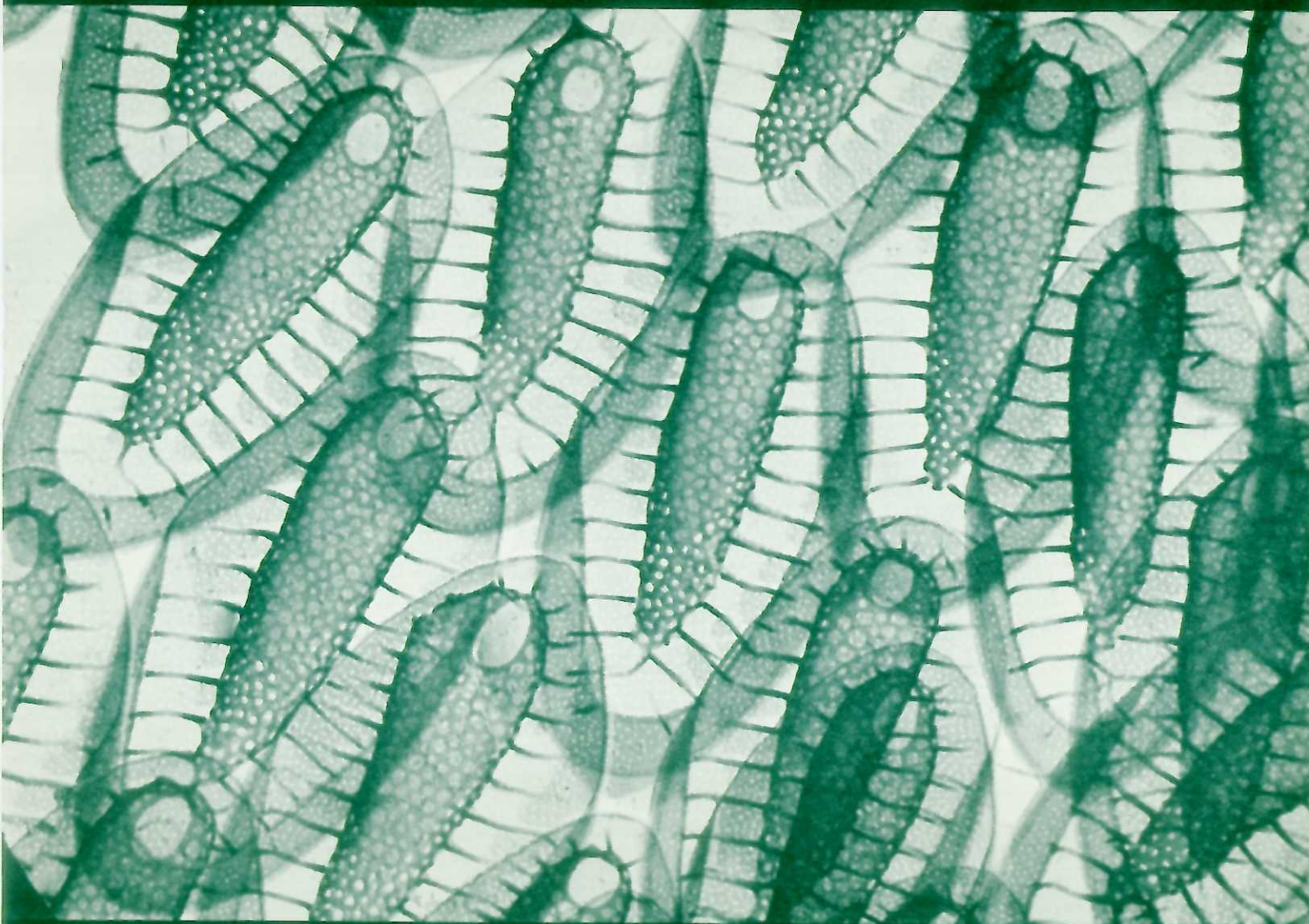


REF
582.26
+
595.1

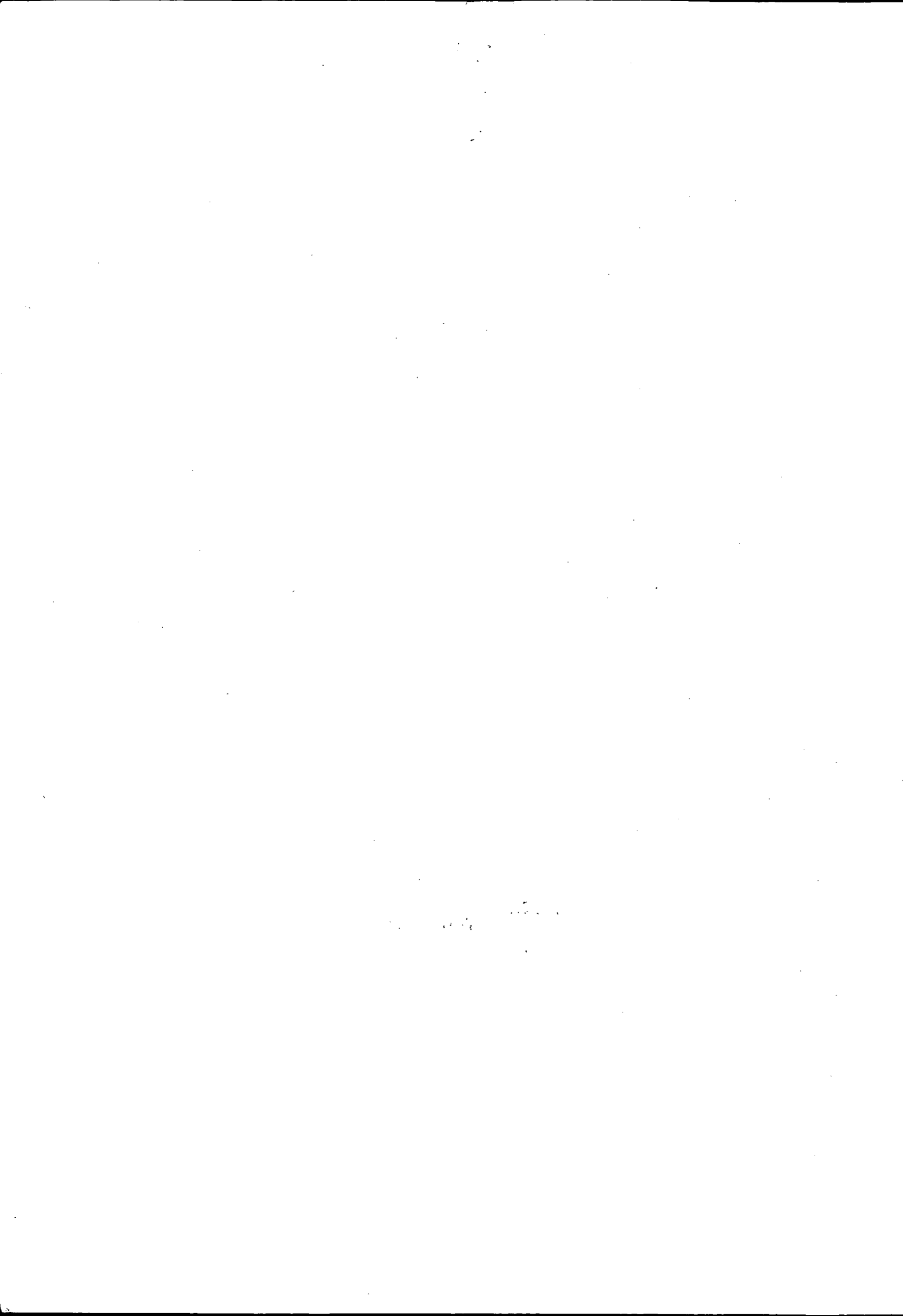
CULTURE CENTRE OF ALGAE AND PROTOZOA

LIST OF STRAINS 1976



INSTITUTE OF TERRESTRIAL ECOLOGY

NATURAL ENVIRONMENT RESEARCH COUNCIL



NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF TERRESTRIAL ECOLOGY
CULTURE CENTRE OF ALGAE AND PROTOZOA

L I S T O F S T R A I N S

INSTITUTE OF TERRESTRIAL ECOLOGY
LIBRARY SERVICE

EDINBURGH LABORATORIES
DUSH ESTATE, PENNICK
MIDLOTHIAN EH20 0Q3

Edited by E. A. GEORGE

INSTITUTE OF
TERRESTRIAL
ECOLOGY
LIBRARY
SERVICE

27 APR 1978

ITE

Rush

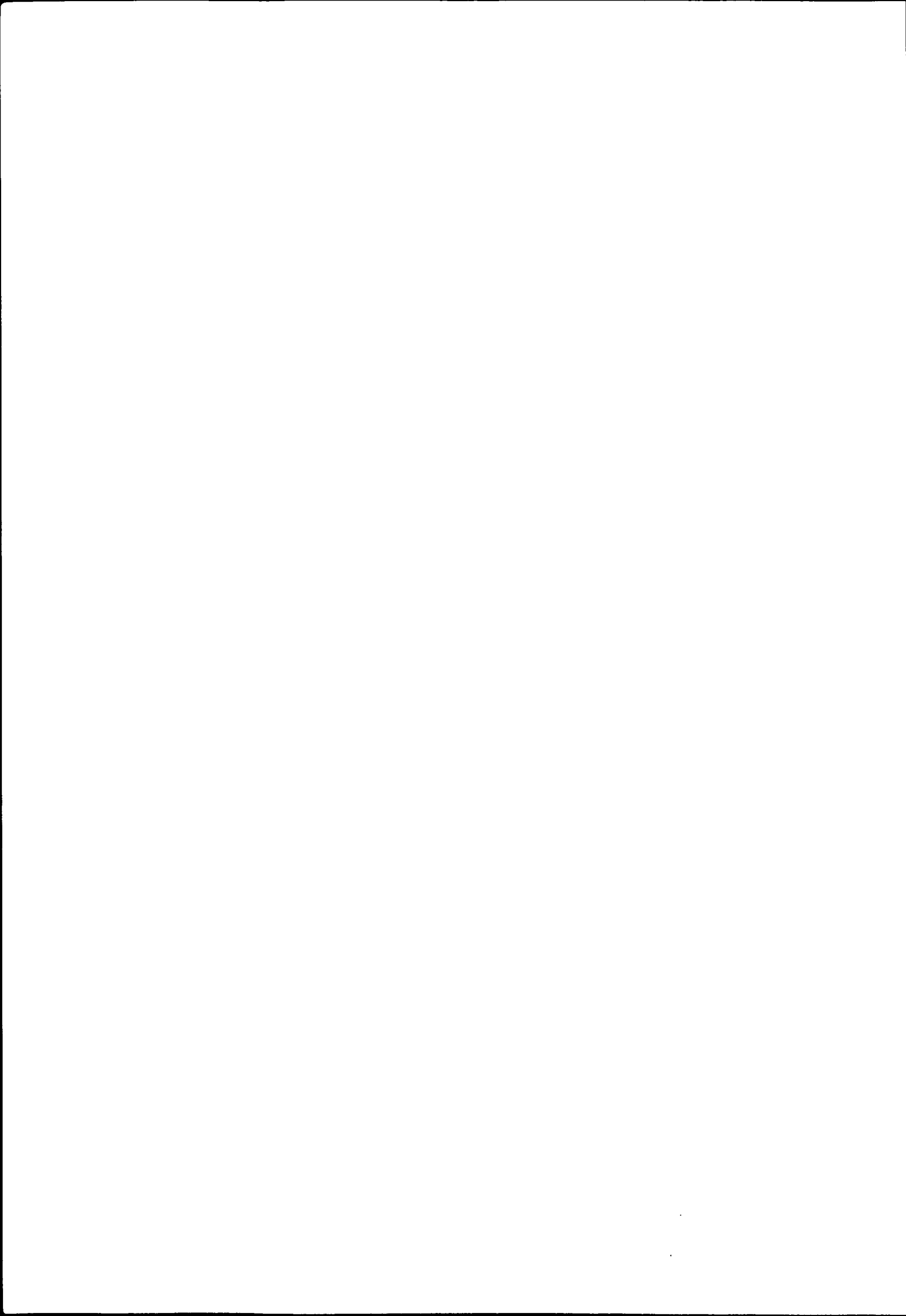
REF
582.26
593.1

First published 1966

2nd Edition 1971

3rd Edition 1976

*The Culture Centre of Algae and Protozoa
is part of the Institute of Terrestrial
Ecology, which itself is a component body
of the Natural Environment Research Council.*



CONTENTS

List of staff	ii
Introduction	1
Explanatory notes	1
Other culture collections	2
Strain numbers	4
Type cultures	5
Preservation	5
Requests for cultures	5
Teaching material	6
Deposition of cultures	8
Systematic list of genera	9
Culture media	15
List of algae and protozoa	21
List of bryophytes	116
References	119

THE CULTURE CENTRE OF ALGAE AND PROTOZOA

36 Storey's Way, Cambridge, CB3 0DT
Telephone: Cambridge (0223) 61378

Director	E. A. George, MA
Curator of Freshwater Algae	D. J. Hibberd, PhD
Assistants	D. R. Perdue, MPhil S. F. Cann
Curator of Marine Algae	J. H. Belcher, DSc
Assistants	N. C. Pennick, BSc J. P. Cann
Curator of Protozoa	F. C. Page, PhD
Assistants	S. M. Blakey, BSc L. Greer
Head of Electron Microscopy Section	E. M. F. Swale, DSc
Technician	K. J. Clarke
Head of Preservation Section	G. J. Morris, PhD

Requests for cultures or information should be addressed
to the Director.

INTRODUCTION

This collection of cultures of algae and protozoa was started by E. G. Pringsheim in Prague and the first list, comprising 48 strains, was published in 1928. It was taken over by Cambridge University in 1947 and subsequently collections at the Universities of Indiana and Göttingen were started each with a nucleus of cultures from Cambridge. Cultures left behind in Prague by Pringsheim were built into another collection there. Thus, in many cases the same strain may be in several or all of these great collections; on the other hand, in spite of considerable interchange, no one collection maintains all available worthwhile strains. In April 1970, the collection was expanded to form the basis of the Culture Centre of Algae and Protozoa, a component body of the Natural Environment Research Council. In November 1975, the Centre was merged into the Institute of Terrestrial Ecology - another and much larger component body of NERC.

As well as algae and free-living protozoa, the Cambridge collection maintains a few other micro-organisms which are not easily available elsewhere, a number of bryophytes and at the moment one flowering plant, *Wolffia*, and one rotifer. The collection does not aim to include parasitic protozoa or the larger seaweeds.

EXPLANATORY NOTES ON THE LIST

Genera, and species within them, are arranged alphabetically. Algae, protozoa, and other micro-organisms are listed together first, then the bryophytes and higher plants. A systematic list of genera is given on page 9.

In general, unless a mistake has clearly been made, or the taxonomy has been revised, names are those given to the strain by the isolator. The main objective in compiling this list has been that of enabling workers who are not well versed in taxonomy and nomenclature to find what they want with the minimum of trouble.

This list must not be taken as an authority for names. Strains are listed under the name of the species, with the following information where available:-

- (a) The reference number in the collection, prefixed by 'L' if the culture is only available in liquid medium, and by 'B' if only with bacteria (agnotoxenic or monoxenic). In the absence of any such prefix, a strain may be assumed to be in pure (axenic) culture on an agar slope. 'N' indicates that the strain is preserved in liquid nitrogen (see Preservation below). An asterisk after a strain number (chiefly diatoms) indicates that the strain probably cannot be maintained indefinitely and may be replaced by a similar strain.
- (b) The name of the isolator and the year of isolation. Where two names are separated by a stroke, usually the first established the agnotoxenic culture and the second rendered it axenic.
- (c) Any reference number given by the isolator, or by another collection in cases where the strain was obtained from it.
- (d) Any other information including an ecological note if other than fresh water, concluding with the country where the wild material was collected.

The absence of a strain or species from the list does not necessarily mean that it is not available. In some cases, we are able to obtain a strain from another collection.

Requests for organisms which lie outside the scope of CCAP should be made to other major culture collections in the United Kingdom.

OTHER CULTURE COLLECTIONS

Bacteria of industrial importance

National Collection of Industrial Bacteria,
Torry Research Station,
PO Box 31,
135 Abbey Road
ABERDEEN,
AB9 8DG,
Scotland

Bacteria of marine importance

National Collection of Marine Bacteria,
Torry Research Station,
PO Box 31,
135 Abbey Road,
ABERDEEN,
AB9 8DG,
Scotland.

Bacteria of medical and veterinary importance

National Collection of Type Cultures,
Central Public Health Laboratory,
Colindale Avenue,
LONDON,
NW9 5HT.

Bacteria from milk and milk products

National Collection of Dairy Organisms,
National Institute for Research in Dairying,
Shinfield,
READING,
Berkshire,
RG2 9AT.

Bacteria pathogenic for plants

National Collection of Plant Pathogenic Bacteria,
Plant Pathology Laboratory,
Hatching Green,
HARPENDEN,
Hertfordshire,
AL5 2BD.

Fungi and yeasts pathogenic for man and animals

Mycological Reference Laboratory,
London School of Hygiene and Tropical Medicine,
Keppel Street (Gower Street),
LONDON
WC1E 7HT.

Fungi, wood rotting

Building Research Establishment, Princes Risborough Laboratory,
Princes Risborough
AYLESBURY,
Buckinghamshire
HP17 9PX.

Fungi (other than animal pathogens and wood-rotting fungi)

Collection of Fungus Cultures,
Commonwealth Mycological Institute,
Ferry Lane,
KEW,
Surrey,
TW9 3AF.

Yeasts (other than pathogens)

National Collection of Yeast Cultures,
Brewing Industry Research Foundation,
Lyttel Hall,
NUTFIELD,
Near Redhill.
Surrey.
RH1 4HY.

STRAIN NUMBERS AND REFERENCES TO THE USE OF CULTURES

Specific names are, in effect, expressions of taxonomic opinion and as such liable to change: precise identification of strains can only be achieved by absolute fixity of strain number. Strain numbers will, therefore, never be altered whatever changes are made to specific names or groupings. If a strain is irreplaceably lost, its strain number will never be used again. Unfortunately, when the Göttingen collection was founded, the Cambridge strain numbers continued to be used there and later additions were independently given new numbers in the old notation. Hence, in some cases different strains have been given the same number. Where confusion is likely, the acronym CCAP should be used as a prefix to our strain numbers.

A sample survey of the literature on algae and protozoa showed that authors do not always give adequate reference to the strains used in work involving cultures. The sample used was the 1971 issues of fourteen journals taken at this establishment which publish original work on algae and protozoa. Papers dealing with fossils, larger seaweeds and organisms not so far cultured, were excluded.

Minimum adequate reference was considered to be the designation of the culture together with, where appropriate, indication of the source collection, e.g. CCAP 211/8d or Göttingen 11/6. A more complete reference would give also the name of the isolator and the date of isolation, but this information is usually available in the list published by the collection.

The survey showed that over three-quarters (153 out of 204) of the authors used cultures when this was possible. It also showed that well over half of the users (89 out of 153) gave inadequate or no reference to the cultures used. This is most unsatisfactory, especially when one considers the rigid insistence by authors and editors on proper bibliographic references.

References to specific names and a collection, e.g. "*Chlamydomonas globosa* from CCAP" are not satisfactory as there may be now, or in the future, more than one strain fitting that description. References such as "*Tetrahymena pyriformis* 'W' strain" are inadequate without mention of the source. It has recently been shown (Borden, Whitt and Nanney, 1973) that strains of this species from different sources, but with the same designation, may differ, while differently designated strains may be identical. The cause of this confusion presumably lies in mislabelling and failure to record the origin of stocks used.

Among the advantages of using properly documented strains are:-

- (a) that the work can be repeated or compared with other work on the same strain; and
- (b) the comparison of different strains of a species or of different species of a genus enables the significance of the particular characters to be assessed.

Too often one sees a general statement about a species made from evidence derived from only one strain.

"TYPE" CULTURES

When a strain is described as 'type material', it has been directly derived from material from which the original description was made. It will usually have been deposited by the author of the taxon.

PRESERVATION

The long-term preservation of viable cultures by lyophilisation or storage under liquid nitrogen is now standard practice for many kinds of micro-organisms. The main advantages are greater stability of type, less handling and hence less risk of contamination or mislabelling and less space needed for storage.

Lyophilised cultures are easily stored and transported. Cultures frozen in liquid nitrogen seem to provide much better survival for many types, but the need to maintain extremely low temperatures imposes inevitable restrictions. Progress toward routine preservation of algae and protozoa has, until now, been slow.

A programme was started in CCAP in 1974 to develop methods suitable for our strains. Despite promising results with liquid nitrogen, it will be several years before the majority of strains are successfully preserved.

REQUESTS FOR CULTURES

All cultures in this list are available for research or teaching. Strains which may be serious pathogens are only supplied to laboratories with proper facilities for handling them. All requests should be addressed to:-

The Director,
Culture Centre of Algae and Protozoa,
Institute of Terrestrial Ecology,
36 Storey's Way,
CAMBRIDGE,
CB3 0DT.
England.

It is strongly recommended that the use for which cultures are required is stated with the order, as, for example, some strains are quite unsuitable for elementary teaching and others very difficult to grow in quantity. For research purposes, if no particular strain is required, some indication of the requirement to be fulfilled will enable us to select a suitable strain.

A *month's notice* is usually necessary, especially in the case of large orders for teaching material; priority is naturally given to orders received in good time. When cultures are required on a certain date, this should be clearly indicated; otherwise they will be sent as soon as they are ready.

Cultures are dispatched by First Class Mail or by Air Mail as appropriate. Special request must be made if cultures are to be sent by Air Freight.

A charge is made to cover the cost of production, packing, etc. For details, see current price sheet.

TEACHING

List of organisms recommended for teaching purposes

Orders from this list should be headed "For teaching". Only the genus should normally be specified, as every effort is made to supply the most suitable strain available.

One culture is normally sufficient for 25 students (of *Acetabularia*, a minimum of six mature caps is supplied).

CYANOPHYCEAE

Anabaena
Chroococcus
Gloeocapsa
Gloeotrichia (does not form typical colonies)
Merismopedia
Nodularia (marine)
Nostoc
Oscillatoria
Scytonema
Spirulina
Tolypothrix

CHLOROPHYCEAE

Volvocales

Asteromonas (marine)
Carteria
Chlamydomonas (for morphology)
Chlamydomonas (mating strains, usually available)
Dunaliella (marine)
Eudorina
Gonium
Haematococcus
Pandorina
Pleodorina
Volvox

Ulotrichales

Cylindrocapsa
Microspora
Ulothrix (*Uronema*)

Chlorococcales

Ankistrodesmus
Chlorella
Chlorococcum
Coelastrum
Hydrodictyon
Pediastrum
Scenedesmus

Chaetophorales

Chaetophora
Coleochaete
Stigeoclonium

Cladophorales

Cladophora

Zygnemales

Closterium
Cosmarium
Micrasterias
Mougeotia
Spirogyra
Staurastrum
Zygnema

Oedogoniales

Bulbochaete
Oedogonium (male & female strains)

Siphonales

Acetabularia (marine)

PRASINOPHYCEAE

Platymonas (marine)
Prasinocladus (marine)
Pyramimonas (marine)

EUGLENOPHYCEAE

Astasia (colourless)
Euglena gracilis (for movement)
Euglena spirogyra (for cell structure)
Peranema (holozoic, shows
Trachelomonas flagellum well)

DINOPHYCEAE

Amphidinium (marine)
Exuviaella (marine)
Glenodinium (marine)
Gymnodinium (marine)
Gymnodinium (Woloszynskia)
 (marine or freshwater)
Oxyrrhis (marine)
Peridinium (marine or freshwater)
Prorocentrum (marine)

CRYPTOPHYCEAE

Chilomonas (colourless)
Cryptomonas (marine or freshwater)

CHRYSOPHYCEAE

Ochromonas (marine or freshwater)
Pseudopedinella (marine)
Synura

PHAEOPHYCEAE

Ectocarpus (marine)

RHODOPHYCEAE

Acrochaetium (marine)
Chroothece (marine)
Porphyridium (marine) unicellular

SARCODINA

Amoebae:

Amoeba proteus
Chaos carolinense (larger than *A. proteus*; multinucleate)
Naegleria gruberi (amoeba/flagellate transformation; encystment and excystment)
Saccamoeba limax (medium sized; good for amoeboid movement & contractile vacuole)

Testate amoebae:

Arcella

Cellular slime moulds:

Dictyostelium (aggregation, sorocarps)

CILIOPHORA

Paramecium caudatum
Paramecium bursaria
 (for conjugation, zoochlorellae)
Tetrahymena (axenic)
Coleps (with 'armour')
Discophrya (suctorian)
 Rotifers are also available

XANTHOPHYCEAE

Botrydiopsis
Bumilleria (larger than *Tribonema*
 and shows H-pieces better)
Ophiocytium
Tribonema
Vaucheria
Vaucheria (fertile, limited amount
 of material only)

HAPTOPHYCEAE

Chrysochromulina (marine)
 a coccolithophorid (marine)
Isochrysis (marine)

BACILLARIOPHYCEAE

Coscinodiscus (marine) centric
Navicula (marine) motile
Nitzschia (marine) motile
Phaeodactylum (marine)
Pinnularia
Skeletonema (marine)

Heliozoans:

Actinosphaerium (larger than *Actinophrys*)
Actinophrys
Acanthocystis (scales of silica)

Stentor
Spirostomum
Blepharisma
Neobursaridium (large)
Stylonychia (hypotrich)
Euplotes (hypotrich; our present
 species are marine)

DEPOSITION OF CULTURES

Intending depositors should first apply to the Senior Officer.

We generally welcome the deposition of cultures of value whether of taxonomic, physiological or other importance, especially those that have been the subject of publication. It is recommended that important strains should be deposited in at least two major collections for safe keeping.

Depositors are requested to supply as much information as possible about their strains, preferably on our data sheets (available on request), or on World Federation of Culture Collections form SCC-4. Reprints relating to strains are most useful.

If desired, a newly-deposited culture may be withheld from issue for a limited time, usually until publication is effected.

Depositors may, within limits, receive cultures of their own strains free of charge.

Arrangements can be made for the deposition of strains, subject to patent applications.

SYSTEMATIC LIST OF GENERA OF ALGAE AND PROTOZOA IN THE COLLECTION

CHLOROPHYCEAE

Volvocales

<i>Balticola</i>	<i>Pascherina</i>
<i>Brachiomonas</i>	<i>Phacotus</i>
<i>Carteria</i>	<i>Platydorina</i>
<i>Chlamydomonas</i>	<i>Pleodorina</i>
<i>Chlorogonium</i>	<i>Polytoma</i>
<i>Dunaliella</i>	<i>Polytomella</i>
<i>Dysmorphococcus</i>	<i>Pteromonas</i>
<i>Eudorina</i>	<i>Pyrobotrys</i>
<i>Gloeomonas</i>	<i>Spermatozopsis</i>
<i>Gonium</i>	<i>Sphaerellopsis</i>
<i>Haematococcus</i>	<i>Stephanosphaera</i>
<i>Lobomonas</i>	<i>Volvox</i>
<i>Pandorina</i>	<i>Volvulina</i>

Chlorococcales

<i>Ankistrodesmus</i>	<i>Hyaloraphidium</i>
<i>Asterococcus</i>	<i>Hydrodictyon</i>
<i>Borodinella</i>	<i>Hypnomonas</i>
<i>Bracteacoccus</i>	<i>Kentrosphaera</i>
<i>Characium</i>	<i>Kirchneriella</i>
<i>Chlorella</i>	<i>Lagerheimia</i>
<i>Chlorochytrium</i>	<i>Micractinium</i>
<i>Chlorococcum</i>	<i>Muriella</i>
<i>Chlorothecium</i>	<i>Myrmecia</i>
<i>Coccomyxa</i>	<i>Nannochloris</i>
<i>Coelastrella</i>	<i>Neospongiococcum</i>
<i>Coelastrum</i>	<i>Nephrochlamys</i>
<i>Crucigenia</i>	<i>Oocystis</i>
<i>Cystococcus</i>	<i>Pediastrum</i>
<i>Dactylococcus</i>	<i>Polyedriopsis</i>
<i>Dietyococcus</i>	<i>Prototheca</i>
<i>Dietyochloris</i>	<i>Pseudochlorococcum</i>
<i>Dictyosphaerium</i>	<i>Pseudococcomyxa</i>
<i>Dimorphococcus</i>	<i>Quadrigula</i>
<i>Elakotothrix</i>	<i>Radiosphaera</i>
<i>Eremosphaera</i>	<i>Rhopalocystis</i>
<i>Fusola</i>	<i>Scenedesmus</i>
<i>Glaucocystis*</i>	<i>Scotiella</i>
<i>Golenkiniopsis</i>	<i>Selenastrum</i>
<i>Gomontia</i>	<i>Spongiochloris</i>
<i>Halochlorella</i>	<i>Tetraedron</i>
<i>Halochlorococcum</i>	<i>Trebouxia</i>
<i>Heterogonium</i>	

* Robinson and Preston (1971) suggest that *Glaucocystis* could be: (1) a red alga; (2) a primitive dinoflagellate; or (3) of an independent group; but not a blue-green symbiont in a colourless green alga.

Tetrasporales

Actinochloris
Asterococcus
Chaetopeltis
Glaucosphaera
Gloeocystis

Nautococcus
Neochloris
Palmodictyon
Paulschulzia
Tetracystis

Ulotrichales

Cylindrocapsa
Interfilum
Klebsormidium (*Hormidium*)
Microspora
Prasiococcus
Prasiola

Pseudostichococcus
Schizomeris
Sphaeroplea
Stichococcus
Ulothrix
Uronema

Chaetophorales

Caespitella
Cephaleuros
Chaetophora
Chlorosarcinopsis
Chlorosphaera
Coleochaete
Dilabifilum
Diplosphaera
Draparnaldia
Gongrosira
Leptosira

Microthamnion
Physolinum
Pilinia
Pleurastrum
Pleurococcus
Pseudendocloniopsis
Pseudendoclonium
Pseudopleurococcus
Raphidonema
Stigeoclonium
Trentepohlia

Cladophorales

Cladophora
Pithophora

Rhizoclonium

Conjugales

Closterium
Cosmarium
Cylindrocystis
Euastrum
Gonatozygon
Hyalotheca
Mesotaenium
Micrasterias
Mougeotia

Netrium
Pleurotaenium
Sphaerososma
Spirogyra
Spondylosium
Staurastrum
Zygnema
Zygnemopsis

Oedogoniales

Bulbochaete
Oedocladium

Oedogonium

Siphonales (Bryopsidales)

Acetabularia
Derbesia

Dichotomosiphon
Protosiphon

PRASINOPHYCEAE

Asteromonas
Bipedinomonas
Halosphaera
Heteromastix
Mesostigma
Micromonas
Monomastix

Nephroselmis
Pedinomonas
Platymonas
Prasinocladus
Pyramimonas
Stephanoptera
Tetraselmis

XANTHOPHYCEAE

Botrydiopsis
Botrydium
Botryococcus
Bumilleria
Bumilleriopsis
Chlorellidium
Chloridella
Chlorocloster
Heterococcus

Heterothrix
Mischococcus
Nephrodiella
Ophiocytium
Pleurochloris
Sphaerosorus
Tribonema
Vaucheria

EUSTIGMATOPHYCEAE

Chlorobotrys
Ellipsoidion
Monodus
Pleurochloris

Polyedriella
Pseudocharaciopsis
Vischeria

CHRYSOPHYCEAE

Anthophysa
Chrysococcus
Chryso-sphaera
Mallomonas
Monas
Ochromonas
Olisthodiscus

Paraphysomonas
Phaeaster
Poterioochromonas
Pseudopedinella
Spumella
Synura

HAPTOPHYCEAE

Chrysochromulina
Coccolithus
Cricosphaera
Crystallolithus
Diacronema
Dicrateria
Emiliana
Hymenomonas

Isochrysis
Monochrysis
Pavlova
Phaeocystis
Pleurochrysis
Prymnesium
Sarcinochrysis
Syracosphaera

DINOPHYCEAE

Amphidinium
Exuviaella (*Prorocentrum*)
Gloeodinium
Heterocapsa

Oxyrrhis
Peridinium
Prorocentrum
Woloszynskia

BACILLARIOPHYCEAE

Amphiprora
Asterionella
Bacillaria
Biddulphia
Chaetoceros
Cyclotella
Fragilaria
Gomphonema
Melosira

Navicula
Nitzschia
Pinnularia
Pleurosigma
Skeletonema
Stephanodiscus
Tabellaria
Thalassiosira

CRYPTOPHYCEAE

Chilomonas
Chroomonas
Cryptomonas

Cyanophora
Cyathomonas
Hemiselmis

CHLOROMONADOPHYCEAE

Fibrocapsa

Vacuolaria

EUGLENOPHYCEAE

Astasia
Colacium
Cryptoglana
Cyclidiopsis
Distigma
Entosiphon
Euglena
Eutreptia
Eutreptiella
Gyropaigne
Hyalophacus

Khawkinea
Lepocinclis
Menidium
Parmidium
Peranema
Phacus
Rhabdomonas
Rhabdospira
Strombomonas
Trachelomonas

PHAEOPHYCEAE

Ectocarpus

Streblonema

RHODOPHYCEAE

Asterocytis
Chantransia
Chroothece
*Cyanidium***
*Glaucocystis**

Hildenbrandia
Porphyra
Porphyridium
Rhodella

** This alga, which at first glance is a 'blue-green *Chlorella*', has been placed in various other classes

* see footnote on page 9

MYXOPHYCEAE (= Cyanophyceae)

<i>Anabaena</i>	<i>Lyngbya</i>
<i>Anabaenopsis</i>	<i>Mastigocladus</i>
<i>Anacystis</i>	<i>Merismopedia</i>
<i>Aphanizomenon</i>	<i>Microchaete</i>
<i>Aphanocapsa</i>	<i>Microcystis</i>
<i>Arthrospira</i>	<i>Myxosarcina</i>
<i>Calothrix</i>	<i>Nodularia</i>
<i>Chlorogloea</i>	<i>Nostoc</i>
<i>Chroococcus</i>	<i>Oscillatoria</i>
<i>Chroococcopsis</i>	<i>Pelogloea</i>
<i>Coccochloris</i>	<i>Phormidium</i>
<i>Coelosphaerium</i>	<i>Plectonema</i>
<i>Cylindrospermum</i>	<i>Pseudanabaena</i>
<i>Dermocarpa</i>	<i>Pseudoholopedia</i>
<i>Entophysalis</i>	<i>Schizothrix</i>
<i>Fischerella</i>	<i>Scytonema</i>
<i>Fremyella</i>	<i>Spirulina</i>
<i>Gloeocapsa</i>	<i>Symploca</i>
<i>Gloeotrichia</i>	<i>Synechococcus</i>
<i>Lampropedia</i>	<i>Synechocystis</i>
<i>Lauterbornia</i>	<i>Tolypothrix</i>

ZOOMASTIGOPHOREA

<i>Bodo</i>	<i>Rhynchomonas</i>
-------------	---------------------

SARCODINA

Amoebida

<i>Acanthamoeba</i>	<i>Naegleria</i>
<i>Adelphamoeba</i>	<i>Paramoeba</i>
<i>Amoeba</i>	(<i>Pelomyxa</i> ; see <i>Chaos</i>)
<i>Cashia</i>	<i>Platyamoeba</i>
<i>Chaos</i>	<i>Rosculus</i>
<i>Echinamoeba</i>	<i>Saccamoeba</i>
<i>Filamoeba</i>	<i>Stachyamoeba</i>
<i>Flabellula</i>	<i>Tetramitus</i>
<i>Hartmannella</i> (see also <i>Acanthamoeba</i> , <i>Cashia</i> , <i>Echinamoeba</i> , <i>Saccamoeba</i>)	<i>Thecamoeba</i>
<i>Heteramoeba</i>	<i>Vahlkampfia</i>
<i>Mayorella</i> (see also <i>Acanthamoeba</i>)	<i>Vannella</i>
	<i>Vexillifera</i>

Arcellinida (lobose testaceans)

<i>Arcella</i>	<i>Cryptodifflugia</i>
<i>Cochliopodium</i>	

Gromiida (filose testaceans)

<i>Euglypha</i>	<i>Trinema</i>
-----------------	----------------

Leptomyxida

Leptomyxa

Mycetoxoa

Dictyostelium

Heliozoia

Acanthocystis

Actinophrys

Actinosphaerium (see also *Echinosphaerium*)

Echinosphaerium

Raphidiophrys

CILIOPHORA

Primociliatida

Coleps

Colpodida

Colpoda

Suctorida

Discophrya

(*Podophrya*; see *Discophrya*)

Hymenostomatida

Colpidium

Paramecium

Tetrahymena

Uronema

Scuticociliatida

Cyclidium

Peritrichida

Vorticella

Heterotrichida

Blepharisma

Neobursaridium

Spirostomum

Stentor

Hypotrichida

Euplotes

Stylonychia

ROTIFERA

Bdelloidea

Philodina

CULTURE MEDIA

Media may be designed for maintenance, i.e., giving prolonged survival between subculturing, for maximum growth rate, for inducing sexuality, or other special purposes. They may be chemically defined or loosely defined, i.e. containing imprecise ingredients such as soil or extracts of yeast, meat, etc. When cultures have other micro-organisms such as bacteria present, the medium must not be such as to encourage excess growth of contaminants lest they overwhelm the desired organism. In general, media with a total of 0.1 per cent or more organic nutrient are only suitable for axenic cultures.

Large numbers of cultures are maintained on the same medium mainly for convenience. It must not be assumed that one medium is optimal for many strains. Frequently, related species, or even strains within a single species, have significantly different requirements.

Details of some of our more useful maintenance media are given below. Many special media and methods for algae are given by Stein (1973) and Venkataraman (1969).

Proteose peptone (Difco)	0.1%*
KNO ₃	0.02%
K ₂ HPO ₄	0.002%
MgSO ₄ .7H ₂ O	0.002%
Agar	1.0%

This medium proves satisfactory for many algae and also quickly reveals the presence of many common contaminants. For agar cultures with bacteria, a less rich medium is necessary; we generally use soil extract agar (e + s).

Soil extract stock solution	10% by volume
KNO ₃	0.02%
K ₂ HPO ₄	0.002%
MgSO ₄ .7H ₂ O	0.002%
Agar	1.0%

The soil extract stock solution is made by heating in a steamer a calcareous garden loam with twice its volume of supernatant water.

It is convenient to make up and sterilise a number of small containers of stock solution each of a size appropriate to making a batch of media. Repeated autoclaving is deleterious; excessive bacterial growth would spoil the stock solution.

Soil and water media

In spite of possible initial difficulties over selection of suitable ingredients, these media have great advantages for many purposes so long as axenic culture is not required. A well-chosen soil and water medium produces a morphologically excellent growth of almost any organism apart perhaps from the more exacting planktonic forms. The soil

* Unless otherwise indicated % means g per 100 ml.

provides not only mineral nutrients and trace elements, but the latter are naturally chelated, pH is buffered, and toxic products rendered innocuous. The microbial flora ensures a supply of growth substances.

Our basic medium "E" is made as follows:-

Put a layer about 1 cm deep of good calcareous garden loam into a test tube or jar. Carefully add 7 to 10 cm of water, plug or cover, and steam for one hour (longer for larger vessels) on each of two consecutive days. Allow to stand a further day before inoculating, when the pH should be between 7 and 8. The use of mud from rivers or ponds is seldom as satisfactory as garden soil.

Innumerable variations of this basic medium are possible. Among those we find useful are "M" in which the garden soil is replaced by a calcareous clay. The addition of a speck (say about 3% of the volume of the soil) of calcium carbonate or of ammonium magnesium phosphate beneath the soil is recommended, the former for many eutrophic Chlorophyceae, the latter for many green euglenids. Sphagnum peat may be added or may replace the soil when growing forms from acid habitats. The addition of a little starch below the soil stimulates growth of many saprophytes like *Polytoma* and *Astasia*. A pearl barley grain, rice grain or wheat grain produces a bacterial flora which forms a suitable food for many ciliates. By giving consideration to the nutrition of the organism and the nature of its habitat, one can produce soil and water media to suit many different organisms.

When selecting soils, the best method is to take a fair-sized sample, say about one cubic foot, pass this through a sieve of about 1 cm mesh and then make up media and test them with a range of organisms. Should a sample prove satisfactory, you have a sufficient stock, it being often difficult to collect an identical sample even from the same locality.

It is strongly recommended that, where possible, teachers obtain inocula from the collection well in advance and grow them in their own laboratory, using the soil and water method described above. This has the advantage of introducing the students to a culture method based on ecological principles, and with a little practice the material will be in perfect condition. With many algae, e.g. *Euglena*, *Oedogonium* and *Ochromonas*, the cell contents often become obscured by accumulated food reserves in old cultures. In other forms, e.g. *Trachelomonas* and *Pithophora*, certain morphological features only become apparent in older cultures.

Bold's basal medium, (Bischoff and Bold, 1963), is a very useful mineral medium for a wide range of algae including those from more or less eutrophic waters or from soils. It may also be supplemented by soil extract and/or vitamins.

Six stock solutions 400 ml in volume are employed, each containing one of the following salts in the concentration listed:-

NaNO ₃	10.0g
CaCl ₂ .2H ₂ O	1.0g
MgSO ₄ .7H ₂ O	3.0g
K ₂ HPO ₄	3.0g
KH ₂ PO ₄	7.0g
NaCl	1.0g

To 940 ml of distilled water are added 10 ml of each stock solution and 1.0 ml of each of the four stock trace-element solutions prepared as follows:-

- 1. 50 g EDTA and 31 g KOH dissolved in 1 litre H₂O.
2. 4.98 g FeSO₄.7H₂O dissolved in 1 litre acidified H₂O.
(Acidified H₂O: 1.0 ml H₂SO₄ added to 999 ml distilled water.)
3. 11.42 g H₃BO₃ dissolved in 1 litre H₂O.
4. The following, in amounts indicated, all dissolved in 1 litre H₂O: ZnSO₄.7H₂O, 8.82 g; MnCl₂.4H₂O, 1.44 g; MoO₃, 0.71 g; CuSO₄.5H₂O, 1.57 g; Co(NO₃)₂.6H₂O, 0.49 g.

Chu (1942) devised a series of media based on the composition of various natural waters. Chu 10, variously modified, has been used for a wide range of green and blue-green algae and also diatoms, particularly from oligotrophic or less rich eutrophic habitats.

The following is given by Gerloff, Fitzgerald and Skoog (1950).

Ca(NO ₃) ₂	0.004%
K ₂ HPO ₄	0.001%
MgSO ₄ .7H ₂ O	0.0025%
Na ₂ CO ₃	0.002%
Na ₂ SiO ₃	0.0025%
Ferric citrate	0.0003%
Citric acid	0.0003%

Nowadays, the last two ingredients are usually replaced by an iron/EDTA complex, and other trace elements and vitamins may be added as in this modification from the Windermere Laboratory of the Freshwater Biological Association.

Modified Chu 10 (EVT)

	amounts per litre
Ca(NO ₃) ₂ .4H ₂ O	20.0 mg
KH ₂ PO ₄	6.2 mg
MgSO ₄ .7H ₂ O	25.0 mg
Na ₂ CO ₃	20.0 mg
Na ₂ SiO ₃	25.0 mg
N.HCl	0.25 ml
Added as complex	
{ EDTA.Na ₂	2.0 mg
{ FeCl ₃	1.0 mg
EDTA.Fe	
{ H ₃ BO ₃	2.48 mg
{ MnCl ₂ .4H ₂ O	1.39 mg
{ (NH ₄) ₆ Mo ₇ O ₂₄ .4H ₂ O	1.00 mg
vitamin B ₁₂	0.25 mg
vitamin B ₁	1.00 mg
biotin	1.00 mg

Many strains require more specialized media; some of the most important are these:-

Euglena gracilis medium (E.g.)

Na acetate. hydrate	0.1%
Beef extract	0.1%
Yeast extract	0.2%
Bacto tryptone	0.2%
CaCl ₂	0.001%
Agar (optional)	1.0%

Ochromonas medium (Ochr)

Liver infusion (dehydrated) Oxoid	0.1%
Glucose	0.1%
Bacto tryptone	0.1%

Tetrahymena medium (P.Y.)

Proteose peptone	1.0%
Yeast extract	0.25%

Polytoma medium (Polyt.)

Na acetate. hydrate	0.2%
Yeast extract	0.1%
Bacto tryptone	0.1%
Agar (optional)	1.0%

Acanthamoeba, when axenic, is maintained in 4 per cent mycological peptone (M.P.).

Marine algae

Many marine algae thrive in Erdschreiber medium:-

Natural seawater	1 litre
Soil extract stock solution	50 ml
NaNO ₃	0.2 g
Na ₂ HPO ₄ .12H ₂ O	0.03 g

The seawater is filtered, pasteurized, and added to the other ingredients after they have been autoclaved.

For more exacting marine algae, media such as ASP2 (Provasoli et al, 1957) are used, often mixed with an equal part of Erdschreiber. Organisms from polluted marine or estuarine habitats often thrive in a soil and water medium made with an appropriate concentration of seawater.

The following are only two of many liquid media used for *Chlorella*, *Chlamydomonas* and other green algae.

Chlorella, Sorokin and Krauss (1958)

	(g. litre)
KNO ₃	1.25
KH ₂ PO ₄	1.25
MgSO ₄ .7H ₂ O	1.00
CaCl ₂	0.0835
H ₃ BO ₃	0.1142
FeSO ₄ .7H ₂ O	0.0498
ZnSO ₄ .7H ₂ O	0.0882
MnCl ₂ .4H ₂ O	0.0144
MoO ₃	0.0071
CuSO ₄ .5H ₂ O	0.0157
Co(NO ₃) ₂ .6H ₂ O	0.0049
EDTA	0.5

Chlamydomonas reinhardtii

For genetic studies, this alga has been grown in the following medium by Sueoka (1960) and Levine's group at Harvard:-

	Minimal medium
* NH ₄ Cl	0.05 g
MgSO ₄ .7H ₂ O	0.02 g
CaCl ₂ .2H ₂ O	0.01 g
** K ₂ HPO ₄	0.72 g
** KH ₂ PO ₄	0.36 g
Hutner's trace elements	1 ml
Distilled water	1 litre
Hutner's trace elements solution: (g)	
EDTA	50.0
ZnSO ₄ .7H ₂ O	22.0
H ₃ BO ₃	11.4
MnCl ₂ .4H ₂ O	5.1
FeSO ₄ .7H ₂ O	5.0
CoCl ₂ .6H ₂ O	1.6
CuSO ₄ .5H ₂ O	1.6
(NH ₄) ₆ Mo ₇ O ₂₄ .4H ₂ O	1.1
Distilled water (ml)	750

Boil, cool slightly, and bring to pH 6.5 - 6.8 with KOH (do not use NaOH). The clear solution is diluted to 1000 ml with distilled water and should have a green colour which changes to purple on standing. It is stable for at least one year.

For heterotrophic acetate mutants, the medium may be supplemented with sodium acetate at a concentration in the medium of 0.2%.

- * concentration may be increased 10-fold
- ** concentration may be doubled

Blue-green algae

Medium C of Kratz and Myers (1955) is a favourite medium used by investigators working with "*Anacystis nidulans*" or other blue-green algae.

	(g/litre)
MgSO ₄ .7H ₂ O	0.25
K ₂ HPO ₄	1.00
Ca(NO ₃) ₂ .4H ₂ O	0.025
KNO ₃	1.0
Na ₃ citrate.2H ₂ O	0.165
Fe ₂ (SO ₄) ₃ .6H ₂ O	0.004
A ₅ microelements	1.0 ml
Microelements stock solution:	
H ₃ BO ₃	2.86
MnCl ₂ .4H ₂ O	1.81
ZnSO ₄ .7H ₂ O	0.222
MoO ₃ (85%)	0.0177
CuSO ₄ .5H ₂ O	0.079

Several other media for blue-green algae are given by Carr and Whitton (1973, Appendix B).

Media for protozoa

Free-living protozoa, apart from the phytoflagellates are nearly all facultative or obligate phagotrophs. Only a few forms such as *Tetrahymena* and *Acanthamoeba* thrive in axenic liquid culture. Most protozoa grow best in agnotoxenic culture with bacteria and perhaps other micro-organisms as food. In some cases, they can be grown in monoxenic culture with one known food organism.

Free swimming ciliates such as *Paramecium* and *Spirostomum* thrive in soil and water medium (see page 15) with the addition of a barley grain or other source of nutrient to provide a flourishing bacterial flora as food for the ciliate. Other protozoa may be more exacting and, in any case, sessile or bottom-living forms may be difficult to separate from the soil particles. Details of media are available on request.

A simple method for the cultivation of *Amoeba proteus*

This method, not original with us, has proved very satisfactory for the easy maintenance of cultures for teaching purposes, assuming that the inoculum includes not only *Amoeba proteus*, but also a food organism (e.g. *Chilomonas paramecium*).

Pour Prescott's and James's solution (see below) into a dish such as a crystalizing dish (diameter ca. 100 mm or a little smaller) to a depth of approximately 1 cm. Add 3 or 4 uncooked rice grains, and then inoculate with 1 or 2 ml of healthy culture of *Amoeba proteus* containing the food organisms. (If you intend to propagate the culture which you obtain from us, request a culture already containing *Chilomonas*, since we also supply from mass cultures not containing *Chilomonas*.) Cover with half a petri dish or other loose cover, and keep preferably at a temperature of 18 or 19°.

In six or eight weeks, the culture should contain good numbers of amoebae, including some among the fungal mycelia usually growing out from the rice grains, and should still be usable after three months. In a health culture, amoebae are moving with pseudopodia well extended. When most amoebae consist of only monopodial elongated forms, the culture is no longer in very good condition, and rounded cells are also usually unhealthy. Be sure to distinguish between amoebae and elongated bits of detritus.

Amoeba proteus seems to need a few bacteria, so sterilisation of the medium is not recommended. Subculture every two months.

Prescott's and James's solution

Make up three stock solutions:

A	CaCl ₂	0.327 g
	KCl	0.162 g
	Distilled water to 100 ml	
B	K ₂ HPO ₄	0.512 g
	Distilled water to 100 ml	
C	MgSO ₄ .7H ₂ O	0.280 g
	Distilled water to 100 ml	

Final solution: 1 ml each of A, B, and C in 997 ml distilled water.

If you cannot prepare the Prescott's and James's solution, try filtered and boiled water from a fairly clean pond or stream.

LIST OF ALGAE AND PROTOZOA

ACANTHAMOEBA Volkonsky

- A. *astronyxis* (Ray *et* Hayes)
1534/1 Harrison 1957: material from Ray: Washington USA
- A. *castellanii* (Douglas)
1501/1a Neff 1957: soil: California USA
1501/1b Neff 1957: Korn's substrain
1501/2a Castellani 1930: England
1501/2b Chang 1959: pathogenic*: Ohio USA
B 1501/2g Nagington 1974: pathogenic*: human cornea: England
1534/2 Lewin 1951: Connecticut USA
1534/3 Singh 1952, as *Hartmannella rhyssodes*: soil: England
- A. *comandoni* Pussard
B. 1501/5 Comandon, AIP: soil: type material
- A. *culbertsoni* (Singh *et* Das)
B 1501/6 Culbertson 1959 as AI: type material: pathogenic*: monkey kidney tissue culture: USA
- A. *griffini* Sawyer
1501/4 Griffin 1962, No. 5-7: type material: reportedly euryhaline: Connecticut USA
- A. *palestinensis* (Reich)
1547/1 Reich 1933: type material of *Mayorella palestinensis*: soil: Israel
- A. *polyphaga* (Puschkarew)
1501/3a Page 1964, No. 23: Wisconsin USA
1501/3b Page 1965, No. 45: Alabama USA
1501/3c Sawyer 1967, OX-1: Maryland USA
B 1501/3d Nagington 1974: pathogenic*: human cornea: England
1501/3g Jones 1974, 'Garcia': human pathogen*: Texas USA
1501/3h Wang 1959: pathogenic*: New York USA

ACANTHOCYSTIS Carter

- A. *erinaceoides* Petersen *et* Hansen
LB 1504/1 Ockleford 1970: Scotland

ACETABULARIA Lamouroux

- A. *acetabulum* (L.) Silva (= *A. mediterranea* Lam.)
LB 702/1 Brachet: marine

ACROCHAETIUM Naegeli

- A. *sagraeanum* (Mont.) Bornet
LB 1350/1 Ott, No. MO 366: marine

* These pathogenic strains will only be issued to recognised laboratories capable of handling them safely.

ACTINOCHLORIS Korshikov

A. *sphaerica* Korschikov

B 247/1 Starr 1951: from soil: England

ACTINOPHRYS Ehrenberg

A. *sol* Ehrenberg

LB 1502/2 Page 1973: England

ACTINOSPHAERIUM Stein

A. *eichhorni* (Ehrenberg)

LB 1507/2 Goodfellow 1974: England

A. *nucleofilum* Barrett see *Echinospaerium*

ADELPHAMOEBEA Napolitano, Wall *et* Ganz

A. *galeacystis* (Napolitano)

B 1506/1 Napolitano 1967: soil: type material: New York USA

AMOEBEA Bory

A. *proteus* Leidy

LB 1503/2 Taylor as *A. lescherae*

LB 1503/3 Ward's strain

LB 1503/4 Carlsberg "A": reportedly free of cytoplasmic bacteria

AMPHIDINIUM Claparède *et* Lachmann

A. *carterae* Hulburt

LB 1102/1 Parke 1954: Plymouth 127: marine: England

LB 1102/2 Butcher: marine: England

A. *klebsii* Kofoid *et* Swezy

LB 1102/3 Butcher: marine: England

A. *spp.*

LB 1102/4 Butcher 1956: brackish: England

LB 1102/5 Butcher 1960: marine: England

AMPHIPRORA Ehrenberg

A. *hyalina* Eulenstein *ex* Van Heurck

LB 1003/1 Grell 1956: marine: a good food organism: Germany

ANABAENA (Bory) Bornet et Flahault

A. *aequalis* Borge

B 1403/2b derived from 1403/2a after treatment with bromouracil and penicillin. Identified as *A. aequalis* by Kantz and Bold (1969)

A. *ambigua* Rao

LB 1403/7 Mitra: identified as *A. oscillarioides* by H. Forest: identified as *A. sphaerica* by Kantz and Bold: India

A. *catenula* (Kütz.) Bornet et Flahault

1403/1 Manten: Utrecht P 36: identified as *A. inaequalis* by H. Forest: soil: Holland

A. *cylindrica* Lemmermann

1403/2a Chu 1939/Fogg 1940: nitrogen fixer: identity confirmed by Kantz and Bold: identified as *A. inaequalis* by H. Forest: England
B 1403/2b derived from 1403/2a after treatment with bromouracil and penicillin: identified as *A. aequalis* by Kantz and Bold

A. *flos-aquae* (Lyng.) Bréb.

1403/13a Tischer, Univ. Indiana No. 1444
LB 1403/13b Lund 1964: England

A. *inaequalis* (Kütz.) Bornet et Flahault

1403/1 as *A. catenula* q.v.
1403/2a as *A. cylindrica* q.v.
B 1403/2b as *A. cylindrica* q.v.
1446/1a Utrecht P31
B 1446/1c Utrecht P32

A. *oscillarioides* (Bory) Bornet et Flahault

LB 1403/7 as *A. ambigua* q.v.
1403/9 Murray 1963: soil: New York USA: identity doubtful
1403/10 Drouet 1954/Forest: Minnesota USA
1403/11 de Halperin 1959

A. *sphaerica* Bornet et Flahault

1403/7 as *A. ambigua* q.v.

A. *subcylindrica* Borge

1403/4b as *A. variabilis* q.v.
1403/12 as *A. variabilis* q.v.

A. *variabilis* (Kütz.) Bornet et Flahault

1403/4b Utrecht P40: identified as *A. subcylindrica* by Kantz and Bold
LB 1403/8 Probably isolated by Pringsheim in Cambridge: grows well and is used for demonstration as '*Anabaena*'
1403/12 Isolated at Bot. Inst. Halle: Griefswald A92: readily develops spores: identified as *A. subcylindrica* by Kantz and Bold

A. spp.

1403/14 Atkinson 1964/65: Malaya
B 1403/17 Rothamsted 31A: Wilcox Strain III
B 1403/15 Wilcox 1971, Strain I: England
B 1403/16 Wilcox 1971, Strain II: England

ANABAENOPSIS Woloszyńska

- A. *circularis* (G.S. West) Wolosz *et* Miller
1402/1 Watanabe, M4: Japan

ANACYSTIS Meneghini

- A. *cyanea* (Kütz.) Drouet *et* Daily
LB 1450/1 as *Microcystis aeruginosa* q.v.

- A. *dimidiata* (Kütz.) Drouet *et* Daily
LB 1412/1b as *Chroococcus turgidus* q.v.

- A. *marina* (Hansg.) Drouet *et* Daily
LB 1479/1a as *Synechococcus elongatus* q.v.

- A. *montana* (Lightf.) Drouet *et* Daily
LB 1404/1 as *Aphanocapsa rivularis* q.v.
1430/1 as *Gloeocapsa alpicola* q.v.

- A. *montana* f. *minor* Drouet *et* Daily
LB 1404/2 as *Aphanocapsa* sp. q.v.
LB 1405/3 Provasoli

- 'A. *nidulans* (Richt.) Drouet

The Kratz/Allen strain widely known under this name is certainly not *Anacystis* sp. We have listed it as *Synechococcus leopoliensis* (Racib) Komarek. See Komarek 1970.

ANKISTRODESMUS Corda, including *Monoraphidium* Fott *et* Novakova
There is uncertainty about the nomenclature and identification of some of these algae.

- A. *acicularis* (A.Br.) Korshikov
202/11a George 1951: England
202/11b George 1951: England
202/11c Lewin 1951: Connecticut USA
202/11d Starr: Indiana USA
202/11e Wurtz, No. 14: France
202/11f George 1950: Denmark

- A. *angustus* Bernard (*A. falcatus* var. *spirilliformis* G. S. West)
202/2 Vischer 1923, No. 9: Geneva No. 227: Switzerland
202/3a Rodhe, No. 1631a: Sweden
202/3b Wurtz, No. 13: France
202/3c Chodat: Prague; No. 75
202/4a Czurda c. 1929: Czechoslovakia
202/4b George 1950: England
202/4c Wurtz, No. 15: France
202/4d George 1951: England
202/4e George 1951: Finland
202/4f George 1954: Nigeria
202/4g Rosé 1952: Lewin NO. 226: Connecticut USA

A. braunii Brunthaler

- 202/7a Vischer 1933, No. 106: Switzerland
- 202/7b George 1948: South Africa
- 202/7c Norris 1954: California USA
- 202/7d George 1951: England
- 202/7e George 1953: England
- 202/7f Wurtz, No. 12: France
- 202/8a Vischer, No. 339
- 202/8b George 1950: England
- 202/8c Pirson 1952: Germany
- 202/8d Fox 1953: Nigeria
- 202/9 George 1950: England

A. convolutus Corda

- 202/10a George 1952: England
- 202/10b George 1952: Walès
- 202/10c George 1952: England
- 202/10d Wurtz 1947, No. 11: France
- 202/10e Lewin 1950: Connecticut USA
- 202/10f George 1951: France
- 202/10g George 1950: Sweden
- 202/10h Weis 1952, Lewin No. 225: Connecticut USA
- 202/10j Golterman 1958: Holland

A. cucumiformis Belcher *et* Swale

- 202/22 Belcher 1961: type material: England

A. curvulus Belcher *et* Swale

- 202/16 Belcher 1958: type material: England

A. densus Korshikov

- 202/1 Vischer 1923: type strain of *A. amalloides* *nom. nud.*: Switzerland
- 202/20 Belcher 1961: England

A. falcatus (Corda) Ralfs

- 202/5a Czurda 1942: Czechoslovakia
- 202/5c Algéus 1942: Sweden
- 202/5d George 1955: England
- 202/14a George 1951: France
- 202/14b Wurtz 1947, No. 17: France
- 202/14c Christensen: Bornholm
- 202/15a Golterman 1958: Holland
- 202/15b Pringsheim 1955: Germany

A. falcatus *var.* *terrestris* Bristol

- 202/23 Flint/King 1966: New Zealand

A. longissimus (Lemm.) Wille

- 202/13 Myers, No. 9: Texas USA

A. lunulatus Belcher *et* Swale

- 202/17 Belcher 1960: type material: England

A. nannoselene Skuja

- 202/6a Rodhe pre 1948, No. 1632: type material: Sweden
- 202/6b George 1951: England

A. *pseudotraunii* Belcher *et* Swale
202/19 Belcher 1962: type material: England

A. *sabrinensis* Belcher *et* Swale
202/21 Belcher 1961: type material: England

A. *spiralis* (Turner) Lemmermann
202/12 Christensen 1948, No. 4879: Bornholm

A. *spirilliformis* see *A. angustus*

A. *subcapitatus* Korshikov
202/18 Belcher 1960: England

A. sp..
LB 202/24 Butcher: marine: England

ANTHOPHYSA Bory

A. *vegetans* (OFM) Stein
LB 905/1 Pringsheim 1950: England

APEDINELLA Throndsen

A. *spinifera* (Thr.) Throndsen
LB 906/1 Throndsen 1965: Plymouth 460: type material: marine: Norway

APHANIZOMENON Morren

A. *flos-aquae* (L.) B. *et* F.
LB 1401/1 Heaney 1968: Ireland

APHANOCAPSA Naegeli

A. *rivularis* (Carm.) Rabenhorst (*Anacystis montana* (Lightf.) Drouet *et* Daily)
LB 1404/1 Pringsheim 1947: England

A. sp. (*Anacystis montana* f. *minor* Drouet *et* Daily)
LB 1404/2 Pringsheim 1947: England

ARCELLA Ehrenberg

A. *polypora* Penard
LB 1505/2 Page 1974: England

ARTHROSPIRA Stitzenberger, see also *Spirulina*

A. sp..
LB 1475/5 Lack 1971, L235: England

ASTASIA Dujardin

- A. *applanata* Pringsheim
LB 1204/1 Pringsheim 1936: type strain: Austria
- A. *curvata* Klebs
LB 1204/5 Pringsheim 1940: England
- A. *dangeardii* Lemmermann *var. parva* Pringsheim
LB 1204/7 Pringsheim: type strain: Brazil
- A. *fritschii* Pringsheim (*Khawkinea*)
LB 1204/8a Pringsheim 1940: England
LB 1204/8b Pringsheim 1940: England
- A. *hallii* (Jahn et McKibben) Pringsheim (*Khawkinea*)
LB 1204/12 Pringsheim 1940: England
- A. *inflata* Klebs
LB 1204/14 Pringsheim: Czechoslovakia
- A. *klebsii* Lemmermann
LB 1204/15 Pringsheim
- A. *linealis* Pringsheim (*Cyclidiopsis acus*)
LB 1204/16b Christen: Clone 1-1
LB 1204/16c Christen: Clone 3-1
LB 1204/16d Christen: Clone 4-1
- A. *longa* Pringsheim
LB 1204/17a Pringsheim: type strain: Czechoslovakia
1204/17b Hall
1204/17c Pringsheim: England
1204/17d Pringsheim: arose from *Euglena* 1224/5g: Scotland
1204/17e Lackey: arose from *Euglena* 1224/5h
1204/17f Provasoli: A8: Italy
1204/17g Dach 1940: as *A. klebsii*
1204/17j Provasoli as *A. lombardica*: Italy
- A. *longa* Pringsh. *var. truncata* Pringsheim
1204/18 Pringsheim 1938: type strain: Czechoslovakia
- A. *ocellata* Khawkine *var. provasolii* Pringsheim (*Khawkinea*)
1204/9 Pringsheim/Provasoli 1947: type strain: Czechoslovakia
- A. *pertyi* Pringsheim (*Khawkinea*)
1204/3 Pringsheim 1939: England
- A. *quartana* (Moroff) Pringsheim (*Khawkinea*)
LB 1204/20a Pringsheim 1939
LB 1204/20b Pringsheim 1940
1204/17h Provasoli as *A. gambarone*: Italy
- A. *sagittifera* Skuja
LB 1204/24 Christen
- A. *solea* Pringsheim (*Khawkinea*)
LB 1204/19 Pringsheim 1947: England

A. torta Pringsheim
LB 1204/21 Pringsheim 1936: type strain: Austria

A. spp.
LB 1204/22 Starr 1950: England
LB 1204/23 Pringsheim: England = ? *A. margaritifera*

ASTERIONELLA Hassall

A. formosa Hassall
LB 1005/1b Jaworski 1974, L272: England

ASTEROCOCCUS Scherffel

A. siderogloeus (Pascher et Jahoda) Novakova
LB 31/2 George 1950: England; typical colonies not produced in culture

A. superbus (Cienk.) Scherffel
3/3a George 1949: France
3/3b George 1950: England

ASTEROCYTIS Gobi

A. ornata (Agardh) Hamel, see *Chroothece richterianum*

A. ramosa (Thwaites) Gobi
LB 1353/3 Belcher 1974: England

ASTEROMONAS Artari

A. gracilis Artari
LB 80/1 Lewin 1955: marine: California USA

A. propulsum Butcher, see *Pyramimonas aff. orientalis* Butcher

BACILLARIA Gmelin

B. paradoxa Gmelin
LB 1006/1* Belcher 1974: marine: England

BALTICOLA Droop (*Haematococcus* Agardh q.v.)

BIDDULPHIA Gray

B. sp..
LB 1007/1* Belcher 1974: marine

BIPEDINOMONAS Carter, see *Heteromastix*

BLEPHARISMA Perty

B. americanum Suzuki

LB 1607/1 Hirshfield 1961: New York USA

B. japonicum Suzuki

LB 1607/2 Suzuki 1946: type material: Japan

BODO Ehrenberg

B. caudatus (Duj.) Stein

LB 1907/4 Brooker 1963, pig dung: England

B. saltans Ehrenberg

LB 1907/2 George 1962: Wales

LB 1907/3 Brooker 1962: brackish: USA

BOEKELOVIA Nicolai et Baas-Becking

B. spp.

LB 908/1 Butcher 1960: marine: England

LB 908/2 Butcher 1953: marine: England

LB 908/3 Butcher 1953: marine: England

LB 908/4 Butcher 1957: marine: England

LB 908/5 Butcher: marine: England

BORODINELLA Miller

? B. sp.

207/1a Vischer, No. 304: *Tetracystis dissociata* Brown et Bold

BOTRYDIOPSIS Borzi

B. alpina Vischer

806/1 Vischer 1940, No. 232: soil: Switzerland

B. arrhiza Borzi

806/2 Pringsheim: soil: England

222/1b George 1947: England

B. intercedens Vischer et Pascher

806/3 Pringsheim: Geneva No. 522: Vischer No. 171

BOTRYDIUM Wallroth

B. bechererianum Vischer

805/1 Vischer 1937, No. 192: soil: France

B. cystosum Vischer

B 805/2 Vischer 1937, No. 196: soil: Switzerland

B. granulatum (L.) Greville

805/3a Vischer

805/3b Vischer

} both these strains received from Vischer in 1939

B. granulatum var. *kolkwitzianum* Vischer
805/4 Vischer 1936, No. 31: from sewage: Germany

B. stoloniferum Mitra
805/5 Mitra/Pringsheim 1950: type material

BOTRYOCOCCUS Kützing

B. braunii Kütz,
LB 807/1 Droop 1950: England

BRACHIOMONAS Bohlin

B. submarina Bohlin
7/1a Droop 1950: Millport No. 42 } heterothallic pair: Finland
7/1b Droop 1950: Millport No. 43 }

B. submarin var. *pulsifera* Droop
7/2a Droop: Millport No. 44 } heterothallic pair: Scotland
7/2b Droop: Millport No. 45 }

BRACTEACOCCUS Tereg

B. cinnabarinus (Kol ~~et~~ Chodat) Starr
221/2 F. Chodat: Vischer No. 162: Switzerland, (formerly *Dictyococcus*)

B. engadinensis (Kol ~~et~~ Chodat) Starr
221/3 F. Chodat: Vischer No. 164: Switzerland. (formerly *Dictyococcus*)

B. minor (Chodat) Petrova
221/1 Chodat 1913 as *Botrydiopsis*, later known as *Dictyococcus*

B. minor f. *desertorum* Friedmann *et* Ocampo-Paus
221/6 Friedmann 1966: type material: Negev desert

B. terrestris (Kol *et* Chodat) Starr
221/4 Chodat: Vischer No. 163 (formerly *Dictyococcus*)

BULBOCHAETE Agardh

B. sp.
LB 555/1 Bold: Indiana No. 517: female strain

BUMILLERIA Borzi

B. exilis Klebs
808/2 Lewin 1951: from snow: Alaska

B. sicula Borzi
808/1 George 1950: from soil: England

B. sp.
808/3 Lewin 1951: from snow: Alaska

BUMILLERIOPSIS Printz

- B. filiformis Vischer
809/2 Vischer 1943, No. 360: type material: from soil: Switzerland
- B. peterseniana Vischer *et* Pascher
809/3 Vischer 1927, No. 38: type material: Switzerland

CAESPITELLA Vischer

- C. pascheri Vischer = *Stigeoclonium pascheri* (Vischer) Cox *et* Bold
410/1 Vischer 1928, No. 45: type material: Switzerland
410/2 Lewin 1950: Connecticut USA

CALOTHRIX (Agardh) Bornet *et* Flahault

- C. anomala Mitra (*nomen nudum*)
LB 1410/4 Mitra No. 5: type material: resembles *Scytonema* more than *Calothrix*
- C. brevissima West
1410/7 Watanabe M7
- C. membranacea Schmidle
1410/1 Pringsheim material from Mitra
- C. pulvinata Bornet *et* Flahault
B 1410/9 Butcher 1956: marine: England
- C. scopulorum Bornet *et* Flahault
1410/5 Stewart: fixes nitrogen: Scotland
- C. spp.
1410/6 Komarek/Baker 1964: mangrove: Cuba
B 1410/8 Wilcox 1971

CARTERIA Diesing

- C. crucifera Korshikov
8/7a Lewin 1950: Connecticut USA
8/7b Lewin 1950: Connecticut USA
8/7c Lewin 1950: Connecticut USA
- C. eugametos Mitra = *C. lunzensis* Pascher *et* Jahoda (see Fott 1968)
8/3 Mitra/Pringsheim: type material: homothallic: from soil: India
- C. incisa Pringsheim *nom. prov.*
LB 8/4 Pringsheim 1941: England
- C. lunzensis Pascher *et* Jahoda see *C. eugametos*
- C. sp.
8/5 Pringsheim 1936: Austria

CASHIA Page

C. limacoides Page
B 1534/5

Page 1965: type material: Alabama USA

CEPHALEUROS Künze

C. sp.

411/1

George 1969: isolated from leaves of tea plant showing red rust:
Assam India. This is probably the causal organism though
reinfection of host from the culture has not been attempted.

CERATIUM Schrank

C. hirundinella (OFM) Dujardin

LB 1110/1

Jaworski 1972, FBA 258: England

CHAETOCEROS Ehrenberg

C. calcitrans (Paulsen) Takano

LB 1010/1

Takano: a very useful form used for oyster feeding: marine:
Plymouth 1056: Japan

CHAETOPELTIS Berthold

C. orbicularis Berthold

LB 412/1

Reynolds pre 1950: Wales

CHAETOPHORA Schrank

C. incrassata (Hudson) Hazen

LB 413/1

George 1949: typical material is seldom achieved in culture:
England

C. sp.

LB 413/2

Reynolds No. 11

CHANTRANSIA

C. sp.

LB 1354/1

Ott, 1965, 0308 (*Audouinella*)

CHAOS Linnaeus

C. carolinense (Wilson)

LB 1511/1

Turtox/Carlsberg 13: New Jersey USA

CHARACIUM Braun

C. starrii Fott

209/1a

Starr 1951: heterothallic, + strain: South Africa

209/1b

Starr 1951: heterothallic, - strain: South Africa

CHILOMONAS Ehrenberg

C. curvata (auct) Pringsheim

LB 977/1 Pringsheim 1940, strain 3: England

C. paramecium Ehrenberg

L 977/2a Pringsheim pre 1940, strain 1

LB 977/2b Hall: Pringsheim, strain 8

LB 977/2c Pringsheim, strain 4

CHLAMYDOBOTRYS Korshikov see *Pyrobotrys* Arnoldi

CHLAMYDOCAPSA Fott

C. ampla (Kütz.) Fott

31/3 Lewin 1950 (not the same as Göttingen 31/3): Connecticut USA

CHLAMYDOMONAS Ehrenberg

C. agloiformis Pascher

11/1 Mainx 1925: Czechoslovakia

C. angulosa Dill

11/59 Tsubo

C. applanata Pringsheim

11/2 Pringsheim 1930: type material: homothallic: Czechoslovakia

C. asymmetrica Korshikov

11/41 Lewin 1951: Connecticut USA

C. baca Ettl

11/77 Ettl 1960: type material: Czechoslovakia

C. brannonii Pringsheim

11/3 Brannon 1938, No. 5: USA

C. bullosa Butcher

11/83 Culture from Butcher, purporting to be Plymouth 205, but that is *Halosphaera*: reisolated by Cann 1975: marine

C. callosa Gerloff

11/24 Pringsheim 1929 (as *C. pulchra* Pringsh.): type material: Czechoslovakia

C. chlamydogama Bold

11/48a Bold 1949: + strain, W 16-1: from soil: Venezuela

11/48b Bold 1949: - strain, W 16-2: from soil: Venezuela

C. chlorostellata Flint *et.* Ettl

B 11/93 Flint 1957: soil: type material: New Zealand

C. coccoides Butcher

LB 11/81 Parke 1957, Plymouth 171: possibly type material: marine: England

C. cribrum Ettl

11/75 Hindak 1962-73: type material: Czechoslovakia

- C. debaryana* Goroshankin
 11/40a Lewin 1951: Connecticut USA
 11/40b Lewin 1953: mutant No. B6: requires acetate: also mutants B1 & B9
 11/56a Lewin 1950: soil: Mexico } heterothallic mating pair
 11/56b Lewin 1950: soil: Mexico }
- C. debaryana* *var. cristata* Ettl
 11/74 Ettl: type material: soil:Czechoslovakia
- C. debaryana* *f.* Ettl
 B 11/94 Ettl 1968 as 1968/15: Czechoslovakia
- C. dorsoventralis* Pascher
 11/4 Mainx 1926: type material: Czechoslovakia
- C. dysosmos* Moewus
 11/36a Lewin 1951: homothallic: USA
 11/36b Lewin 1951: sterile mutant, No. 270
 11/36c Lewin: mutant D2075: obligate autotroph
 11/31 Neish: from soil: Canada
 Also mutants D381, D2048 and D2377 from Lewin 1974
- C. eugametos* Moewus (see also *C. moewusii* Gerloff)
 11/5a + strain } isolated by Czurda from a contaminated
 11/5b - strain } culture from Moewus
 11/5c + strain } received from Moewus 1951
 11/5d - strain }
- C. euryale* Lewin
 11/62 Lewin 1957: type material: ≡ strain 11/59 of Gottingen: marine:
 Nova Scotia
- C. fimbriata* Ettl
 11/69 Hindak 1962-74: type material: Czechoslovakia
- C. foveolarum* Skuja
 11/68 Pringsheim 1950/Baker 1966: England
- C. gerloffii* Ettl
 11/72 Ettl: type material: Czechoslovakia
- C. globosa* Snow
 11/60 George 1954: Uganda
- C. gloeopara* Rodhe *et* Skuja
 11/7 Rodhe No. 1635: type material: Sweden
- C. gregaria* Butcher
 11/84a Butcher/Cann 1975: marine: England
 11/84b Butcher/Cann 1975, as 'subtype': salt marsh: Wales
- C. gyrus* Pascher
 11/8 Pringsheim: type material: Czechoslovakia: identity doubtful
- C. humicola* Lucksch
 11/9 Lucksch 1929: type material: Czechoslovakia

- C. hydra* Ettl
 11/6a subdioecious + strain
 11/6b subdioecious - strain } isolated by Czurda from contaminated
 11/6c subdioecious - strain } cultures from Moewus
- C. hydra* Ettl *var. micropapillata* Ettl
 11/76 Ettl; soil: type material: Czechlovakia
- C. incisa* Pringsheim (non Korsh.) see *Sphaerellopsis incisa*
- C. indica* Mitra
 11/11 Mitra/Pringsheim 1947: soil: India
- C. inepta* Ettl
 11/70 Ettl soil: type material: Czechoslovakia
- C. intermedia* Chodat
 11/13 Pringsheim 1939: England
- C. iyengarii* Mitra
 11/14 Mitra/Pringsheim 1947: soil: India
- C. komma* Gerloff
 11/63 Tsubo as T-B-3
- C. laciniata* Gerloff see *Sphaerellopsis incisa*
- C. mexicana* Lewin
 11/55a Lewin 1953, Y62 } heterothallic pair: type material: soil: Mexico
 11/55b Lewin 1953, Y64 }
- C. moewusii* Gerloff (*C. eugametos var. moewusii* (Gerloff) Gowans) see Farooqui (1974)
 11/16f Provasoli 1948: + wild type } heterothallic pair
 11/16g Provasoli 1948: - wild type }
 11/61a Lewin 1957 } heterothallic pair, not interfertile with
 11/61b Lewin 1957 } 11/16f,g: soil: Caroline Is.
 11/16a Lewin, mutant M236 +: paralysed
 11/16b Lewin, mutant M202 +: monsters
 11/16d Lewin, mutant M470 +: twins and monsters
 11/16e Lewin, mutant M478: slow growing, deformed plastids

The following mutants were received from Lewin in 1974.
 For full reference the mutant designations should be prefixed
 by CCAP 11/16 in all cases.

M 224 +	M 1060 +
M 470 -	M 1074 - nm*
M 475 +	M 1081 +
M 475 nm*	M 1082+
M 1001 -	M 1083 -
M 1002 +	M 1085 -
M 1011 +	M 1086 -
M 1014 +	M 1087 -
M 1016 -	M 2002 +
M 1034 -	M 2004 +
M 1036 +	M 470.1001 +
M 1041 +	M 475.1051 +
M 1041 -	M 475.1051 -
M 1043 +	M 1001.1017 +
M 1043 -	M 1001.1074 +

* no modifier for M 1074

M 1044 +	M 1001.1074 -
M 1050 +	M 1002.1082 +
M 1051 -	M 1021.1051 +
M 1053 -	M 1021.1074 +
M 1053.1 +	M 1021.1074 -
M 1053.1 -	M 1021.1085.1 -
M 1053.2 +	M 1043.1074 -
M 1054 +	M 1043.1088 +

- C. moewusii* *var. rotunda* Tsubo
 11/64a Tsubo 1952: 24 + } heterothallic pair, not interfertile
 11/64b Tsubo 1952: 24 - } with any of the above: Japan
- C. monoica* Strehlow
 11/17 Pringsheim: material from Kniep: homothallic: ? Germany
- C. nivalis* Wille
 11/51 Lewin 1952: from snow: Alaska
- C. oblonga* Pringsheim
 11/18 Pringsheim 1930: type material: Czechoslovakia
- C. orbicularis* Pringsheim
 11/19 Pringsheim 1930: type material: Czechoslovakia
- C. pallens* Pringsheim
 11/67 Pringsheim 1959; type material: South Africa
- C. parkeae* Ettl
 11/79 Parke/Cann: type material: marine: Plymouth 285: England
- C. perforata* Pascher *et* Jahoda
 11/43 Pringsheim 1950: Finland
- C. philotes* Lewin
 11/53 Lewin 1953: type material: from soil: homothallic: Mexico
- C. plethora* Butcher
 11/84a Butcher/Cann 1975; marine: England
 11/86a Butcher/Cann 1975: designated "sub-type" by Butcher:
 brackish: England
 11/86b Butcher/Cann 1975: brackish: England
- C. proboscigera* *var. conferta* Ettl
 11/38 Lewin 1951: Connecticut USA
- C. proteus* Pringsheim
 11/21 Pringsheim 1930: type material: Czechoslovakia
- C. pseudagloe* Pascher
 11/22b Lewin 1950: Connecticut USA
- C. pseudococcum* Lucksch
 11/23 Lucksch 1929: type material: Czechoslovakia
- C. pulchra* Pringsheim (= *C. callosa* Gerloff)
- C. pulsatilla* Wollenweber
 11/44 Pringsheim 1950: Finland

- C. pulvinata** Vischer
11/25 Vischer 1923, No. 4: type material: Switzerland
- C. rapa** Ettl *f. vasta* Ettl
11/73 Ettl 1962: type material: Czechoslovakia
- C. reginae** Ettl *et* Green
11/78 Jowett 1966/Cann 1975: Plymouth No. 399: type material: France
- C. reinhardii** Dangeard
- | | | |
|--------|--------------------------------------------------------|------------------------------------------------|
| 11/32a | G. M. Smith No. 137c + | } from soil: Massachusetts USA |
| 11/32b | G. M. Smith No. 137c - | |
| 11/32c | wild type + | { from R. P. Levine: morphologically identical |
| 11/32d | wild type - | |
| 11/32e | Levine, mutant Arg. 1 - | |
| 11/32f | Levine, mutant Arg. 2 + | |
| 11/32g | Levine, mutant Pab. 2 + | |
| 11/32h | Levine, mutant Pf. 15A + | |
| 11/32k | Levine, mutant Pab. 1A + | |
| 11/32m | Levine, mutant Ac. 17 + | |
| 11/32n | Levine, mutant Thi. 2 - | |
| 11/32o | Levine, mutant Thi. 8 - | |
| 11/32p | Levine, mutant Pf 1 + | |
| 11/32q | Levine, mutant Ac. 31 + | |
| 11/32r | Levine, mutant Pf. 14 - | |
| 11/32s | Levine, mutant SR. 1a + | |
| 11/32w | Levine, mutant Ac. 14 A Arg. 2 - | , allelic |
| 11/32x | Levine, mutant Ac. 14 B | +, allelic |
| 11/32y | Levine, mutant Ac. 14 C | -, allelic |
| 11/32z | Levine, mutant Ac. 14 E | -, allelic |
| 11/45 | Lewin 1950: (<i>C. reinhardii?</i>): Connecticut USA | |

Owing to the large number of mutant strains involved, we are using the isolator's designations. The full reference to these strains should, therefore, be CCAP 11/32 Pf 1-, etc.

Pf 1 -	R. A. Lewin	HA 24 -	McVittie
Pf 2 +	R. A. Lewin	HA 26 -	McVittie
Pf 3 +	R. A. Lewin	HA 28 -	McVittie
Pf 4 +	R. A. Lewin	HA 29 +	McVittie
Pf 5 -	R. A. Lewin	NG 1 +	McVittie
Pf 6 -	R. A. Lewin	NG 2 +	McVittie
Pf 7 -	R. A. Lewin	NG 5 + (Lf1)	McVittie
Pf 8 +	R. A. Lewin	NG 6 +	McVittie
Pf 9 -	R. A. Lewin	NG 9 +	McVittie
Pf 10 +	R. A. Lewin	NG 10 +	McVittie
Pf 12	R. A. Lewin	NG 11 -	McVittie
Pf 13 -	R. A. Lewin	NG 13 + (Lf2)	McVittie
Pf 14 +	R. A. Lewin	NG 14 +	McVittie
Pf 16 -	R. A. Lewin	NG 15 +	McVittie
Pf 17 -	R. A. Lewin	NG 16 +	McVittie
Pf 18 +	R. A. Lewin	NG 17 +	McVittie
Pf 19 +	R. A. Lewin	NG 19 +	McVittie
Pf 20 +	R. A. Lewin	NG 22 +	McVittie
AO 3 +	McVittie	NG 24 +	McVittie
AO 4 +	McVittie	NG 25 +	McVittie
AO 6 +	McVittie	NG 28 +	McVittie
AO 7 +	McVittie	NG 30 +	McVittie

HA 1 -	McVittie	NG 35 +	McVittie
HA 3 -	McVittie	NG 36 +	McVittie
HA 7	McVittie	NG 37 +	McVittie
HA 10 -	McVittie	S 3 +	McVittie
HA 13 -	McVittie	S 13 +	McVittie
HA 16 -	McVittie	S 16 +	McVittie
HA 18 +	McVittie	SU 1	J. R. Warr
HA 19 +	McVittie		
HA 21 -	McVittie		

Mutants received from D. R. Davies 1974/75

Ac 14 E-	CW 18-
Ac 14 ECW1+	CW 19-
Ac 14 ECW2	CW 20-
Ac 14 ECW8	CW 51-
Ac 14 ECW10	CW 51+
Ac 14 ECW18/2+	CW 92-
Ac 14 ECW 18/3-	CW 177+
Ac 14 ECW18/4+	Nic 13+
Ac 14 ECW18/6-	Pab 1+
Ac 14 ECW19	Pab 2-
Ac 14 E UVS1-	PF 4-
Ac 14 E UVS1/B-	SR 1+
2 Ac 14 EY/1	UVS 1-
Ac 17 E-	UVS1/b+
Ac 17 ECW8	UVS 2+
Ac 17 ECW10	UVS 3-
Ac 76+	UVS 4-
Arg 1+	UVS 5+
Arg 2+	UVS 6+
Can R+	UVS 7-
CW 1-	UVS 8
CW 2+	UVS 9
CW 3+	Y +
CW 4+	YUVS 1+
CW 6+	YUVS 6+
CW 7-	
CW 8+	
CW 9-	
CW 10-	
CW 14+	
CW 15+	
CW 17-	
CW 18+	

C. rosaë H. Let O. Ettl (= *Chloromonas rosaë* Ettl)
11/66 Ettl: type material: from soil: Czechoslovakia

C. ? rotula Playfair
11/33 Vischer, No. 389

C. rugosa Butcher
11/85 Butcher/Cann 1975: marine

C. segnis Ettl
11/71 Ettl: soil: type material: Czechoslovakia

- C. aff. snowiae* Prinz
8/2 arose as a contaminant in a *Carteria* culture
- C. sphaerella* Pringsheim
11/27 Pringsheim: England
- C. sphaeroides* Gerloff
11/29 Pringsheim 1929: Czechoslovakia
- C. stercoraria* Pringsheim *nom. prov.*
11/49 Pringsheim 1951: England
- C. subangulosa* Fritsch *et* John
11/28 Pringsheim 1940: material from John: from soil: England
- C. spreta* Butcher
LB 11/87 Butcher: marine: England
- C. subehrenbergii* Butcher
11/88 Butcher/Cann 1975: marine: England
- C. subglobosa* Pringsheim (= *C. sphaeroides* Gerloff)
11/29 Pringsheim 1929: type material: Czechoslovakia
- C. subtilis* Pringsheim
11/30 Pringsheim 1929: type material: Czechoslovakia
- C. terricola* Gerloff
11/37 Lewin 1950: Connecticut USA
- C. ulvaensis* Lewin
11/58 Lewin 1951: type material: Scotland
- C. uva-maris* Butcher
11/89 Butcher/Cann 1975: marine: England
- C. vectensis* Butcher
11/90 Butcher/Cann 1975: marine: England
- C. spp.*
11/26 Pringsheim: formerly listed as *C. simplex*
11/35 Lewin 1950: marine: used for oyster feeding: USA
11/42 Lewin 1951: (*Chlorogoniella*): Massachusetts USA
LB 11/46 George 1948: (*Aglæe*): England
11/47 Droop 1951: Finland
11/50 Droop 1951: (*Chloromonas*): Finland
11/52 Lewin 1952: from snow: Alaska USA
11/54 Lewin 1953, Y 80: homothallic: from soil: Mexico
11/56a Lewin 1953, Y 68 } mating pair : from soil: Mexico
11/56b Lewin 1953, Y 69 }
11/57 Lewin 1951, DD 1/174: homothallic: Scotland
11/82 Blakey 1973: (*Euchlamydomonas*): a large form recommended for
 teaching: England
11/91 Butcher/Cann 1975: marine: England

CHLORELLA Beijerinck

It has long been recognised that the specific names given to strains of *Chlorella* have in many cases been useless or even misleading. The names *C. pyrenoidosa* and *C. vulgaris* especially have been used with little regard for either the characters of the alga or the code and practice of nomenclature. In general, we follow the revision of Fott and Novakova (1969) as modified by Kessler (1974) and confirmed by Morris (1976). Unfortunately, over the years, there has been some confusion of strains in all the main culture collections. Where the Göttingen strains have proved different from ours of the same designation, we have distinguished them by adding 'G8' or 'CCAP' to the strain number.

All except the marine strains are now preserved under liquid nitrogen, indicated by 'N'. Only the strains in frequent demand will still be maintained on agar slopes. The marine species have not yet been taxonomically revised.

Chlorella autotrophica Shihira et Krauss

=*C. vulgaris* var. *autotrophica* (S. et K.) Fott et Novakova

C. candida S. et K.

=*C. vulgaris* var. *vulgaris* according to F. et N.

C. ellipsoidea Gerneck

=*C. saccharophila* var. *ellipsoidea* (Gerneck) F. et N.

C. emersonii S. et K. var. *emersonii* (formerly *C. fusca* var. *vacuolata*. see Fott et al., 1975)

- | | | |
|---|---------|-------------------------------------------------------------------------------------------------------------------------|
| N | 211/8a | Pringsheim: type material of <i>C. photophila</i> S. et K. |
| N | 211/8b | Emerson 1923: type material of <i>C. fusca</i> var. <i>vacuolata</i> , formerly known as <i>C. pyrenoidosa</i> : Pa USA |
| N | 211/8c | Emerson 1926: from tapwater in Warburg's laboratory: formerly known as <i>C. pyrenoidosa</i> : Germany |
| N | 211/8g | Emerson '3': used in Cambridge Botany School as <i>C. pyrenoidosa</i> up to 1957 |
| N | 211/8h | Emerson '3': received from A. H. Brown 1957 |
| N | 211/11m | 'Cornell 11' used by <i>inter alia</i> Hopkins and Wann (1926) and Pearsall and Loose (1937): from soil |
| N | 211/11n | from Emerson's laboratory, isolated before 1939 |
| N | 211/15 | Pringsheim c. 1945: England |

C. emersonii var. *rubescens* Fott et al.

- | | | |
|---|-------|----------------------------------------------------------------------|
| N | 232/1 | Izard 1966: type material of <i>Halochlorella rubescens</i> Dangeard |
|---|-------|----------------------------------------------------------------------|

C. fusca S. et K. var. *fusca* = *Scenedesmus* spp. see Fott, B., Lochhead et Clemenccon (1975)

C. fusca var. *rubescens* (Dangeard) Kessler et al = *C. emersonii* var. *rubescens* Fott et al

C. fusca var. *vacuolata* S. et K. = *C. emersonii* S. et K. var. *emersonii*

C. kessleri F. et N.

- | | | |
|---|---------|----------------------------------------------------------------------------------|
| N | 211/11g | Winokur, received 1945: type material: also type material of <i>C. regularis</i> |
| N | 211/11h | used by Pratt, received from Emerson 1946. |

- C. luteoviridis** Chodat
- | | | |
|---|----------------|----------------------------------------------------------------------------------------|
| N | 211/2a | Kufferath 1912: Geneva No. 95: type material: Belgium |
| N | 211/2b | Beijerinck, received from Baarn 1949 |
| N | 211/3 | ? Kluyver: from Delft as <i>C. aureoviridis</i> |
| N | 211/4 | Kufferath 1912: Geneva No. 111: type material of <i>var. lutescens</i> Chodat, Belgium |
| N | 211/5a | Pringsheim: type material of <i>C. mutabilis</i> S. et K. |
| N | 211/5b | Gaffron: HMS No. Z.11.1.1 as <i>Palmellococcus: C. nocturna</i> S. et K. |
| N | 211/10a (CCAP) | Beijerinck: Meyer No. 20, clone B 410 |
| N | 211/10d (CCAP) | Beijerinck: received from Delft 1946 |
| N | 211/10e (CCAP) | received from Prague 1946 |
- C. marina** Butcher
- | | | |
|----|--------|------------------------------------------|
| LB | 211/27 | Collyer: marine: type material?: England |
|----|--------|------------------------------------------|
- C. miniata* (Naegeli) Oltmanns
- | | | |
|---|--------|--------------------------------------------------------------------------------------------|
| N | 211/14 | Dönz 1933: type material: type of <i>C. zofingiensis</i> according to F. et N: Switzerland |
|---|--------|--------------------------------------------------------------------------------------------|
- C. mutabilis* S. et K. = *C. luteoviridis* Chodat
- C. nocturna* S. et K. See *C. luteoviridis*
- C. ovalis* Butcher = *C. vulgaris* var. *vulgaris*
- | | | |
|----|---------|-----------------------------------------------------|
| N | 211/21a | Butcher/George 1956: type material: marine: England |
| LB | 211/21b | Butcher 1953: marine: England |
- C. photophila* S. et K.
- | | | |
|--|--------|------------------------------------------------------------------------|
| | 211/8a | Pringsheim: type material: = <i>C. emersonii</i> var. <i>emersonii</i> |
|--|--------|------------------------------------------------------------------------|
- C. pringsheimii* S. et K. = *C. saccharophila*
- C. protothecoides** Krüger
- | | | |
|---|--------------|--------------------------------------------------------------------------------------------------------------|
| N | 211/7a | Krüger 1912: type material |
| N | 211/7b | ? Kluyver |
| N | 211/7c | ? Kluyver |
| N | 211/7d | Czurda: type material of <i>var. galactophila</i> S. et K. |
| N | 211/8d | Pringsheim 1947: from <i>Ulmus</i> sap: England |
| N | 211/10a (Gö) | |
| N | 211/10b | Beijerinck: Chodat No. 21, Clone G 13 |
| N | 211/10c | Beijerinck: Chodat No. 21, Clone G 122 |
| N | 211/10d (Gö) | |
| N | 211/10e (Gö) | |
| N | 211/11a | Pringsheim: <i>var. mannophila</i> S. et K. |
| N | 211/11i | Beijerinck, received from Baarn 1946: selected as type of <i>C. vulgaris</i> Beij. by Drouet et Daily (1956) |
| N | 211/13 | Beijerinck, as <i>C. xanthella</i> : received from Delft 1948 |
| N | 211/17 | Beijerinck, from Baarn 1949 |
| N | 211/6 | Loefer 1934: from <i>Paramecium bursaria</i> |
- C. pyrenoidosa* Chick *nomen confusum*. Several strains used under this name are now listed as *C. emersonii*
- C. regularis* (Artari) Oltmanns *nom. illeg.*: = *C. kessleri*

C. saccharophila (Krüger) Nadson

- N 211/1a Pringsheim: type material of *var. ellipsoidea*
(Gerneck) F. et N.
N 211/1b Brannon 1938, No. 6: USA
N 211/1c (Gö)
N 211/1d Kellner 1951: from Pirson as M-St
N 211/1f Wood, Millport 116
N 211/9a (Gö)
N 211/9b (Gö)

C. salina Kufferath

- LB 211/25 Parke 1963, Plymouth No. 309: marine: England

C. sorokiniana S. et K. = *C. vulgaris* f. *tertia* F. et N.

C. spaerckii ^oÄlvik

- LB 211/29a Butcher: marine: Wales
LB 211/29b Butcher: marine: Wales

C. stigmatophora Butcher

- 211/20 Parke 1935/George 1954: type material: marine:
Plymouth No. 85, off Isle of Man

C. variabilis S. et K. = *C. protothecoides*

C. variegata Beijerinck nom. nud. = *C. protothecoides*

C. vulgaris Beijerinck *var. vulgaris*

- N 211/1c (CCAP) Rodhe No. 1633
N 211/1e Gaffron: used by Tamiya as A002¹
N 211/9a (CCAP) Kruger 1892: type material of *Chlorothecium*
saccharophilum
N 211/9b (CCAP) Pringsheim, ? 1939: England
N 211/11b Beijerinck: type material: = *C. candida* according to S. et K.
N 211/11j Rodhe No. 1630: type material of *C. simplex* S. et K.
N 211/11p Algéus 1942: 'B' Sweden
N 211/11q Czurda
N 211/11s from Pirson 1952 as M.A.
N 211/12 Chodat: type material of *var. viridis* Chodat, Geneva No. 45
N 211/19 received from Harder 1950
N 211/11c Pringsheim: type material of *C. candida* S. et K.
N 211/11f Pringsheim: 1939: England
N 211/11r Krollpfeiffer: received from Pirson 1952 as M-Kr
N 211/21a Butcher/George 1956: type material of *C. ovalis*:
marine: England

C. vulgaris *var. autotrophica* (S. et K.) F. et N

- N 211/24 Lewin: University of Indiana No. 580

C. vulgaris f. *tertia* F. et N

- N 211/8k Sorokin et Myers, Tx 7.11.05: high temperature strain:
(*C. sorokiniana* S. et K.) Texas USA
N 211/11d Brannon 1938, No. 1: USA
N 211/11k Rice
N 211/18 Algéus 1948, 'A': Sweden

C. vulgaris *var. viridis* Chodat = *C. vulgaris* *var. vulgaris* according to F. et N.

C. xanthella Beijerinck nom. nud. = *C. protothecoides*

C. zofingiensis Dönz

N 211/14 Donz 1933: type material: also type of *C. miniata* S.et K: Switzerland

C. spp.

N 211/8p derived from Cornell 11, now differs slightly: received from Syrett 1965

N 211/9c Thain 1970, Endophyte from *Selaginella*: Australia

N 211/22 Lewin 1957, Endozoon from *Spongilla fluviatilis*: USA

N 211/26 Fogg 1956: arctic: Sweden

211/28 Ho 1972, UL 196 RI 200674: factory effluent, Malaya

CHLORELLA - Numerical list

211/1a	<i>C. saccharophila</i>	211/10e	<i>C. luteoviridis</i>
211/1b	<i>C. saccharophila</i>	211/10e G8	<i>C. protothecoides</i>
211/1c	<i>C. vulgaris</i>	211/11a	<i>C. protothecoides</i>
211/1c G8	<i>C. saccharophila</i>	211/11b	<i>C. vulgaris</i>
211/1d	<i>C. saccharophila</i>	211/11c	<i>C. vulgaris</i>
211/1e	<i>C. vulgaris</i>	211/11d	<i>C. vulgaris f. tertia</i>
211/1f	<i>C. saccharophila</i>	211/11f	<i>C. vulgaris</i>
211/2a	<i>C. luteoviridis</i>	211/11g	<i>C. kessleri</i>
211/2b	<i>C. luteoviridis</i>	211/11h	<i>C. kessleri</i>
211/3	<i>C. luteoviridis</i>	211/11i	<i>C. protothecoides</i>
211/4	<i>C. luteoviridis</i>	211/11j	<i>C. vulgaris</i>
211/5a	<i>C. luteoviridis</i>	211/11k	<i>C. vulgaris f. tertia</i>
211/5b	<i>C. luteoviridis</i>	211/11m	<i>C. emersonii</i>
211/6	<i>C. protothecoides</i>	211/11n	<i>C. emersonii</i>
211/7a	<i>C. protothecoides</i>	211/11p	<i>C. vulgaris</i>
211/7b	<i>C. protothecoides</i>	211/11q	<i>C. vulgaris</i>
211/7c	<i>C. protothecoides</i>	211/11r	<i>C. vulgaris</i>
211/7d	<i>C. protothecoides</i>	211/11s	<i>C. vulgaris</i>
211/8a	<i>C. emersonii</i>	211/12	<i>C. vulgaris</i>
211/8b	<i>C. emersonii</i>	211/13	<i>C. protothecoides</i>
211/8c	<i>C. emersonii</i>	211/14	<i>C. zofingiensis</i>
211/8d	<i>C. protothecoides</i>	211/15	<i>C. emersonii</i>
211/8g	<i>C. emersonii</i>	211/17	<i>C. protothecoides</i>
211/8h	<i>C. emersonii</i>	211/18	<i>C. vulgaris f. tertia</i>
211/8k	<i>C. vulgaris f. tertia</i>	211/19	<i>C. vulgaris</i>
211/8p	<i>C. sp.</i>	211/20	<i>C. stigmatophora</i>
211/9a	<i>C. vulgaris</i>	211/21	<i>C. vulgaris</i>
211/9a G8	<i>C. saccharophila</i>	211/22	<i>C. spp.</i>
211/9b	<i>C. vulgaris</i>	211/23	<i>Scenedesmus sp.</i>
211/9b G8	<i>C. saccharophila</i>	211/24	<i>C. vulgaris var. autotrophica</i>
211/9c	<i>C. sp.</i>	211/25	<i>C. salina</i>
211/10a	<i>C. luteoviridis</i>	211/26	<i>C. sp.</i>
211/10a G8	<i>C. protothecoides</i>	211/27	<i>C. marina</i>
211/10b	<i>C. protothecoides</i>	211/28	<i>C. sp.</i>
211/10c	<i>C. protothecoides</i>	211/29a	<i>C. spaerckii</i>
211/10d	<i>C. luteoviridis</i>	211/29b	<i>C. spaerckii</i>
211/10d G8	<i>C. protothecoides</i>		

CHLORELLIDIUM Vischer *et* Pascher

C. tetrabotrys Vischer *et* Pascher

811/1a Vischer No. 153: Switzerland
811/1b Vischer No. 155: Czechoslovakia

CHLORHORMIDIUM Fott = *Klebsormidium* Silva, Mattox *et* Blackwell

CHLORIDELLA Pascher

C. minuta Moewus

813/2 Moewus: type material

C. neglecta Pascher

813/1 Vischer 1940, No. 216: from soil: Switzerland

CHLOROBOTRYS Bohlin

C. regularis (W. West) Bohlin

LB 810/1 Hibberd 1967: England

CHLOROCHYTRIDIUM Vischer

C. tuberculata Vischer see *Pedinomonas tuberculata*

CHLOROCHYTRIUM Cohn

C. spp.

212/1 Mitra/Pringsheim
LB 212/2 George 1952: England

CHLOROCLOSTER Pascher

C. engadinensis Vischer

812/1 Vischer 1940, No. 252: from soil: Switzerland

C. solani George see *Pseudococcomyxa adhaerens*

Our strains of *Chlorocloster* were shown to contain chlorophyll
b. They are presumably not therefore members of the
Xanthophyceae. Until the type species is checked, *Chlorocloster*
may itself still be a xanthophycean genus.

CHLOROCOCCUM Meneghini

C. echinozygotum Starr

213/5 Bold: type material: from soil: Philippine Is.

C. hyposporum Starr

213/6 Bold: type material: from soil: Tennessee USA
237/1 Pringsheim 1940: formerly listed as *Hypnomonas lobata*
Korsh: soil: England

C. infusionum (Schrank) Meneghini

213/2a Mainx
213/2b Mainx

C. macrostigmatum Starr

213/9 Starr: from soil: Connecticut USA

C. minutum Starr

213/7 Bold: type material: from soil: India

C. multinucleatum Starr = *Neosporangiococcum granatum* Deason

213/1a Pringsheim (as *C. humicolum*): type material: from soil

C. vacuolatum Starr

213/8 Starr 1952: type material: from soil: South Africa

C. wimmeri Rabenhorst = *Neochloris wimmeri* (Rab.) Archibald et Bold

213/4 Mainx: Meyer No. Chlor. 7

CHLOROGLOEA Wille

C. fritschii Mitra (= ? *Nostoc* sp.)

LB 1411/1a Mitra 1950: No. 7: type material: from soil: India

C. sp.

L 1411/2 Kunisawa, Stanier 6712: California USA

CHLOROGLOEOPSIS Mitra et Pandey

C. sp. "Chlorogloea fritschii"

1411/1b origin previous to Botany Department, Berkeley, is uncertain: Stanier 6718: fixed nitrogen

CHLOROGONIUM Ehrenberg

C. elongatum Dangeard

12/1 Pringsheim 1942: England
12/2a Hartmann/Pringsheim
12/2b George 1948: South Africa
12/2c Pringsheim 1949: France
12/2d Pringsheim 1951: South Africa
12/4 Meyer: formerly listed as *C. tetragamum*:
Czechoslovakia

C. euchlorum Ehrenberg

12/3 Kniep/Mainx: Germany

C. spp.

LB 12/5 Pringsheim as K
L 12/6 Pringsheim as N

CHLOROMESON Pascher

C. sp.

LB 814/1 Butcher 1954: marine: England

CHLOROSARCINOPSIS Herndon

- C. *negevensis* Friedmann *et* Ocampo-Paus *f.* *ferruginea*
14/1 Baldinger 1-112: type material: Negev Desert
- C. *negevensis f. negevensis*
14/2 Baldinger 1-116: type material: Negev Desert
- C. *sempervirens* Groover *et* Bold
214/1 Pringsheim: type material, probably isolated in Prague before 1939

CHLOROSPHAERA Klebs

- C. *klebsii* Vischer
215/1 Vischer, No. 58

CHROMULINA Cienkowski

- C. *ochromonoides* (Auct?)
LB 909/1 Butcher 1959: marine: England
LB 909/3 Butcher 1956: marine: England
- C. *spp.*
LB 909/2 Butcher 1956: marine: England
LB 909/5 Butcher: marine: Wales
LB 909/6 Butcher 1957: marine: England
LB 909/7 Butcher 1956: marine: England
LB 909/8 Butcher: marine: England

CHROOCOCCOPSIS Geitler

- C. *sp.*
B 1409/1 Butcher: marine: England

CHROOCOCCUS Naegeli

- C. *minutus* (Kütz.) Naeg.
B 1412/5 Laporte 1965: thermal water
- C. *prescottii* Drouet *et* Daily
LB 1412/4 George 1954: Hong Kong
- C. *turgidus* (Kütz.) Naegeli
LB 1412/10 Starr (a large form)
- C. ? *versicolor*
LB 1412/2 Pringsheim (a very small form: ?*Coccochloris peniocystis*)

CHROOMONAS Hansgirg

- C. atrorosea* Butcher
LB 978/6a Butcher: type material: marine: England
LB 978/6b Butcher: marine: England
- C. collegionis* Butcher
LB 978/11 Butcher 1961: type material: marine: England
- C. diplococca* Butcher
LB 978/26 Butcher 1960: marine: England
- C. dispersa* Butcher
LB 978/10 Butcher 1960: type material: marine: England
- C. falcata* Butcher
LB 978/5a Butcher: type material: marine: Wales
LB 978/5b Butcher: marine: England
- C. heteromorpha* Butcher
LB 978/7 Butcher 1960: marine: England
- C. mesostigmatica* Butcher
LB 978/9 Butcher: type material: marine: England
- C. placoidea* Butcher
LB 978/8 Butcher 1959: type material: marine: England
- C. salina* (Wislouch) Butcher
LB 978/24 Butcher 1959: marine: England
LB 978/27 Butcher 1954: marine: England
- C. salina* f. *adolescens* Butcher
LB 978/12a Butcher 1957: marine: England
LB 978/12b Butcher 1958: marine: England
- C. salina* f. *carterae* Butcher
LB 978/13 Butcher 1956: marine: England
LB 978/14 Butcher 1958: marine: England
- C. salina* f. *eroticon* Butcher
LB 978/15a Butcher: marine: England
LB 978/15b Butcher: marine: England
- C. salina* f. *granulata* Butcher
LB 978/16 Butcher 1954: marine: England
LB 978/17 Butcher: marine: England
- C. salina* f. *leucofera* Butcher
LB 978/19 Butcher 1955: marine: England
LB 978/20 Butcher: marine: Wales
- C. salina* f. *oculus-bovis* Butcher
LB 978/21a Butcher 1957: marine: England
LB 978/21b Butcher 1959: marine: England
- C. salina* f. *refracta* Butcher
LB 978/22 Butcher 1956: marine: England
LB 978/23 Butcher: marine: England

C. virescens (Butcher) Butcher
LB 978/25 Butcher 1958: marine: England

C. spp.
LB 978/1 Pringsheim, 1
LB 978/2 Pringsheim, 2
LB 978/3 Pringsheim, 'Wales'
LB 978/4 Pringsheim, 4

CHROOTHECE Hansgirg

C. richterianum Hansgirg (= ? *Asterocytis ornata* (Ag.) Hamel see Drouet and Daily 1956, p147)
B 1353/1 Belcher 1956: brackish?: Isle of Man

CHRYSOCAMPANULA Fournier

C. spinifera Fournier
LB 907/1 Jowett 1964, Plymouth No. 328: marine: England

CHRYSOCHROMULINA Lackey

C. acantha Leadbeater *et* Manton
LB 910/10 Parke 1964, Plymouth No. 326: type material: marine: England

C. chiton Parke *et* Manton
LB 910/7 Parke 1955, Plymouth No. 146: type material: marine: England

C. cymbium Leadbeater *et* Manton
LB 910/13 Parke 1964: type material: marine: England

C. ericina Parke *et* Manton
LB 910/4 Parke 1950, Plymouth No. 25: type material: marine: England

C. kappa Parke *et* Manton
LB 910/1 Parke 1939, Plymouth No. K: type material: marine: Isle of Man

C. minor Parke *et* Manton
LB 910/3 Parke, Plymouth No. 52: type material: marine

C. polylepis Manton *et* Parke
LB 910/9 Adams 1958, Plymouth No. 200: marine: England

C. pringsheimii Parke *et* Manton
LB 910/11 Parke 1957, Plymouth No. 166: marine: England

C. strobilus Parke *et* Manton
LB 910/12 Jowett 1967, Plymouth No. 43a: marine: England

CHRYSOCOCCUS Klebs

C. rufescens Klebs
LB 916/1 Belcher and Swale 1976: England

CHRYSOSPHAERA Pascher

- C. magna* Belcher
LB 911/1 Belcher 1972: type material: England

CLADOPHORA Klützing

- C. coelothrix* Klützing
LB 505/10 van den Hoek 1960: marine: Algeria
- C. fracta* Klützing *var. fracta*
LB 505/1b George 1950: Sweden
LB 505/2a George 1948: England
LB 505/2b van den Hoek 1960: Holland
- C. fracta var. intricata* (Lyngbye) van den Hoek
LB 505/1a George 1947: England
- C. globulina* Klützing
LB 505/5 van den Hoek 1961: France
- C. glomerata* (L.) Klützing
LB 505/3 George 1950: rarely typical in culture: England
- C. glomerata var. crassior* (Ag.) van den Hoek
LB 505/4 van den Hoek 1959: Holland
- C. kosteriae* van den Hoek
LB 505/6 van den Hoek 1961: type material: France
- C. parriaudii* van den Hoek
LB 505/9 van den Hoek 1960: type material: marine: France
- C. sp.*
LB 505/11 Westlake 1957: England

CLOSTERIUM Ralfs

- C. acerosum* (Schrank) Ehrenberg
LB 611/4 George 1951: England
- C. braunii* Reinsch
LB 611/7 Lefèvre 1954: France
- C. ehrenbergii* Menegh. *var. malinvernianum* De Not
LB 611/8 Hibberd 1970: used for demonstration
- C. leibleinii* Klützing
LB 611/2 Starr 1951: France
- C. littorale* Gay
LB 611/6 Starr 1956: homothallic: Indiana No. 736
- C. moniliferum* Ehrenberg
LB 611/1 Starr 1951: France
- C. parvulum* Naegeli
LB 611/5 Starr: homothallic: Indiana No. 735

COCCOCHLORIS Sprengel

- C. *elabens* (Bréb.) Drouet *et* Daily
LB 1413/1 Lewin: saline: California USA
- C. *peniocystis* (Kütz.) Drouet *et* Daily
LB 1412/2 Pringsheim as ? *Chroococcus versicolor*
LB 1461/1 Pringsheim 1948 as *Pelogloea*: England

COCCOLITHUS Schwarz

- C. *pelagicus* (Wallich) Schiller
LB 913/2 Parke, Plymouth No. 182: marine: English Channel
LB 913/3 Parke 1964, Plymouth No. 317: marine: English Channel
LB 912/1 Pringsheim: marine: Isle of Man
- C. *spp.*
LB 913/4a Butcher 1961: marine: England
LB 913/4b Butcher 1960: marine: England
LB 913/5 Butcher 1956: marine: with type material of *Paraphysomonas butcheri*: England
LB 913/6 Butcher 1961: marine: Guernsey
LB 913/7 Butcher: marine: with colourless flagellate: England

COCCOMYXA Schmidle

- C. *arvernensis* Jaag
216/1 Jaag, No. 149: type material: France
- C. *chodatii* Jaag
216/2 Chodat, No. 186: type material: Switzerland
- C. *elongata* Jaag
216/3a Pringsheim 1927: identified by Jaag, No. 203: Czechoslovakia
216/3b Chodat, No. 190: Switzerland
216/3c Brannon 1938, No. 3: USA
- C. *mucigena* Jaag
216/4 Jaag, No. 123: *Peltigerae aphtosae*: Switzerland
- C. *peltigerae* Waren
216/5 Jaag
- C. *peltigerae variolosae* Jaag
216/6 Jaag, No. 194: type material: Norway
- C. *pringsheimii botrydinae* Jaag
216/7 Pringsheim: Jaag, No. 202: type material: Finland
- C. *rayssiae* Chodat *et* Jaag
216/8 Rayss: Jaag, No. 185: Rumania
- C. *simplex* (Pringsheim) Mainx
216/9a Pringsheim: Czechoslovakia
216/9b Mainx: Germany

- C. solorinae bisporae* Jaag
216/10 Jaag, No. 142: type material: Switzerland
- C. solorinae croceae* Chodat
216/11a Chodat, Jaag, No. 188: type material: Switzerland
216/11b Jaag, No. 143: Switzerland
- C. solorinae saccatae* Chodat
216/12 Jaag, No. 189: Switzerland
- C. subellipsoidea* Acton
216/13 Pringsheim (*botrydinae*): lichen originally from Skuja
216/15 Richardson 1964 *ex Botrydina vulgaris*
- C. viridis* Chodat
216/14 Chodat: Jaag, no. 192: type material: Switzerland
- C. spp.*
216/16 Bednar *ex Peltigera aphtosa*: USA
LB 216/17 Butcher: marine

COCHLIOPODIUM Hertwig *et* Lesser

- C. actinophorum* (Auerbach)
B 1537/2 Page 1964: Wisconsin USA
- C. actinophorum var. minus* Page
B 1537/1a Page 1965: type material: Wisconsin USA

COELASTRELLA Chodat

- C. costata* (Korshikov) Kalina
LB 217/5 Droop 1950, as *Coelastrum morus*: Finland

COELASTRUM Naegeli

- C. microporum* Naegeli
217/1a Pringsheim 1940: England
217/1b Rodhe, No. 1615a; Sweden
217/1c Starr 1951: England
- C. morus* W. *et* G. S. West
217/4 Lewin 1950? No. 6: Connecticut USA
- C. proboscideum* Bohlin *var. dilatatum* Vischer
217/2 Vischer 1924, No. 13: type material: Switzerland
- C. proboscideum var. gracile* Vischer
217/3 Vischer 1924, No. 15: type material: Switzerland

COELOSphaerium Naegeli

- C. kutzingianum* Naegeli
LB 1414/1 George 1951: England

COENOCOCCUS Korshikov

C. planctonicus Korshikov

LB 112/1 Lund 1967, FBA L126: England

COLACIUM Ehrenberg

C. cyclopicolum (Gicklhorn) Pringsheim (= *C. vesiculosum* Ehr. q.v.)-

C. mucronatum Bourrelly et Chadeffaud

1211/2 Bourrelly, Paris, No. 100

C. vesiculosum Ehrenberg

1211/2 Pringsheim 1943: off *Daphnia*: England

COLEOCHAETE Brébisson

C. scutata Brébisson

LB 414/1 George 1949: England

COLEPS Nitzsch

C. hirtus OFM

LB 1613/1 George 1950 (cultured with *Chilomonas*): England

LB 1613/2 George 1965 (cultured with *Chilomonas*): England

COLPIDIUM Stein

C. colpidium (Schewiakoff) Corliss

LB 1614/1 George 1953: Ireland

C. striatum Stokes

LB 1614/2 Jankowsky: Russia

COLPODA Müller

C. aspera Kahl

LB 1615/3 Page 1974: soil: England

C. cucullus Müller

LB 1615/2 West 1971: England

COSMARIUM Ralfs

C. bioculatum Brébisson

LB 612/17 Jaworski 1967, FBA L129: England

C. botrytis Meneghini

612/1a Pringsheim/Czurda 1926: Germany

612/4 Ondraček, No. 1: Prague No. 227

612/5 Ondraček, No. 2: Prague No. 228

C. botrytis var. depressum W. et G. S. West

LB 612/1b Christensen 1956, No. 5614: homothallic: Indiana No. 953

- C. contractum* Kirchner *var. ellipsoideum* (Elfv.) West *et* West
 LB 612/16 Lund 1958, FBA L128: England
- C. cucumis* Corda
 612/10 Ondraček, No. 27: Prague No. 239
- C. formulosum* Hoff
 612/7 Ondraček, No. 8: Prague No. 232 (a small form)
- C. impressulum* Elfv.
 612/2 Czurda 1925: Czechoslovakia
- C. lundellii* Delponte
 LB 612/15 Lefèvre 1929: France
- C. praemorsum* Brébisson
 B 612/13 George 1951: England
- C. subtumidum* Nordsted
 612/8a Ondraček No. 25: Prague No. 245
 612/8b Ondraček No. 26: Prague No. 246
 612/11 Ondraček No. 22: Prague No. 242, differs slightly from type
 612/12 Lewin 1950: differs slightly from type: Connecticut USA
- C. turpinii* Brébisson
 LB 612/14a Starr No. 3: Indiana No. 733
 LB 612/14b Starr No. 4: Indiana No. 734 } heterothallic pair

CRICOSPHAERA Braarud

- C. carterae* (Braarud *et* Fagerland) Braarud (formerly *Syracosphaera*)
 LB 961/1 Parke 1949, Plymouth No. 17: marine: England
 944/1 Pringsheim 1951: type material of *Pleurochrysis scherffellii*:
 brackish: England
- C. aff. carterae*
 LB 961/2 Adams 1958, Plymouth No. 181: marine: England
 LB 961/5 Adams 1956, Plymouth No. 156: marine: a good food organism: England
- C. elongata* (Droop) Braarud
 LB 961/3 Droop, Millport 62, Plymouth No. 414: type material: marine: England
- C. sp.*
 LB 961/4 von Stosch, No. 7133 as *Syracosphaera sp.* : Plymouth No. 151: marine

CRUCIGENIA Morren

- C. tetrapedia* (Kirchner) W. *et* G. S. West
 218/3 Starr: Indiana No. 63: Massachusetts USA

CRUCIGENIELLA Lemmermann

- C. apiculata* (Lemmermann) Komárek
 218/1 George 1949: from Paris No. 89
- C. rectangularis* (Naeg) Komárek
 218/2 Pringsheim 1951: France

CRYPTODIFFLUGIA Penard

C. oviformis Penard

B 1514/1 Page 1964: type material of *C. operculata* Page: Wisconsin USA
B 1514/2 Hedley 1968: Wales

CRYPTOGLENA Ehrenberg

C. pigra Ehrenberg

LB 1212/1 Pringsheim 1947: England

CRYPTOMONAS Ehrenberg

C. abbreviata Butcher

LB 979/16 Butcher 1960: marine: Guernsey

C. acuta Butcher

LB 979/10 Butcher: type material: marine: Wales

C. appendiculata Butcher

LB 979/13 Parke 1950, Plymouth No. 23: marine: Scotland

C. calceiformis Lucas

LB 979/6 Jowett 1966, Plymouth No. 412: type material: marine: England

C. chrysoidea Butcher

LB 979/8 Butcher 1953: type material: brackish: England

C. irregularis Butcher

LB 979/7 type material: marine: England

C. maculata Butcher

LB 979/12 Butcher: marine: England

LB 979/14 Parke 1950, Plymouth No. 29: type material: marine

LB 979/17 Butcher: marine: England

C. major Butcher

LB 979/11 Butcher 1958: type material: marine: England

C. ovata Ehrenberg var. palustris Pringsheim

979/3 Pringsheim: type material: Czechoslovakia

C. pseudobaltica Butcher

LB 979/9 Butcher 1961: type material: marine: Germany

C. reticulata Lucas

LB 979/15 Jowett 1965, Plymouth No. 358: marine: England

C. spp.

LB 979/18 Plymouth No. 65: marine

The collection has many freshwater strains, none axenic, which were isolated by Pringsheim while in Cambridge. Strain 37 (*C. curvata*?) is normally supplied for demonstration purposes.

CRYSTALLOLITHUS Gaarder et Markali see *Coccolithus*.

CYANIDIUM Geitler

- C. *caldarium* Geitler *em.* Hirose
1355/1 Allen, No. C14.1.1

CYANOPHORA Korshikov

- C. *paradoxa* Korshikov
LB 981/1 Pringsheim

CYATHOMONAS Fromentel

- C. *truncata* Ehrenberg
LB 982/1a Pringsheim 1942: England
LB 982/1b Schuster 1963: California USA

CYCLIDIOPSIS Korshikov see *Astasia*

CYCLIDIUM Müller

- C. *glaucoma* Müller
LB 1616/1 George 1962: Russia

CYCLOTELLA Kützing

- C. *cryptica* Reimann, J. Lewin *et* Guillard
1070/1 from Göttingen collection: brackish: type material

CYLINDROCAPSA Reinsch

- C. *involuta* Reinsch
LB 314/1 George 1950: England. Hoffman and Hofmann (1975) doubt
the identify of this strain

CYLINDROCYSTIS Meneghini

- C. *brebissonii* Meneghini
LB 615/1a George 1948: England

CYLINDROSPERMUM Kützing

- C. *aff. alatosporum*
B 1415/3 Wilcox 1971: England
- C. *maius* Kütz.
B 1415/2 Komarek/Baker 1961: N5: Czechoslovakia
- C. *sp.*
LB 1415/1 Fogg 1945

CYSTOCOCCUS Naegeli see *Trebouxia*

DACTYLOCOCCUS Naegeli

D. bicaudatus A. Br.
223/1 Flint 1959: soil: New Zealand

DERBESIA Solier

D. ? tenuissima
LB 706/1 Starr 1959, IU 1260: marine: Mediterranean

DERMOCARPA Crouan

D. violacea Crouan
1416/1 Lewin 1965: marine: California USA

DIACRONEMA Prauser

D. vlkianum Prauser
LB 914/1 Butcher/Parke 1961, Plymouth No. 244: marine: England
LB 914/2 Hibberd 1975: England

DICHOTOMOSIPHON Ernst

D. tuberosus (A.Br.) Ernst
LB 707/1 Korn 1960: Indiana No. 1036: Indiana USA

DICRATERIA Parke

D. inornata Parke
LB 915/1 Gross 1935/36: Plymouth B: type material: marine: England

DICTYOCHLORIS Vischer *ex* Starr

D. fragrans Vischer *ex* Starr
220/1 Vischer 1942, No. 334: type material (Starr 1955) from soil: Switzerland
249/3 Pringsheim 1940: material from John as *Muriella magna*: soil: England

DICTYOCOCCUS Gerneck, see also *Bracteacoccus*

D. varians Gerneck *em.* Starr
LB 221/5 Starr 1951: type material: Scotland

DICTYOSPHAERIUM Naegeli

D. ehrenbergianum Naegeli
LB 221/1c Jaworski 1966, L141: England

D. pulchellum Wood
222/1a Pringsheim 1940: England
222/2a George 1949: France
222/2b Lewin 1952: Nova Scotia, Canada
B 222/2c Bucka: Poland
LB 222/2d Jaworski 1972, FBA L246: England

DICTYOSTELIUM Brefeld

D. discoideum Raper
B 1515/2 Ashworth 1969: England

D. mucoroides Brefeld
B 1515/1 Page 1964: Idaho USA

DILABIFILUM Tschermak-Woess

D. arthopyreniae (Vischer *et* Klement) Tsch.-Woess
B 415/2 Tschermak-Woess

D. incrustans (Vischer) Tschermak-Woess
B 415/1 Tschermak-Woess 1970: *ex Verrucaria aquatilis* Mudd: Austria

D. printzii (Vischer) Tschermak-Woess
467/1 Vischer 1926, No. 10: type material: Switzerland

DIMORPHOCOCCUS A. Braun

D. lunatus A. Braun
224/1 George 1949: from Paris No. 90

DIPLOSPHAERA Bialosuknia *em* Vischer

D. sp..
416/1 Vischer No. 556

DISCOPHYA Lachmann

D. collini (Root)
LB 1618/2 Paulin and Cook 1967: Georgia USA

DISTIGMA Ehrenberg

D. curvata Pringsheim *var. major* Pringsheim
LB 1216/1 Pringsheim 1935: type material: Czechoslovakia

D. gracilis Pringsheim
LB 1216/2 Pringsheim 1936: type material: Austria

D. proteus Ehrenberg
LB 1216/3a Pringsheim: Czechoslovakia
LB 1216/3b Pringsheim: England
LB 1216/3c Pringsheim 1948: England

D. senii Pringsheim
LB 1216/4 Pringsheim 1940: type material: England

DRAPARNALDIA Bory

D. plumosa (Vaucher) Agardh
418/1a Reynolds: Wales
This strain does not satisfactorily show the characteristic
main axis of plants of this genus

DUNALIELLA Teodoresco

D. bioculata Butcher

LB 19/4 Mainx: Prague 281a: type material: Russia
Listed as *D. marina* in the Göttingen and Prague collections.

D. minuta Lerche

LB 19/5 Jowett 1967, Plymouth No. 430: marine: France

D. parva Lerche

LB 19/9 Butcher 1956: marine: England

D. parva Lerche f. eugametos Lerche

LB 19/1 Pringsheim: material from Lerche

D. percei Nicolai

LB 19/2 Pringsheim 1935: material from Nicolai: reputed type material
but this strain does not closely resemble the published description

D. polymorpha Butcher

LB 19/7a Butcher 1960: marine: England

LB 19/7b Butcher 1959: marine: England

LB 19/7c Butcher 1954: marine: England

D. primolecta Butcher

11/34 George 1950, from Gross's Plymouth No. 81, long known as 'the
Plymouth Chlamydomonas': type material: marine: England

D. quartiolecta Butcher

LB 19/8 Butcher 1953: marine: England

D. salina (Dunal) Teodoresco

LB 19/3 Mainx, material from Pascher

D. tertiolecta Butcher

19/6a Foyt 1928/Cann 1975, Plymouth No. 83, previously *Chlamydomonas* III:
type material: marine: Norway

19/6b Plymouth No. 83: Indiana No. 999: treated with antibiotics
by Overnell

DYSMORPHOCOCCUS Takeda

D. globosus Bold et Starr

LB 20/1 Bold 1951: type material: Tennessee USA

ECHINAMOEBA Page

E. exundans (Page)

B 1534/4 Page 1965: FCP No. 46: type material: Alabama USA

E. silvestris Page

B 1519/1 Page 1973: FCP No. 154: type material: soil: England

ECHINOSPHAERIUM

E. nucleofilum (Barrett)

LB 1507/1 originally from Carolina Biological Company as *Actinosphaerium*.

ECTOCARPUS Lyngbye

E. siliculosus Harvey

LB 1310/2 Russell 1970

E. ? variabilis Vickers

LB 1310/1 Lewin: marine: California USA

ELAKATOTHRIX wille

E. viridis (Snow) Printz, = *Fusola viridis* Snow

227/1 George 1949, from Paris No. 38

ELLIPSOIDION Pascher

E. acuminatum Pascher

LB 822/1 Westlake/Trown 1969: England

EMILIANIA Hay *et* Mohler

E. huxleyi (Lohm.) Hay *et* Mohler

LB 920/1a Parke 1950, Plymouth No. 92: marine: England

LB 920/1c Parkins 1971, Plymouth No. 92c: marine: England

Neither strain produces coccoliths

ENTOPHYSALIS Kützing

E. rivularis (Kütz.) Drouet

LB 1422/1 Norby, Indiana No. 131

ENTOSIPHON Stein

E. sulcatum (Duj.) Stein

LB 1220/1a George 1965: England

LB 1220/1b George 1966; England

EREMOSPHAERA De Bary

E. gigas (Archer) Fott *et* Kalina (= *Oocystis eremosphaeria*)

LB 257/4 Staff 1952: Indiana USA

E. viridis De Bary

LB 228/1b Whybrow: England

EUASTRUM Ralfs

E. verrucosum (Ehrenberg) Ralfs

LB 624/1 Ott 1961: Virginia USA

EUDORINA Ehrenberg

E. *charkowiensis* (Korshikov) Pascher (= *Pandorina charkowiensis* Korsh.)
24/2a Droop 1951: Finland
24/2b Peck 1962 from Ott's 068: Virginia USA

E. *elegans* Ehrenberg
24/1a Mainx, Strain 1: female: Czechoslovakia
24/1b Rodhe, No. 1637b: Sweden

E. *illinoisensis* (Kofoid) Pascher (= *Pleodorina illinoisensis* Kof.)
162/2a Stein 1956: male: Minnesota USA
162/2b Stein 1956: female: Minnesota USA

E. *unicocca* Smith
24/1c Starr, Indiana No. 737: female
24/1d Starr, Indiana No. 738: male

EUGLENA Ehrenberg

E. *acus* var. *gracilis* Pringsheim
LB 1224/1d Pringsheim 1943: type material: England

E. *acus* var. *major* Pringsheim
LB 1224/1b Pringsheim: type material: England

E. *agilis* Carter see *E. pisciformis* Klebs

E. *anabaena* Mainx
1224/15b Pringsheim 1940: England
1224/15c Pringsheim 1941: England

E. *anabaena* var. *minor* Mainx
1224/2 Mainx 1924: type material: Czechoslovakia
LB 1224/15d Pringsheim 1943: England

E. *cantabrica* Pringsheim
LB 1224/33 Pringsheim 1943: type material: England

E. *caudata* Hübner
LB 1224/24b Pringsheim: England

E. *clara* Skuja
LB 1224/27 Pringsheim 1949: England

E. *communis* Gojdics
LB 1224/35 Leedale 1957: Scotland

E. *cuneata* Pringsheim
LB 1224/32a Pringsheim 1944: type material: England
LB 1224/32b Pringsheim 1945: type material: England

E. *deses* Ehrenberg
LB 1224/19a Pringsheim 1940: England
LB 1224/19b Pringsheim 1943: England
LB 1224/19c Pringsheim 1943: England
LB 1224/19d Pringsheim as 'No. 3, var *intermedia*?'
LB 1224/20 Dusi: type material of *E. mesnili* Deflandre : Dusi
LB 1224/3 Pringsheim 1941

- E. deses* var. *vermiformis* Carter
 LB 1224/22 Pringsheim 1951: from brackish water: England
- E. ehrenbergii* Klebs
 LB 1224/36 Pringsheim: Germany
- E. geniculata* Dujardin
 LB 1224/4e Pringsheim 1942: England
 LB 1224/4f Pringsheim 1951: Austria
- E. geniculata* var. *terricola* Dangeard
 1224/4b Mainx 1923 (as *E. deses*): Czechoslovakia
 1224/4c Vischer, No. 400: Switzerland
 LB 1224/4d Pringsheim 1943: England
 LB 1224/40a Pringsheim as strain 2) These two strains are of doubtful identify;
 LB 1224/40b Pringsheim as strain 3) in some respects they resemble *E. viridis*
- E. gracilis* Klebs
 1224/5a Mainx 1927 (1)*: Czechoslovakia
 1224/5b Elmore-Sauer 1935 (2)
 1224/5c Vischer 1936, No. 22 (3)
 1224/5d Pringsheim 1950 (26) material from Sister Monica Taylor
 1224/5e Pringsheim 1940 (5) material from Fogg: England
 1224/5f Pringsheim 1940 (6) material from Harris: England
 1224/5g Pringsheim 1939 (4) material from Sister Monica Taylor: gave rise to *Astasia longa* 1204/17d (see Pringsheim 1948)
 1224/5i Pringsheim 1948 (19) from Paris No. 101
 1224/5k Pringsheim 1945 (11) material from Chu
 1224/5l Pringsheim 1945 (10) material from Mackinnon
 1224/5m Pringsheim 1944 (8) material from Sister Monica Taylor
 1224/5n Pringsheim 1948 (17): England
 1224/5q Provasoli 1948, No. 7 (16)
 1224/5s Pringsheim 1948 (18): England
 1224/5u Hartshorne 1950 (22): England
 1224/5v Pringsheim 1948 (20) from Paris No. 115
 1224/5w Pringsheim 1948 (21) from soil: England
 1224/5x Pringsheim 1949 (23) France
 1224/5y Pringsheim 1949 (24): England
 1224/5z Pringsheim 1950 (25) material from de Saedeleer; the well-known 'Z' strain, widely used for the bioassay of vitamin B₁₂
- E. gracilis* var. *saccharophila*
 1224/5h Lackey (7)*: gave rise to *Astasia longa* 1204/17e (see Pringsheim 1948)
 1224/5r Pringsheim 1946 (13): England
 1224/5t Pringsheim 1945 (9) material from Tomlinson: England
 1224/6 Provasoli 1948 (14) '*var. urophora*'
 1224/7a Cori 1938 (15) '*var. bacillaris*' used for vitamin B₁₂ bioassay
 1224/7b a colourless mutant of 1224/7a induced by streptomycin, designated SM-L1 by Gross and Jahn
- E. granulata* (Klebs) Schmitz
 1224/8b Provasoli: type material of *E. rostrifera* Johnson
 LB 1224/8c Pringsheim: England
- E. laciniata* Pringsheim
 LB 1224/31 Pringsheim 1951: type material: Austria

*These numbers against strains of *E. gracilis* refer to Pringsheim 1952.

- E. limnophila** Lemmermann
LB 1224/23 Pringsheim: England
- E. magnifica** Pringsheim
LB 1224/30 Pringsheim 1945: type material: England
- E. mesnili** Deflandre *et* Dusi see *E. deses* 1224/20
- E. mutabilis** Schmitz
1224/9a Pringsheim as *E. deses* 8; material from Chu: England
1224/9b Mainx 1924 as *E. klebsii* (Lemm.) Mainx: Czechoslovakia
1224/9c Lewin: Canada
LB 1224/9d Pringsheim 1943: England
- E. pisciformis** Klebs
LB 1224/18f Pringsheim 1949: England
LB 1224/18g Pringsheim 1948: England
LB 1224/18h Pringsheim 1948: (? = *var. minima* Mainx): England
LB 1224/39 Pringsheim 1947 (of doubtful identity): England
- E. pisciformis var. fallax** Pringsheim
LB 1224/18c Pringsheim 1943: England
- E. pisciformis var. lata** Pringsheim
LB 1224/18d Pringsheim 1943: England
- E. pisciformis var. procera** Pringsheim
LB 1224/18b Pringsheim 1951: France
- E. pisciformis var. striata** Pringsheim
LB 1224/18e Pringsheim 1945: England
- E. polymorpha** Dangeard
LB 1224/26 Pringsheim 1938: Czechoslovakia
- E. schmitzii** Gojdics = *E. geniculata* q.v.
- E. sociabilis** Dangeard
LB 1224/12a Pringsheim 1938: Czechoslovakia
LB 1224/12b Pringsheim 1940: England
- E. spirogyra** Ehrenberg
LB 1224/13a Pringsheim 1938: Czechoslovakia
LB 1224/13b Pringsheim 1940: England
LB 1224/13c Pringsheim 1947: England
- E. spirogyra var. fusca** Klebs
LB 1224/37 Leedale: Scotland
- E. splendens** Dangeard
LB 1224/29a Pringsheim 1944: England
- E. stellata** Mainx
1224/14 Mainx: type material: Czechoslovakia
- E. myxocylindracea** Bold *et* MacEntee *var. terricola* Bold *et* MacEntee
1224/21 Lewin 1950: Indiana No. 457: type material: Connecticut USA

- E. tripteris* (Dujardin) Klebs
 LB 1224/16a Pringsheim 1936: Austria
 LB 1224/16b Pringsheim 1943: England
- E. tristella* Chu
 LB 1224/34 Pringsheim
- E. velata* Klebs
 LB 1224/25 Pringsheim 1944: England
- E. viridis* Ehrenberg
 1224/17a Pringsheim 1940: a large form: England
 1224/17b Pringsheim: from Paris No. 108
 1224/17c Pringsheim 1951: England
 LB 1224/17f Pringsheim 1940: England
 LB 1224/17g Pringsheim 1941: a large form: England
 LB 1224/17h Pringsheim 1943: England
 LB 1224/17k Pringsheim 1944: England
 LB 1224/17l Pringsheim 1949: a small, very metabolic form: England
 LB 1224/17m Pringsheim 1949: England
 LB 1224/17n Pringsheim 1949: England
 LB 1224/17p Pringsheim 1950: England
 LB 1224/17q Pringsheim 1949: England
- E. viridis* *var. halophila* Pringsheim
 LB 1224/17e Pringsheim 1951: type material: brackish: England
- E. viridis* *var. maritima* Pringsheim
 LB 1224/17d Pringsheim 1951: type material: brackish: England
- E. sp.*
 1224/38 Leedale as '5': a vigorous strain resembling *E. gracilis*
- EUGLYPHA** Dujardin
- E. acanthophora* Ehrenberg
 LB 1520/3 Hedley 1972: sewage: England
- E. rotunda* Wailes
 LB 1520/1 Hedley 1968: England
- E. strigosa* (Ehrenberg)
 LB 1520/2 Hedley 1970: England
- EUPLOTES** Ehrenberg
- E. parkei* Curds
 LB 1624/3 Parke 1972: type material: saline: Austria
- E. rarisseta* Curds, West *et* Dorahy
 LB 1624/2a Andrews 1971: marine: England

EUTREPTIA Perty

- E. lanowii Steuer
LB 1226/2 Pringsheim 1951: brackish: England
- E. pertyi Pringsheim
LB 1226/3 Pringsheim: type material: brackish: England
- E. viridis Perty
LB 1226/1a Pringsheim 1947: brackish: England
LB 1226/1c Pringsheim: brackish: England

EUTREPTIELLA Da Cunha

- E. spp.
LB 1227/2 Jowett 1965, Plymouth No. 359: marine: England
LB 1227/3 Jowett 1975, Plymouth No. 395: marine: England
- E. gymnastica Throndsen
LB 1227/4 Throndsen 1964, Plymouth No. 462: type material: marine: Norway

EXUVIAELLA Cienkowski see *Prorocentrum*

FIBROCAPSA Toriumi *et* Takano

- F. japonica Toriumi *et* Takano
LB 1177/1 Toriumi 1972: type material: marine: Japan

FILAMOEBA Page

- F. nolandi Page
B 1526/1 Page 1964: FCP No. 22: type material: Minnesota USA

FISCHERELLA Gomont

- F. muscicola (Thuret) Gomont
LB 1427/1 Mitra, No. 6
- F. sp.
B 1427/2 Komarek: mangroves: Cuba

FLABELLULA Schaeffer

- F. calkinsi (Hogue)
B 1529/1 Page 1969: FCP No. 80: marine: Maine USA
- F. citata Schaeffer
B 1529/2 Page 1969: FCP No. 90: marine: Maine USA

FRAGILARIA Lyngbye

- F. crotonensis Kitton
LB 1029/1 Jaworski 1974, FBA L237: England

FREMYELLA J. de Toni

F. diplosiphon (Bornet *et* Flahault) Drouet
B 1429/1 Strout

FUSOLA Snow

F. viridis Snow
227/1 George 1949 from Paris No. 38, as *Elakatothrix viridis*

GEMINELLA Turpin

G. sp..
LB 333/1 Lund 1958, FBA L149: England

GLAUCOCYSTIS Itzigsohn

G. nostochinearum Itzigsohn
229/1 George/Lewin 1963: England

GLAUCOSPHAERA Korshikov

G. vacuolata Korsh.
LB 130/1 Starr, University of Indiana No. 1662

GLENODINIUM Ehrenberg

G. foliaceum Stein
LB 1116/3 Fott, Va 43: marine: Virginia USA

G. sp..
LB 1116/2 Fott, Va 32: marine: Virginia USA

GLOEOCAPSA Kützing

G. alpicola (Lyngbye) Bornet
B 1430/1 Allen, identified by Drouet

G. spp.
L 1430/2 M. M. Allen: Stanier 6501: California USA
1430/3 Markle: Stanier 6909: University of Indiana No. 795

GLOEOCOCCUS A. Braun

G. maximus (Mainx) Fott *et* Novakova
31/1 Mainx 1925: type material: Czechoslovakia

GLOEOCYSTIS Naegeli

G. maxima Mainx = *Gloeococcus maximus* (Mainx) Fott *et* Novakova

G. vesiculosa Naegeli
31/3 Lewin 1950 (not the same as Göttingen 31/3): Connecticut USA

GLOEODINIUM Klebs

G. montanum Klebs
B 1120/1 von Stosch: terrestrial: Germany

GLOEOMONAS Klebs

G. kupfferi (Skuja) Gerloff
LB 33/1 Bourrelly, Paris No. 36

GLOEOTRICHIA Agardh

G. echinulata (Smith) Richter
LB 1432/1 George 1950: Sweden

GOLENKINIOPSIS Korshikov

G. parvula (Woronich) Korshikov
231/1 George 1949: England

GOMONTIA Bornet *et* Flahault

? G. sp.
LB 432/1 Lewin Y1/12: does not penetrate shell: marine: Canada

GOMPHONEMA Agardh

G. parvulum Kützing
B 1032/1 J. Lewin 1949: Connecticut USA

GONATOZYGON de Bary

G. monotaenium de Bary
LB 632/1 King 1963: Wales

GONGROSIRA Kützing

G. terricola Bristol
434/1 Flint/King: soil: New Zealand

GONIUM Müller

G. pectorale Müller
32/1a Pringsheim 1940: England
32/1b Droop 1961: Finland (not the same as Göttingen 32/1b)
32/1c Hibberd 1972: England

G. sociale (Dujardin) Warming
 32/2a Pringsheim 1941: England
 32/2b Starr 1951: homothallic: England
 32/3 Meyer: formerly listed as *G. tetras*: Germany

GONYAULAX Diesing *em.* Kofoid

G. tamarensis Lebour
 LB 1119/1 Adams 1957/71, Plymouth No. 173: marine: England
G. diegensis Kofoid
 LB 1119/2 Ott

GYMNODINIUM Stein

G. pigmentosum (Dodge) Loeblich (*Aureodinium*)
 LB 1103/1 Parke 1958, Plymouth No. 208: type material: marine: England
G. aff. simplex (Iohm) Kofoid *et* Swezy
 LB 1117/3 Jowett 1965, Plymouth No. 368: marine: England

GYROPAIGNE Skuja

G. lefevrei pourrelly *et* Georges
 LF 1233/1 Christen

HAEMATOCOCCUS Flotow

H. capensis Pocock
 LB 34/4b George/Pringsheim: material from Pocock: South Africa
H. droehakensis Wollenweber
 34/2a Pringsheim 1950: Sweden
 34/2c Pringsheim 1950: Sweden
 34/2g George 1950: material from Pocock: England
H. droehakensis *var.* *fastigata* Wollenweber
 LB 34/3 Droop 1951: Finland
H. lacustris (Girod-Chantrons) Rostafinski
 34/1a Pringsheim: material from Naumann
 34/1b Pringsheim: Czechoslovakia
 34/1c Mainx: Czechoslovakia
 34/1d Vischer 1923, No. 2: Switzerland
 34/1e George 1950: England
 34/1f Pringsheim 1951: Spitzbergen
 34/1h Droop 1951: Finland
 34/1j Lewin 1951: England
H. pluviialis Flotow *em.* Wille = *H. lacustris* *q.v.*
H. zimbabwiensis Pocock
 L 34/5 George 1964: material from Pocock: South Africa

HALOCHLORELLA Dangeard

H. rubescens Dangeard = *Chlorella fusca* var. *rubescens* Kessler et al.
232/1 Izard 1966: type material: France

HALOCHLOROCOCCUM Dangeard

H. marinum Dangeard
B 233/1 Izard 1965: type material: marine: France

HALOSPHAERA Schmitz

H. minor Ostenfeld in Knudsen et Ostenf.
LB 135/3 Plymouth No. 205c: marine

H. russellii Parke
LB 135/1 Adams 1961, Plymouth No. 247: type material: marine: England
Both strains are in flagellate stage only

HARTMANNELLA Alexeieff (see *Acanthamoeba*)

H. cantabrigiensis Page
B 1534/8 Page 1972, No. 123: type material: England

H. castellanii Douglas see *Acanthamoeba*

H. limacoides see *Cashia*

H. limax see *Saccamoeba*

H. rhyodes Singh see *Acanthamoeba*

H. vermiformis Page
B 1534/7 Page, No. 25: type material: Wisconsin USA

HEMISELMIS Parke

H. brunnescens Butcher
LB 984/2 Parke 1949, Plymouth No. 14: type material: marine
LB 984/6 ? Butcher: marine

H. rotunda Butcher
LB 984/4 Butcher: marine

H. rufescens Parke
LB 984/1 Parke 1937, Plymouth 'D': type material: marine: Isle of Man

H. virescens Droop
LB 984/5 Adams 1956, Plymouth No. 157: marine

HETERAMOEBEA Droop

H. clara Droop
B 1536/1 Droop 1960: type material: marine: Scotland

HETEROCAPSA Stein

H. triquetra (Ehr.) Stein

- LB 1125/1 Adams 1957, Plymouth 169: marine: England
LB 1125/2 Ott 1975, Va 14: marine: Virginia USA

HETEROCOCCUS Chodat

H. brevicellularis Vischer

- 835/1 Vischer 1943, No. 351: from soil: Switzerland

H. caespitosus Vischer

- 835/2a Vischer 1934, No. 116: from soil: Germany
B 835/2b Vischer 1934, No. 131: Switzerland

H. chodatii Vischer (*H. viridis* Chodat)

- 835/3 Chodat: Vischer No. 161

H. crassulus Vischer

- 835/4 Vischer 1943, No. 367: Switzerland

H. fuornensis Vischer

- 835/5 Vischer No. 279: Switzerland

H. mainxii Vischer

- 835/6 Mainx 1926: Vischer No. 160: from soil: Czechoslovakia

H. marietanii Vischer

- 835/7 Vischer 1936, No. 167: Switzerland

H. protonematoides Vischer

- 835/9 Vischer 1945, No. 369: Switzerland

HETEROGONIUM Dangeard

H. salinum Dangeard

- 234/1 Lepaileur: marine: France

HETEROMASTIX Korshikov

H. ? angulata

- LB 1960/4 Belcher and Swale 1975: England

H. longifilis (Butcher) Rayns

- LB 1960/3 Parke 1950, Plymouth No. 58: type material: marine: England

H. rotunda (Carter) Manton

- LB 1960/1 Butcher: marine

H. sp.

- 1960/2 marine: origin unknown: rendered axenic by Pennick 1965

HETEROTETRACYSTIS Cox et Deason

H. macrogranulosa Cox et Deason

- 136/1 Cox 1964: soil: Tennessee USA

HETEROTHRIX Pascher

- H. debilis Vischer
836/1 Vischer 1929, No. 50: Switzerland
- H. hormidioides Vischer
836/2 Vischer 1943, No. 358: from soil: Switzerland
- H. montana Vischer
836/3 Vischer 1945, No. 288: from soil: Switzerland
- H. solida Vischer
836/4 Vischer 1940, No. 214: Switzerland
- H. sp..
836/5 Vischer, No. 391

HILDENBRANDIA Nardo

- H. rivularis (Lieben) J. Agardh
LB 1368/1 Ott, No. O 341

HORMIDIUM Klebs see *Klebsormidium*

HYALODISCUS Hertwig et Lesser see *Cochliopodium*

HYALOPHACUS Pringsheim

- H. ocellatus Pringsheim
LB 1237/1a Pringsheim 1947: England
LB 1237/1b Christen: Switzerland

HYALORAPHIDIUM Pascher et Korshikov

- H. curvatum Korshikov
235/1 Lewin 1949: Connecticut USA

HYALOTHECA Ehrenberg

- H. dissiliens (Smith) Brébisson
LB 637/1 Pringsheim 1947: England

HYDRODICTYON Roth

- H. africanum Yamanouchi
LB 236/2 George 1948: South Africa
- H. reticulatum (L.) Lagerheim
LB 236/1a George 1947: England
LB 236/1b Pirson: Germany
LB 236/1c Marchant 1969: Australia

HYMENOMONAS Stein

H. carterae (Braarud *et* Fag.) = *Cricosphaera carterae* q.v.

H. roseola Stein

LB 925/1 Pringsheim: England

INTERFILUM Chodat

I. paradoxum Chodat

338/1 Pringsheim: material from Miss John: from soil: England

ISOCHRYSIS Parke

I. galbana Parke

LB 927/1 Parke 1938, Plymouth I: type material: marine: Isle of Man

I. spp.

LB 927/2 Butcher: grows well: marine: England
LB 927/3 Butcher: grows well: marine: England
LB 927/4 Butcher: marine: England
LB 927/5 Butcher 1960: marine: England
LB 927/6 Butcher 1959: marine: England
LB 927/7 Butcher 1956: marine: England
LB 927/8 Butcher 1960: marine: England

I. spp. ?

LB 927/9 Butcher 1959: marine: Wales
LB 927/10 Butcher 1960: marine: England

KENTROSPHAERA Borzi

K. sp..

LB 241/1 Starr 1951: Scotland

KHAWKINEA Jahn *et* McKibben see under *Astasia*

KIRCHNERIELLA Schmidle

K. contorta (Schmidle) Bohlin

243/3 Wurtz: France

K. lunaris (Kirchner) Moebius

243/1 Pringsheim 1939: England

*K. lunaris var. diana*e Bohlin

243/4 Wurtz: France

KLEBSORMIDIUM Silva, Mattox *et* Blackwell (= *Hormidium* Klebs)

K. flaccidum (Kütz.) S.M. *et* B.

335/1a Pringsheim: material from Barlow: (Wisconsin USA?)
335/1b Pringsheim: material from Barlow: (Wisconsin USA?)
335/2a Pringsheim: material from Barlow: (Wisconsin USA?)
335/2b Pringsheim: material from Barlow: (Wisconsin USA?)
335/4 Pringsheim: as ? *H. stoechidum*
335/9 Lewin 1952: Nova Scotia Canada

K. subtilissimum (Rabenhorst) S.M. et B.
384/1 Lewin 1952: from snow: Alaska

The following strains, formerly identified as *Hormidium*
probably belong here.

LB 335/6 Pringsheim as *Hormidium crenulatum* Kützing: material from
John: England
335/3 Pringsheim as *Hormidium nitens*
335/5 Strout 1951: Connecticut USA
335/7 Algéus, No. 1: Sweden
B 335/8 Czurda: Czechoslovakia
335/9 Lewin 1952: Nova Scotia Canada

LAGERHEIMIA Chodat

L. genevensis Chodat

LB 246/1 Belcher and Swale 1975: England

LAMBORNELLA Keilin = *Tetrahymena* q.v.

LAMPROPEDIA Schroeter

L. hyalina (Ehrenberg) Schroeter

1444/1 Pringsheim 1951 (Göttingen 1740/1): England

LAUTERBORNIA Pringsheim see under *Synechococcus leopoliensis*

LEPTOMYXA Goodey

L. reticulata Goodey

B 1546/1 Page 1971: England

LEPTOSIRA Borzi

L. obovata Vischer = *Pleurastrum obovata* (Vischer) Tupa

445/1 Vischer 1928, No. 46: type material: Switzerland

LOBOMONAS Dangeard

L. piriformis Pringsheim

45/1 Pringsheim 1930: type material: Czechoslovakia

LYNGBYA Agardh ex Gomont

L. majuscula Harvey

LB 1446/4 George 1953: brackish: England

L. spp.

1459/2 Manten: Utrecht P. 35, formerly listed as *Oscillatoria*

B 1446/5 Butcher: marine

MALLOMONAS Perty

M. cratis Harris *et* Bradley
LB 929/1 Belcher 1962: England

M. papillosa Harris *et* Bradley
LB 929/2 Belcher 1965: England

MANTONIELLA Desikachary

M. squamata (Manton *et* Parke) Desikachary
LB 1965/1 George 1951: type material: brackish: England
LB 1965/5 Butcher, as *Thalassomonas caeca*: marine

MASTIGOCLADUS Kirchner

M. laminosus Cohn
1447/1 Fogg: from hot springs: New Zealand

MAYORELLA Schaeffer

M. palestinesis Reich see *Acanthamoeba*

M. riparia Page
B 1547/3 Page 1971: type material: England

M. viridis Leidy
LB 1547/4 George 1966: England

MELOSIRA Agardh

M. italica (Ehr.) Kützing
LB 1048/3 Jaworski 1965, L154: England

M. varians Ag.
LB 1048/1 Belcher 1974: England
LB 1048/2 Lund 1970, FBA L222: England

MENOIDIUM Perty

M. bibacillatum Pringsheim
LB 1247/1 Pringsheim 1940: type material: England

M. cultellus Pringsheim
LB 1247/2 Pringsheim: type material: Czechoslovakia

M. intermedium Pringsheim
LB 1247/3 Pringsheim 1940: type material: England

M. obtusum Pringsheim
LB 1247/4 Pringsheim: Germany

M. sp..
LB 1247/6 Pringsheim as 'X'

MERISMOPIEDIA Meyen

- M. convoluta Brébisson
B 1448/3 Pringsheim 1967: Germany
- M. glauca (Ehr.) Naegeli f. insignis (Schkorb.) Geitler
LB 1448/1 Pringsheim 1947: England
- M. punctata Meyen
LB 1448/2 Komarek

MESOSTIGMA Lauterborn

- M. viride Lauterborn
LB 50/1 Pringsheim 1943: England

MESOTAENIUM Naegeli

- M. caldariorum (Lagerheim) Hansgirg
230/1 van Overbeek: HMS 2.5.1.1
648/1 Czurda 1924: Czechoslovakia

MICRACTINIUM Fresenius

- M. pusillum Fresenius
248/1 George 1954: England

MICRASTERIAS Agardh

- M. papillifera Brébisson
LB 649/7 Lefevre 1936
- M. rotata (Greville) Ralfs
LB 649/4b Kallio: diploid strain
LB 649/9 Hibberd 1970
- M. thomasiana var. notata Gronblat
LB 649/5 Kallio: haploid and diploid
- M. truncata (Corda) Brébisson
LB 649/6 King 1952: England

MICROCHAETE Bornet et Flahault

- M. grisea Thuret ex Bornet et Flahault
B 1445/1 Butcher: marine: England

MICROCOLEUS Gomont

- M. paludosus (Kützing) Gomont
B 1449/1 George 1950: England
- M. vaginatus (Vaucher) Gomont var. radiatus Baker et Bold
1459/4 Manten Utrecht P. 27: soil: Holland. Identified by Baker and Bold

MICROCYSTIS Lemmermann

M. aeruginosa Kützing (= *Diplocystis aeruginosa* (Kütz.) Trev.)
LB 1450/1 Gerloff 1948, No. 1036: Wisconsin USA

M. incerta Lemmermann
B 1450/2 from Griefswald via Trebon

MICROMONAS Manton et Parke

M. pusilla (Butcher) Manton et Parke
LB 1965/4 Parke 1950, Plymouth No. 27: marine

M. squamata Manton et Parke see *Mantoniella*

MICROSPORA Thuret

M. amoena (Kütz.) Rabenhorst
LB 348/1 George 1948: England

MICROTHAMNION Naegeli

M. kutzingianum Naegeli
B 450/1a Christensen 1949: England
450/1b Pringsheim 1948: England

MISCHOCOCCUS Naegeli

M. sphaerocephalus Vischer
847/1 Vischer 1929, No. 61: type material: Switzerland

MONAS O.F. Müller

M. pudica Pringsheim
LB 930/1 Pringsheim 1944: England

M. sociabilis Meyer = *Anthophysa vegetans* q.v.

MONOCHRYISIS Skuja

M. lutheri Droop = *Pavlova lutheri* q.v.

MONODUS Chodat

M. subterraneus Petersen
848/1 Lewin: USA

MONOMASTIX Scherffel

M. minuta Skuja
LB 1963/2 Belcher 1967: England

MOUGEOTIA Agardh

M. sp.

LB 650/1 George 1949: cells 30-37 μ br: England

MURIELLA Petersen

M. aurantiaca Vischer

249/1 Vischer 1933, No. 108: terrestrial: Switzerland

M. decolor Vischer

249/2 Vischer 1926, No. 29: Switzerland

M. magna Fritsch *et* John = *Dictyochloris fragrans* q.v.

MYRMECIA Printz

M. pyriformis Tschermak-Woess *et* Plessl

LB 250/1 Tschermak-Woess: type material: from gonidium of *Biatorrella simplex*:
Austria

M. reticulata Tschermak-Woess

250/3 Tschermak-Woess *ex Phlyctis argena*

M. sp.

250/2 Ahmadjian 1965 *ex Dermatocarpon tuckmani*

MYXOSARCINA Printz

M. chroococcoides Geitler

1451/1 Greifswald No. A149

NAEGLERIA Alexeieff

N. fowleri Carter

B 1518/3 Jamieson 1972 'Morgan': Australia
B 1518/4 Jamieson 1972 'PA90': Australia
B 1518/5 Butt ca. 1967 'HB1': type of *N. aerobia* Singh *et* Das: USA

These strains are dangerous pathogens and are only issued to recognised laboratories capable of handling them safely.

N. gruberi (Schardinger) Alexeieff

B 1518/1a Pringsheim, used by Willmer: cysts not typical of species
B 1518/1b Pringsheim
B 1518/1c Pringsheim
B 1518/1d Pringsheim/Fulton
B 1518/1e Page: Wisconsin USA
B 1518/1f Page: Indiana USA
B 1518/1g Page: Alabama USA
B 1518/1s Pringsheim, used by Singh, probably is one of the Pringsheim strains above

N. jadini willaert *et* Le Ray

B 1518/2 Jadin: type material: Belgium

NANNOCHLORIS Naumann

- N. atomus Butcher
251/4a Knight-Jones 1948/Cann 1975: marine: Plymouth 84 as
Ulvelia lens: England
LB 251/4b Butcher 1960: marine: England
- N. coccooides Naumann
251/1a Lewin 1949: Connecticut USA
251/1b George 1951: England
- N. maculata
LB 251/3 Butcher: marine
- N. oculata Droop
B 251/6 Ott; Va 19: marine: Virginia USA
- N. sarniensis
LB 251/2 Butcher
- N. sp.
LB 251/5 Butcher 1959: marine: Wales

NAUTOCOCCUS Korshikov

- N. emersus Geitler
53/4 Bold 1974: Texas, USA
- N. piriformis Korshikov
53/1 Stafr: University of Indiana 125; from soil: Massachusetts USA
- N. soluta Archibald
B 53/2 Bold: type material: soil: Texas USA
- N. terrestris Archibald
B 53/3 Bold: type material: soil: Texas USA

NAVICULA Bory

- N. complanatula Hustedt
LB 1050/5* Belcher 1975: marine: England
- N. pelliculosa Brébisson
1050/3a Lewin: Connecticut USA
- N. sp.
1050/1 George 1948: from soil: South Africa

NEOBURSARIDIUM Balech

- N. gigas Balech
LB 1652/1 Nilsson 1956: Uganda

NEOCHLORIS Starr

N. *conjuncta* Archibald

254/1 Bold 1968: type material: Texas USA

N. *texensis* Archibald

B 254/2 Fold 1968: type material: soil: Texas USA

N. *vigensis* Archibald

254/3 Bold 1968: type material: Texas USA

N. *wimmeri* (Rabenhorst) Archibald *et* Bold

213/4 Mainz: Meyer Chlor. 7.

NEOSPONGIOCOCCUM Deason

N. *granatum* (Starr) Deason

213/1a Pringsheim: type material: soil

NEPHROCHLAMYS Korshikov

N. *subsolitaria* (West) Korshikov (*Kirchmeriella subsolitaria* West)

B 252/1 Belcher, No. 15
243/2a George 1947: England
243/2b George 1949: Switzerland

NEPHRODIELLA Pascher

N. *brevis* Vischer

850/1 Vischer 1941, No. 267: from soil: Switzerland

NEPHROSELMIS Stein

N. *gilva* Parke *et* Raynes

LB 151/1 den Hartog-Adams 1958: Plymouth No. 197: type material:
marine: England

N. *sp.*

LB 151/2 Plymouth No. 204: marine

NETRIUM Itzigsohn *et* Rothe, in Rabenhorst

N. *digitus* (Ehrenberg) Itzigsohn *et* Rothe

LB 652/1 George 1951: Wales

NITZSCHIA Hassall

N. *closterium* (Ehrenberg) W. Smith

LB 1052/8 Belcher 1974: marine: England

- N. closterium* (Ehr.) W. Smith f. *minutissima* Allen et Nelson
see *Phaeodactylum tricorutum*
- N. frustulum* Kützing
1052/2 Pringsheim 1948: material from Rice: brackish: Massachusetts USA
- N. gotlandica* Euler
LB 1052/7 Parke: Plymouth No 121: marine: England
- N. kutzingiana* Hilse
B 1052/4 Lewin: Massachusetts USA
- N. palea* (Kützing) W. Smith
1052/3 Harder
- N. sigma* (Kütz.) W. Smith
LB 1052/10* Belcher 1974: marine: England
- N. tryblionella* Hantz. *van victoriae* Grun.
LB 1052/9* Belcher 1974: marine: England

NODULARIA Mertens

- N. harveyana* Thuret
B 1452/1 Butcher: marine
- N. spumigena* Bornet et Flahout
B 1452/4 Nordin c. 1972, No. 1: soil: British Columbia Canada
- N. spP.*
B 1452/2 Smith and Wilcox 1972 as N1: England
B 1452/3 Smith and Wilcox 1972 as N2: ? *Sphaerocarpa*: England

NOSTOC Vaucher ex Bornet et Flahault

- N. calcicola* Brébisson
1453/1 Manten, Utrecht No. P.33 (= *N. ellipso sporum* according to Forest):
from soil: Holland
- N. commune* Vaucher
B 1453/24 du Preez 1971 Mes 1: from *Encephalartos horridus*: South Africa
B 1453/3 Wassink, Utrecht No. P.1: from soil: as *N. punctiforme*
B 1453/29 Donaldson and Whitton, Durham 201: mud: Aldabra Atoll
used for demonstration
- N. ellipso sporum* (Desmaz.) Bornet et Flahault
1453/1 as *N. calcicola* q.v.
1453/2 Manten, Utrecht No. P.42: Holland
1453/11 George 1950 as *N. pruniforme*: Sweden
1453/13 Mitra, No. 3 as *N. paludosum* Kütz.
1453/15 Forest from *Anabaena variabilis* in Drouet's herbarium: Ohio USA
1453/16 Forest from *Anabaena variabilis* in Drouet's herbarium
1453/17 Forest, FOG 470: from Fogg's culture 47b: USA
1453/18 Gerloff, No. 1013j
1453/19 'W' strain of Lazaroff and Vishniac: obtained from Forest as WIS 038

- N. entophytum* Bornet *et* Flahault
 1453/14 Stewart: marine (= *N. muscorum* according to Forest):
 nitrogen-fixer: Scotland
- N. muscorum* Agardh
 1453/8 Gibson as *Anabaena* No. 30: Scotland
 1453/9 Gibson as *Anabaena* No. 2: Scotland
 1453/12 Allison, H.M.S. No. Z.56.1.1: nitrogen fixer
 1453/14 Stewart as *N. entophytum* q.v.
 1453/20 Allen No. M.12.4.3: obtained from Forest as ALN 242
 B 1453/21 Forest, from specimen in Drouet's herbarium
 1453/22 Watanabe 1951: U.L. culture No. 51
 1453/23 du Preez 1971 Mes 7: from *Encephalartos umbeluziensis*:
 South Africa
- N. paludosum* Kützing
 1453/13 Mitra, as No. 3 (= *N. ellipsosporum* according to Forest)
- N. pruniforme* Agardh
 1453/11 George 1950 (= *N. ellipsosporum* according to Forest)
- N. punctiforme* (Kützing) Hariot
 1453/3 Wassink, Utrecht P.1: from soil: Holland (= *N. muscorum*
 according to Forest)
- N. spp.*
 1453/4 Wassink, Utrecht No. P.12: from soil: Holland
 1403/5 Wassink, Utrecht No. P.15: from soil: Holland
 1403/6 Wassink, Utrecht No. P.21: from soil: Holland
 1403/4a Hecker 1950
 B 1453/25 Wilcox and Smith 1971, as Nostoc I: England
 B 1453/26 Wilcox and Smith 1971, as Nostoc II; England
 B 1453/27 from Rothamsted via Wilcox as '*Nostoc col.*'
 B 1453/28 Rodgers 1972: *ex. Anthoceros*: Scotland
- OCHROMONAS** Wyssotzki (see also *Poterioochromonas*)
- O. danica* Pringsheim
 L 933/2 Pringsheim 1954: type material: Denmark
- O. minuta* *nom. prov.* Pringsheim
 L 933/10 Pringsheim 1951: Germany
- O. spp.*
 L 933/4 Atkinson 1965/Trown 1968: Malaya
 LB 933/5 Jowett 1966, Plymouth No. 420: marine: Wales
 LB 933/6 Jowett 1963; Plymouth No. 338: marine: England
 LB 933/7 Jowett 1963; Plymouth No. 346: marine: England
 LB 933/8a Butcher 1956 as "*adiposus*": marine: England
 LB 933/8b Butcher as "*adiposus*": marine: Wales
 LB 933/8c Butcher as "*adiposus*": marine: England: grows very well
 LB 933/9 Butcher 1959 as "*magnoliae*": marine: England
 LB 933/17 Butcher 1955 as "*magnoliae*": brackish: England
 LB 933/18 Butcher as "*magnoliae*": brackish: England
 LB 933/11 Butcher as "*maxima*": marine: England
 LB 933/12 Butcher 1954 as "*astigma*": brackish: Wales
 LB 933/15 Butcher as "*bicolor*": marine: England
 LB 933/16 Butcher as "*bicolor*": marine: England

LB 933/13 Butcher as "*globosa*": brackish: England
 LB 933/14 Butcher as "*globosa*": marine: England
 LP 933/19 Butcher 1960 as "*phaeocystoides*": brackish: England
 LB 933/20 Butcher 1960 as "*phaeocystoides*": brackish: England
 LB 933/21 Butcher 1956 as "*stigmatica*": marine: England
 LB 933/22 Butcher 1960 as "*stigmatica*": marine: England
 LB 933/23 Butcher as "*subglobosa*": marine: England

OEDOCLADIUM Stahl

O. cirratum Beaney et Hoffman
 LB 574/1 Milliger 1964: Indiana 1532: type material : Texas USA

OEDOGONIUM Wittrock

O. cardiacum Wittrock
 LB 575/1a Christensen 1949: male: England
 LB 575/1b Christensen 1949: female: England

O. foveolatum Wittrock
 LB 575/2 Bold 1958: homothallic: Indiana No. 933: previously listed as
O. rupestre

OLISTHODISCUS Carter

O. luteus Carter
 LB 934/1 Throndsen 1964, Plymouth No. 461: marine: Norway
 LB 934/2 Adams 1959, Plymouth No. 12A: marine: England
 LB 934/3 Lackey, Plymouth No. 239: Marine: Florida USA

OOCYSTIS Naegeli

O. apiculata W. West
 257/3 Wurtz, No. 24 (= *O. solitaria* Wittrock f. *major* Wille)

O. eremosphaeria G. M. Smith
 see *Eremosphaera gigas*

O. marssonii Lemmermann
 257/1 Beijerinck: perhaps not *Oocystis* sp.

O. solitaria Wittrock f. *major* Wille
 257/3 Wurtz No. 24

O. sp.
 257/2 Vischer

OPHIOCYTIUM Naegeli

O. majus Naegeli
 855/1 Pringsheim: England

OSCILLATORIA Vaucher *ex* Gomont

- O. animalis* Agardh
LB 1459/6 from University College London
- O. lutea* Agardh *var. contorta* Baker *et* Bold
LB 1459/3 Pringsheim 1941: identified by Baker and Bold
- O. princeps* Vaucher
LB 1459/7 Aschner 1964: Israel
- O. tenuis* Agardh
1459/4 Manten, Utrecht No. P.27: from soil: Holland
- O. spp.*
B 1459/8 Butcher: brackish
B 1459/9 Butcher: as "*nigro-viridis*": marine
B 1459/13 Butcher: marine: England

OXYRRHIS Dujardin

- O. marina* Dujardin (with diatom as food)
LB 1133/2 Pennick 1972: marine: England
LB 1133/3 Jowett 1967, Plymouth No. 209b: marine: England
LB 1133/4 Pennick 1974: marine: Bahrain

PALMODICTYON Kützing

- P. varium* (Naegeli) Lemmermann
LB 59/1 George 1949: seldom achieves typical form in culture: England

PANDORINA Bory

- P. charkowiensis* Korshikov (= *Eudorina charkowiensis* (Korsh.) Pascher)
24/2a Droop 1951: Finland
24/2b Peck 1962: from Ott No. 068: Virginia USA
- P. morum* Bory
60/1a Czurda: Czechoslovakia
60/1b Chu
60/1c George 1950: England
60/1d Wilbois, No. In-50-3, + strain: Indiana No. 788
60/1e Wilbois, No. In-50-11, - strain: Indiana No. 789

PARAMECIUM Hill

- P. aurelia* Ehrenberg
LB 1660/2a Pringsheim
LB 1660/2e George 1965: USA
LB 1660/3 strain GML
LB 1660/3 strain 50
LB 1660/3 strain 51 sensitive
LB 1660/3 strain 51 killer
LB 1660/3 strain J7, Jankowsky 1959: Russia
LB 1660/3 strain J19, Jankowsky 1959: Russia
LB 1660/3 strain J20, Jankowsky 1959, Russia
(these last two strains have abnormal morphology)

P. bursaria Focke

- LB 1660/1a Pringsheim: Czechoslovakia
- LB 1660/1b George 1949: England
- LB 1660/1c George 1949: England
- LB 1660/1d George 1949: England
- LB 1660/1e Pringsheim: England
- LB 1660/1f Pringsheim: mates with 1660/1g: Scotland
- LB 1660/1g George 1950: mates with 1660/1f: England
- LB 1660/1j Page 1976: mates with 1660/1k: England
- LB 1660/1k Page 1976: mates with 1660/1j: England

P. caudatum Ehrenberg

- LB 1660/2c George 1954: material from H. Gilbert Carter: England
- LB 1660/2f Page 1973: England

P. putrinum Clap. *et* Lach.

- LB 1660/7 Patterson 1975: England

P. woodruffi Wenrich

- LB 1660/4a Jankowsky 1959, No. 20: mates with 1660/4b: Russia
- LB 1660/4b Jankowsky 1959, No. 28: mates with 1660/4a: Russia

PARAMOEBA Schaudinn

P. eilhardi Schaudinn

- LB 1560/2 Grell 1960: marine: France

P. pemaquidensis Page

- B 1560/3 Page 1969: type material: marine: Maine USA

PARAPHYSOMONAS de Saedeleer

P. butcheri Pennick *et* Clarke

- LB 935/1 Butcher 1956: type material: cultured with a coccolithophorid: brackish: England

P. vestita (Stokes) de Saedeleer

- LB 935/3 Butcher 1960: marine: England
- LB 935/4 Butcher: marine: England

P. corbidifera Pennick *et* Clarke

- LB 935/2 (in 4/1 *Pyramimonas aff. orientalis*) type material: marine: England

PARMIDIUM Christen

P. scutulum (Skuja) Christen

- LB 1258/1 Christen: type material: Switzerland

PASCHERIELLA Korshikov = *Pascherina* q.v.

PASCHERINA Silva

P. tetras (Korshikov) Silva
LB 159/2 Belcher and Swale 1975: England

PAULSCHULZIA Skuja

P. pseudovolvox (Schulz) Skuja
58/1 Droop 1951: Finland

P. tenera (Korshikov) Lund (= *P. elegans* Lund)
LB 58/2 Lund: type material: England

PAVLOVA Butcher

P. gyrans Butcher
LB 940/1a Butcher 1947: type material: marine: England
LB 940/1b Knight-Jones 1946: Plymouth No. 93: marine: England
LB 940/1c Butcher 1957: marine: Wales

P. lutheri (Droop) Green
LB 931/1 Droop, Millport No. 60: Plymouth No. 75: marine

P. mesolychnon Van der Veer
LB 940/3 Van der Veer 1967: type material: marine: England

P. pinguis Green
LB 940/2 Green 1970: type material: marine: Madeira

P. spp.
LB 931/2 Butcher (as *Monochrysis* sp.): grows well: marine: England
LB 931/3 Butcher (as *Monochrysis* sp.): marine: England
LB 931/4 Butcher 1960 (as *Monochrysis* sp.): marine: England

PEDIASTRUM Meyen

P. biradiatum Meyen
261/1 Rodhe No. 1611a: Sweden

P. boryanum (Turpin) Meneghini var. *boryanum*
LB 261/2 Rodhe

P. boryanum var. *cornutum* (Racib.) Salek
LB 261/3a Pringsheim 1948: England

P. duplex var. *reticulatum* Lagerh.
LB 261/7 Ott No. 201

P. tetras (Ehr.) Ralfs
261/5 Pringsheim: Czechoslovakia
261/6 Czurda 1932: Prague No. 216: Austria

PEDINELLA Wysotzki

P. spp.

- LB 941/1a Butcher: as "*marina*": marine: England
- LB 941/1b Butcher: as "*marina*": marine: England
- LB 941/2 Butcher: marine: England
- LB 941/3 Butcher 1959: marine: England

PEDINOMONAS Korshikov

P. minor Korshikov

- B 1965/3b Hindak 1959: from Ettl as 117b: Czechoslovakia

P. tuberculata (Vischer) Gams

- LB 1965/2 Vischer, No. 274: type strain, as *Chlorochytridion tubercuatum*: Switzerland

PELOGLOEA Lauterborn

P. sp.

- LB 1461/1 Pringsheim 1948: ? = *Coccochloris peniocystis*: England

PELOMYXA Greeff see *Chaos*

PERANEMA Dujardin

P. trichophorum Stein

- 1260/1 Chen 1950, material from Pringsheim

PERIDINIUM Ehrenberg *em.* Stein

P. cinctum (Müller) Ehrenberg

- LB 1134/2 Pringsheim, strain 2
- LB 1134/3 Pringsheim, strain 1: grows poorly

P. faeroense Paulsen

- LB 1134/4 Parke 1957, Plymouth No. 180: marine: England

P. trochoideum (Stein) Lemmermann

- LB 1134/1 Parke 1949, Plymouth No. 104: marine: England

PHACOTUS Perty

P. lenticularis Ehrenberg

- LB 61/1 Pringsheim: England

PHACUS Dujardin

P. acuminata Klebs

- LB 1261/1 Pringsheim 1940: England

- P. alata** Klebs
 LB 1261/2b Pringsheim 1940: England
 LB 1261/2c Pringsheim 1940: England
- P. caudata** Hübner
 LB 1261/5 Pringsheim 1943: England
- P. megalopsis** Pochmann
 LB 1261/9 Droop 1951: identified by Pochmann: England
- P. oscillans** Klebs
 LB 1261/10 Pringsheim
- P. pleuronectes** (O.F.M.) Dujardin
 LB 1261/3a Pringsheim 1937: Czechoslovakia
 LB 1261/3b Pringsheim: England
- P. pusilla** Lemmermann
 LB 1261/6 Pringsheim 1945: England
- P. pyrum** (Ehrenberg) Stein
 LB 1261/4a Pringsheim 1940: England
 LB 1261/4b Pringsheim: England
- P. triqueter** (Ehrenberg) Dujardin
 LB 1261/8 De Bussy 1948: England

PHAEASTER Scherffel

- P. pascheri** Scherffel
 LB 942/1 Belcher 1968: England

PHAEOCYSTIS Lagerheim

- P. pouchettii** (Hariot) Lagerheim
 LB 943/1 Adams 1955, Plymouth No. 147: marine: England
 LB 943/2 ? 1952, Plymouth No. 64: marine: England
- P. spp.**
 LB 943/3 Butcher 1960: marine: England
 LB 943/4 Butcher: marine: Adriatic

PHAEODACTYLUM Bohlin

- P. tricornutum** Bohlin
 1052/1a Pringsheim, from the Plymouth strain No. 100, Allen 1910,
 long known as *Nitzschia closterium* f. *minutissima*: marine:
 England
 1052/1b Barker: H.M.S. Z.9.1.2.: from the Plymouth strain: England
 1052/6 Droop 1951: marine: Finland

PHILODINA Ehrenberg (rotifer)

- P. acuticornis** var. *odiosa*
 LB R1 originally from Carolina Biological Supply Company

PHORMIDIUM Kützing

P. autumnale (Agardh) Gomont)

LB 1462/6 Lefèvre 1930: France

P. foveolarum Gomont

1462/1 De 1939 (*Schizothrix calcicola* var. *glomerulata* Baker et Bold)

P. inundatum (Kütz.) Gom.

LB 1462/9 Lefèvre 1952: thermal: used as food for ciliates

P. luridum var. olivaceum Boresch

1462/2 Boresch. type material: identified as *Plectonema boyranum* by Allen and as *Schizothrix calcicola* var. *glomerulata* by Baker et Bold

P. minnesotense (Tilden) Drouet

LB 1462/3 Myers, Tx 7

P. periscinum (Reinke) Gomont

B 1462/5 Provasoli 1954

P. uncinatum (Agardh) Gomont

LB 1462/7 Lefèvre 1936: France

P. sp.

1462/8 Lewin 1965: marine: California USA

PHYSOLINUM Printz see *Trentepohlia*

PILINIA Kützing

?P. sp. Kützing

461/1 Lewin 1953: marine: Canada

PINNULARIA Ehrenberg

P. maior (Kütz.) Rabenhorst

LB 1056/1 Munch 1975: Maryland USA

PITHOPHORA Wittrock

P. oedogonia (Montagne) Wittrock var. *polyspora* Rendle et West

LB 530/1 George 1954: Hong Kong

PLAGIOSELMIS Butcher

P. punctata Butcher

LB 990/1 Butcher: Plymouth No. 172A: marine

PLATYAMOEBA Page

P. bursella Page

B 1565/5 Page 1971: type material: marine: England

- P. calycinucleolus** Page
 B 1565/6 Page 1972: type material: marine: England
- P. flabellata** Page
 B 1565/4 Page 1972: type material: marine: England
- P. mainensis** Page
 B 1565/1 Page 1969: type material: marine: Maine USA
- P. placida** Page
 B 1565/2 Page: type material: Wisconsin USA
- P. plurinucleolus** Page
 B 1565/7 Page 1972: type material: marine: England
- P. stenopodia** Page
 B 1565/3 Page: type material: Alabama USA

PLATYDORINA Kofoid

- P. caudata** Kofoid
 LB 160/1a Wilbois 1957: Indiana No. 850: female: Iowa USA
 LB 160/1b Wilbois 1957: Indiana No. 851: male: Iowa USA
 LB 160/1c Harris 1965, Indiana No. 1659: female: Kansas USA
 LB 160/1d Harris 1965, Indiana No. 1658: male: Kansas USA
 LB 160/1e Harris 1965, Indiana No. 1660: male: Kansas USA
 LB 160/1f Harris 1965, Indiana No. 1661: female: Kansas USA

PLATYMONAS West (see also *Tetraselmis*)

- P. convolutae** Parke *et* Manton
 66/9 Provasoli 1958 *ex Convoluta roscoffensis*, Plymouth No. 372: marine
 66/10 Jowett/Cann 1966, Plymouth No. 372a: type material: marine: France
- P. gracilis** Kylin
 161/4 Littler 1973: marine: California USA
- P. impellucida** McLachlan *et* Parke
 161/5 Pintner/Cann 1959, Plymouth No. 429: type material: marine:
 Puerto Rico
- P. subcordiformis** (Wille) Hazen
 161/1a Lewin 1952: marine: USA
 161/1b Strout 1952: marine: USA
 161/3 from University of California, Irvine, as *Platymonas* A:
 originally from Caltech
- P. spp.**
 66/3 Wood/Droop 1957: Millport 115: marine: N.S.W. Australia
 66/8 Parke 1965: Plymouth No. 315: marine: England
 66/11 Jowett 1965: Plymouth No. 362: as *Pyramimonas* sp.: marine: England

PLECTONEMA Thuret *ex* Gomont

- P. battersii** Gomont
 1463/3 Lewin 1965: marine: California USA

- P. boryanum** Gomont
 1446/2 Dyer, B.G. 15, strain 55: H.M.S. Z. 55.3.1
 1446/3 Dyer, B.G. 16, strain 6: H.M.S. Z. 55.2.1
 1462/2 Boresch as *Phormidium luridum* var. *olivaceum* Boresch
 1462/4 Dyer, strain 76 as *Phormidium*
 1463/1 Dyer H.M.S. Z. 59.1.1. as *Plectonema notatum*
 1463/2 Lewin: from soil: Nova Scotia Canada

PLEODORINA Shaw

- P. californica** Shaw
 LB 162/1 Starr 1953: homothallic: Tennessee USA
- P. illinoisensis** Kofoid (*Eudorina illinoisensis* (K.) Pascher)
 L 162/2a Stein 1956: male: Minnesota USA
 L 162/2b Stein 1956: female: Minnesota USA

PLEURASTRUM Chodat

- P. obovatum** (Vischer) Tupa
 445/1 Vischer 1928, No. 46: Switzerland
- P. paucicellulare** Vischer
 463/1 Vischer 1930, No. 68: Switzerland
- P. terrestre** Fritsch *et* John
 463/2 Pringsheim 1940: material from John: type material: from soil: England
- P. terrestre** var. *indica* Mitra
 463/3 Pringsheim: material from Mitra

PLEUROCHLORIS Pascher

- P. commutata** Pascher
 860/1a Vischer 1940, No. 241: from soil: Switzerland
 B 860/1b Flint, No. 27: from soil: New Zealand
- P. magna** Boye-Petersen
 B 860/4 Flint, No. 32: from soil: New Zealand
- P. meiringensis** Vischer
 860/3 Vischer 1945, No. 368: from soil: Switzerland

PLEUROCHRYSIS Pringsheim

- P. scherffelii** Pringsheim (= *Cricosphaera carterae*)
 LB 944/1 Pringsheim 1951: type material: brackish: England

PLEUROCOCOCCUS Meneghini

P. sp.
464/1 Chodat: Vischer No. 146

PLEUROSIGMA W. Smith *emend.* Cleve

P. sp.
LB 1058/1 Belcher 1974: marine

PLEUROTAENIUM Naegeli

P. minutum (Ralfs) Delponte
LB 664/1 George 1949: Ireland

PODOPHRYA Ehrenberg see *Discophrya*

POLYEDRIELLA Pascher

P. helvetica Vischer *et* Pascher
861/1 Chodat, Geneva No. 255: Vischer No. 170

POLYEDRIOPSIS Schmidle

P. bitridens (Beck-Mannagetta) Kováčik
282/1 Starr: soil: USA

POLYTOMA Ehrenberg

P. uvella Ehrenberg
62/2a Pringsheim, strain 2
62/2b Pringsheim, strain 13
62/2c Pringsheim, 1941, strain 1: England
LB 62/2d Pringsheim
LB 62/2e Pringsheim 1941: England
LB 62/2f Pringsheim 1940, strain 4
LB 62/2h Pringsheim, strain 10
LB 62/2k Pringsheim 1941, strain M: from manure
62/2m Pringsheim: Holland

POLYTOMELLA Aragao

P. caeca Pringsheim
LB 63/2a Pringsheim pre 1937, material from Kniep: Germany

P. caeca *var.* minor Pringsheim
LB 63/2b Pringsheim 1937: Czechoslovakia

P. magna Pringsheim
63/3 Pringsheim 1947: from *Ulmus* sap: type material: England

P. papillata Pringsheim
LB 63/2c Pringsheim 1944, material from Sister Monica Taylor: type material: Scotland

P. parva Pringsheim
LB 63/1 Pringsheim: soil: England

PORPHYRA Agardh

P. linearis Greville (*Conchocelis* Stage)
LB 1379/1 Chen 1969: Canada

P. miniata (Agardh) Ag. (*Conchocelis* Stage)
LB 1379/2 Chen 1968: Canada

PORPHYRIDIDIUM Naegeli

P. aerugineum Geitler
1380/2 Starr: USA

P. purpureum (Bory) Ross (= *P. cruentum*)
1380/1a Vischer 1935, No. 107: Switzerland: halophilic
1380/1b halophilic
1380/1c halophilic

POTERIOOCHROMONAS Scherffel

P. malhamensis (Pringsheim) Peterfi
L 933/1a Chen 1948: type material: England: much used as *Ochromonas malhamensis*
L 933/1b Provasoli
L 933/1c Provasoli

P. nutans Jane
L 933/1d Lewin 1950, formerly listed as *P. stipitata*

P. sociabilis (Pringsheim) Peterfi
L 933/3 Pringsheim: type material

PRASINOCCLADUS Kuckuck

P. marinus (Cienk.) Waern
163/1a Parke/George 1954, Plymouth No. 79: marine: England
163/1b Parke/Cann 1963, Plymouth No. 308: marine: England

P. verrucosa (Butcher) Parke
163/3 Butcher/Cann, Plymouth No. 396, sent there by Provasoli: type material: marine
163/4 Butcher/Pennick: marine

P. sp.
163/2 Provasoli/Cann, Ca-5, Plymouth No. 371: marine

PRASIOCOCCUS Vischer

- P. calcarius* (B. Petersen) Vischer
365/1 Vischer 1950: received from Christensen: Germany

PRASIOLA Agardh

- P. stipitata* Suhr
468/1 Lewin 1953: marine: Nova Scotia, Canada

PROROCENTRUM Ehrenberg *em.* Dodge

- P. balticum* (Lohmann) Loeblich
LB 1114/1 Parke 1950 as *Exuviaella baltica*, Plymouth No. 28: marine:
England

- P. dentatum* Stein
LB 1136/3 Jowett 1965, Plymouth No. 386 as *P. obtusidens*: marine:
England

- P. micans* Ehrenberg
LB 1136/1 Parke 1956, Plymouth No. 97: marine: England
LB 1136/4 Adams 1957, Plymouth No. 97a: marine: England
LB 1136/6 F. Ott, Va 5: marine: Virginia USA

- P. minimum* (Pavillard) Schiller
LB 1112/1 Parke (as *Exuviaella mariaae-lebouriaae*) Plymouth No. 18:
type material: marine: England
LB 1136/7 F. Ott, Va 13: marine: Virginia USA

- P. nanum* Schiller
LB 1114/2 Adams 1957 (as *Exuviaella pusilla*) Plymouth No. 184:
marine: England

- P. triestinum* Schiller
LB 1136/5 Jowett 1965, Plymouth No. 394: marine: England

PROTOSIPHON Klebs

- P. botryoides* (Kützing) Klebs
731/1a Pringsheim, material from Pascher: monoecious
731/1b Cowan 1951: monoecious: Connecticut USA
731/2 Pringsheim, material from Moewus: dioecious, only one strain extant

- P. botryoides f. parieticola* Iyengar
731/3 Mitra

PROTOTHECA Krüger. *Some of these strains are probable human pathogens. All should be handled with the greatest care*

- P. chlorelloides* Beijerinck
N 263/1 ?Beijerinck: received from Delft 1948: ?= *P. zopfii*

P. krugeri
N 263/6 from Delft: isolated from *Xanthoria parietina*

P. moriformis Krüger
N 263/2 ? Krüger: received from Delft 1948

P. portoricensis Ciferri, Ashford, and Dalmau
N 263/3a Ashford: type material
N 263/3b Parker 1953: from milk: England

P. portoricensis var. *trisporus* Ciferri, Ashford, and Dalmau
N 263/4 Ashford: type material

P. zopfii Krüger
N 263/5 Pringsheim: ?= *P. portoricensis*

P. sp.
N 263/7 Hong Kong

PRYMNESIUM Massart

P. parvum Carter
LB 946/1b Butcher 1952, Plymouth No. 94: marine: toxic to fish:
England
946/1d Reich 1954: Israel

P. sp.
LB 946/2 Butcher 1958: marine: England

PSEUDANABAENA Lauterborn

P. brunea ? *auct.*
LB 1464/2 Pringsheim 1956

P. catenata Lauterborn
B 1464/1 Pringsheim 1940: England

P. sp.
LB 1464/3 Parke, Plymouth No. 114: marine

PSEUDENDOCLONIOPSIS Vischer

P. botryoides Vischer
465/1 Vischer 1929, No. 21: type material: Switzerland

PSEUDENDOCLONIUM Wille

P. basiliense var. *brandii* Vischer
466/2 Vischer 1933, No. 52: type material: Switzerland

PSEUDOCHARACIOPSIS Lee et Bold

P. texensis Lee et Bold
864/1 Tupa, ? 1969: type material: Texas USA

PSEUDOCHLOROCOCCUM Archibald

P. polymorphum Archibald

265/2 Archibald: type material: soil

P. typicum Archibald

B 265/1 Archibald: type material: soil

PSEUDOCOCCOMYXA Korshikov

P. adhaerens Korshikov

812/2a Simmonds 1962: from potato plant: England

812/2b Simmonds 1964: from tomato plant: England. Several strains listed as *Coccomyxa* probably belong here

PSEUDOHOLEPIDIA Elenkin

P. convoluta (Brébisson) Elenkin

LB 1481/1 Pringsheim, as *Tetrachloris* sp.

PSEUDOISOCRYSIS *nom. prov.* (F. Ott)

P. paradoxa *nom. prov.* (F. Ott) (resembles *Isochrysis litoralis* Billard et Gayral

LB 949/1 Ott, Va 12: marine: Virginia USA

PSEUDOPEDINELLA Carter

P. spp.

LB 947/1a Jowett 1965, Plymouth No. 361A: marine: England
LB 947/1b Jowett 1965, Plymouth No. 361: marine: England
LB 947/2 Jowett 1967, Plymouth No. 439: marine: England
LB 947/3 Jowett 1968, Plymouth No. 451: marine: England
LB 947/4a Butcher/Parke 1959, Plymouth No. 214: marine: England
LB 947/4b Butcher, received before 1965: marine
LB 947/5 Jowett 1967, Plymouth No. 436: marine: England
LB 947/6 Jowett 1967, Plymouth No. 437: marine: England
LB 947/7 Jowett 1967, Plymouth No. 438: marine: England
LB 947/8 Jowett 1965, Plymouth No. 343: marine: England
LB 947/9 Jowett 1966, Plymouth No. 413: marine: England
LB 948/1 Parke, Plymouth No. 91: marine: England: received as *Pseudopedinella* in 1954: identity now doubtful

PSEUDOPLEUROCOCCUS Snow

P. printzii Vischer

467/1 Vischer 1926, No. 10: type material: Switzerland

PSEUDOSTICHOCOCCUS Moewus

P. monallantoides Moewus

364/1 Moewus 1950: type material: marine: Germany

PSEUDOTREBOUXIA Archibald

P. aggregata Archibald

219/1d Quispel: *ex Xanthoria parietina*

P. decolorans (Ahmadjian in Ed.) Archibald

219/4 di Benedetto *ex Xanthoria parietina*: type material of
Trebouxia albulescens: Italy

219/5a Ahmadjian *ex Xanthoria parietina*: type material of
Trebouxia decolorans: University of Indiana No. 901

P. incrustata (Ahmadjian in Ed.) Archibald

219/6 Ahmadjian *ex Lecanora dispersa*: type material: University of
Indiana No. 784

P. potteri (Ahmadjian in Ed.) Archibald

219/7 Ahmadjian: type material: University of Indiana No. 900

PTEROMONAS Seligo

P. angulosa Lemmermann

LB 64/3 Pringsheim 1948: England

P. angulosa Lemm. *var. takedana* (West) Pascher

LB 64/2 Pringsheim 1944: England

P. protracta Lemmermann

LB 64/1 Pringsheim 1942: England

P. varians Jane

LB 64/4 Evans 1961: England

PTEROSPERMA Pouchet

P. nationalis Lohm.

LB 165/2 Parke 1963, Plymouth No. 302: marine: England

PYRAMIMONAS Schmarda

P. amyliifera Conrad

LB 67/3 Adams 1961, Plymouth No. 246: marine: England

P. grossii Parke

LB 67/10 Reynolds 1970, Ci 11: marine: Scotland

LB 67/11 Pennick 1974: marine: England

P. obovata N. Carter

LB 67/6 Parke 1962, Plymouth No. 280: marine: England

P. aff. orientalis Butcher

- LB 4/1 Butcher, pre 1957 as type material of *Asteromonas propulsum*:
marine
LB 67/8 Butcher 1960, as *P. disomata*: marine: England
LB 67/9 Butcher 1956, as *P. disomata*: marine: England
LB 67/12 Butcher: marine: England
LB 67/14 Van der Veer 1967, Plymouth No. 453: marine: England
LB 67/18 Butcher: marine: England
LB 67/19 Butcher: marine: England
LB 67/20 Pennick 1975: marine: England
LB 11/92 Butcher 1959 as ? *Chlamydomonas*: marine: England

P. parkeae Norris *et* Pearson

- LB 67/7 Parke 1963, Plymouth No. 299: material from Norris: marine: USA
LB 67/17 Pennick 1974, *ex* Plymouth No. 340: marine: England
LB 67/15 Plymouth "PP": marine
LB 67/21 Norris 1966, University of Washington 15.8.25, Plymouth No. 492:
type material: marine: California USA
LB 135/2 Adams 1958, Plymouth No. 205: as *Halosphaera minor*: marine: England

P. tetra-rhynchus Schmar-da

- LB 67/4 Belcher and Swale 1971: England

P. virginica *nom. prov.*

- LB 67/16 Ott: marine: Virginia USA

PYROBOTRYS Arnoldi

P. stellata Korshikov

- LB 10/1c Pringsheim 1956: Florida USA

QUADRIGULA Printz

Q. closterioides (Bohlin) Printz

- 268/1 George 1949, material from Pringsheim: Ireland

RADIOSPHAERA Snow

R. dissecta (Korshikov) Starr

- B 247/1 Starr 1951: from soil: England
3/2b Vischer 1942, No. 321: from soil, as *Asterococcus (Macrochloris)*
terrestris Vischer

R. negevensis Ocampo-Paus *et* Friedmann *f. negevensis*

- 247/2 Ocampo-Paus: type strain 1-110: soil: Negev Desert

R. negevensis f. minor Ocampo-Paus *et* Friedmann

- 247/3 Ocampo-Paus: type strain 1-117: soil: Negev Desert

R. sphaerica (Korshikov) Fott

- 3/2b Vischer 1942, No. 321 (according to Fott 1971)
247/1 Starr 1951 (according to Fott 1971)

RAPHIDIOPHRYS Archer

R. *ambigua* Penard
LB 1568/1 Page 1974: England

RAPHIDONEMA Lagerheim

R. *longiseta* Vischer
470/1a Vischer 1932, No. 97: type material: Switzerland
470/1b Pringsheim

R. *spiculiforme* Vischer
470/2a Vischer 1940, as No. 208: type material: Switzerland
470/2b George 1951: England
470/2c George 1951: England

R. *sp.*
470/3 Belcher 1961: England

RHABDOMONAS Fresenius

R. *costata* (Korshikov) Pringsheim (= *Menoidium longum* Pringsheim)
LB 1271/1 Pringsheim: Czechoslovakia

R. *gibba* (Skuja) Pringsheim
LB 1271/2 Pringsheim 1940: England

R. *incurva* Fresenius *var. major* Pringsheim
LB 1271/4 Pringsheim: Czechoslovakia

R. *spiralis* Pringsheim (= *Rhabdospira*)
LB 1271/5 Pringsheim 1936: Austria

RHABDOSPIRA Pringsheim

R. *spiralis* Pringsheim
LB 1271/5 Pringsheim 1936: type material: Austria

RHIZOCLONIUM Kützing

R. *hieroglyphicum* (Agardh) Kützing
LB 540/1 George 1950: from soil: England

RHODELLA Evans

R. *maculata* Evans
LB 1388/2 Droop, Millport 207: type material: marine

RHOPALOCYSTIS Schussnig

R. *sp.*
274/1 Flint 1962/King: soil: New Zealand

RHYNCHOMONAS Klebs

R. *nasuta* (Stokes) Klebs
B 1972/1 Page 1972: England

ROSCULUS Hawes

R. *ithacus* Hawes
B 1571/1 Fennell 1974: from *Zea mays*: Illinois USA

SACCAMOEBIA Frenzel

S. *limax* (Dujardin)
B 1534/6 Page 1967, No. 57: Alabama USA

S. *stagnicola* Page
B 1572/1 Page 1972: type material: England

SARCINOCHRYSIS Geitler

S. *granifera* (Mack) Tschermak-Woess
LB 952/1 Tschermak-Woess 1970: saline: Austria

SCENEDESMUS Meyen

S. *acuminatus* (Lagerheim) Chodat
276/12 Algéus ?1950: Sweden

S. *acutiformis* Schroeder
276/11 Algéus ?1950: ?Sweden

S. *acutus* f. *alternans* Hortobagyi
276/3a Pringsheim, as *S. obliquus*

S. *basiliensis* Chodat
276/1a Chodat: received from Vischer
276/1b Chodat: received from Vischer

S. *bijugatus* (Turpin) Kützing var. *seriatus* Chodat
276/14 L. Møewus

S. *dimorphus* Kützing
276/10 Algéus 1950: Sweden

S. *dispar* Brébisson
276/13 George 1950: material from Pringsheim: Sweden

S. *naegelii* Chodat
276/2 Rodhe No. 1598.1: Sweden

S. *obliquus* (Turpin) Krüger
276/3b Algéus 1939: ?Sweden
276/3c Pirson, as M-B

S. opoliensis P. Richter

276/15 Atkinson/Baker 1960: Malacca

S. pannonicus Hortobagyi

276/4a Pringsheim as *S. quadricauda*: Czechoslovakia

S. quadricauda (Turpin) Brébisson

276/4b Pringsheim 1940: England

276/4c Rodhe No. 1621a: ?Sweden

276/4d Algéus 1950: ?Sweden

276/4e Pirson as M-A

S. spp.

276/5 Pringsheim

276/6a Gaffron, clone D3

276/6b Gaffron, clone D3: received from A.H. Brown 1957

276/7 Pringsheim 1940: England

276/8 Lewin 1950: Connecticut USA

276/9 Harder: ?Germany

211/23 Lewin, Indiana No. 343: type of *Chlorella fusca*: shown to be a unicellular *Scenedesmus* by Fott *et al* (1975)

SCHIZOMERIS Kützing

S. ? leibleinii Kützing

376/1 Christensen No. 9131/Baker: Kentucky, USA

SCHIZOTHRIX Kützing *ex* Gomont

S. calcicola (Ag.) Gomont

1470/1 Myers, Tx 27: identified by Drouet

B 1470/3 Pentecost 1972: tufa deposit: England

S. calcicola var. glomerulata Baker *et* Bold

1462/1 De 1939: identified by Baker and Bold

1462/2 Boresch

S. sp.

LB 1470/2 Ott 0404: USA

SCOTIELLA Fritsch

S. oocystiformis Lund

277/1 George 1955: material from Lund: England

SCYTONEMA Agardh *ex* Bornet *et* Flahault

S. javanicum (Kützing) Bornet

1473/1 George 1964: from material epiphytic on *Peperomia* leaf

S. ocellatum Lynqbye

B 1473/2 Ott/Baker: Ott 317: soil: Hawaii

S. spp.

B 1473/3 George 1968: soil: Japan

LB 1410/4 *Calothrix anomala*, may belong here

SELENASTRUM Reinsch

S. bibraianum Reinsch

278/1 Pringsheim 1940: England

S. capricornutum Printz

278/4 University of Indiana No. 1648: ?Norway

S. gracile Reinsch

278/2a George 1947: England

278/2b George 1954: Nigeria

278/2c Starr: Tennessee USA

278/2d Cowan: Connecticut USA

278/2e Bourrelly, Paris No. 84

278/2f Wurtz, No. 16: France

278/2g Lewin, Connecticut USA

278/2h Starr: Tennessee USA

S. minutum (Naegeli) Collins

278/3 Myers, No. Tx 1: Texas, USA

SKELETONEMA Greville

S. costatum (Greville) Cleve

LB 1077/1a Droop: Millport 73

LB 1077/1b Robinson 1950, Plymouth No. 106: marine: England

SPERMATOZOPSIS Korshikov

S. exsultans Korshikov

LB 175/1 Belcher and Swale: England

SPHAERELLA Sommerfeldt = *Haematococcus* Flotow

SPHAERELLOPSIS Korshikov = *Vitreochlamys* Batko

SPHAEROPLEA Agardh

S. soleirolii (Duby) Montagne

LB 377/1a Starr 1951: England

S. wilmanae Fritsch *et* Rich

LB 377/1b George 1951: South Africa

LB 377/1c George 1951: South Africa

LB 377/1d George 1951: South Africa

LB 377/1e George 1951: South Africa

SPHAEROSORUS Pascher

S. composita Moewus

876/1 Moewus: marine: type material

SPIRILLUM Ehrenberg (bacteria)

S. serpens (Müller) Winter
LB 1780/1 Pringsheim

SPIROGYRA Link

S. grevilleana (Hassall) Kützing
LB 678/1 George 1947: England

S. majuscula Kützing
LB 678/2 George 1947: England

S. pratensis Transeau
LB 678/7a Allen No. 10: diploid: Indiana No. 924: Indiana USA
LB 678/7b Allen No. 100: tetraploid: Indiana No. 926: Indiana USA
LB 678/7c Allen No. 103: tetraploid: Indiana No. 927: Indiana USA

S. varians (Hassall) Kützing
LB 678/3 George 1947: England

S. spp.
LB 678/4 Pringsheim: resembles *S. grevilleana* but has plain end walls: Czechoslovakia
LB 678/6 George 1956: an attached species: Ireland
LB 678/8 Peck 1967: England

SPIROSTOMUM Ehrenberg

S. ambiguum Ehrenberg
LB 1677/2b George 1955: England

S. intermedium Kahl
LB 1677/3 George 1951: England

S. teres Claparède *et* Lachmann
LB 1677/1 Chen 1949: England

SPIRULINA Gomont

S. geitleri de Toni
LB 1475/4b Wood: alkali lake: Abyssinia
LB 1475/4c Clement, T274: Lake Chad

S. major Kützing
LB 1475/3 George 1953: brackish: England

S. platensis (Nordstedt) Geitler (*Arthrospira platensis*)
LB 1475/4a George 1955: alkali lake: Mexico

S. subsalsa Oerstedt *ex* Gom. *f. versicolor*
LB 1475/2 Pringsheim 1949: marine: England

S. sp.
LB 1475/1 Pringsheim 1951: *aff. S. major*: marine: England

SPONDYLOSIUM Brébisson

- S. pulchellum Archer
LB 680/1 George 1952: Ireland

SPONGIOCHLORIS Starr

- S. excentrica Starr
280/1 Bold: type material: soil: Tennessee USA
- S. spongiosa (Vischer) Starr
3/1 Vischer 1942, No. 318: type material: soil: Switzerland
3/2a Pringsheim: material from John as *Asterococcus terrestris*

SPUMELLA Cienkowski

- S. elongata (Stokes) Belcher *et* Swale
LB 955/1 Belcher and Swale 1974: soil: England

STACHYAMOEBA Page

- S. lipophora Page
B 1579/1 Darbyshire 1973: type material: soil: Scotland

STAURASTRUM Ralfs

- S. gracile Ralfs
LB 679/3 Rodhe: Sweden
- S. ? muricatum Brébisson
LB 679/5 George 1956: Ireland
- S. orbiculare Ralfs ? *var. ralfsii* W. *et* G.S. West
679/2 Ondraček, as *Cosmarium* No. 4: Prague No. 230
- S. punctulatum Brébisson
679/1 Czurda 1930: Prague No. 226
- S. sp. aff. *S. teliferum*
LB 679/4 King 1953: Wales

STENTOR Oken

- S. coeruleus Ehrenberg
LB 1682/1 George 1963: England
- S. polymorphus (Müller)
LB 1682/2 Goodfellow 1975: England

STEPHANODISCUS Ehrenberg

- S. sp.
LB 1079/1 Belcher 1974: England

STEPHANOSPHAERA Cohn

S. pluvialis Cohn

- LB 78/1a Pringsheim 1950: Sweden
- LB 78/1b Pringsheim 1950: Sweden
- LB 78/1c Pringsheim 1950: Sweden
- LB 78/1d Pringsheim 1950: Sweden

STICHOCOCCUS Naegeli

S. bacillaris Naegeli

- 379/1a Vischer
- 379/1b Vischer 1923, No. 1: Switzerland
- 379/1c Algéus: Sweden
- 379/1d Lewin 1952: Alaska
- 379/1e Gray 1956: from freeze-dried contents of a cow's rumen: England
- 379/5 Parke 1949/George 1954, Plymouth No. 82: marine: type of material of *S. cylindricus* Butcher: England

S. chloranthus Krüger

- 379/2 Krüger: type material

S. cylindricus Butcher

- 379/5 as *S. bacillaris* q.v.

S. ? fragilis Gray

- 379/4 Lewin 1951: Massachusetts USA

S. mirabilis Largerheim

- 379/3 Pringsheim

STIGEOCLONIUM Kützing

S. ? amoenum Kützing

- 477/8 Reynolds No. 6

S. farctum Berthold

- LB 477/10a Reynolds No. 1: Wales
- LB 477/10b Butcher: Reynolds No. 15b

S. helveticum Vischer *var. minus* Vischer (? = *S. amoenum*)

- 477/1 Vischer 1925 No. 24: type material: Switzerland

S. helveticum var. maius Vischer (? = *S. amoenum*)

- B 477/2 Vischer 1926 No. 26: type material: Switzerland

S. ? huberi Heering

- 477/7 Reynolds No. 2

S. nanum Kützing

- LB 477/18 Butcher: Reynolds No. 8b: England

S. pascheri (Vischer) Cox *et* Bold

- 410/1 Vischer 1928, No. 45: type material of *Caespitella pascheri*: Switzerland
- 410/2 Lewin 1950: Connecticut USA

S. tenue Kützing

- LB 477/11a Reynolds, No. 4: Wales
LB 477/11b Butcher: Reynolds No. 1b: England

S. ? variabile Naegeli

- LB 477/13 Butcher: Reynolds No. 9b: England

S. spp.

- 477/3 Lewin, No. 4: resembles *S. helveticum*: USA
477/4 Lewin, No. 3: USA
477/6 Lewin, No. 6: USA
477/9 Reynolds, No. 7: resembles *S. farctum*
LB 477/12 Reynolds, No. 4: a very slender form: ? *S. setigerum*: Wales
LB 477/14 Reynolds 1950, No. 28: a very long erect system: England
LB 477/15 Reynolds, No. 15: with conspicuous hairs: Wales
LB 477/16 Reynolds, No. 25: prostrate system grows indefinitely: Wales
LB 477/17 Reynolds, No. 16: a large plant, approaching *Draparnaldia*
in morphology: Wales
477/19a Lewin, No. 102: Massachusetts USA
477/19b Lewin, No. 104: Massachusetts USA
477/19c Lewin, No. 106: Massachusetts USA
477/19d Lewin, No. 109: Massachusetts USA
477/19e Lewin, No. 112: Massachusetts USA
477/20 Vischer, No. 139: ? Switzerland
477/21 Vischer, No. 115: ? Switzerland
477/22 Vischer, No. 579: epiphyte from *Cladophora*: ? Switzerland
477/23 Vischer, No. 195: ? Switzerland

STREBLONEMA Derbès et Solier

S. sp.

- 1337/1 Lewin: marine: California USA

STROMBOMONAS Deflandre

S. conspersa (Pascher) Deflandre

- LB 1280/1 Pringsheim 1943: England

STYLONYCHIA Ehrenberg

S. mytilus (Müller) (syngen 1)

- LB 1681/2 Ammermann 1975: Germany

SYMPLOCA Kützing

S. muscorum (Agardh) Gomont

- B 1478/1 George 1955: British Columbia Canada

SYNCRYPHA Ehrenberg *emend.* Bourrelly

S. glomerifera Clarke *et* Pennick

- LB 958/1 Butcher, FH14: type material: marine: England

SYNECHOCOCCUS Naegeli

S. cedrorum Sauv.

B 1479/2a Gif strain M 137/1a

S. elongatus Naegeli (= *Anacystis marina* Drouet et Daily)

LB 1479/1a Pringsheim 1940

1479/1b Gif M 137/2

S. leopoliensis (Racib.) Komárek

1405/1

Kratz/Allen: see Komárek 1970 for an account of the generic identity of this strain which has been much used under the name "*Anacystis nidulans*"

S. sp.

1479/4

Jaworski 1974: L270: England

SYNECHOCYSTIS Sauvageau

S. minima Bourr.

B 1480/1

Gif No. A.M. 138/2

SYNURA Ehrenberg

S. petersenii Korsh.

LB 960/1a

Pringsheim strain 1

LB 960/1b

Pringsheim strain 2

LB 960/1c

Pringsheim strain 6

S. uvella Ehrenberg

LB 960/2

Pringsheim strain 4

SYRACOSPHAERA Lohmann

S. carterae Braarud et Fagerland = *Cricosphaera carterae* q.v.

TABELLARIA Ehrenberg

T. flocculosa (Roth) Kützing var. *asterionelloides* (Grun. in V.H.) Knudsen

LB 1081/1

Jaworski 1974, FBA L228: England

TETRACYSTIS Brown et Bold

T. aeria Brown et Bold

181/1a

Brown 1960: type material: from air over Texas USA

181/1b

Brown 1960: from air over Texas USA

T. aggregata Brown et Bold

181/2

Brown 1960: type material: from air over Texas USA

- T. *aplanosporum* (Arce *et* Bold) Brown *et* Bold
 181/9 Arce: type material: Indiana No. 773: from soil: Cuba
- T. *dissociata* Brown *et* Bold
 207/1b Vischer No. 304 as *Borodinella*: type material: Indiana
 No. 128: via Brown
- T. *excentrica* Brown *et* Bold
 181/3 Brown 1961: type material: from soil: Colorado USA
- T. *illinoisensis* Brown *et* Bold
 181/4 Brown 1962: type material: from air over Illinois USA
- T. *intermedium* (Deason *et* Bold) Brown *et* Bold
 181/10 type material: Indiana No. 974
- T. *isobilateralis* Brown *et* Bold
 181/5 Johnston 1960: type material: from soil: Texas USA
- T. *pampae* Brown *et* Bold
 181/6 Brown 1961: type material: from soil: Texas USA
- T. *pulchra* Brown *et* Bold
 181/7 Sweet 1962: type material: from soil: Texas USA
- T. *tetrasporum* (Arce *et* Bold) Brown *et* Bold
 181/11 Arce: type material: Indiana No. 780: from soil: Cuba
- T. *texensis* Brown *et* Bold
 181/8 Mattox: type material: from soil: Texas USA

TETRAEDRON Kützing

- T. *bitridens* Beck Mannagetta = *Polyedriopsis bitridens* (Beck Mannagetta) Kováčik
 282/1 Starr 1952: University of Indiana No. 120: Massachusetts USA

TETRAHYMENA Furgason. Some of these strains were formerly known as *Glaucoma*

- T. *patula* (Müller) Corliss
 L 1630/2 L-FF Fauré Fremiet/Lwoff 1942: selected as type material by
 Corliss (1971): France

T. pyriformis (Ehrenberg) Lwoff

L	1630/1	Ch-S, Chatton 1925: France
L	1630/1	E, Elliott 1932: selected as type material by Corliss (1971): New York USA
L	1630/1	Gf-J, Johnson 1934: New York USA
L	1630/1	GL, Lwoff 1922: France
L	1630/1	G1-R, Robertson 1935: England
L	1630/1	GP, Hetherington 1934: Massachusetts USA
L	1630/1	H, Hetherington 1931: California USA
L	1630/1	HS, Phelps 1949: thermal strain: Texas USA
L	1630/1	L-I, Loefer 1948: Texas USA
L	1630/1	L-II, Loefer 1948: Texas USA
L	1630/1	N, Phelps 1948/9 mating type 1/I, Arizona USA
L	1630/1	N, Phelps 1948/9 mating type 1/II
L	1630/1	N, Phelps 1948/9 mating type 1/III
L	1630/1	N, Phelps 1948/9 mating type 1/IV
L	1630/3	PP, Kidder 1942: Tennessee USA
L	1630/1	S, Seaman 1946: USA
L	1630/1	T, Thomas 1931: California USA
L	1630/3	V ₁ , Lilly 1940: Rhode Island USA
L	1630/1	W, Claff 1939: Massachusetts USA
L	1630/1	WH-6, Elliott: Massachusetts USA
L	1630/1	WH-14, Elliott: Massachusetts USA

T. vorax (Kidder, Lilly et Claff) Kidder

L	1630/3	V ₂ Lilly 1947: (polymorphic strain): selected as type material by Corliss (1971): Rhode Island USA
---	--------	-------------------------------------------------------------------------------------------------------------------

The following *Tetrahymena pyriformis* strains have been characterized electrophoretically by Borden, Whitt and Nanney (1973). The first letter indicates the phenoset as designated by Borden *et al*; the second letter(s) the original strain designation and finally the source is indicated

A/GL/Zeuthen	C/GL/ATCC 30006
A/GL/Frankel	D/HS/Eichel
A/H/CCAP	D/HSM/Cameron
B/GL/Eichel	
B/E/CCAP	

Other CCAP strains were placed in phenosets as follows:

H S, T and W as phenoset A	ChS, Gf-J, GP and PP as phenoset E
E and G1 as phenoset B	HS (micronucleate) as phenoset G
	G1-R as phenoset H

TETRAMITUS Perty

T. rostratus Perty

B	1581/1	Department of Public Health, Austin: Texas USA
---	--------	------------------------------------------------

TETRASELMIS Stein (see also *Platymonas*)

T. apiculata (Butcher) Butcher

66/15	Butcher/Belcher and Cann: brackish: England
66/17	Butcher/Belcher and Cann: type material: marine
66/20	Butcher/Cann: marine: England

- T. carteriiformis* Butcher
66/2 Droop 1952/Belcher and Cann, Millport No. 10: type material:
supralittoral: Scotland
- T. chuii* Butcher
8/6 Chu: type material: marine: Scotland
66/21a Butcher 1958/Belcher and Cann: marine: England
66/21b Butcher 1960/Belcher and Cann: marine: England
66/21c Butcher/Belcher and Cann: marine: England
- T. gracilis* (Kylin) Butcher
66/13 Butcher 1959/Belcher and Cann: marine: England
- T. hazenii* Butcher (? = *T. tetrathele*)
66/7 Butcher(?)/Belcher and Cann: Plymouth No. 457, sent there by
Provasoli 1968
- T. inconspicua* Butcher
66/19a Butcher 1955/Belcher and Cann: marine: England
66/19b Butcher/Belcher and Cann: marine: England
66/19c Butcher 1959/Belcher and Cann: brackish: England
66/19d Butcher/Belcher and Cann: marine: England
- T. levis* Butcher
66/12 Butcher 1956/Belcher and Cann: marine: England
- T. rubens* Butcher
66/6 Butcher/Belcher and Cann: Plymouth No. 456, sent there by
Provasoli 1968: type material: brackish: England
66/18a Butcher/Belcher and Cann: marine: England
66/18b Butcher/Belcher and Cann: marine: England
- T. striata* Butcher
66/16 Butcher/Belcher and Cann: marine: Wales
66/5 Knight-Jones 1946/Belcher and Cann: Plymouth No. 443: type
material: marine: Wales
- T. suecica* (Kylin) Butcher
66/4 Bernhard pre 1962/Parke 1964/Belcher and Cann: Plymouth No,
305: marine: Italy. Recommended as a food organisms
66/22a Butcher 1959/Belcher and Cann: marine: England
66/22b Butcher 1960/Belcher and Cann: marine: Guernsey
66/22c Butcher 1958/Belcher and Cann: marine: England
66/22d Butcher 1959/Belcher and Cann: marine: England
- T. tetrathele* (West) Butcher
66/1a George 1950: brackish: England
66/1b George 1950: brackish: England
66/1c Butcher pre 1961/Cann: Plymouth No. 272: marine
66/1d Butcher 1956/Belcher and Cann: marine: England
66/14 Butcher 1958/Belcher and Cann: marine: England
161/2 Droop 1952: Millport No. 19: brackish: Wales
- T. verrucosa* Butcher
66/23 Butcher/Belcher and Cann: marine: Wales

T. spp.
 66/24 Butcher/Cann: marine: Adriatic Sea
 66/25 Butcher/Cann: marine: France
 66/26 Butcher/Belcher and Cann: marine: France
 66/27 Butcher/Belcher and Cann: marine: Malta
 66/28 Butcher/Belcher and Cann: marine: Adriatic Sea
 66/29 Butcher/Belcher and Cann: marine: Monaco

TETRASTRUM Chodat

T. staurogeneiformis (Schroeder) Lemm.
 284/1 Belcher and Swale 1975: England

THALASSIOSIRA Cleve

T. sp.
 LB 1085/1* Belcher 1975: marine: England

THALASSOMONAS Butcher *nom. confus.* = *Micromonas* p.p. (see Parke *et* Rayns 1964)
 = *Mantoniella* p.p. (see Desikachary 1972)

THECAMOEBA Fromental

T. granifera (Greeff)
 B 1583/5 Page 1973 (153): soil: neotype: England

T. orbis Schaeffer
 B 1583/2 Page 1969 (78) marine: Maine USA

T. proteoides Page
 LB 1583/6 Hülsmann/Page 1974: type material: Germany

T. quadrilineata (Carter)
 B 1583/7 Page 1971 (113) neotype: England

T. similis (Greeff)
 B 1583/8 Page 1974 (180): soil: neotype: England: *multiplies rapidly*

T. sphaeronucleolus (Greeff)
 B 1583/3 Page 1967: Alabama USA

T. striata Penhard
 B 1583/4 Page 1968: Wisconsin USA

T. terricola (Greeff)
 B 1583/9 Page 1974 (173): soil: neotype: England

TOLYPOTHRIX Kützing *ex* Bornet *et* Flahault

T. distorta Kützing
 LB 1482/5 George 1962: soil: California USA

T. distorta *var. symplocoides* Hansgirg
 1482/2 Manten 1948: Utrecht No. P.39: soil: Holland

- T. tenuis* Kützing
 1482/3a Watanabe, W1, Nagao Institute No. A.005: N fixing: Japan
 B 1482/3b Watanabe, M29: N fixing: Japan

TRACHELOMONAS Ehrenberg

- T. bernardinensis* Vischer
 LB 1283/5a Pringsheim, strain 33
- T. bulla* Stein
 LB 1283/6 Pringsheim 1951, strain 39: France
- T. deflandrei* Pringsheim
 LB 1283/7a Pringsheim, strain 35: type material
- T. grandis* Singh
 LB 1283/20 Singh: type material: Tennessee USA
- T. hispida* (Perty) Stein *em.* Deflandre
 LB 1283/8 Pringsheim, strain 3
- T. hispida* *var.* *acuminata* Deflandre
 LB 1283/9 Pringsheim 1940, strain 4: England
- T. hispida* *var.* *coronata* Lemmermann
 LB 1283/2 Pringsheim 1940, strain 5: England
- T. lefevrei* Deflandre
 LB 1283/10a Pringsheim 1943, strain 20: England
 LB 1283/10c Pringsheim 1952, strain 42: England
- T. oblonga* Lemmermann
 LB 1283/11 Pringsheim, strain 9
- T. oblonga* *var.* *punctata* Pringsheim
 LB 1283/12 Pringsheim, strain 22: type material
- T. pertyi* Pringsheim
 LB 1283/13 Pringsheim 1945, strain 30: England
- T. volvocina* Ehrenberg
 LB 1283/4b Pringsheim 1945, strain 28: England
- T. volvocinopsis* *var.* *spiralis* Pringsheim
 LB 1283/17 Pringsheim 1943, strain 21: type material: England
- T. zorensis* Deflandre
 LB 1283/18 Pringsheim 1940, strain 7: England

TREBOUXIA de Puymaly (see also *Pseudotrebourgia* Archibald)

- T. *albescens* de Nicola *et* di Benedetto (= *Pseudotrebourgia decolorans* (Ahmad.) Arch.
219/4 di Benedetto *ex Xanthoria parietina*: type material: Italy
- T. *anticipata* (Ahmadjian in Ed.) Archibald
219/3 Ahmadjian *ex Parmelia rufecta*: type material: University of
Indiana No. 903
- T. *arboricola* de Puymaly
219/1a isolated?: from Delft: Meyer No. 2
- T. *crenulata* Archibald
219/1b Quispel: *ex Parmelia acetabulum*
219/2 Richardson, 927: *ex Xanthoria aureola*: England
- T. *flava* Archibald
219/1c Quispel: *ex Physcia pulverulenta*
- T. *italiana* Archibald
219/5b Tomasalli *ex Xanthoria parietina*: Italy
- T. *spp.*
213/1b Beijerinck: Meyer No. 8: formerly listed as *Chlorococcum humicolum*
213/3 Beijerinck: as *Chlorococcum humicolum*: *ex Cladonia sp.*

TRENTEPOHLIA Martius

- T. *aurea* Martius
B 483/1 George 1949: subaerial: Wales
- T. *monile* de Wildeman (*Physolinum*)
460/1 Flint/George 1955: subaerial: Nigeria
- T. ? *dialepta* (Nylander) Heriot
483/2 George 1962: material from Leakey: subaerial: Uganda
- T. *sp.*
B 483/3 George 1964: subaerial: Ireland

TRIBONEMA Derbès *et* Solier

- T. *aequale* Pascher
880/1 Pringsheim: identified by Pascher: Czechoslovakia
- T. *viride* Pascher
LB 880/3 George 1948: England
- T. *sp.*
B 880/2 Christensen 1949: England

TRINEMA Dujardin

T. lineare Penard
LB 1584/1 Hedley 1970: England

ULOTHRIX Kützing

U. crenulata (Kützing) Kützing
LB 335/6 Pringsheim: material from John; England

U. confervicola (Lagerh.) Mattox et Bold
386/2 Pringsheim: Wisconsin USA

U. fimbriata Bold
384/2 Bold 1955: type material: Tennessee USA

U. gigas (Vischer) Mattox et Bold
386/3 Vischer 1930, No. 69: type material of *Uronema gigas*:
Switzerland

U. minuta Mattox et Bold
386/1 Pringsheim: type material: Wisconsin USA

U. subtilissima Rabenhorst, see *Klebsormidium*

U. sp.
386/4 Pringsheim 1949: type material of *Uronema terrestre* Mitra

URONEMA Lagerheim (alga) = *Ulothrix* Kützing emend Mattox et Bold

URONEMA Dujardin (ciliate)

U. ? marinum
LB 1686/2 Burkhill 1973: marine: England

U. schewiakoffi Buddenbrock
LB 1686/1 Parke, Plymouth No. 118: marine: England

UVA Playfair = *Pyrobotrys* Arnoldi

VACUOLARIA

V. virescens Cienkowski
LB 1195/1 Pringsheim 1950: England

VAHLKAMPFIA Chatton et Lalung-Bonnaire

V. aberdonica Page
B 1588/4 Darbyshire 1972: type material: soil: Scotland

V. avara Page
B 1588/1a Page 1964: type material; Indiana USA
B 1588/1b Page 1964: type material; Washington USA

V. enterica Page
B 1588/5 Kadlec 1972: type material: from intestine of a turkey:
Czechoslovakia

V. inornata Page
B 1588/2 Page 1964: type material: Wisconsin USA

V. jugosa Page
B 1588/3a Page 1964: type material: Idaho USA
B 1588/3b Darbyshire 1974: soil: Orkney Islands
B 1588/3c Darbyshire 1974: soil: Scotland
B 1588/3d Darbyshire 1974: soil: Scotland
B 1588/3f Darbyshire 1974: soil: Orkney Islands

V. ustiana Page
B 1588/6 ✓ Cerva 1972: type material: Czechoslovakia

VANNELLA Bovee

V. mira (Schaeffer)
B 1589/1 Page 1964: Wisconsin USA

V. platypodia (Gläser)
B 1589/2 Page 1964; Indiana USA

V. simplex (Wohlfarth-Bottermann)
B 1589/3 Hülsmann: Germany

VAUCHERIA de Candolle

V. debaryana Woronin
LB 745/5 Christensen 1949: England

V. geminata de Candolle
LB 745/4 Christensen

V. sessilis (Vaucher) de Candolle
LB 745/1b Christensen
LB 745/1c Pringsheim

V. woroniniana Heering
LB 745/3 Christensen 1949

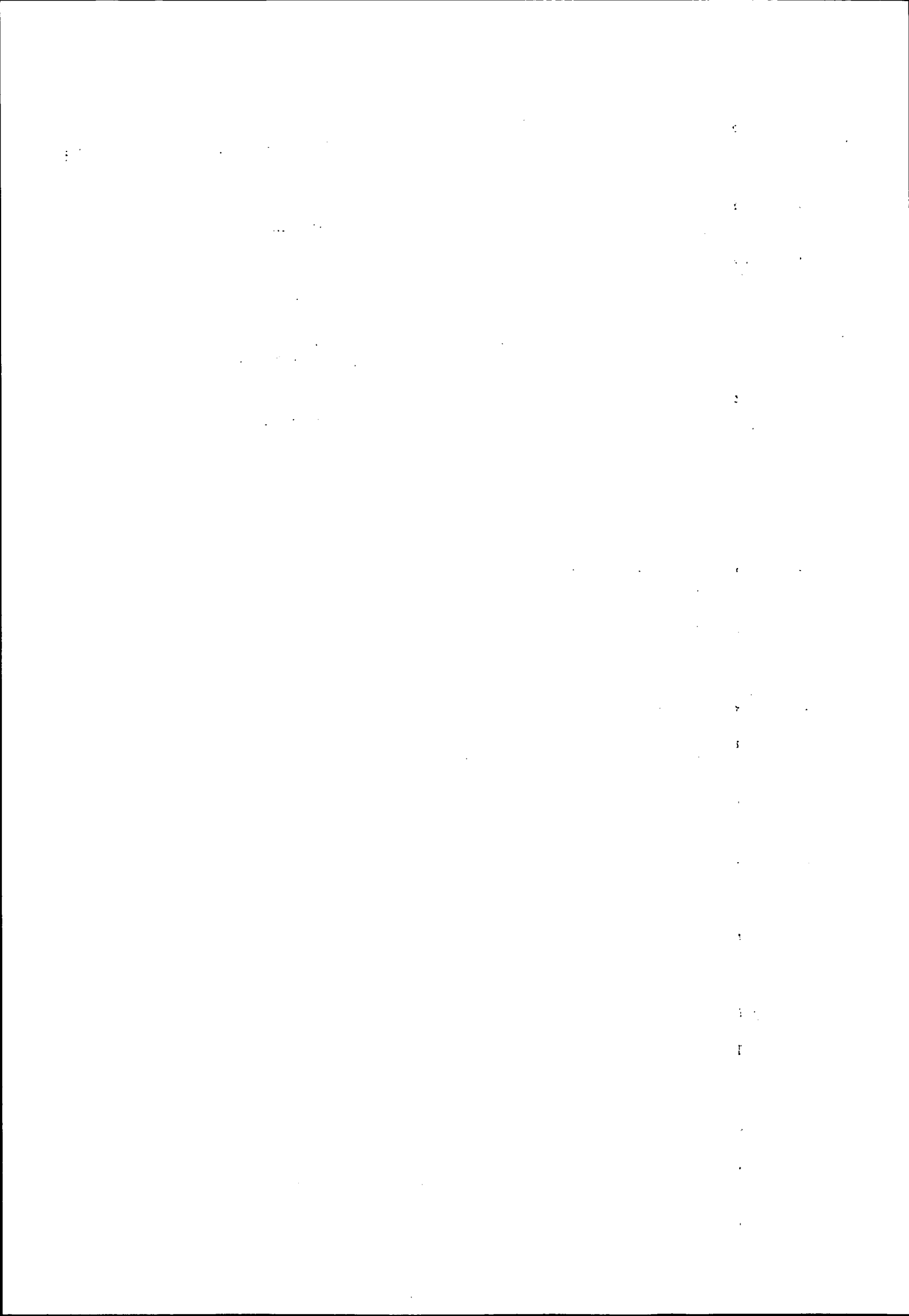
VEXILLIFERA Schaeffer

V. bacillipedes Page
B 1590/1 Page 1968: type material: Wisconsin USA

VISCHERIA Pascher

V. punctata Vischer
887/1 Vischer 1941, No. 266: soil: Switzerland

V. stellata (Poulton) Pascher
887/2b Chodat, No. 185: Vischer No. 169: University of Indiana
No. 312: Switzerland



Z. sp.

698/4 Pringsheim 1948: England

All recent attempts to obtain conjugation in either of the above pairs have failed

ZYGNEMOPSIS Skuja *em.* Transeau

Z. sp.

LB 699/1 Ott, No. 0379: USA

BRYOPHYTA AND HIGHER PLANTS

AULACOMNIUM Schwaeg

- A. androgynum (L.) Schwaeg
1802/1 Pringsheim: ? Czechoslovakia

BRYUM Dill.

- B. sp.
1804/1 George 1955: Hong Kong

BUXBAUMIA Haller

- B. aphylla Hedw.
1805/1 Keil 1947: Czechoslovakia

- B. indusiata Brid.
1805/2 Keil 1948: Czechoslovakia

CERATODON Brid.

- C. purpureus Brid.
1807/1 Pringsheim: Czechoslovakia

FOSSOMBRONIA Raddi

- F. cristula Austin
1862/2 Morris 1958: New Jersey USA

- F. pusilla (L.) Dum.
1862/1 Pringsheim 1939: England

FUNARIA Schreb.

- F. hygrometrica Hedw.
1813/1 Pringsheim: Czechoslovakia

HAPLODON R. Br.

- H. sp.
1817/1 von Stosch 1938: Germany

HAPLOMITRIUM Nees

- H. hookeri (Sm.) Nees
B 1868/1 Lorbeer: female strain: Czechoslovakia. *Grows slowly.*

HYPNUM L.

H. riparium L.
1820/1 Lewin 1954: Nova Scotia

LEPTOBRYUM Wils.

L. pyriforme (Hedw.) Schpr.
1822/1a Pringsheim: ? Czechoslovakia
1822/1b Pringsheim: ? Czechoslovakia
1822/2 Pringsheim: bivalent strain from Wettstein
1822/3 Pringsheim: univalent strain

LOPHOCOLEA Dum.

L heterophylloides Nees
B 1874/1 Berrie: Australia

MONOSELENIUM Griff.

M. tenerum Griff.
B 1875/1 Lorbeer: Czechoslovakia

PHASCUM Schreb.

P. cuspidatum Schreb.
1831/1a Hughes 1954
1831/1b Whitehouse 1961: bivalent: England

PHYSCOMITRELLA B. & S.

P. patens (Hedw.) B, S, and G.
1833/1 Whitehouse 1961 as PH1: England

RICCIA L.

R. glauca L.
1885/2 Whitehouse 1958: England

R. rhenana Lorbeer ex K. Müller
B 1885/1 George 1959: England

R. sorocarpa Bisch.
1885/3 Whitehouse 1960: England

R. duplex
1885/4 G.K.Berrie: Australia

RIELLA Mont.

R. americana Howe et Underwood
LB 1887/1a Proctor: male strain: New Mexico USA
LB 1887/1b Proctor: female strain: New Mexico USA

SCHISTOSTEGA Mohr.

S. osmundacea Mohr.

1837/1 Keil. *Grows slowly.*

SPHAEROCARPOS Ludwig

S. texanum Aust.

1890/2 Lorbeer: male strain. *Grows slowly.*

SPHAGNUM Dill

S. squarrosum Pers.

1838/1 Keil 1947: Czechoslovakia

S. sp.

1838/2 Lhotsky 1946: Czechoslovakia

SPLACHNUM L.

S. ampullaceum Hedw.

1839/1a Keil 1946: male strain: Czechoslovakia

1839/1b Keil 1946: female strain: Czechoslovakia

S. sphaericum L.

1839/2a Keil 1946: male strain: Czechoslovakia

1839/2b Keil 1946: female strain: Czechoslovakia

TETRAPHIS Hedw.

T. pelludica Hedw.

1842/1 Lewin 1954: Nova Scotia

WOLFFIA Horkel *ex* Schleid.

W. arrhiza (L.) Wimm.

LB P 1 George 1961: material from Zürich Botanic Garden

REFERENCES

- Bischoff, H. W. and Bold, 1963. Phycological Studies IV. Univ. Texas Public. No. 6318
- Borden, D., Whitt and Nanney, 1973. J. Protozool. 20(5) 693-700
- Carr, N. G. and Whitton, 1973. The Biology of the Blue Green Algae. Blackwell
- Chu, S. P., 1942. J. Ecol. 30 284-325
- Corliss, J. O. 1971. Trans. Amer. Micros. Soc. 90(2) 243-252
- Desikachary, T. V. 1972. Curr. Sci. 41(12) 445-447
- Drouet, F. and Daily, 1956. Butler Univ. Bot. Stud. XII 1-222
- Farooqui, P. B. 1974. Arch. f. Protistenk. 116 185-191
- Fott, B. 1968. Acta Univ. Carol. Biol. 1967 223-240
- Fott, B. 1971. Preslia (Praha) 43 289-303
- Fott, B. Lockhead and Clemençon, 1975. Arch. Protistenk. 117 288-296
- Fott, B. and Novakova, 1969. Studies in Phycology, Academia, Prague. 10-59
- Gerloff, G. C., Fitzgerald and Skoog, 1950. in Culturing of Algae, ed. by Brunel, J., Prescott and Tiffany. Charles Kettering Foundation
- Hoffman, L. R. and Hofmann, 1975. Can. J. Bot. 53 439-451
- Hopkins, E. F. and Wann, 1926. Bot. Gaz. 81 353
- Kantz, T. and Bold, 1969. Texas Univ. Publ. No. 6924
- Kessler, E. 1974. Arch. Microbiol. 100 51-56
- Komarek, J. 1970. Arch. Protistenk. 112 343-364
- Kratz, W. A. and Myers, 1955. Am. J. Bot. 42 282-287
- Morris, G. J. 1976. Arch. Microbiol. 107 57-62
- Parke, M. and Raynes, 1964. J. mar. biol. Ass. 44 209-217
- Pearsall, W. H. and Loose, 1937. Proc. R. Soc. London B 121 451-501
- Pringsheim, E. G. 1928. Ber. deutsch. bot. Ges. XLVI 216-219
- Pringsheim, E. G. 1948. New Phytol. 47(1) 52-87
- Pringsheim, E. G. 1952. New Phytol. 51(1) 65-76
- Provasoli, L., McLaughlin and Droop, 1957. Arch. Microbiol. 25 392-428
- Robinson, D. G. and Preston, 1971. J. Exp. Bot. 22 635-643

Sorokin, C. and Krauss, 1958. Plant Physiol. 33 109-113

Stein, J. (Ed.) 1973. Handbook of Phycological Methods. Cambridge Univ. Press

Sueoka, N. 1960. Proc. Natl. Acad. Sci. 46 83-91

Venkataraman, G. S. 1969. The Cultivation of Algae: ICAR, New Delhi



This cover shows scales of *Synura petersenii* Korsch.
x23,000. Electron micrograph by D. J. Hibberd

ISBN 0 904282 06 6

£1.00 net