproduction by oogamy or compound zoospores *Vaucheria* §

*Botrydiaceae*

*Botrydium granulatum* (L.) Grev.

Tokano (N); Mercer (T) †

*Vaucheriaceae*

*Vaucheria dillwynii* Ag.

No locality (Hooker, 1855).

\**Vaucheria geminata* (Vauch.) D C.

Middlemore pool (T)

*Vaucheria sessilis* (Vauch.) D C. var. *hookeri* Kütz.

Waimakariri R. (N); Teremakau (N); Arahura (N); Hutt Valley (N); Blueskin Bay (N); Ruataniwha (S1).

Another near to *Vaucheria terrestris* (Vauch.) Lyngb.

Blueskin Bay (N).

## CHRYSTOPHYCEAE

1. Motile in vegetative state with 1-2 flagellae *Chrysomonadales*  
 Non-motile in vegetative state
2. Amoeboid or with rhizopodal tendencies *Rhizochrysidales*  
 Not amoeboid nor with rhizopodia *Chrysotrichales*

2

§ The biochemistry and cytology of this genus suggest it belongs here rather than to the Siphonales.

CHRYSOMONODALES		
1. Swimming by one flagellum	.. . . . .	2
Swimming by two flagella	.. . . . .	3
2. Cell membrane decorated	.. . . . .	Chromulinaceae
Cell membrane not decorated	.. . . . .	Mallomonadaceae (Mallomonas)
3. Flagella of equal length, lorica absent	.. . . . .	Synuraceae (Synura)
Flagella of unequal length, lorica absent or present	.. . . . .	Ochromonadaceae
<i>Chromulinaceae</i>		
1. Cells naked	.. . . . .	2
Cells with thick sheaths	.. . . . .	Chrysococcus
2. Cells flattened	.. . . . .	Sphaleromantis
Cells not flattened	.. . . . .	Chromulina
<i>Ochromonadaceae</i>		
1. Cells not enclosed in a lorica	.. . . . .	Ochromonas
Cells enclosed in a lorica	.. . . . .	Dinobryon
<i>Chromulinaceae</i>		
* <i>Chromulina flavicans</i> Butschli		
Albany (T); Dunedin (T, T).		
* <i>Chrysococcus rufescens</i> Klebs		
Waikato R., Mercer (T); Albany (T); Mercer Swamps (T).		
* <i>Chrysococcus majus</i> Lackey		
Albany (T); Mercer swamps (T).		
* <i>Sphaleromantis olivacea</i> Pascher		
Western Springs (T); Mercer swamp (T).		
<i>Mallomonadaceae</i>		
* <i>Mallomonas acaroides</i> Perty		
Rangiriri swamp (T); Western Springs (T); Lake Whangape (T); Albany (T).		
<i>Synuraceae</i>		
* <i>Synura uvella</i> Ehrenb.		
Hutt Valley (Ma); Mercer swamps (T)†; Albany (T)†; Rangiriri (T)†;		
Dunedin (T, T)†; Western Springs (T)†.		
* <i>Synura adamsii</i> G. M. Smith		
Western Springs (T).		
<i>Ochromonadaceae</i>		
* <i>Ochromonas crenata</i> Klebs		
Mercer swamp (T); Lake Whangape (T).		
<i>Dinobryon cylindricum</i> Imb.		
Hutt Valley (Ma).		
<i>Dinobryon sertularia</i> Ehrenb.		
Lake Sarah (F); Hutt Valley (Ma); Mercer swamps (T)†; Albany (T)†;		
Lake Pupuke (T)†.		
RHIZOCHRYSIDALES		
<i>Rhizochrysiaceae</i>		
* <i>Chrysopyxis bipes</i> Stein		
Dunedin (T, T)		
CHRYSOTRICHIALES		
<i>Phaeothamniaceae</i>		
* <i>Phaeothamnion confervicolum</i> Lagerh.		
Dunedin (T, T).		
CRYPTOPHYCEAE		
1. Motile	.. . . . .	Cryptomonadales
Non-motile	.. . . . .	Cryptococcales

CRYPTOMONADALES

- |                   |               |
|-------------------|---------------|
| 1. Gullet present | Chroomonas    |
| Gullet absent     | Cryptochrysis |

*Cryptochrysidaceae*

- \***Cryptochrysis commutata** Pascher  
Western Springs (T); Mercer swamps (T).  
\***Chroomonas Nordstedtii** Hansg.  
Mercer swamp (T).

CRYPTOCOCCALES

- \***Tetragonidium verrucatum** Pascher  
Western Springs (T).

CHLOROMONADALES

- \***Gonyastomum semen** (Ehrenb.) Diesing  
Western Springs (T).

BACILLARIOPHYCEAE

- |   |                       |
|---|-----------------------|
| 1. Valves radially symmetrical about a central point                                      | 2                     |
| Valves isobilateral, medianly zygomorphic   | 7                     |
| 2. Cells subspherical or shortly cylindrical, united to long filaments                    |                       |
| Cells disc-shaped and usually solitary  | <i>Melosira</i> 3     |
| 3. Margins of valves striate, centre smooth, punctate or granulate                        | 4                     |
| Margins and centre not distinct   | 5                     |
| 4. Centre smooth or granulate   | <i>Cyclotella</i>     |
| Centre umbilicate, punctate   | <i>Hyalodiscus</i>    |
| 5. Valves divided into alternate light and dark segments                                  | <i>Actinoptychus</i>  |
| Valves uniform in colour  | 6                     |
| 6. Valves with marginal spines  | <i>Stephanodiscus</i> |
| Valves with submarginal spines and a differentiated edge                                  | <i>Coscinodiscus</i>  |
| 7. Frustules without a true raphe, possibly with a raphe in same direction as apical axis | Araphideae            |
| True raphe present, though often difficult to see   | 8                     |
| 8. Raphe rudimentary, developed only at poles of frustules                                | Raphidioideae         |
|   | ( <i>Eunotia</i> ) 9  |
| At least one frustule with well developed raphe   |                       |
| 9. Only one frustule with developed raphe   | Monoraphidimiae       |
| Both frustules with developed raphes  | Biraphidineae         |

CENTRALES

*Discoideae*

- Actinoptychus undulatus** Ralfs  
Green Island, Otago (L)  
**Coscinodiscus lacustris** Grün.  
Green Island, Otago (L).  
**Coscinodiscus radiatus** Ehr.  
Hutt Valley (Ma).  
**Cyclotella kutzingiana** Thw  
Green Island, Otago (L).  
**Cyclotella operculata** (Ag.) Kütz  
Green Island, Otago (L).  
**Cyclotella stelligera** Cleve et Grun  
Whakarewarewa (DF)  
**Hyalodiscus subtilis** Bail.  
Green Island, Otago (L).  
**Melosira arenaria** Moore  
Hutt Valley (Ma).  
**Melosira crenulata** Kütz. var. *ambigua* Grün.  
Whakarewarewa (DF).

- Melosira granulata** (Ehr.) Ralfs var. *angustissima* O. Muell.  
Rotorua, Ohinemutu (DF).
- Melosira granulata** (Ehr.) Ralfs var. *decussata* (Ehr.) Grün.  
Rotorua, Ohinemutu (DF).
- Melosira lyrata** (Ehr. ?) Kütz.  
Whakarewarewa (DF).
- Melosira moniliforme** Müll.  
Green Island, Otago (L).
- Melosira varians** Ag.  
Green Island, Otago (L); Whakarewarewa (DF); Rotorua (DF).
- Melosira orichalcea** (Mert.) Kütz.  
Green Island, Otago (L).
- Stephanodiscus astraea** (Ehr.) Gom. var. *minutulus* (Kütz.) Grün.  
Green Island, Otago (L).
- Stephanodiscus novae-zelandiae** Cleve  
Rotorua, Ohinemutu (DF); Whakarewarewa (DF).

## PENNALES

*Araphideae*

- |   |                     |   |
|---|---------------------|---|
| 1. Cells with strong septa which are parallel to the valvar plane                 | (Tabellariaceae)    | 2 |
| Cells without such conspicuous septa  |                     |   |
| 2. Frustules with strong transapical ribs   |                     | 3 |
| Frustules without strong transapical ribs   |                     | 4 |
| 3. Apical axis isopolar, cells symmetrical  | <i>Diatoma</i>      |   |
| Apical axis heteropolar, cells wedge-shaped                                       | <i>Meridion</i>     |   |
| 4. Valves equally developed at both ends, frustules solitary or colonial          |                     | 5 |
| Valves more swollen at one end than other, frustules forming star-shaped colonies | <i>Asterionella</i> |   |
| 5. Colonies ribbon-like   | <i>Fragilaria</i>   |   |
| Solitary or attached radiating clusters   | <i>Synedra</i>      |   |

- Asterionella gracillima** (Hantsch.) Heib.  
Lake Sarah (F).
- Diatoma elongatum** Ag.  
Lake Sarah (F); Hawke's Bay (S).
- Diatoma vulgare** Bory  
Hawke's Bay (S).
- Diatoma vulgare** Bory var. *grande* (W. Sm) Grün.  
Hawke's Bay (S).
- Fragilaria brevistriata** Grün.  
Lake Sarah (F).
- Fragilaria capucina** Desmaz.  
Hutt Valley (Ma); Green Island, Otago (L); Napier (S1 as *F. pectinalis*).
- Fragilaria construens** (Ehr.) Grün. var. *venter* Grün.  
Lake Sarah (F).
- Fragilaria crotonensis** (Edw.) Kitton  
Lake Sarah (F).
- Fragilaria pinnata** Ehr.  
Green Island, Otago (L).
- Fragilaria virescens** Ralfs  
Lake Sarah (F).
- Meridion circulare** (Grev.) Ag.  
Green Island, Otago (L).
- Meridion constrictum** Ralfs  
Hawke's Bay (S); Green Island, Otago (L).

**Synedra acus** Kütz.

Green Island, Otago (L); Rotorua (DF).

**Synedra affinis** Kütz. var. **fasciculata** (Kütz.) V. H. Syn.

Green Island, Otago (L).

**Synedra delicatissima** W. Sm.

Green Island, Otago (L).

**Synedra goulardi** Bréb.

Whakarewarewa (DF).

**Synedra pulchella** (Ralfs) Kütz.

Hutt Valley (Ma).

**Synedra radians** Kütz.

Hutt Valley (Ma); Green Island, Otago (L).

**Synedra ulna** (Nitzsch.) Ehr.Hutt Valley (Ma); Green Island, Otago (L); Rotorua, Ohinemutu (DF);  
Whakarewarewa (DF).**Synedra ulna** (Nitzsch.) Ehr. var. **Lanceolata** (Kütz.) Grün.

Whakarewarewa (DF).

**Synedra ulna** (Nitzsch.) Ehr. var. **oxyrynchus** (Kütz.) Grün. f. **medioconstricta**  
Forti

Whakarewarewa (DF).

**Synedra vaucheriae** Kütz. var. **parvula** (Kütz.) Rabenh.

Green Island, Otago (L).

*Raphidioideae***Eunotia gracilis** W. Sm.

Green Island, Otago (L).

**Eunotia major** (W. Sm.) Rabenh.

Green Island, Otago (L).

**Eunotia maskellii** (Inglis) nov. comb.

Ngapari (I); Avon R. (Bruce).

**Eunotia pectinalis** (Dillw.) Rabenh.Green Island, Otago (L); Black Lake, Mayor Island (T. C. Chambers and  
I. A. Bayly); Whakarewarewa (DF).**Eunotia serpentina** Ehr.

Whakarewarewa (DF).

**Eunotia veneris** Kütz.

Rotorua, Ohinemutu (DF).

*Monoraphideae*

- |  |  |                      |        |
|--|--|----------------------|--------|
| 1. Girdle view not cuneate   |  |                      |        |
| Girdle view cuneate, valves somewhat clavate                               |  | <i>Rhoicosphenia</i> | .... 2 |
| 2. Valves lanceolate or rod-shaped, frustules usually as stalked epiphytes |  | <i>Achnanthes</i>    |        |
| Valve subcircular or elliptical, frustules attached by flat faces          |  | <i>Cocconeis</i>     |        |

**Achnanthes brevipes** Ag.

Hutt Valley (Ma).

**Achnanthes coarctata** (Bréb.) Grün.

Green Island, Otago (L).

**Achnanthes flexillum** (Kütz.) Bréb.

Hutt Valley (Ma).

**Achnanthes exilis** Kütz.

Green Island, Otago (L).

**Achnanthes inflata** (Kütz.) Grün.

Whakarewarewa (DF).

**Achnanthes lanceolata** (Bréb.) Grün.

Green Island, Otago (L); Whakarewarewa (DF).

- Achnanthes lanceolata** (Bréb.) Grün. var. **dubia** Grün.  
Whakarewarewa (DF).
- Achnanthes lanceolata** (Bréb.) Grün. var. **inflata** A. Mayer  
Whakarewarewa (DF).
- Achnanthes linearis** (W. Sm.) Grün.  
Green Island, Otago (L).
- Achnanthes microcephala** (Kütz.) Grün.  
Hutt Valley (Ma).
- Achnanthes minutissima** Kütz. var. **cryptocephala** Grün.  
Lake Sarah (F).
- Cocconeis pediculus** Ehr.  
Hutt Valley (Ma); Green Island, Otago (L).
- Cocconeis placentula** Ehr.  
Hutt Valley (Ma); Green Island, Otago (L); Lake Sarah (F); Whakarewarewa (DF); Rotorua, Ohinemutu (DF).
- Cocconeis placentula** Ehr. var. **lineata** (Ehr.) H.  
Whakarewarewa (DF).
- Rhoicosphenia curvata** (Kütz.) Grün.  
Hutt Valley (Ma); Green Island, Otago (L); Whakarewarewa (DF).

*Biraphideae*

- |  |                      |    |
|--|----------------------|----|
| 1. Raphe not canalicular   |                      | 7  |
| Raphe canalicular  |                      | 2  |
| 2. Keel points or wing canals missing, or only developed as faint dot lines                      | ..... ..             | 4  |
| Keel points or wing canals very distinct, raphe keel-like and protruding                         | ..... ..             | 3  |
| 3. Keeled canal raphe lying in valvar plane, or only one margin of frustule has keel             | ..... ..             | 5  |
| Keel with canal raphe encircles frustule completely  | ..... ..             | 6  |
| 4. Apical axis straight, raphe not broken in valvar plane  | <i>Denticula</i>     |    |
| Apical axis curved, raphe broken to form an angle in valvar plane                                | <i>Epithemia</i>     |    |
|  | <i>Nitzschia</i>     |    |
|  | <i>Nantzschia</i>    |    |
| 5. Keels of two valves diagonally opposite   |                      |    |
| Keels of the two valves on same girdle face  |                      |    |
| 6. Valves elliptical, linear or ovate; pseudoraphe of valves parallel                            | <i>Surirella</i>     |    |
| Valves circular, frustules saddle-shaped; pseudoraphe of valves at right angles to each other    | <i>Campylodiscus</i> |    |
| 7. Axes isopolar   | ..... ..             | 8  |
| At least one axis heteropolar, sometimes both  | ..... ..             | 14 |
| 8. Cells with distinct intercalary bands and septa   | ..... ..             | 9  |
| Cells without distinct septa   | ..... ..             | 10 |
| 9. Intercalary bands with chambered margin   | <i>Mastogloia</i>    |    |
| Intercalary bands without a chambered margin   | <i>Diatomella</i>    |    |
| 10. Valves sigmoid   | <i>Pleurosigma</i>   |    |
| Valves of another shape  | ..... ..             | 11 |
| 11. Raphe enclosed between two siliceous ribs, frustules lancet-like                             | <i>Frustulia</i>     |    |
| Raphe not enclosed between two siliceous ribs  |                      | 12 |
| 12. Transapical striae smooth and usually crossed on each side by one or more longitudinal lines | <i>Pinnularia</i>    |    |
| Transapical striae punctuated or streaked, not crossed by any longitudinal lines                 | ..... ..             | 13 |
| 13. Central nodule small and rounded   | <i>Navicula</i>      |    |
| Central nodule transversely distended  | <i>Stauroneis</i>    |    |
| 14. Cell body unsymmetrical in relation to transverse plane                                      | <i>Gomphonema</i>    |    |
| Cell body symmetrical in relation to transverse plane  | ..... ..             | 15 |
| 15. Pervalvar axis almost straight; raphe removed from edge of girdle                            | <i>Cymbella</i>      |    |
| Pervalvar axis much curved; raphe near edge of girdle  | <i>Amphora</i>       |    |



- Amphora ovalis** (Bréb.) Kütz.  
Green Island, Otago (L)
- Amphora ovalis** (Bréb.) Kütz. var. **affinis** (Kütz.) V. H.  
Whakarewarewa (DF).
- Campylodiscus echeneis** Ehr.  
Green Island, Otago (L).
- Campylodiscus hibernicus** Ehr. (as *C. costatus*)  
Hutt Valley (Ma); Hawke's Bay (S).
- Cymbella amphicephala** Näg.  
Whakarewarewa (DF).
- Cymbella australica** (A. Schm.) Cleve  
Whakarewarewa (DF).
- Cymbella cesatii** (Rabenh.) Grün.  
Whakarewarewa (DF).
- Cymbella cuspidata** Kütz.  
Green Island, Otago (L).
- Cymbella cymbiforme** (Kütz.) Bréb.  
Hutt Valley (Ma).
- Cymbella cymbiforme** (Kütz.) Bréb. var. **parva** V.H.  
Whakarewarewa (DF).
- Cymbella helvetica** Kütz.  
Green Island, Otago (L).
- Cymbella lanceolata** (Ehr) Kirchn.  
Hutt Valley (Ma).
- Cymbella leptoceras** (Ehr.) Rabenh.  
Green Island, Otago (L).
- Cymbella lindsayana** Grev.  
Green Island, Otago (L).
- Cymbella (Encyonema) ventricosa** Ag.  
Rotorua (DF).
- Epithemia argus** (Ehr.) Kütz.  
Hutt Valley (Ma).
- Epithemia gibba** (Ehr.) Kütz.  
Green Island, Otago (L); Rotorua, Ohinemutu (DF).
- Epithemia gibba** (Ehr) Kütz. var. **ventricosa** Grün.  
Whakarewarewa (DF).
- Epithemia gibberula** Kütz.  
Rotorua, Ohinemutu (DF).
- Epithemia musculus** Kütz.  
Green Island, Otago (L).
- Epithemia sores** Kütz.  
Lake Sarah (F); Green Island, Otago (L); Whakarewarewa (DF).
- Epithemia turgida** (Ehr.) Kütz.  
Green Island, Otago (L).
- Epithemia turgida** (Ehr.) Kütz. var. **westermanniae** (Ehr.) Grün.  
Green Island, Otago (L); Whakarewarewa (DF).
- Epithemia zebra** (Ehr.) Kütz.  
Green Island, Otago (L).
- Denticula frigida** Kütz.  
Green Island, Otago (L).
- Diatomella balfouriana** Grev.  
Green Island, Otago (L).
- Frustulia crassinervia** (Ehr.) De Toni var. **saxonica** Rabenh.  
Green Island, Otago (L).

- Frustulia neglecta** (Thw.) De Toni  
Green Island, Otago (L).
- Frustulia rhomboides** (Ehr.) De Toni  
Lake Sarah (F); Green Island, Otago (L).
- Frustulia rhomboides** (Ehr.) De Toni var. *saxonica* (Rabenh.) De Toni  
Whakarewarewa (DF).
- Frustulia vulgaris** (Thw.) De Toni  
Green Island, Otago (L); Whakarewarewa. (DF).
- Gomphonema acuminatum** Ehr.  
Napier (S1); Hawke's Bay; Hutt Valley (Ma).
- Gomphonema augur** Ehr.  
Green Island, Otago (L).
- Gomphonema constrictum** Ehr.  
Hutt Valley (Ma); Green Island, Otago (L).
- Gomphonema dichotomum** Kütz.  
Green Island, Otago (L).
- Gomphonema geminatum** (Lyng.) Ag.  
Hutt Valley (Ma).
- Gomphonema intricatum** Kütz.  
Green Island, Otago (L).
- Gomphonema parvulum** Kütz.  
Green Island, Otago (L); Whakarewarewa (DF).
- Gomphonema sarcophagus** Greg.  
Green Island, Otago (L).
- Gomphonema vibrio** Ehr.  
Green Island, Otago (L).
- Hantzschia amphioxys** (Ehr.) Grün.  
Lake Sarah (F); Green Island, Otago (L); Rotorua, Ohinemutu (DF).
- Mastogloia melegris** (Kütz.) Grün.  
Green Island, Otago (L).
- Navicula appendiculata** (Ag.) Kütz.  
Green Island, Otago (L); Whakarewarewa (DF).
- Navicula appendiculata** (Ag.) Kütz. var. *budensis* Grün.  
Rotorua (DF).
- Navicula clavicularis** (Greg.) Ralfs  
Green Island, Otago (L).
- Navicula cocconeiformis** Greg.  
Green Island, Otago (L).
- Navicula cuspidata** Kütz. var. *craticula* Ehr.  
Green Island, Otago (L).
- Navicula cryptocephala** Kütz.  
Green Island, Otago (L).
- Navicula elliptica** Kütz.  
Green Island, Otago (L); Whakarewarewa (DF).
- Navicula firma** Kütz.  
Green Island, Otago (L).
- Navicula inflata** Kütz.  
Green Island, Otago (L).
- Navicula iridis** Ehr. var. *dubia* (Ehr.) V.H.  
Whakarewarewa (DF); Rotorua, Ohinemutu (DF).
- Navicula laevissima** Kütz.  
Green Island, Otago (L); Rotorua, Ohinemutu (DF).
- Navicula lanceolata** Kütz.  
Green Island, Otago (L).

- Navicula placentula* (Ehr.) Kütz.  
Whakarewarewa (DF).
- Navicula pupula* Kütz.  
Rotorua, Ohinemutu (DF).
- Navicula rhyncocephala* Kütz. var. *amphiceros* (Kütz.) Grün.  
Whakarewarewa (DF).
- Navicula scita* W. Sm.  
Green Island, Otago (L).
- Navicula serians* (Bréb.) Kütz.  
Hutt Valley (Ma).
- Navicula sphaerophora* Kütz.  
Hutt Valley (Ma); Rotorua, Ohinemutu (DF).
- Navicula sphaerophora* Kütz. f. *guntheri* O. Mull.  
Rotorua, Ohinemutu (DF).
- Navicula sphaerophora* Kütz. f. *rostrata* O. Mull.  
Rotorua (DF).
- Navicula trinodis* W. Sm.  
Green Island, Otago (L).
- Nitzschia amphibia* Grün.  
Rotorua, Ohinemutu (DF).
- Nitzschia angustata* (W. Sm.) Grün.  
Green Island, Otago (L).
- Nitzschia debilis* (A. et R.) Grün.  
Green Island, Otago (L).
- Nitzschia dubia* W. Sm.  
Rotorua (DF).
- Nitzschia fasciculata* Grün.  
Green Island, Otago (L).
- Nitzschia frauenfeldii* Grün.  
Rotorua, Ohinemutu (DF).
- Nitzschia linearis* (Ag.) W. Sm.  
Rotorua, Ohinemutu (DF).
- Nitzschia nova-zelandia* Inglis  
Ngapari (I).
- Nitzschia obtusa* W. Sm. var. *scalpelliformis* Grün.  
Rotorua, Ohinemutu (DF).
- Nitzschia palea* (Kütz.) W. Sm. var. *tenuirostris* Grün.  
Rotorua (DF).
- Nitzschia parvula* W. Sm.  
Green Island, Otago (L).
- Nitzschia sinuata* (W. Sm.) Grün.  
Hutt Valley (Ma).
- Nitzschia spathulata* Bréb.  
Green Island, Otago (L).
- Nitzschia thermalis* (Ehr.) Auersw.  
Rotorua, Ohinemutu (DF).
- Nitzschia tryblionella* Hantzsch.  
Green Island, Otago (L).
- Nitzschia tryblionella* Hantzsch. var. *levidensis* (W. Sm.) Grün.  
Green Island, Otago (L).
- Pinnularia borealis* Ehr.  
Green Island, Otago (L).

- Pinnularia dactylus** Ehr.  
Whakarewarewa (DF).
- Pinnularia divergens** W. Sm.  
Whakarewarewa (DF).
- Pinnularia gibba** Ehr.  
Green Island, Otago (L).
- Pinnularia hartleyana** Grev.  
Whakarewarewa (DF).
- Pinnularia major** W. Sm.  
Green Island, Otago (L); Whakarewarewa (DF).
- Pinnularia mesolepta** Ehr.  
Green Island, Otago (L).
- Pinnularia mesolepta** Ehr. var. *stauroneiformis* Grün.  
Green Island, Otago (L).
- Pinnularia oblonga** Rabenh.  
Hawke's Bay (S).
- Pinnularia parva** (Ehr.) Greg.  
Whakarewarewa (DF).
- Pinnularia peregrina** Ehr.  
Green Island, Otago (L).
- Pinnularia radiosa** W. Sm.  
Green Island, Otago (L); Lake Sarah (F).
- Pinnularia stauroneiformis** W. Sm.  
Green Island, Otago (L).
- Pinnularia stauroptera** (Grün.) Cleve  
Whakarewarewa (DF); Rotorua (DF).
- Pinnularia subcapitata** Grev.  
Green Island, Otago (L).
- Pinnularia viridis** (Nitzch.) Ehr.  
Hutt Valley (Ma); Green Island, Otago (L); Whakarewarewa (DF); Rotorua,  
Ohinemutu (DF).
- Pinnularia viridis** (Nitzch.) Ehr. var. *affinis* (Ehr.) V. H. Syn.  
Green Island, Otago (L).
- Pinnularia viridula** W. Sm.  
Green Island, Otago (L).
- Pleurosigma attenuatum** (Kütz) W. Sm.  
Hawke's Bay (S).
- Pleurosigma balticum** (Ehr.) W. Sm var. *brebissonii* V.H.  
Whakarewarewa (DF).
- Pleurosigma crookii** Inglis  
New Brighton (I).
- Pleurosigma macrum** W. Sm.  
Hawke's Bay (S).
- Pleurosigma obscurum** W. Sm.  
Hutt Valley (Ma).
- Pleurosigma spencerii** (Quek.) W. Sm.  
Hutt Valley (Ma).
- Pleurosigma tenuissimum** W. Sm.  
Hutt Valley (Ma).
- Stauroneis acuta** W. Sm.  
Whakarewarewa (DF).
- Stauroneis anceps** Ehr.  
Green Island, Otago (L); Whakarewarewa (DF).

- Stauroneis gracilis** W. Sm.  
Green Island, Otago (L); Whakarewarewa (DF).
- Stauroneis inflata** Heid.  
Whakarewarewa (DF).
- Stauroneis lineata** Ehr.  
Green Island, Otago (L).
- Stauroneis phoenicenteron** (Nitzsch.) Ehr.  
Lake Sarah (F); Hawke's Bay (S); Green Island, Otago (L).
- Stauroneis platystoma** (Ehr.) Kütz.  
Green Island, Otago (L).
- Stauroneis rotundata** Grev.  
Green Island, Otago (L).
- Stauroneis scaphulaeformis** Grev.  
Green Island, Otago (L).
- Surirella anceps** Lewis  
Rotorua, Ohinemutu (DF).
- Surirella biseriata** Bréb.  
Hawke's Bay (S); Hutt Valley (Ma); Green Island, Otago (L).
- Surirella contorta** Kitton  
Whakarewarewa (DF).
- Surirella elegans** Ehr.  
Green Island, Otago (L).
- Surirella gracilis** Grün.  
Whakarewarewa (DF).
- Surirella inducta** A. Schmidt  
Rotorua, Ohinemutu (DF).
- Surirella linearis** W. Sm.  
Green Island, Otago (L).
- Surirella ovalis** Bréb.  
Rotorua, Ohinemutu (DF).
- Surirella ovalis** Bréb. var. **angusta** (Kütz.) V.H.  
Whakarewarewa, Rotorua, Ohinemutu (DF).
- Surirella ovalis** Bréb. var. **excelsa** O. Mull.  
Rotorua, Ohinemutu (DF).
- Surirella ovalis** Bréb. var. **minuta** (Bréb.) V.H. Syn.  
Green Island, Otago (L).
- Surirella ovalis** Bréb. var. **ovata** (Kütz.) V.H. Syn.  
Green Island, Otago (L).
- Surirella robusta** Ehr.  
Hutt Valley (Ma).
- Surirella splendida** (Ehr.) Kütz.  
Green Island, Otago (L); Whakarewarewa (DF)
- Surirella tenera** Greg.  
Green Island, Otago (L).

## MYXOPHYCEAE

- |  |   |   |
|--|---|---|
| 1. Unicellular or colonial   | .....                                       | 2 |
| Simple or branched filaments, not compacted, reproduction by hormogonia          |   | 3 |
| 2. Cells undifferentiated, reproduction by simple division                       | Chroococcales                               |   |
| Cells differentiated into base and apex, reproduction by gonidia                 | Chamaesiphonales<br>( <i>Entophysalis</i> ) |   |
| 3. Branching if present usually false, no protoplasmic connections between cells | Nostocales                                  |   |
| Filaments branched, protoplasmic connections between cells                       | Stigonematales                              |   |

## CHROOCOCCALES

The arrangement in this order follows the revision of the Coccoid Myxophyceae by Drouet and Daily (1956). We thank Dr. Drouet for identifying many recent collections.

- |   |                     |   |
|---|---------------------|---|
| 1. Cells before division ovoid to cylindrical, longer than broad, each dividing in a plane perpendicular to the long axis         | <i>Coccochloris</i> |   |
| Cells before division spherical, ovoid, discoid, cylindrical or pyriform, never dividing in planes perpendicular to the long axis | .....               | 2 |
| 2. Cell division in three planes, cells irregularly distributed within the gelatinous matrix                                      | <i>Anacystis</i>    |   |
| Cell division in two planes, cells arranged regularly in rows forming a flat or curved plate                                      | <i>Agmenellum</i>   |   |

*Chroococcaceae****Agmenellum quadruplicatum* Bréb.**

Lake Lyndon (N); Hutt Valley (Ma), both as *Merismopedia glaucum* (Ehrenb.) Näg.

***Anacystis dimidiata* Dr. & Daily**

Auckland (C, unpub.); Orakei-Korako (N); both as *Chroococcus turgidus* (Kütz.) Näg.

***Anacystis incerta* Dr. & Daily**

Hutt Valley (Ma) as *Microcystis stagnalis* Lemm.

Lake Sarah (F) as *M. pulverea* (Wood) Migula.

***Anacystis montana* (Lightf.) Dr. & Daily f. *montana* Dr. & Daily**

Tokano (N); Wairakei (D, D); Whakarewarewa (D, D); Rotorua (D, D); Tunnel, Great Barrier Island (K.W.L.)†; Hen Island (K.W.L.)†; Westfield shower room (K.W.L.)†; Rangitoto (D, D); Lake Sarah (F) as *Aphanocapsa elachista* W. & G. S. West; Rotorua, Ohinemutu (DF) as *Chroococcus cohaerens* (Bréb.) Kütz.; Harihari, Westland (C) as *Gloeocapsa magma*.

***Anacystis thermalis* (Menegh.) Dr. & Daily f. *major* (Lagerh.) Dr. & Daily**

Lake Sarah (F) as *Chroococcus limneticus* Lemm. and as *C. minor* (Kütz.) Näg. var. *dispersus* (Keissler) Lemm.

***Anacystis thermalis* (Menegh.) Dr. & Daily f. *thermalis* Dr. & Daily**

Wardell Stream, Bay of Islands (D, D); Huia Weir (K.W.L.)†.

***Coccochloris peniocyctis* Dr. & Daily**

Cave, Piha (D, D).

***Coccochloris stagnina* Sprengel**

Cave, Russell (D, D); Orongo Bay, Russell (D, D); Rangitoto (D, D); Hutt Valley (Ma); Huia (K.W.L.)†; Whangamumu (K.W.L.)†; Hukatere (K.W.L.)†; Hutt Valley (Ma) as *Aphanothece pallida* (Kütz.) Rabenh.; roof, Biology Dept., A U.C. (K.W.L.)†; Hawke's Bay (S) as *Microhalea rupestris*.

## CHAMAESIPHONALES

*Chamaesiphonaceae****Entophysalis conferta* Dr. & Daily**

Hutt Valley (Ma) as *Dermocarpa prasina* (Reinsch.) Thur.; *D. smaragdinus* (Reinsch.) Tild., and *Xenococcus schousbei* Thur. These records must all come from brackish water, as the species is not found in fresh water.

***Entophysalis lemaniae* (Ag.) Dr. & Daily f. *lemaniae* Dr. & Daily**

On *Cladophora* in Lake Taupo (N); Lake Roto-aira (N); Tokano (N); Hunua (C); Hutt Valley (Ma) (all the preceding as *Chamaesiphon incrustans* Grün.); on *Bostrychia harveyi*, Coromandel (N) as *C. curvatus* Nordst; Hutt Valley (Ma) as *Xenococcus kernerii* Hansg.; on *Cladophora glomerata*, Wairakei (D, D); Whakarewarewa (D, D).

**Entophysalis rivularis** (Kütz.) Dr. f. **rivularis** Dr. & Daily  
 Lake Taupo (N); Hot Spring, Tarawera (K.W.L.)†; Swanson (K.W.L.)†  
 all as **Oncobyrsa rivularis** Kütz.

NOSTOCALES

1. Heterocysts absent	..	2
Heterocysts present	..	9
2. Trichomes single within sheath, not tapering from base to apex	..	4
Several trichomes in sheath	..	3
Trichomes single, arising from basal interwoven layer, tapering from base to apex	..	
3. Sheaths hyaline, trichomes numerous	<i>Amphithrix</i>	
Sheaths often coloured, trichomes few	<i>Microcoleus</i>	
	<i>Schizothrix</i>	
4. Filaments unbranched		5
False branches present, often geminate	<i>Plectonema</i>	
False branches present, solitary	<i>Schizothrix</i>	
5. Trichomes without a sheath		6
Trichomes with a sheath	.....	7
6. Trichomes spirally twisted with obvious septa	<i>Arthrospira</i>	
Trichomes straight or extremities only curved	<i>Oscillatoria</i>	
7. Sheaths thin, hyaline, trichomes agglutinated to form leathery, papery strata	<i>Phormidium</i>	
Sheaths firm, agglutinated to form matted or tufted strata	..	8
8. Filaments free-floating or forming a mat	<i>Lyngbya</i>	
Filaments forming erect tufts, often with single false branches	<i>Schizothrix</i>	
9. Trichomes unbranched, sheaths gelatinous, not firm	..	10
Trichomes mostly falsely branched, sheaths firm	.....	12
10. Trichomes flexuose and contorted, within a gelatinous investment	<i>Nostoc</i>	
Trichomes more or less straight, free, or forming a thin mucous stratum	.....	11
11. Heterocysts and spores intercalary	<i>Anabaena</i>	
Heterocysts terminal and spores always adjacent	<i>Cylindrospermum</i>	
12. Trichomes cylindrical	.....	13
Trichomes conspicuously attenuated at one or both extremities	..	15
13. One trichome in a sheath	..	14
2-6 trichomes in a sheath	<i>Desmonema</i>	
14. Branches often geminate, arising between heterocysts	<i>Scytonema</i>	
Branches usually single, adjacent to heterocysts	<i>Tolythrix</i>	
15. Filaments not united into definite thallus	..	16
Filaments in mucilage forming definite thallus	..	17
16. Branches distinct and free	<i>Calothrix</i>	
Branches several within a common sheath	<i>Dichothrix</i>	
17. Spores unknown	<i>Rivularia</i>	
Spores regularly produced	<i>Gloeotrichia</i>	

*Oscillatoriaceae*

- \***Microcoleus vaginatus** (Vauch.) Gom.  
 Hen Island (K.W.L.).
- \***Microcoleus paludosus** (Kütz.) Gom.  
 Hen Island (K.W.L.).
- Arthrospira jenneri** (Kütz.) Stiz.  
 Hawke's Bay (S1).
- Oscillatoria amphibia** Ag.  
 Tokano (N).
- Oscillatoria angustissima** W. & G. S. West  
 Hutt Valley (Ma).
- Oscillatoria anguina** (Bory) Gom.  
 Hutt Valley (Ma).
- \***Oscillatoria brevis** (Kütz.) Gom.  
 Greenhouse, P.D.D., Mt. Albert (K.W.L.).

- \*Oscillatoria chalybea** (Mert.) Gom.  
Waitakeres (K.W.L.).
- Oscillatoria chlorina** (Kütz.) Gom.  
Hutt Valley (Ma).
- Oscillatoria coerulea** Kütz.  
Hutt Valley (Ma).
- Oscillatoria cortiana** (Menegh.) Gom.  
Hawke's Bay (S1).
- Oscillatoria cruenta** Grün.  
Hutt Valley (Ma).
- Oscillatoria lacustris** (Kleb.) Geitler  
Lake Sarah (F).
- Oscillatoria limosa** (Roth.) Ag.  
Hawke's Bay (S1); Hutt Valley (Ma); Tokano (N).
- Oscillatoria nigra** Vauch.  
Hawke's Bay (S1); Hutt Valley (Ma).
- Oscillatoria proboscidea** Gom.  
Hutt Valley (Ma).
- \*Oscillatoria sancta** (Kütz.) Gom.  
Greenhouse, A.U.C. (K.W.L.).
- Oscillatoria splendida** Grev.  
Hutt Valley (Ma); Western Springs (K.W.L.) †; Waitakeres (K.W.L.) †; Swanson (K.W.L.) †.
- Oscillatoria tenuis** Ag.  
Hawke's Bay (S1); Tokano (N).
- Lyngbya aerugineo-coerulea** (Kütz.) Gom.  
Hutt Valley (Ma).
- \*Lyngbya digueti** Gom.  
Sandringham Road (Auckland) (K.W.L.) †.
- Lyngbya martensiana** Menegh.  
Hutt Valley (Ma); Sandringham Road (K.W.L.) †.
- Lyngbya putealis** Mont.  
Hutt Valley (Ma).
- Phormidium autumnale** (Ag.) Gom.  
Hawke's Bay (S); Hutt Valley (Ma); Auckland (K.W.L.) †; Waitakeres (K.W.L.) †.
- \*Phormidium favosum** (Bory) Gom.  
Albert Park (K.W.L.) †.
- Phormidium laminosum** (Ag.) Gom.  
Tokano (N); Rotorua, Ohinemutu (DF).
- \*Phormidium inundatum** Kütz.  
Grafton Gully, Auckland (K.W.L.).
- \*Phormidium papyraceum** (Ag.) Gom.  
Glendowie (K.W.L.).
- Phormidium retzii** (Ag.) Gom.  
Russell (V.W.L. Exsicc.); Huia (K.W.L.) †; Rotorua, Ohinemutu (DF).
- \*Phormidium tenue** (Menegh.) Gom.  
Cascades (K.W.L.).
- Phormidium uncinatum** (Ag.) Gom.  
Cascades (K.W.L.).
- \*Plectonema purpureum** Gom.  
Hen Island (K.W.L.).



**\*Plectonema nostocorum** Born.

Auckland (K.W.L.); Hen Island (K.W.L.); Whakapara (K.W.L.); Westfield shower room (K.W.L.).

**Schizothrix calcicola** Gom.

Rotorua, Ohinemutu (DF).

**Schizothrix lamyi** Gom.

Omanuta (C.).

**\*Schizothrix thelophoroides** (Mont.) Gom.

Rangitoto (K.W.L.).

**\*Symploca muralis** Kütz.

Hen Island (K.W.L.).

**Symploca muscorum** Gom.

Kerikeri (V.W.L. Exsicc.); Huia (K.W.L.)†; Waitakeres (K.W.L.)†; Rotorua, Ohinemutu (DF).

*Nostocaceae***Anabaena flos-aqua** (Lyng.) Bréb.

Hutt Valley (Ma); Green Lake, Mayor Island (T.C. Chambers, 1955).

**Anabaena inaequalis** (Kütz.) Born. et Flah.

Waimakariri R. (N); Hutt Valley (Ma).

**Cylindrospermum comatum** Wood

Hutt Valley (Ma).

**Cylindrospermum licheniforme** Kütz.

Hawke's Bay (S); Waitakeres (K.W.L.)†.

**Cylindrospermum majus** Kütz.

Hutt Valley (Ma); Glendowie (K.W.L.)†.

**Nostoc caeruleum** Lyng.

Hutt Valley (Ma).

**\*Nostoc carneum** Ag.

Le Roys Bush (K.W.L.).

**Nostoc commune** Vauch.

Kelly's Range (N); Banks Peninsula (N); Otatau R. (N); Taupo (N); Tokano (N); Omatangi (N); Orakei-korako (N); Russell (V.W.L. Exsicc.); Huia (K.W.L.)†; Hen Island (K.W.L.)†.

**Nostoc ellipso sporum** (Desmaz.) Rabenh.

Tauranga (N).

**Nostoc microscopicum** Carm.

Omanuta (C); Bealy River (N); Tauranga (N); Hen Is. (K.W.L.)†; Whangamumu (K.W.L.)†.

**\*Nostoc passerinianum** (de Not) Born.

Greenhouse, A.U.C. (K.W.L.).

**Nostoc rivulare** Kütz.

Tokano (N).

**Nostoc sphaericum** Vauch.

No locality (K.W.L.); Hen Is. (K.W.L.); Huia (K.W.L.).

**Nostoc verrucosum** (L.) Vauch.

Otau R. (N); Waitangi (V.W.L. Exsicc) R.; streams of Canterbury Plains (Hooker, 1855); Hutt Valley (Ma); Huia (K.W.L.)†; Mokoroa Falls, Waitakeres (K.W.L.)†.

**Nostoc zetterstedtii** Aresch.

Lake Taupo (N).

*Rivulariaceae***\*Amphithrix janthina** (Mont) Born. & Flah.

Huia (K.W.L.).

**Calothrix parasitica** (Chauv.) Thur.

Hutt Valley (Ma).

**Calothrix parietina** (Näg.) Thur.

Tauranga (N); Omatangi (N); Hen Is. (K.W.L.)†; Whakapara (K.W.L.)†; Orakei-korako (Fan, 1956); Wairakei (Fan, 1956); Rotorua (Fan, 1956).

**Calothrix pulvinata** Ag.

Lyttelton (N); Hutt Valley (Ma).

**\*Dichothrix baueriana** (Grün.) Born.

Lake Okataina (K.W.L.).

**Dichothrix gypsophila** (Kütz.) Born. et Flah.

Lake Pearson (N); Omatangi (N); Ruapehu and Tongariro (N); Kerikeri (V.W.L. Exsicc.).

**Gloeotrichia pisum** Thur.

Dunedin (N); Bluff (N).

**Rivularia beccariana** (De Not.) Born. et Flah.

Kerikeri (V.W.L. Exsicc.).

**\*Rivularia haematites** (D.C.) Ag.

Whangamumu (K.W.L.); Huia (K.W.L.); Mokoroa Falls, Waitakeres (K.W.L.); Karekare (K.W.L.).

**Rivularia natans** (Hedw.) Welw.

Hutt Valley (Ma).

**Rivularia pisum** Ag.

Hutt Valley (Ma).

**Rivularia vieillardii** (Kütz.) Born. et Flah.

Russell (V.W.L. Exsicc.); Huia (K.W.L.)†.

*Scytonemataceae***Desmonema wrangelii** (Ag.) Born. et Flah.

Teremakau (N); Arahura (N); Waitakeres (K.W.L.)†.

**Scytonema hoffmanni** Ag.

Tauranga (N); Tongariro (N); Ruapehu (N); Hen Is. on liverwort (K.W.L.)†; Greenhouse, A.U.C. (K.W.L.)†.

**Scytonema mirabile** (Dill.) (= *S. figuratum* Ag.) Born.

Arthur's Pass (N); Harihari (C); Kerikeri (C); Hen Is. (K.W.L.)†.

**Scytonema myochrous** (Dillw.) Ag.

Taupo (N); Omatangi (N); Tauranga (N).

**Scytonema stuposum** Born.

No locality (S).

**Scytonema varium** ? Kütz.

Bealy River (N).

**Tolypothrix distorta** ? Kütz.

Hawke's Bay (S).

**Tolypothrix lanata** (Desv.) Wartmann

Orakei-Korako (N); Paeroa (N); Whatipu (K.W.L.)†.

**\*Tolypothrix limbata** Thur.

Karekare (K.W.L.); Cave, Whatipu (K.W.L.).

**Tolypothrix tenuis** Kütz.

Omatangi (N); Orakei-korako (N); Lake Tarawera (N); Lake Sarah (F).

## STIGONEMATALES

1. Trichomes of a single row of cells  
Trichomes of several rows of cells

*Hapalosiphon*  
*Stigonema*

## STIGONEMATALES

**Hapalosiphon fontinalis** (Ag.) Born.

Arthur's Pass (N); Taupo (N).

**Hapalosiphon laminosus** Hansg.

No locality, but probably in hot springs, Rotorua (Bot. Depart. A.U.C.); Lake Taupo (K.W.L.); Rotorua (DF).

**Stigonema hormoides** (Kütz.) Born. et Flah.

Omatangi (N).

**Stigonema informe** Kütz.

Omatangi (N).

**Stigonema mamillosum** (Lyng.) Ag.

Rangitoto (C); Kerikeri (V.W.L. Exsicc.).

**Stigonema minutum** (Ag.) Hass.

Omatangi (N); Tongariro (N); Ruapehu (N).

**Stigonema ocellatum** (Dillw.) Thur.

Arthur's Pass (N); Kelly's Range (N); Taupo (N); Waikato (N); Omatangi (N); National Park (C).

**Stigonema panniforme** (Ag.) Kirchn.

Bealy River (N); Ohaeawai (N); Omatangi (N).

**Stigonema turfaceum** (Berkl.) Cooke

Arthur's Pass (N); Omatangi (N); Tauranga (N).

## RHODOPHYCEAE

- |   |                        |   |
|---|------------------------|---|
| 1. Terrestrial, globose cells in mucilage   | <i>Porphyridium</i>    | 2 |
| Aquatic, filamentous or forming a crust   | ..                     | 3 |
| 2. Thallus erect, aerial  | .....                  | 3 |
| Thallus a crust of closely apposed vertical filaments                                   | <i>Hildenbrandtia</i>  |   |
| 3. Thallus polysiphonous with cortication, carpospores in closed cystocarps             | <i>Bostrychia</i>      |   |
| Thallus monosiphonous with or without cortication, carpospores not in closed cystocarps | .....                  | 4 |
| 4. Nodes obscured by abundant production of secondary laterals                          | <i>Nothocladus</i>     |   |
| Nodes marked by the laterals  | ..                     | 5 |
| 5. Gonimoblast threads short, not extending over internodes                             | <i>Batrachospermum</i> |   |
| Gonimoblast threads long, extending over the internodes                                 | <i>Sirodotia</i>       |   |

## BANGIALES

**Porphyridium cruentum** (Ag.) Näg.

Auckland, greenhouse, College grounds (V.J.C. 1955)†; Otago (Lindsay, 1863).

\***Asterocytis smaragdina** Reinsch

Torbay, fresh water seep high above tides (T).

## NEMALIONALES

**Batrachospermum atrichum** Skuja, sp. ined.

Milford Sound (Laing, 1939).

**Batrachospermum campyloclonum** Skuja, sp. ined.

Streams, Canterbury Plains; Lyall; Inchbonnie; near Whangarei (all Laing, 1939).

**Batrachospermum dillenii** Bory

Anawhata (Laing, 1939)

**Batrachospermum fruticans** Skuja, sp. ined.

Cleddau R.; Inchbonnie (both Laing, 1939).

**Batrachospermum gallaei** Sirodot var. **longipolum** Skuja

Tikitikiora Creek (V.W.L. Exsicc.).

**Batrachospermum novae-zelandiae** Skuja, sp. ined.

Lyall; Whangarei; Waipoua; Henderson (all Laing, 1939); Hawke's Bay (S1);

Canterbury (Hooker, 1855, as *B. moniliforme*).

*Batrachospermum pulcherrimum* Harv.

R. Esk (S1).

*Nothocladus lindaueri* Skuja

Waitangi (V.W.L. Exsicc.).

*Sirodotia fennica* Skuja, sp. ined.

Cass (Laing, 1939).

*Sirodotia suecica* Kylin

Ruataniwha Plains (S1); stream near Coroglen (V.J.C., 1955) †.

#### CRYPTONEMIALES

*Hildenbrandtia rivularis* (Liebm.) J. Ag.

Hutt Valley (Ma); Waitakere stream (T) †.

#### CERAMIALES

*Bostrychia harveyi* Mont. *ecad distans* (Harv.) De Berg

Coromandel (N); Kowhai R.; Faraheru Stream; Swanson Stream; Mokaroa Stream; Anawhata; Karekare; Mick's Creek (Warkworth); Cape Brett; Bay of Islands; Waipoua Stream; Bethells; Wellington streams; Little Barrier; Orongorongo R.; Doubtful Sound; Banks Peninsula; Westport; Prices Bay (Stewart Island); (all De Berg, 1949); The Narrows (Waikato R.) (V.J.C., 1954) †.

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