

国立環境研究所研究報告 第182号

ISSN 1341-3643

Research Report from the National Institute for Environmental Studies, Japan No. 182, 2004
R-182-2004

NIES-Collection
LIST OF STRAINS
Seventh Edition
2004
Microalgae
and
Protozoa

Edited by
Fumie Kasai, Masanobu Kawachi,
Mayumi Erata and Makoto M. Watanabe
Supervised by
Committee for Evaluating Microbial Culture Strains

National Institute for Environmental Studies
JAPAN

**NIES-Collection. List of Strains
Seventh Edition
Microalgae and Protozoa
March 1, 2004**

Contributors:

Fumie Kasai, Masanobu Kawachi,
Mayumi Erata, Makoto M. Watanabe,
Akira Shimizu, Fumi Mori, Kosei Yumoto,
Mayumi Moriya and Miwa Ishimoto

Acknowledgment

Sincere thanks are expressed to Dr. T. Nakayama, University of Tsukuba, and Ms. T. Suzuki and S. Takasaki, National Institute for Environmental Studies, for their helpful advice and technical assistance about the taxonomy and the maintenance of some strains.

Cover design : Fumi Mori

第七版の序

国立環境研究所微生物系統保存施設が、2000年に保存株リスト第六版を発行してから、4年を迎えることとなった。初版～六版に関して、国内国外の各方面から多くの建設的意見や激励が寄せられたことには非常に勇気づけられたと共に、我々の事業が環境科学分野のみならず、基礎生物学、農学、水産学、食品学、医学等の分野でも注目され、重要視されていることを知り、責任の重さを痛感したものである。

この第七版は、初版～六版と同様に微生物系統保存株評価委員会の監修を受け、微細藻類 1,215 株、原生動物 6 株を掲載した。特に保存株の分類、保存株特性については注意深い検討がなされたが、不備な点をご指摘願えれば幸いである。

本施設に保存されている微生物株の殆どは、わが国の藻類学者によって分離培養されたものであり、他の微生物保存機関には保存されていないものである。今後、貴重な微生物株については、国内国外の微生物保存機関と密接な連携・協力関係を組み、共通のルールで共有していくことを考えている。また、本施設の事業は、微生物株の収集・保存・分譲にとどまらず、分類学的研究、保存技術の開発、株情報の収集およびその電算機管理システムの開発等多岐に亘っているが、これらの事業が益々充実し成果をあげるために、施設・要員の充実と拡充をはかっていく所存である。今後とも一層のご批判とご支援を賜ることができれば幸いである。

最後に、寄託依頼された藻類株の評価並びに本リスト刊行に際して様々なご指導とご助言をいただいた評価委員会委員に深甚な謝意を表するとともに、微生物系統保存施設のスタッフ一同の熱意に満腔の敬意を表したい。

平成16年3月

国立環境研究所微生物系統保存株評価委員会委員長
国立環境研究所生物圏環境領域長

渡 邊 信

保存株リスト第一版発刊に寄せて

国立環境研究所に我が国最初の環境微生物の系統保存施設が設置されたのは、昭和58年1月であったが、その後約2年間にわたって、同研究所の関係者の並々ならぬ努力によって、微生物保存事業に関する周到なる準備作業が繰り展げられ、ようやくここにその成果を保存株リストとして集大成されたことは、環境科学にたずさわる多くの研究者にとって、これ程慶ばしいことはない。ここに関係者各位に対して満腔の敬意を表明したい。

今回刊行された保存株リストは、当面環境生物学上重要な生産者である微細藻類に的を絞ったものであるが、これは我が国の現行微生物系統保存事業のうちで最も弱点とされていた分野であり、学界・産業界からもその実現が強く要望されていたところである。微細藻類の系統保存は、長年にわたり活発に研究されてきた細菌類や菌類の系統保存とは異なり、その分離、培養、保存等の条件が極めて複雑で、技術的に多くの困難な作業を伴うものである。本研究所においてはその性格上多角的研究に取り組んでいるが、その特徴を生かして所内の衆知を結集してこの点を克服し、世界的に通用する信頼度の高い系統保存事業を軌道に載せることに成功した。本施設の保存する微生物株は、その特性が科学的に実証されているために、これを実験的に使用する研究者、あるいはそれら微生物株データの利用者にとって、高い信頼感をもって利用することができる。しかも本施設では、保存微生物株に関する独自の電算機管理システムを開発したので、その保存株データを環境生物に関するデータベースの一環として利用することが可能となった。このことによって、とかく遅れがちであった我が国環境生物学の近代化が著しく促進されるものと信ずる。

本施設の当初の目標は環境問題に関係ある多種多様の微生物株を総合的に収集保存することにあったが、現状ではようやく微細藻類についての系統保存体制が確立されたに止まっている。今後益々施設設備の充実をはかって、微細藻類のみならず、環境生物学の調査研究上欠かすことのできないその他の微生物の系統保存をも実施し、名実ともにそなわった世界的な環境微生物株保存センターの一つとして発展されることを期待したい。

昭和60年2月

元富山大学長
東京大学名誉教授

柳 田 友 道

目 次

第七版の序.....	渡 邊 信
保存株リスト第一版発刊に寄せて.....	柳 田 友 道
I. はじめに.....	1
II. 培養株の寄託.....	4
1. 寄託条件.....	4
2. 寄託にあたっての同意事項.....	4
3. 寄託方法.....	5
III. 保存株の分譲.....	9
1. 分譲にあたっての同意事項.....	9
2. 株の注文方法.....	10
3. 株の価格.....	10
4. "Untransportable" (輸送が困難な) 株と凍結保存株の分譲についての注意.....	10
5. 1993年以降採集された外国産株の取り扱い.....	11
6. 有毒物質を生産する株の取り扱い.....	11
7. 国立環境研究所の職員、客員研究員、共同研究員への分譲.....	11
IV. 分譲株の培養保存法.....	19
V. 藻類培地作成の基本手法.....	19
1. 保存試薬液.....	19
2. 培地作成.....	21
3. 寒天斜面培地.....	22
VI. 培地 (Media)	49
1. 藻類の保存培地 (Stock media for algae)	49
2. 無菌検査培地 (Bacteria-free check media)	56
3. 微量金属混液・ビタミン混液・土壌浸出液 (Trace metals, vitamin mixes and soil extract)	57
4. 原生動物の保存培地 (Stock medium for protozoa)	58
VII. 保存株データの利用法.....	59
VIII. 保存株データ (Strain data)	63
付表 1. 凍結保存株一覧 (List of cryopreserved strains)	188
付表 2. 有毒株一覧 (List of toxic strains)	190
付表 3. 遺伝子データ一覧 (List of gene data)	191
IX. 索引 (Indexes)	198
1. 株番号索引 (Numerical index)	198
2. 分類群別索引 (Systematic index)	211
X. 文献 (References)	226

I. はじめに

独立行政法人国立環境研究所微生物系統保存施設（NIESコレクション）は1983年に環境微生物の系統保存を行うことを目的として設立された。当時は湖沼の富栄養化や大気汚染が現在より深刻な時代であった。そのような時代に、NIESコレクションは環境研（当時は公害研）内の研究者が分離した株や他のコレクションから移管された微細藻類株、250株余りでスタートを切った（文献526, 527）。小さなコレクションとしてのスタートであったが、まさに時を得ていたといえる。設立当時はシャットネラやヘテロシグマといった赤潮形成藻、ミクロキスティスのような水の華を形成するシアノバクテリアが代表的な保存株であり、これらは現在でも諸外国のコレクションにはないユニークなコレクションとしてのNIESコレクションの特徴となっている。

保存株

研究者からの寄託と保存施設における独自の分離によって、設立から20年の間に保存株数は1,400株余りに増加し、コレクションは大きく躍進した（Fig. 1）。この保存株リスト第7版は、このうち微細藻類1,215株と原生動物6株をNIES株として掲載している。微細藻類については現在知られているほとんどの綱を網羅している（Table 1）。

NIESコレクションでは、ほとんどの株が5~25°C、4~40 $\mu\text{mol} / \text{m}^2\text{sec}$ （12時間ごとの明暗周期）の最適増殖条件あるいはそれに準ずる環境で維持され、10日~4ヶ月ごとに新しい培地に植え継がれている（継代培養）。培養条件は、このリストの第八章に示されているが、株によって異なる。また、継代培養中に何らかの原因で保存株の状態が悪くなり、最終的に株を失ってしまう危険性をコレクションは常にもっている。これをできる限り防ぐために保存株の生育状態を毎週チェックしている。また、現在保存されている株のうち400株程度が無菌培養株である。これらは遺伝学や生理学の研究には欠かせない。これらの無菌培養株については毎年無菌チェックを行っている。

デジタル画像や18Sリボソーム遺伝子の塩基配列データの収集も業務として行い、保存株の評価に用いている。これらのデータは、通常3年ごとに出版している保存株リスト

（文献521, 528, 529, 531, 532, 540,

541）における分類学的位置の確認

などに利用され、またホームページ

（URL: <http://www.nies.go.jp/biology/mcc/home.htm>）でも検索できるよう

準備が進められている。

準備が進められている。

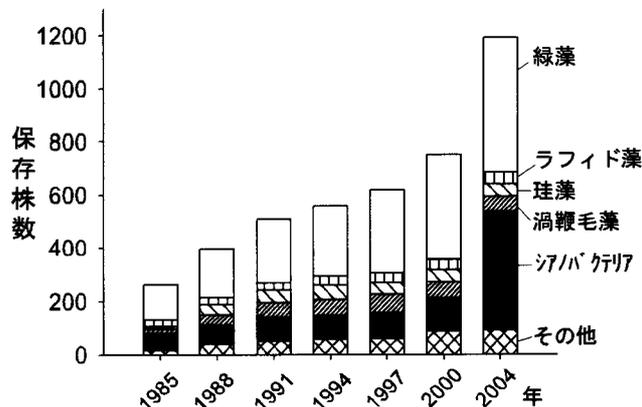


Fig. 1. 第1版~7版に掲載された保存株数の推移。緑藻は狭義の緑藻綱、ペディノ藻綱、アオサ藻綱、トレボキシア藻綱、車軸藻綱を含む。

Table 1. NIESコレクションに保存されている保存株の属、種、株数

門	綱	属	種/変種	株
藍色植物門	藍藻綱	28	68	445
灰色植物門	灰色藻綱	2	3	4
紅色植物門	紅藻綱	2	2	6
クリプト植物門	クリプト藻綱	4	19	40
不等毛植物門	黄金色藻綱	3	5	7
	ラフィド藻綱	6	10	42
	ディクチオカ藻綱	1	1	1
	珪藻綱	19	27	46
	褐藻綱	1	1	1
	黄緑色藻綱	3	3	3
	ペラゴ藻綱	1	1	1
	ピングイオ藻綱	1	1	2
	シゾクラディオ藻綱	1	1	1
ハプト植物門	プリムネシオ藻綱	12	16	39
	パプロバ藻綱	1	1	1
渦鞭毛植物門	渦鞭毛藻綱	19	38	58
ユーグレナ植物門	ユーグレナ藻綱	3	6	7
クロララクニオン植物門	クロララクニオン藻綱	1	1	1
緑色植物門	プラシノ藻綱	6	11	23
	ペディノ藻綱	1	1	1
	アオサ藻綱	2	5	6
	トレボキシア藻綱	14	24	57
	緑藻綱	52	130	275
	車軸藻綱	16	60	148
原生動物	貧膜口綱	2	2	2
	ビコソエカ綱	1	1	1
	プラシディア綱	2	2	3
合計		204	438	1,221

分譲と寄託

過去10年間、NIESコレクションでは毎年400～600株を研究や商業目的で分譲してきた。*Microcystis aeruginosa*、*Selenastrum capricornutum*（現在は*Pseudokirchneriella subcapitata*として知られている）、*Chlorella vulgaris*、*Anabaena flos-aquae*や*Chattonella antiqua*が過去5年間で最もよく分譲された種である。分譲された株は、AGPや生態毒性テスト、系統分類学的研究、新規生理活性物質の探求など、様々な分野の研究に用いられている。

NIESコレクションは、また、寄託も受け付けている（第II章参照）。寄託された株は原則として全て、系統保存株評価委員会の評価の後NIES株番号が付され、公開される。分譲依頼があると、新しい培地に植え継がれ、依頼者に郵送ないし宅配便で送られる。NIESコレクションでは、NIES株を使った研究論文を出版した場合、別刷の送付をお願いしている。参考文献の項に示されているように、これまでに多くの科学的に有用な研究成

果が出版されている。

凍結保存

凍結保存は、カルチャーコレクションにおける培養株の長期保存には必須の手段である。繰り返しの植え継ぎ作業がほとんどないことから、継代培養では常に危惧される細菌などの混入の危険を回避できる。また、細胞分裂を押さえることから、保存中の培養株の変質、特に突然変異などによる遺伝的な変質を最小限におさえることができる。現在、NIESコレクションには300余りのシアノバクテリア株と単細胞性紅藻株が液体窒素中の凍結保存（気相保存）のみで維持されている。Appendix I を参照されたい。

分類学的再検討

コッコイドの緑藻は、近年、鞭毛装置構造などの微細構造、18Sリボソーム遺伝子や *rbcL* 遺伝子などの塩基配列解析によって分類学的位置の再検討が行われている。一部の目が改訂されたり、トレボキシア藻綱が設立されたりするなど、分類体系の再検討がなされる一方、科や属レベルでの多系統性が指摘されるようになった。そこで、NIESコレクションにおいても18Sリボソーム遺伝子の解析を独自に行い、一部の株を緑藻綱からトレボキシア藻綱に移行した。また、この解析の過程で、不適当な種名または分類学的位置にある藻類株が見つかった。これらは、寄託者による誤同定か、寄託当時の分類学情報の欠如によるものであると考えられるが、本リストではコメントをつけてそのままにした。今後の分類学的研究に託したい。

シアノバクテリア株について

水の華形成藻類はNIESコレクションの特徴ともなっており、多くの分類学的研究がNIES株を用いて行われている。その中で *Microcystis* 属の5種 [*M. aeruginosa* (Kützinger) Lemmermann, *M. ichthyoblabe* Kützinger, *M. novacekii* (Komárek) Compère, *M. viridis* (A. Braun) Lemmermann, *M. wesenbergii* Komárek] を *M. aeruginosa* に統合することが提案されている（第X章参照）。NIESコレクションではこれを支持し、*Microcystis* 属の5種のうちNIESコレクションで保存する株を *M. aeruginosa* と表示し、前名をデータ中に示した。

他の保存施設との連携

NIESコレクションは、現在、英国のCCAP、フランスのPCC、米国のCCMP、ドイツのSAG、ノルウェーのNIVA（略称の正式名称は第VII章参照）と一部の株を共有している。これらの株にはNIES番号が付してあるが、元の保存機関における株番号も各々の株データ欄に記してある。このような保存機関同士の連携は、保存株を災害などで失わないため、また、世界各地で微細藻類培養株の利用を可能にするために重要な活動である。NIESコレクションでは、このような他機関との連携をさらに拡大しようと考えている。

II. 培養株の寄託

1. 寄託条件

国立環境研究所微生物系統保存施設では基本的に次の条件を満たす株について寄託を受け付けています。寄託された株の受け入れの可否は微生物系統保存株評価委員会で決定します。寄託された株は、原則として、すべて分譲の対象になります。

- (1) 環境問題にかかわる微生物、指標生物、タイプ株、有用な性質をもつ微生物、重要な研究で使われた微生物などの科学的に重要な微生物。
- (2) 履歴が明らかであり、適正な種名のついた株であることを原則としますが、既に属名のみで多くの研究に使われている株は受け入れ対象とします。
- (3) 保存条件が確立しており、安定した培養が可能な株であること。無菌培養株が望ましいが、微細藻類の場合はクローン培養株か単藻培養株であること。原生動物の場合は、無菌株か餌としての生物のみが混入している単一種培養株、細菌類は純粋培養株であること。
- (4) その他、微生物系統保存株評価委員会が特に必要と認めた株。

2. 寄託にあたっての同意事項

国立環境研究所微生物系統保存施設（以後 NIES コレクションと記す）は以下の同意事項に同意していただいた方からの寄託を受け付けます。

- (1) 寄託者は、寄託株を NIES コレクションに無償で寄託することとします。この寄託においては、知的所有権の移転は含まれません。寄託を受けて、NIES コレクションは、寄託された培養株の維持、保存、増殖を行い、また研究者に対し提供することができます。
- (2) 寄託者は、寄託にあたって、寄託株の特性や品質に関する正確な情報（特許等を含む）を添付することとします（微生物株寄託依頼書兼同意書参照）。
- (3) NIES コレクションに寄託するにあたり、寄託株は法律上あるいは契約上いかなる制限も受けていないものであり、その由来は以下のいずれかに該当することとします。
 - ・ 寄託株は、寄託者が分離・開発した培養株である。
 - ・ 他者が分離・開発した培養株であるが、寄託にあたっては分離・開発者の許可を得ている。
 - ・ 寄託者が購入したものであるが、譲渡や寄託をすることについて制限を受けていない。
- (4) NIES コレクションは寄託者の定める以下の条件で利用を希望する者へ寄託株を提供することができます。

- ・論文発表まで寄託株を公開・分譲しない。
- ・その他、寄託者の定める条件。

条件が付与されている場合でも、非公開は原則として寄託日から 1 年以内を目安とします。また、条件が付与されていない場合は、寄託後、保存株評価委員会等の審査を経て直ちに公開・分譲します。

- (5) 寄託者は、寄託株の維持・保存・増殖段階でのやむを得ない事情による変質・滅失あるいは自然災害その他の不可抗力による滅失・散逸などについて、NIES コレクションに対し責任を問うことはできません。
- (6) NIES コレクションは、保存株評価委員会等の意見等を踏まえ、維持方針の変更が生じた場合は事前に寄託者に連絡のうえ、寄託株の維持・保存・提供の中止その他の処分をすることができます。

3. 寄託方法

「微生物株寄託依頼書兼同意書」（6～8 頁）に必要事項を記入し、以下の宛先に郵送してください。ファクスまたは PDF ファイルで送付いただく場合でも、署名捺印された上記「依頼書兼同意書」の原本を後日必ず郵送してください。実際の株の引き取り時期などについては、スタッフにおたずねください。

宛先：〒305-8506 つくば市小野川16-2

国立環境研究所微生物系統保存施設

電話：029-850-2556

ファクス：029-850-2587

電子メール：mcc@nies.go.jp

寄託された株を受領後、株の状態が「寄託依頼書」に記された内容と相違した場合、当施設の判断で株の受け入れを取り消すことがあります。

微生物株寄託依頼書兼同意書

寄託依頼年月日： 年 月 日
依頼者名（フリガナ付）：
所属機関名（日本語名）：
所属機関名（英語名）：
所属機関住所：〒
電話： (内線)
FAX：
Eメールアドレス：

下記微生物の寄託を依頼します。

寄託理由：

[基本情報]

学名及び命名者名：

門名：

綱名：

目名：

科名：

シノニム：

同定者名（フリガナ付）：

同定年： 年 月 日

株番号又は符号：

他の寄託先情報（同じ株を別の機関に寄託している場合、機関名と保存株番号を記述してください）：

[採集]

採集年月日： 年 月 日

採集者名（フリガナ付）：

採集地情報

国名：

産地住所（県名から）：

地名（河川、湖、池、湾、砂浜等の名称）：

緯度経度：

海域名と最も近い国名：

生息環境：陸域 海域 汽水域（塩濃度： ‰）

生息環境の詳細：貧栄養 中栄養 富栄養 腐植栄養 表層 クロロフィル極大水深

その他の水深（— m） その他（ ）

陸水環境の詳細：湖沼 河川 湿原 湿地 水田 塩水 土 温泉 鉱泉 雪または氷

その他（ ）

海水環境の詳細：海浜域 沿岸域 外洋域 潮だまり（タイドプール） 潮間帯 干潟

マングローブ 河口 港湾 漂着（打ち上げ） ドレッジ その他（ ）

生息環境コメント：

[分離]

分離年月日： 年 月 日

分離者名（フリガナ付）：

分離試料源：水 海水 砂 泥 底泥 土 植物 海藻 海草 動物 サンゴ スポンジ

雪または氷 その他（ ）

分離時の状態：運動性栄養細胞 非運動性栄養細胞 休眠細胞 孢子 四分孢子 果孢子

接合子 単為発生配偶子 葉状体 その他（ ）

分離方法：ピペット洗浄法 切り出し 希釈法 寒天平板法 走性 セルソーター

その他（ ）

分離時の培養条件（培地の種類，濃度，光，温度条件等）が後述の保存条件と異なる場合，その詳細を記述してください：

分離時の処理：無処理 抗生物質(名称： ， mg/l) 紫外線照射
化学物質(名称： ， mg/l) 熱処理 集積強化培養 超音波処理
酸化ゲルマニウム その他()

[状態]

藻類・シアノバクテリア：単藻 混合
クローン 非クローン
無菌 非無菌
バクテリア：純粋 混合
原生動物：無菌 二者培養（餌生物： ）
混合

最新の無菌検査年月日： 年 月 日

[保存条件]

保存形態：継代培養 凍結保存 両者併用 その他()

培地名：

培地の出典：

培地形状：液体 半固体 固体 二相 その他()

培地作成等の特記事項：

継代培養による保存条件

温度(°C)：

光強度(Lux)：

光強度($\mu E/m^2sec$)：

光質：白色蛍光灯 赤色蛍光灯 青色蛍光灯 自然光 その他()

明暗周期：

継代培養(植え継ぎ)周期： (□日 □月間隔)

培養条件や植え継ぎ操作に関する特記事項(前培養の条件，特別な処理，最大の増殖率を得る条件，細胞の接種方法や接種量など)：

凍結保存：可 否 不明

凍結保護剤名： (濃度 %)：

保存温度(°C)：

凍結方法：

凍結乾燥保存：可 否 不明

L-乾燥保存：可 否 不明

[特性]

環境上の特性

赤潮形成 水の華形成 AGP試験 生物指標 水の華形成藻の捕食 異味 異臭
浄水障害 毒性 高CO₂固定 有害物質分解 生分解活性 酸化池 汚泥 生物膜処理
腐食性 その他()

生理生態的特性

独立栄養 混合栄養 摂食栄養 従属栄養 浮遊性 底生 共生 寄生 腐生
コスモポリタン 広温性 狭温性 好熱性 好冷性 広塩性 狭塩性 好塩性 好酸性
陽生型 陰生型 窒素固定 発酵 生物発光 走光性 水素発生 オイル生産
内生植物的生活 植物着生 岩石着生 その他()

その他の特性

分類学上重要な株 タイプ株 運動性 非運動性 休眠孢子形成 休眠孢子非形成 色順応
突然変異株 雌雄異株 雌雄同株 雌雄異体 雌雄同体 同型配偶 異型配偶 卵生殖
H,h型生活環 H,d型生活環 D,d+h型生活環 倍数性株 交配型(+) 交配型(-)
雌 雄 その他()

III. 保存株の分譲

1. 分譲にあたっての同意事項

国立環境研究所微生物系統保存施設（以後 NIES コレクションと記す）は、以下の事項に同意していただいた方に培養株を分譲します。

- (1) NIES コレクションから分譲された微生物培養株、それを増殖させたもの及び由来物（以後培養株等と記す）は教育、試験・研究および製品等の開発目的でのみ使用できます。人に直接使用することはできません。また、利用者は使用の際に、分譲された培養株に潜在的な危険性があることを認識し、その国、自治体、機関等の法令や規則を遵守しなければなりません。特に有毒物質を生産する株については、使用中の管理に責任を持ち、使用後は株及び由来物を適切な方法で処理しなければなりません。
- (2) 分譲を希望する場合は、利用者本人が分譲依頼書を提出してください。
- (3) 培養株等に関する知的所有権等が、分譲によって利用者へ与えられるものではありません。
- (4) 利用者が分譲時に示した使用目的から大幅に異なる目的に使用する場合、利用者はその旨を NIES コレクションに書面で連絡しなくてはなりません。
- (5) 利用者は分譲された培養株等を第三者に分与または販売することはできません。
- (6) NIES コレクションから分譲された株を利用した成果を発表する場合、番号の前に必ず NIES-をつけた株番号を記し（例：NIES-123）、国立環境研究所微生物系統保存施設に保存されている株であることを明記してください。分譲された株を利用して論文発表した場合は別刷りまたはコピーを2部、NIES コレクションに送ってください。
- (7) 分譲された培養株等の使用が第三者の知的所有権やその他の権利を侵害していた場合、利用者は利用者の責任によって対処しなければなりません。
- (8) 分譲された培養株等が、欠点、危険な特性、不具合等を有している可能性があること、あるいは特定の目的に合致しているとは限らないことを認識し、分譲された培養株等の利用によって損失が生じた場合は、利用者は、利用者自らの責任で処理しなくてはなりません。
- (9) 利用者は、培養株を受領後、1ヶ月以内に受領報告書を NIES コレクション宛に提出しなくてはなりません。輸送中の環境条件の変化などにより、その時点で増殖状態が悪い場合、利用者は NIES コレクションに無償で再分譲を要求することができます。ただし、NIES コレクションはその期間内であっても、利用者の過失に対する責任は負いません。

2. 株の注文方法

- (1) 「微生物株分譲依頼書兼同意書」（12 頁）に必要事項を記入し、以下の宛先に郵送してください。依頼者が学生、非常勤職員などの場合は、指導教官、雇用者などから依頼するようお願いします。株は指導教官、雇用者宛に郵送されます。また、お急ぎの場合は、分譲依頼のみをあらかじめファクス、PDF ファイルまたは電子メールでお送りください。なお株は署名捺印された依頼書兼同意書原本の到着確認後でないと発送できませんので、この点くれぐれもご注意ください。
- (2) 保存株を受け取った方は、受領後 1 ヶ月以内に「微生物株受領報告書」（18 頁）に必要事項を記入し、以下の宛先にファクス、郵送、または電子メールで連絡してください。

宛先：〒305-8506 つくば市小野川16-2

国立環境研究所微生物系統保存施設

電話：029-850-2556

ファクス：029-850-2587

電子メール：mcc@nies.go.jp

3. 株の価格

約 15mL の培養液に植え込まれた培養株 1 本につき、非営利組織：6,000 円、営利組織：10,000 円となります。この他に消費税と郵送料がかかります。小、中、高等学校の学校教育用、また、大学であっても教育目的で使用する場合は無料です。ただし、これらの場合、種類の選択は保存施設にお任せいただきます。

4. “Untransportable”（輸送が困難な）株と凍結保存株の分譲についての注意

“Untransportable”と記されている株は、保存株の状態や季節によって分譲依頼を受け付けられない場合があります（第VII章を参照のこと）。原則的に、これらの株はとりに来ていただくことになります。スタッフにご相談ください。

また、“[Cryopreserved]”と記されている株は、凍結保存されている株を解凍後、培養してからお送りします。したがって株を発送するまでに1ヶ月くらいかかる場合があります（Appendix I も参照のこと）。

5. 1993年以降採集された外国産株の取り扱い

1993年1月以降に外国より採集された株については、リストに掲載されていても生物多様性条約に関連して当面分譲を見合わせているものがあります。分譲依頼に際しては必ず保存株リストで産地および採集年をご確認の上、本項に該当すると思われる場合にはスタッフにお問合せください。

6. 有毒物質を生産する株の取り扱い

現時点で有毒物質を生産することがわかっている培養株は“Toxic”と記されています(Appendix II も参照のこと)。これらの株の分譲を希望する場合は、「有毒株分譲依頼書兼同意書」(13頁)を提出してください。

7. 国立環境研究所の職員、客員研究員、共同研究員への分譲

それぞれに該当する「微生物株分譲依頼書兼同意書」(14~17頁)に必要な事項を記入し、署名捺印のうえ所内便で送付するか、微生物系統保存施設のスタッフに直接渡してください。お急ぎの場合は、分譲依頼のみ電子メール(mcc@nies.go.jp宛)で受け付けます。後日上記依頼書を必ずお持ちください。保存株は無料です。

微生物株分譲依頼書兼同意書（一般用）

分譲依頼年月日： 年 月 日
依頼者名（フリガナ）： ()
所属機関名：
郵便番号：〒
住所：
電話：
FAX：
Eメールアドレス：
請求先：（上記機関、住所等と異なる場合にご記入ください）

下記微生物についての分譲を依頼します。
微生物学名（NIES株番号）：
研究目的（できるだけ詳しくご記入ください）：

合計株数：
株データシートの必要な株番号：

分譲依頼にあたって以下の同意事項に同意いたします。
年 月 日

氏名： 印（又はサイン）

分譲依頼者が学生、非常勤職員等の場合、指導教官又は責任者は以下の欄にご記入ください。
年 月 日

指導教官又は責任者名： 印（又はサイン）

所属機関名：
郵便番号：〒
住所：
電話：
FAX：
Eメールアドレス：

分譲にあたっての同意事項

1. 国立環境研究所微生物系統保存施設（以後 NIES コレクションと記す）から分譲された微生物培養株、それを増殖させたもの及び由来物（以後培養株等と記す）は教育、試験・研究および製品等の開発目的でのみ使用できません。人に直接使用することはできません。また、利用者は使用の際に、分譲された培養株に潜在的な危険性があることを認識し、その国、自治体、機関等の法令や規則を遵守しなければなりません。
2. 分譲を希望する場合は、利用者本人が分譲依頼書を提出してください。
3. 培養株等に関する知的所有権等が、分譲によって利用者へ与えられるものではありません。
4. 利用者が分譲時に示した使用目的から大幅に異なる目的に使用する場合、利用者はその旨を NIES コレクションに書面で連絡しなくてはなりません。
5. 利用者は分譲された培養株等を第三者に分与または販売することはできません。
6. NIES コレクションから分譲された株を利用した成果を発表する場合、番号の前に必ず NIES・をつけた株番号を記し（例：NIES-123）、国立環境研究所微生物系統保存施設に保存されている株であることを明記してください。分譲された株を利用して論文発表した場合は別刷りまたはコピーを2部、NIES コレクションに送ってください。
7. 分譲された培養株等の使用が第三者の知的所有権やその他の権利を侵害していた場合、利用者は利用者の責任によって対処しなければなりません。
8. 分譲された培養株等が、欠点、危険な特性、不具合等を有している可能性があること、あるいは特定の目的に合致しているとは限らないことを認識し、分譲された培養株等の利用によって損失が生じた場合は、利用者は利用者自らの責任で処理しなくてはなりません。
9. 利用者は、培養株を受領後、1ヶ月以内に受領報告書を NIES コレクション宛に提出しなくてはなりません。輸送中の環境条件の変化などにより、その時点で増殖状態が悪い場合、利用者は NIES コレクションに無償で再分譲を要求することができます。ただし、NIES コレクションはその期間内であっても、利用者の過失に対する責任は負いません。

有毒株分譲依頼書兼同意書（一般用）

分譲依頼年月日： 年 月 日
依頼者名（フリガナ）： ()
所属機関名：
郵便番号：〒
住所：
電話：
FAX：
Eメールアドレス：
請求先：（上記機関、住所等と異なる場合にご記入ください）

下記微生物についての分譲を依頼します。
微生物学名（NIES株番号）：
研究目的（できるだけ詳しくご記入ください）：

合計株数：
株データシートの必要な株番号：

分譲依頼にあたって以下の同意事項に同意いたします。
年 月 日

氏名： 印（又はサイン）

分譲依頼者が学生、非常勤職員等の場合、指導教官又は責任者は以下の欄にご記入ください。
年 月 日

指導教官又は責任者名： 印（又はサイン）

所属機関名：
郵便番号：〒
住所：
電話：
FAX：
Eメールアドレス：

分譲にあたっての同意事項

1. 国立環境研究所微生物系統保存施設（以後 NIES コレクションと記す）から分譲された微生物培養株、それを増殖させたもの及び由来物（以後培養株等と記す）は教育、試験・研究および製品等の開発目的であり、公共の安全が保証される目的でのみ使用できます。人に直接使用することはできません。また、利用者は、使用の際に、分譲された培養株が有毒物質を生産する株であることを認識し、その国、自治体、機関等の法令や規則を遵守しなければなりません。利用者は使用中の管理に責任を持ち、使用後は培養株をオートクレーブなどで死滅させ、由来物質については適切に処理しなければなりません。
2. 分譲を希望する場合は、利用者本人が分譲依頼書を提出してください。
3. 培養株等に関する知的所有権等が、分譲によって利用者へ与えられるものではありません。
4. 利用者が分譲時に示した使用目的から大幅に異なる目的に使用する場合、利用者はその旨を NIES コレクションに書面で連絡しなくてはなりません。
5. 利用者は分譲された培養株等を第三者に分与または販売することはできません。
6. NIES コレクションから分譲された株を利用した成果を発表する場合、番号の前に必ず NIES-をつけた株番号を記し(例：NIES-123)、国立環境研究所微生物系統保存施設に保存されている株であることを明記してください。分譲された株を利用して論文発表した場合は別刷りまたはコピーを2部、NIES コレクションに送ってください。
7. 分譲された培養株等の使用が第三者の知的所有権やその他の権利を侵害していた場合、利用者は利用者の責任によって対処しなければなりません。
8. 分譲された培養株等が、欠点、危険な特性、不具合等を有している可能性があること、あるいは特定の目的に合致しているとは限らないことを認識し、分譲された培養株等の利用によって損失が生じた場合は、利用者は利用者自らの責任で処理しなくてはなりません。
9. 利用者は、培養株を受領後、1ヶ月以内に受領報告書を NIES コレクション宛に提出しなくてはなりません。輸送中の環境条件の変化などにより、その時点で増殖状態が悪い場合、利用者は NIES コレクションに無償で再分譲を要求することができます。ただし、NIES コレクションはその期間内であっても、利用者の過失に対しての責任は負いません。

IV. 分譲株の培養保存法

微生物株は、ねじ口試験管に培養された状態で郵送される。株の分譲を受けた場合、株を絶やさないために下記の点に留意する必要がある。

- i) 培地は株を受け取る前に作成しておく。
- ii) 株を受領後速やかに荷をとき、新鮮な培地に植え継ぎ、当方で指示した温度と光強度下（第Ⅷ章参照）で培養する。その場合明暗サイクルは12時間明期12時間暗期とし、ねじ口試験管のねじ蓋をゆるくする。
- iii) 良好な増殖が確認された後に、更に株を保存する場合には、当方で指示した期間毎に新鮮な培地に移植する必要がある（第Ⅷ章参照）。

V. 藻類培地作成の基本手法

藻類株の保存には、数多くの培地を必要とする。それぞれの培地は次章に掲載した処方せんに従って作成されるが、正確かつ簡便に培地を作成するために、本施設で採用している基本手法について述べておきたい。

1. 保存試薬液

培地は一般に多量栄養素、微量金属、およびビタミン類(表2)で構成されている。これらの諸成分の保存試薬液を作成しておくことが、培地作成の簡便さをもたらす。このうち微量金属やビタミン類の保存液の濃度は非常に低いので、保存試薬液作成時には、より濃度の高い原液を作成する必要がある。以下、各々について保存試薬液の濃度と作成方法について述べる。

A 多量栄養素：各栄養素につき、10mg/mlの濃度の保存試薬液を別々に作成し、冷蔵庫(5℃)で保管する。

B 微量金属：これらの成分は、各種の保存試薬液として別々に作成され保管される場合と、混液で保管される場合がある。

(1) 各種保存試薬液

- i) 10～100mg/mlの濃度で各種金属の原液を作成する。
- ii) 各原液を1mg/mlの濃度に希釈し冷蔵庫(5℃)に保管する。

表 2. 培地に使われる各種栄養素

多量栄養素	微量金属
NaCl	H ₃ BO ₃
KCl	MnCl ₂ · 4H ₂ O
CaCl ₂ · 2H ₂ O	MnSO ₄ · 7H ₂ O
MgCl ₂ · 6H ₂ O	FeCl ₃ · 6H ₂ O
Na ₂ SO ₄	FeSO ₄ · 7H ₂ O
K ₂ SO ₄	CoCl ₂ · 6H ₂ O
MgSO ₄ · 7H ₂ O	ZnSO ₄ · 7H ₂ O
NaNO ₃	CuSO ₄ · 5H ₂ O
KNO ₃	Na ₂ MoO ₄ · 2H ₂ O
Ca(NO ₃) ₂ · 4H ₂ O	ビタミン類
NH ₄ NO ₃	Vitamin B ₁₂
NaH ₂ PO ₄ · 2H ₂ O	Biotin
β -Na ₂ glycerophosphate · 5H ₂ O	Thiamine HCl
KH ₂ PO ₄	Nicotinic acid
K ₂ HPO ₄	Calcium panthothenate
Na ₂ CO ₃	<i>p</i> -Aminobenzoic acid
NaHCO ₃	Inositol
Na ₂ SiO ₃ · 9H ₂ O	Folic acid
	Thymine

(2) 混液

- i) (1)-i)と同様の操作を行う。
- ii) 必要量の80%の蒸留水をビーカーに加える。
- iii) 十分に攪拌しながら必要量のNa₂EDTAを溶解する。
- iv) 十分に攪拌しながら各種微量金属原液を必要量添加する。
- v) 蒸留水を加え、最終量に調整し、冷蔵庫(5℃)に保管する。

C ビタミン類：ビタミンB₁₂、ビオチン、チアミンの3種のビタミンだけで多くの藻類が増殖するので、殆どの培地はこれら3種のビタミン類だけが添加されている。しかし、いくつかの培地では、他のビタミン類が添加されている。

(1) ビタミンB₁₂、ビオチン、チアミン

- i) ビタミンB₁₂とビオチンについては、各々0.1mg/mlの原液を作成し、チアミンについては10mg/mlの原液を作成する。

- ii) これらの原液を多数の試験管に1mlずつ分注し、オートクレーブ滅菌(121℃, 20min)後、-20℃のフリーザーに保管する。
 - iii) 各ビタミンについて、保存原液の1mlを融解し、蒸留水で1/100に希釈してビタミンB₁₂、ビオチンについては1µg/mlの保存試薬液、チアミンについては、100µg/mlの保存試薬液を作成し、冷蔵庫に保管しながら使用する。
- (2) 他のビタミン類：ある培地では、多種のビタミン類が混液の形で添加される(第VI章-64参照)。大量に作成しておくことをすすめる。
- i) 各種のビタミンについて0.1~1mg/mlの原液を作成する。
 - ii) 必要量の80%の蒸留水をビーカーに加える。
 - iii) 十分に攪拌しながら各種ビタミンを必要量加える。
 - iv) 蒸留水で最終量に調整する。
 - v) ミリポアフィルター(0.22µm)でろ過滅菌したのち、滅菌された試薬瓶に100mlずつ分注し、-20℃のフリーザーで保管する。一部を融解し、冷蔵庫(5℃)に保管しながら使用する。

2. 培地作成

培地は、合成培地と強化培地に大別される。すべての淡水藻や一部の海産藻は合成培地で、殆どの海産藻は強化培地で保存されている。

- (1) 合成培地(淡水)
- i) 必要量の80~90%の蒸留水をビーカーに加える。
 - ii) 十分に攪拌しながら、Tris、glycylglycine、HEPES、TAPS、Bicine、MES等の緩衝剤(必要とされる場合)を必要量天秤で秤量し、添加する。
 - iii) 各種栄養塩を各々の保存液から必要量添加する。
 - iv) 蒸留水で最終量に調整する。
 - v) 緩衝剤が使用されている場合、1N HClあるいは、1N NaOHで、使用されていない場合は各々1/10の濃度でpHを調整する。
 - vi) 培地10mlずつ試験管(18×150mm)に分注し、オートクレーブで滅菌する(121℃, 20min)。
- (2) 合成培地(海水)
- i) 必要量の80%の蒸留水をビーカーに加える。
 - ii) 十分に攪拌しながら、緩衝剤(Tris, NTA等)および多量栄養塩類(NaCl, MgSO₄·7H₂O, KCl, CaCl₂·2H₂O)を必要量天秤で秤量し、添加する。
 - iii) 他の各種栄養塩を各々の保存液から必要量添加する。
 - iv) 蒸留水で最終量に調整する。

- v) 1N HClでpHを調整する(通常8.0)。
 - vi) 培地10mlずつ試験管に分注し、オートクレーブで滅菌する(121℃, 20min)。
- (3) 強化海水培地
- i) 汚染のない外洋海水を採取し、ワットマンGF/Cフィルターでろ過し、粒子を除く。
 - ii) 塩分を調べる。通常の外洋海水の塩分は約35‰である。
 - iii) 必要量の80~90%の海水をビーカーに加える。
 - iv) 必要量のTris等の緩衝剤を天秤で秤量し、溶解する(必要とされる場合)。
 - v) 他の栄養塩類を各々の保存液から必要量添加する。
 - vi) 海水で最終量に調整する。
 - vii) pHを測定する。指示されている場合は1N HClで調整する(通常8.0)。
 - viii) 培地10mlずつ試験管に分注し、オートクレーブで滅菌する(121℃, 20min)。

3. 寒天斜面培地

通常寒天は1.5%の濃度で滅菌する前に液体培地に加えられる。

- i) 寒天を必要量天秤で秤量し、液体培地に添加し、オートクレーブで121℃に熱し、溶解する。
- ii) 溶解後、速やかに10mlずつ試験管に分注し、オートクレーブで滅菌する(121℃, 20min)。
- iii) 滅菌後、試験管上部に直径1cmの枕木をして寝かせ、放冷して培地を斜面状に固まらせる。

PREFACE TO THE SEVENTH EDITION

Four years have past since we published the sixth edition of the list. During this period a considerable number of new cultures have been added to the NIES-Collection. We appreciate the many comments and words of encouragement about the publications from people in diverse places. These have led us to recognize more than ever the value of the NIES-Collection for research and development. Its use extends not only to environmental science, but also to basic biology and microbiology-related fields such as agriculture, fisheries, food manufacture and medical science.

The seventh edition lists 1,215 strains of microalgae and 6 strains of protozoa. These have been evaluated by the Committee for Evaluating Microbial Culture Strains, which is composed of microbiologists from this institute and authorities from other organizations. Although special care has been exercised to ascertain that the taxonomy and characteristics of all strains are clear and precise, we are always grateful for further advice and criticism.

Most of the strains in the NIES-Collection were isolated originally by phycologists in our country and do not exist in other collections. We plan to share responsibility for preservation of the important strains by keeping close contacts with other culture collections.

The NIES-Collection carries out such wide-ranging activities as collection, preservation, distribution, taxonomy, preservation technology, and development of a microbial strain data processing system. We hope to make steady progress in these various activities by expansion of facilities and staff. We would much appreciate your advice, criticism and cooperation concerning the performance of the NIES-Collection.

I wish to express my sincere thanks to all of the members of the committee for their effort devoted to the evaluation of microbial strains for deposit, and their numerous considerations and suggestions for this publication. I would also like to pay my respect to the staffs of the NIES-Collection for their enthusiasm for culture collection.

March 1, 2004



Makoto M. Watanabe, D.Sci.
Chairman for the Committee for
Evaluating Microbial Culture Strains
Director of Environmental Biology Division

PREFACE TO THE FIRST EDITION

In January 1983, the first culture collection of environmental microorganisms in Japan was established at the National Institute for Environmental Studies. In the two years since that time, many dedicated people have collaborated in the collection of microorganisms for the institute. The fruits of their efforts have culminated in a "List of Strains," which I feel will be highly praised by environmental scientists. I would like to extend to all who were involved, my most sincere thanks and gratitude.

The list published herein focuses on microalgae which are important primary producers in the environment. Notwithstanding the fact that there has been a high demand for microalgal collections by both the academic and industrial worlds, until the establishment of the NIES-Collection, no microalgal culture collection for environmental studies *per se* existed in Japan. Unlike the culture collection of bacteria and fungi, organisms which have been actively studied for a long time, the isolation, cultivation, and preservation of microalgae are technically much more complex. Since this institution has characteristically performed interdisciplinary studies, it was possible to conquer these difficulties, and set the culture collection of microalgae on the right path by utilizing the knowledge of its many experts.

Users of the microbial strains of the NIES-Collection will find both their quality and the data maintained about them, highly reliable because the characteristics of the microalgae have been carefully examined and re-examined. Due to the development of the strain computer data processing system, strain data have added to the general data base of environmental biology. Collectively, these developments will contribute to the rapid growth of environmental microbiology, and allow it to catch up with microbiological research in other fields.

Although the ultimate objective of the NIES-Collection is to collect and preserve a great variety of microorganisms related to environmental problems, at present only the collection of microalgal cultures has been established. I hope that in the future the NIES-Collection will preserve not only microalgae, but also other microorganisms which are indispensable to environmental biology. By planning expansion of the facilities and the staff, the NIES-Collection should develop as an international culture collection center, truly worthy of the name.

September 1, 1985



Tomomichi Yanagita, D. Sci.

Professor Emeritus of the University of Tokyo.

CONTENTS

Preface to the Seventh Edition	Makoto M. Watanabe
Preface to the First Edition	Tomomichi Yanagita
I. Introduction	27
II. Deposition of Strains	30
1. Conditions for deposit	30
2. Agreement for deposit	30
3. Procedure for deposit	31
III. Ordering and Distribution of Strains	35
1. Agreement for distribution	35
2. Order procedures	35
3. Price of strains	36
4. Special warning for distribution of "Untransportable" and "[Cryopreserved]" strains	36
5. Special warning for distribution of strains collected outside of Japan since 1993.	36
6. Special warning for "Toxic" strains	37
7. Distribution to researchers belonging to the NIES	37
IV. Establishment of Fresh Cultures	45
V. Basic Methods for Preparation of Algal Culture Media	45
1. Stock solutions	45
2. Media	47
3. Agar slant	48
VI. Media	49
1. Stock media for algae	49
2. Bacteria-free check media	56
3. Trace metals, vitamin mixes and soil extract	57
4. Stock medium for protozoa	58
VII. Explanatory Notes about Strain Data	61
VIII. Strain Data	63
Appendix I. List of cryopreserved strains	188
Appendix II. List of toxic strains	190
Appendix III. List of gene data	191
IX. Indexes	198
1. Numerical index	198
2. Systematic index	211
X. References	226

I. INTRODUCTION

The Microbial Culture Collection at the National Institute for Environmental Studies (NIES-Collection) was founded in 1983 within NIES. When the NIES-Collection was created, environmental issues such as eutrophication of lakes and rivers, air and water pollution, and human health problems caused by environmental pollution were much more severe than nowadays. The NIES-Collection started with ca. 250 strains mostly deposited by NIES scientists who were involved in environmental research and by other culture collections in Japan (Ref. 526, 527). Thus, red-tide-forming algae, such as *Chattonella antiqua* and *Heterosigma akashiwo*, and water-bloom-forming cyanobacteria, such as *Microcystis aeruginosa* were representatives at the start, and still characterize the culture collection.

Strains maintained

During 20 years, the number of strains has increased (Fig. 1) by deposition from researchers and original isolation in the NIES-Collection. At present, the NIES-Collection holds more than 1,400 strains in total, including unidentified strains, and 1,221 strains (Table 1), which cover almost all classes of algae so far described, are available to distribution as the NIES strains listed herein.

In the NIES-Collection, most strains are maintained under optimal and/or suboptimal conditions ranging from 5 to 25 °C and 4 to 40 $\mu\text{mol}/\text{m}^2$ sec light intensity in a 12-h-light:12-h-dark photo-regime. The strains are serially transferred at 10 days to 4 months intervals. These maintenance conditions differ depending on algal strains as described in Chap. VIII of this list. To prevent loss of the strains during maintenance by serial transfer, we check growth weekly. Once a year, a check for absence of bacteria is also carried out for the axenic strains by using several bacterial check media (refer to Chap. V). Axenic strains are necessary for conducting some genetic and physiological work. Now, we have about 400 axenic strains.

Digital images and sequences of 18S rDNA are also routinely collected for evaluation of the strains. These data are reflected in the list published every 3 years (Ref. 521, 528, 529, 531, 532, 540, 541) or can be searched online (<http://www.nies.go.jp/biology/mcc/home.htm>).

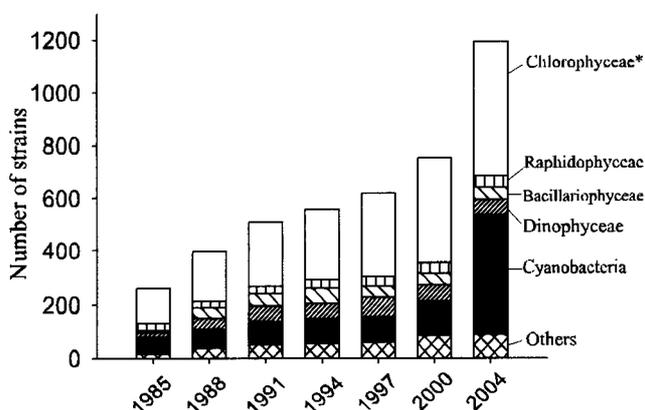


Fig. 1. Changes in strain numbers appeared in the List of Strains, from the first to seventh editions. In this figure *Chlorophyceae includes Chlorophyceae *sensu stricto*, Pedinophyceae, Ulvophyceae, Trebouxiophyceae and Charophyceae.

Table1. Number of genera, species and strains in the NIES-Collection.

Phylum	Class	Genus	Species	Strains	
Cyanophyta (Cyanobacteria)	Cyanophyceae	28	68	445	
Glaucophyta	Glaucophyceae	2	3	4	
Rhodophyta	Rhodophyceae	2	2	6	
Cryptophyta	Cryptophyceae	4	19	40	
Heterokontophyta	Chrysophyceae	3	5	7	
	Raphidophyceae	6	9	42	
	Dictyochophyceae	1	1	1	
	Bacillariophyceae	19	27	46	
	Phaeophyceae	1	1	1	
	Xanthophyceae	3	3	3	
	Pelagophyceae	1	1	1	
	Pinguiphyceae	1	1	2	
	Schizocladiophyceae	1	1	1	
	Haptophyta	Prymnesiophyceae	12	16	39
		Pavlophyceae	1	1	1
	Dinophyta	Diophyceae	19	38	58
	Euglenophyta	Euglenophyceae	3	6	7
Chlorarachniophyta	Chlorarachniophyceae	1	1	1	
Chlorophyta	Prasinophyceae	6	11	20	
	Pedinophyceae	1	1	1	
	Ulvophyceae	2	5	6	
	Trebouxiophyceae	14	24	57	
	Chlorophyceae	52	130	275	
	Charophyceae	16	60	148	
	Protozoa	Oligohymenophorea	2	2	2
Bicoecea		1	1	1	
Placididea		2	2	3	
Total		204	438	1,221	

Distribution and deposition

In the last 10 years, the NIES-Collection has distributed 400 to 600 strains a year to both academic and commercial users. *Microcystis aeruginosa*, *Selenastrum capricornutum* (currently known as *Pseudokirchneriella subcapitata*), *Chlorella vulgaris*, *Anabaena flos-aquae*, and *Chattonella antiqua* were the 5 most popular species in the last 5 years. Distributed strains are used for various purposes, e.g. various tests to evaluate algal growth potential and ecotoxicity, phylogenetic studies, characterization of physiological traits leading to the development of bioactive compounds, and so on.

The NIES-Collection accepts the deposit of strains, all of which become available to all users after evaluation by the Committee for Evaluating Microbial Culture Strains and allocation of a NIES strain number. Upon request, the strain is transferred to fresh medium, and shipped to the customer.

We ask customers to send reprints if they publish results based on our strains. A lot of challenging studies have been conducted using NIES strains, as seen in Chap. X.

Cryopreservation

Cryopreservation is necessary for long-term preservation in culture collections, preventing contamination during repetitive transfer and genetic changes by mutation. We have about 300 cyanobacterial and unicellular red algal strains preserved only in liquid nitrogen as listed in Appendix I.

Taxonomic re-evaluation

The taxonomic positions of coccoid green algae have been revised in recent years on the basis of the ultrastructure of the flagellar apparatus and DNA sequences. This revision has advanced the taxonomy of green algae and led to the revision of several orders as well as the creation of a new class. However, as polyphyly in some families and genera is recognized, it is difficult to classify those groups without sequence data. Moreover, this fact has directly affected the list of strains, in which classification to class level is necessary. Thus, we started the sequencing of 18S rDNA to increase the knowledge of culture strains in the NIES-Collection. As a result, some strains have been transferred from Chlorophyceae to Trebouxiophyceae. In addition, we found several strains assigned to inappropriate taxonomic status, e.g. taxonomic position and species names, in the course of those analyses. It may be due to misidentification by depositors, or to paucity of phylogenetic information. We left those strains as they were with comments.

Cyanobacterial strains

As mentioned above, bloom-forming cyanobacterial strains are characterizing our culture collection, and taxonomic studies of cyanobacteria have been comprehensively carried out using NIES strains (see Chap. X). As a result of those taxonomic studies on *Microcystis*, five morphospecies of *Microcystis* (*M. aeruginosa* (Kützing) Lemmermann, *M. ichthyoblabe* Kützing, *M. novacekii* (Komárek) Compère, *M. viridis* (A. Braun) Lemmermann, and *M. wesenbergii* Komárek) were unified into one species, *M. aeruginosa*. The NIES-Collection accepted this proposal. In Chap. VIII, however, former names are also shown in individual strain data.

Collaboration with other culture collections

Now, the NIES-Collection shares several strains with CCAP, PCC, CCMP, SAG and NIVA (see Chap. VII for acronyms). Those strains are shown with the strain numbers given by the former culture collections. We are planning to expand these collaborations to other culture collections as well, for safety and to enlarge the availability of strains in the world.

II. DEPOSITION OF STRAINS

1. Conditions for deposit

The Committee for Evaluating Microbial Culture Strains at NIES (abbreviate to CEMCS hereafter) has decided to accept for deposit strains that satisfy the following conditions as the NIES strains maintained in the NIES-Collection. In principle, all deposited strains will be available to the public.

- (1) Scientifically important microorganisms, e.g. microorganisms which cause or remediate environmental problems, bioindicators, type strains, microorganisms with useful physiological and biochemical properties, and established strains which have been used for valuable research.
- (2) The background of the strain should be clarified, and the specific name should be established; however, strains that have been used in a number of studies may be accepted even if only the generic name is known.
- (3) The strain should be stable under defined culture conditions and shall be in one of the following states:
 - Microalgae: clonal or unialgal strain (axenic strains are preferable)
 - Protozoa: axenic or xenic strain with supplemented microorganisms as food
 - Bacteria: pure strain
- (4) Some other microorganisms may be accepted for deposit when the CEMCS recognizes their importance.

2. Agreement for deposit

When the depositor agrees to the following conditions, the NIES-Collection shall accept his/her submission of the Strain Deposit Request and Agreement Form:

- (1) The depositor shall deposit the strain to the NIES-Collection without charge. The transfer of intellectual properties is not included in the agreement. The NIES-Collection may maintain, culture and distribute the strain to users.
- (2) The depositors shall submit accurate strain data to the NIES-Collection, which shall include patents, properties and states of the strain (see Strain Deposit Request and Agreement Form).
- (3) The strain shall be free from any limitation, legally and contractually, pursuant to one of the following reasons:
 - The strain was isolated/developed by the depositor
 - The strain is deposited with the permission of the isolator/developer

- The strain has been purchased without any limitation regarding the deposit thereof
- (4) The NIES-Collection may distribute the deposited strains to users in accordance with the following condition(s):
- The strain shall not be disclosed to the public until the paper regarding the strain has been published
 - Other reason specified by the depositor
- This condition will last no longer than one year and the strain will be open to the public, even if the depositor imposes conditions. If the depositor does not specify a condition, then the strain will be open to the public immediately after approval by the CEMCS.
- (5) The NIES-Collection shall bear no responsibility for inevitable change and loss during maintenance, or for loss caused by natural disasters.
- (6) The NIES-Collection may stop the maintenance and distribution of the strains according to a decision of the CEMCS, after prior notification is given to the depositor.

2. Procedure for deposit

- (1) The depositor should complete the “Strain Deposit Request and Agreement Form” (pp.32~34) and send it to the following address:
- Microbial Culture Collection
National Institute for Environmental Studies,
16-2 Onogawa, Tsukuba, Ibaraki 305-8506, Japan
Phone : +81-29-850-2556
Fax : +81-29-850-2587
Email: mcc@nies.go.jp
- (2) The decision regarding the deposit of the strain is given within one month from the date of receipt of the Strain Deposit Request and Agreement Form.
- (3) The depositor should send an actively growing or lyophilized sample of the strain with two copies of relevant reprint(s), if available, within one month of the date of acceptance.
- (4) If the state of the strain sent does not coincide with the description on the Strain Deposit Request and Agreement Form, or does not meet any of the conditions described above, the NIES-Collection acceptance for deposit shall be canceled.

Strain Deposit Request and Agreement Form

Date:
Depositor's full name with family name in capital:
Depositor's affiliation and address:
Tel:
Fax:
E-mail:

I wish to deposit the following microbial culture strain to the NIES-Collection.

Reason for deposit:

[Basic information]

Scientific name with author name(s):

Division:

Class:

Order:

Family:

Synonym:

Identified by (full name with family name in capital):

Identification year:

Strain designation or code:

Other collection number (note collection name and number, if you deposit the strain in other collection):

[Collection]

Collection date:

Collector's name (full name with family name in capital):

Site information

Country:

Address (most detailed one):

Place name (e.g. name of river, lake, pond, bay and coast):

Latitude and longitude:

Ocean name with a nearest country:

Habitats: marine freshwater (incl. terrestrial and aerial) brackish (salinity: ‰)

Details of habitats: oligotrophic mesotrophic eutrophic dystrophic surface
depth in chlorophyll max other depth (- m) others ()

Details on the freshwater environment: lake pond river wetland rice field
salt water soil rock bark hot spring cold spring snow or ice
others ()

Details on the marine environment: shore coastal pelagic tide pool intertidal
tidal flat mangrove estuary harbor wrack dredge sample
others ()

Other information or comments on the habitat:

[Isolation]

Date of isolation:

Isolator's name (full name with family name in capital):

Isolation source: water seawater sand mud sediment soil plant seaweed
sea grass animal coral sponge snow ice others ()

Isolation objective motile vegetative cell non-motile vegetative cell dormant cell spore
tetraspore carospore zygote parthenogenetic gamete thallus
others ()

Isolation method: pipette washing cut-out of specimen dilution agar plating taxis
flow cytometry with cell sorter others ()

Notes on isolation conditions (e.g. medium, light, temperature, if different from maintenance conditions):

Isolation treatment: none antibiotics (name: _____, mg/l) ultra-violet irradiation
chemicals (name: _____, mg/l) heat ultra-sonic enrichment culture
GeO₂ others (_____)

[Strain status]

Algae and cyanobacteria: unialgal mixed
clonal non-clonal
axenic non-axenic
Bacteria: pure mixed
Protozoa: axenic monoxenic (food: _____)
mixed

Date of axenic check: _____

[Preservation conditions]

State of the preservation: subculture cryo-preservation both others (_____)

Medium: _____

Reference of the medium: _____

Medium form: liquid semisolid solid soil water biphasic

Notes for preparation of medium: _____

Sub-culturing conditions

Temperature (°C): _____

Light intensity (Lux): _____

Light intensity ($\mu\text{E}/\text{m}^2 \text{ sec}$) : _____

Light quality: white fluorescent red fluorescent blue fluorescent natural light

others (_____)

L/D cycle: _____

Duration (day(s), month(s)): _____

Culture vessel: test tube Erlenmeyer flask plastic culture flask

others (_____)

Additional notes for culture conditions (e.g. pre-culture conditions, special treatments, information for optimal growth conditions, transfer methods, quantity of cells to transfer, others (_____)):

Cryopreservation: yes no unknown

Cryoprotectant: _____ (concentration _____ %)

Preservation temperature (°C): _____

Method: _____

Preservation in freeze-drying: yes no unknown

Preservation in L-drying: yes no unknown

[Characteristics]

Environmental characteristics

red tide water bloom AGP bioindicator predator of water bloom forming species

offensive taste offensive odor clogging of purification toxic

high CO₂ fixing potential decomposition of hazardous substances biodegradation

oxidation pond activated sludge biofilm process corrosion

others (_____)

Physiological and ecological characteristics

autotrophic mixotrophic phagotrophic heterotrophic planktonic benthic

symbiotic parasitic saprophytic cosmopolitan eurythermal stenothermal

thermophilic cryophilic euryhaline stenohaline halophilic acidophilic

sun plant type shade plant type nitrogen fixation fermentation bioluminescence

phototaxis hydrogen evolution oil (hydrocarbon) production endophytic epiphytic

epilithic others (_____)

Miscellaneous characteristics

taxonomic importance type strain motile immotile resting spore forming

resting spore not forming chromatic adaptation mutant heterothallic homothallic

dioecious monoecious isogamy anisogamy oogamy life cycle (H, h type)

life cycle (H, d type) life cycle (D, d+h type) polyploidy mating type(+)

mating type(-) female male others (_____)

[Genetic information (please write all registered data)]

Gene name:

Accession no:

Registrant (full name with family name in capital):

Registration date:

[References]

Publications in which the strains were used (please make a reference list according to an example below)

(Example) Otsuka, S., Suda, S., Shibata, S., Oyaizu, H., Matsumoto, S. & Watanabe, M. M. 2001. A proposal for the unification of five species of the cyanobacterial genus *Microcystis* Kützing ex Lemmermann 1907 under the rules of the Bacteriological Code. *Int. J. Syst. Evol. Microbiol.*, 51, 873-879.

Other references relevant to the strain(s) (e.g. references used for identification, please make a reference list according to an example above)

[Others]

Any other remarks and comments:

I accept the following conditions for deposit of the strain(s).

Signature

Printed name

Date

Agreement for deposit

1. The depositor shall deposit the strain to the NIES-Collection without charge. The transfer of intellectual properties is not included in the agreement. The NIES-Collection may maintain, culture and distribute the strain to users.
 2. The depositor shall submit accurate strain data to the NIES-Collection, which shall include patents, properties and states of the strain.
 3. The strain shall be free from any limitation, legally and contractually, pursuant to one of the following reasons (please tick).
 - The strain was isolated/developed by the depositor
 - The strain is deposited with the permission of the isolator/developer
 - The strain has been purchased without any limitation regarding the deposit thereof
 4. The NIES-Collection may distribute the deposited strains to users in accordance with the following condition (please tick):
 - The strain shall not be disclosed to the public until the paper regarding the strain has been published
 - Other reason ()
This condition will last no longer than one year and the strain will be open to the public, even if the depositor imposes conditions. If the depositor does not specify a condition, then the strain will be open to the public immediately after approval by the Committee for Evaluating Microbial Culture Strains.
 5. The NIES-Collection shall bear no responsibility for inevitable change and loss during maintenance, or for loss caused by natural disasters.
 6. The NIES-Collection may stop the maintenance and distribution of the strains according to a decision of the Committee for Evaluating Microbial Culture Strains, after prior notification is given to the depositor.
-
-

III. ORDERING AND DISTRIBUTION OF STRAINS

1. Agreement for distribution

The NIES-Collection will distribute strains to users who agree to the following conditions:

- (1) The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research, and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the potential risks of the strains and shall use them in compliance with domestic and foreign laws, regulation, and guidelines. Especially for strains that produce toxic substances, the user shall store and discard them appropriately.
- (2) The user shall be requested to submit the application form personally.
- (3) The user shall not acquire any intellectual property rights by the purchase of the strain.
- (4) The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
- (5) The user shall not distribute the strains, replicates and derivatives to any third party.
- (6) The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
- (7) When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
- (8) The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor and deal with the matter on its own.
- (9) The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.

2. Order procedures

- (1) All requests to the NIES-Collection for strains shall be by completing the "Strain Ordering and Agreement Form" (p.38), and by sending it **via mail** to the following address:

Microbial Culture Collection
National Institute for Environmental Studies,

16-2 Onogawa, Tsukuba, Ibaraki 305-8506, Japan

Phone : +81-29-850-2556

Fax : +81-29-850-2587

Email: mcc@nies.go.jp

Please note that we can ship the strain only after we accept the original copy (with the user's signature and date) of the order form.

- (2) Upon receipt of a strain, the "Strain Receipt Form" (p.44) should be completed and returned to the NIES-Collection within one month.

3. Price of strains

Sales tax (5%) and postage will be requested in addition to the culture price for 15 mL.

Academic purpose	6,000 yen
Commercial purpose	10,000 yen

For educational use in schools and universities, the NIES-Collection distributes selected strains without charge. Please contact the staff of the NIES-Collection. In this case, the user cannot specify species and strains.

4. Special warning for distribution of "Untransportable" and "[Cryopreserved]" strains

Orders for the strains designated as "Untransportable" in the strain description may not be accepted, depending on the season or condition of the cultures. For transport overseas, such strains should in principle be carried personally (e.g., in hand luggage). Such transportation shall be arranged by individual requestors.

For strains designated as "[Cryopreserved]" in the strain description, frozen cells are thawed and inoculated into fresh medium just after the order is accepted. As a result, it takes at least one month for the overseas shipping of these strains. See also Appendix I.

5. Special warning for distribution of strains collected outside of Japan since 1993

Distribution of some strains collected and isolated outside of Japan since 1993 is now suspended pursuant to the Convention of Biological Diversity, although the strain data are available in the catalogue. Please contact the staff of the NIES-Collection if you wish to request those strains.

6. Special warning for “Toxic” strains

Strains that have been reported to produce toxic substance are shown “toxic” in their descriptions (See also Appendix II). Users who order those strains must complete the “Toxic Strain Ordering and Agreement Form” (p.39) and send it to the NIES-Collection.

7. Distribution to researchers belonging to the NIES

Strains are available without charge. Please complete the “Strain Ordering and Agreement Form” (pp.40~43) and send it via in-house mail or pass it to the staff directly.

Strain Ordering and Agreement Form

Date:

Requestor's full name (family name with capital letters):

Requestor's affiliation and address:

Tel:

Fax:

E-mail:

I request the following culture strain(s).

Scientific name(s) and strain number(s):

Object of use (in detail):

Do you need the strain data? (Yes or No):

I accept the following conditions for ordering the strain(s).

Signature

Printed name _____

Date _____

Agreement for distribution

1. The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research, and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the potential risks of the strains and shall use them in compliance with domestic and foreign laws, regulation, and guidelines.
 2. The user shall be requested to submit the application form personally.
 3. The user shall not acquire any intellectual property rights by the purchase of the strain.
 4. The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
 5. The user shall not distribute the strains, replicates and derivatives to any third party.
 6. The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
 7. When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
 8. The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor and deal with the matter on its own.
 9. The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.
-
-

Toxic Strain Ordering and Agreement Form

Date:

Requestor's full name (family name with capital letters):

Requestor's affiliation and address:

Tel:

Fax:

E-mail:

I request the following culture strain(s).

Scientific name(s) and strain number(s):

Object of use (in detail):

Do you need the strain data? (Yes or No):

I accept the following conditions for ordering the strain(s).

Signature

Printed name _____ Date _____

Signature of responsible person (Please sign if the requestor is a student/ part-time staff.)

Printed name _____ Date _____

Agreement for distribution

1. The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research, and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the risks of toxic strains and shall use them in compliance with domestic and foreign laws, regulation, and guidelines. The user shall store and discard them appropriately.
 2. The user shall be requested to submit the application form personally.
 3. The user shall not acquire any intellectual property rights by the purchase of the strain.
 4. The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
 5. The user shall not distribute the strains, replicates and derivatives to any third party.
 6. The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
 7. When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
 8. The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor and deal with the matter on its own.
 9. The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.
-
-

Strain Ordering and Agreement Form (For NIES staff)

Date:
Requestor's full name (family name with capital letters):
Requestor's affiliation at NIES:
Tel:
Fax:
E-mail:

I request the following culture strain(s).

Scientific name(s) and strain number(s):
Object of use (in detail):

Registered research name:
Registered research code:
Do you need the strain data? (Yes or No):

I accept the following conditions for ordering the strain(s).

Signature

Printed name

Date

Agreement for distribution

1. The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research, and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the potential risks of the strains and shall use them in compliance with domestic and foreign laws, regulation, and guidelines.
 2. The user shall be requested to submit the application form personally.
 3. The user shall not acquire any intellectual property rights by the purchase of the strain.
 4. The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
 5. The user shall not distribute the strains, replicates and derivatives to any third party.
 6. The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
 7. When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
 8. The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor, and deal with the matter on its own.
 9. The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.
-
-

Toxic Strain Ordering and Agreement Form (For NIES staff)

Date:

Requestor's full name (family name with capital letters):

Requestor's affiliation and address:

Tel:

Fax:

E-mail:

I request the following culture strain(s).

Scientific name(s) and strain number(s):

Object of use (in detail):

Registered research name:

Registered research code:

Do you need the strain data? (Yes or No):

I accept the following conditions for ordering the strain(s).

Signature

Printed name _____ Date _____

Signature of responsible person (Please sign if the requestor is a student/ part-time staff.)

Printed name _____ Date _____

Agreement for distribution

1. The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the risks of toxic strains and shall use them in compliance with domestic and foreign laws, regulations and guidelines. The user shall store and discard them appropriately.
 2. The user shall be requested to submit the application form by personally.
 3. The user shall not acquire any intellectual property rights by the purchase of the strain.
 4. The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
 5. The user shall not distribute the strains, replicates and derivatives to any third party.
 6. The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
 7. When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
 8. The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor and deal with the matter on its own.
 9. The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.
-
-

Strain Ordering and Agreement Form (For guest researchers and collaborators)

Date:

Requestor's full name (family name with capital letters):

Requestor's affiliation and address:

Tel:

Fax:

E-mail:

Responsible researcher at NIES

Affiliation

I request the following culture strain(s).

Scientific name(s) and strain number(s):

Object of use (in detail):

Do you need the strain data? (Yes or No):

I accept the following conditions for ordering the strain(s).

Signature

Printed name _____

Date _____

Agreement for distribution

1. The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the potential risks of the strains and shall use them in compliance with domestic and foreign laws, regulations and guidelines.
 2. The user shall be requested to submit the application form by personally.
 3. The user shall not acquire any intellectual property rights by the purchase of the strain.
 4. The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
 5. The user shall not distribute the strains, replicates and derivatives to any third party.
 6. The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
 7. When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
 8. The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor and deal with the matter on its own.
 9. The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.
-
-

Toxic Strain Ordering and Agreement Form (For guest researchers and collaborators)

Date:

Requestor's full name (family name with capital letters):

Requestor's affiliation and address:

Tel:

Fax:

E-mail:

I request the following culture strain(s).

Scientific name(s) and strain number(s):

Object of use (in detail):

Do you need the strain data? (Yes or No):

I accept the following conditions for ordering the strain(s).

Signature

Printed name

Date

Signature of responsible person (Please sign if the requestor is a student/ part-time staff.)

Printed name

Date

Agreement for distribution

1. The strains (including replicates and derivatives from the strains), which are distributed from the NIES-Collection, shall be available for education, research, and development purpose only. The strains are not intended to apply directly to humans. The user hereby acknowledges and accepts the risks of toxic strains and shall use them in compliance with domestic and foreign laws, regulation, and guidelines. The user shall store and discard them appropriately.
 2. The user shall be requested to submit the application form personally.
 3. The user shall not acquire any intellectual property rights by the purchase of the strain.
 4. The user shall provide written notice to the NIES when the purpose has changed considerably from the purpose that was stated at the time of submission.
 5. The user shall not distribute the strains, replicates and derivatives to any third party.
 6. The user shall use the NIES strain number (e.g., NIES-125) when he/she uses a NIES strain in a paper which is subsequently published, and shall send two copies of the reprint(s) or photocopies thereof to the NIES-Collection.
 7. When the use of the strain violates another person's rights, the user shall bear responsibility therefor, and deal with the matter on its own.
 8. The user shall acknowledge the possibility that the strain is deficient and harmful, and inadequate to the user's aim. Thus, if the user suffers any loss by the strain, he/she shall bear responsibility therefor and deal with the matter on its own.
 9. The user shall submit the Strain Receipt Form within one month of the date of the receipt. The user may request that the strains be sent again without charge if the strain does not show good growth during this warranty period. The NIES-Collection shall not bear any responsibility for mistakes by the user.
-
-

Strain Receipt Form

Date:

Recipient's full name (family name with capital letters):

Recipient's affiliation and address:

Tel:

Fax:

E-mail:

I received the following culture strain(s).

Date of strain receipt:

Scientific name(s) and strain number(s):

States of strain(s) received:

Good (strain number)

Poor (strain number)

Others (strain number)

Comments:

IV. ESTABLISHMENT OF FRESH CULTURES

When investigators are to receive culture strains, the following steps should be carried out to establish fresh cultures.

- i) Appropriate culture media should be prepared before receipt of the strains according to the recipes given in Chap. VI and with reference to the basic methods given in Chap. V.
- ii) Immediately after receipt, cultures should be unpacked, transferred to new media and grown at the temperature and light intensity directed by the Collection (cf. Chap. VIII); the light-dark cycle should be 12 hours light : 12 hours dark, and the screw-cap on the tube should be loosened.
- iii) After detecting good growth, further maintenance of cultures requires transfer into new media at intervals suggested by the Collection (cf. Chap. VIII).

V. BASIC METHODS FOR PREPARATION OF ALGAL CULTURE MEDIA

A number of media are used for maintenance of algal cultures and prepared according to the recipes given in the next chapter. The present chapter introduces the basic methods for preparation adopted in the Global Environmental Forum.

1. Stock solutions

Media are generally composed of three components, macronutrients, trace metals and vitamins (cf. Table 2) and prepared from stock solutions of these components. The concentration of stock solutions of trace metals and vitamins is very low and primary stock solutions are prepared for dilution to obtain the stock solutions.

A. Macronutrients : Separate stock solutions with a concentration of 10 mg/ml of each macronutrient are prepared and stored in a refrigerator (5°C).

B. Trace metals : These elements are prepared either as separate stock solutions or mixed stock solutions.

(1) Separate stock solutions

- i) Prepare a separate primary solution with a concentration of 10-100 mg/ml.
- ii) Dilute each primary solution to prepare the stock solution with a concentration of 1 mg/ml and store in a refrigerator (5°C).

Table 2. Chemicals employed for culture media

Macronutrients	Trace metals
NaCl	H ₃ BO ₃
KCl	MnCl ₂ ·4H ₂ O
CaCl ₂ ·2H ₂ O	MnSO ₄ ·7H ₂ O
MgCl ₂ ·6H ₂ O	FeCl ₃ ·6H ₂ O
Na ₂ SO ₄	FeSO ₄ ·7H ₂ O
K ₂ SO ₄	CoCl ₂ ·6H ₂ O
MgSO ₄ ·7H ₂ O	ZnSO ₄ ·7H ₂ O
NaNO ₃	CuSO ₄ ·5H ₂ O
KNO ₃	Na ₂ MoO ₄ ·2H ₂ O
Ca(NO ₃) ₂ ·4H ₂ O	Vitamins
NH ₄ NO ₃	Vitamin B ₁₂
NaH ₂ PO ₄ ·2H ₂ O	Biotin
β -Na ₂ glycerophosphate·5H ₂ O	Thiamine HCl
KH ₂ PO ₄	Nicotinic acid
K ₂ HPO ₄	Calcium panthothenate
Na ₂ CO ₃	p-Aminobenzoic acid
NaHCO ₃	Inositol
Na ₂ SiO ₃ ·9H ₂ O	Folic acid
	Thymine

(2) Mixed stock solution

- i) Same as (1)-i)
- ii) Add approximately 80 % of the required volume of distilled water to a beaker.
- iii) Dissolve the required amount of Na₂EDTA, while stirring continuously.
- iv) Dispense the required volume of each trace metal from primary solution, while stirring continuously.
- v) Dilute to final volume with distilled water and store in a refrigerator (5°C).

C. Vitamins : Only three vitamins, vitamin B₁₂, biotin, and thiamine HCl have been found necessary for growth of many microalgae and are added to most media. Some media, in addition, contain other vitamins

(1) Vitamin B₁₂, biotin and thiamine HCl

- i) Prepare separate primary stock solution with a concentration of 0.1 mg/ml of vitamin B₁₂ and biotin and 10 mg/ml of thiamine HCl.
- ii) After dispersing 1 ml of these primary stock solution into each of a number of test tubes and autoclaving (121°C, 20 min), store in a freezer at -20°C.
- iii) Thaw and dilute 1 ml of primary stock solution of each vitamins to prepare the working stock solution with a concentration of 1 µg/ml of vitamin B₁₂ and biotin or of 100 µg/ml of thiamine HCl, and store in a refrigerator (5°C).

(2) Other vitamins: Additional vitamins are added to some media in the forms of mixes (cf. Chap. VI-64). It is recommended to prepare a large volume of mixed stock solution.

- i) Prepare a separate primary solution with a concentration of 0.1-1.0 mg/ml.
- ii) Add approximately 80 % of the required volume of distilled water to a beaker.
- iii) Dispense the required volume of each vitamin from the primary solution, while stirring continuously.
- iv) After sterilization by passing through a Millipore filter (0.22 μm), aseptically dispense 100 ml of the mixed stock solution into each of a number of vessels and store in a freezer at -20°C .

2. Media

Media are divided broadly into two categories, synthetic and enriched. The former are used for maintenance of all freshwater algal cultures and some marine ones and the latter for most marine ones.

(1) Synthetic medium (freshwater)

- i) Add approximately 80-90% of the required volume of distilled water to a beaker.
- ii) Dissolve appropriate quantities of weighed buffer such as Tris (hydroxymethyl) aminomethane (known as Tris), glycylglycine, HEPES, TAPS, Bicine, MES or 1, 2, 3, 4-cyclopentan tetracarboxylic acid (if required), while stirring continuously. These buffers are easily soluble with stirring.
- iii) Dispense the appropriate nutrients from previously prepared stock solutions, while stirring continuously.
- iv) Dilute to final volume with distilled water.
- v) Check the pH and make any adjustments with either 1N HCl or 1N NaOH (if buffers required) or with either 0.1N HCl or 0.1N NaOH (if no buffers required).
- vi) Dispense 10 ml of medium into each of the test tube (18×150mm) and sterilize by autoclaving (121°C , 20 min).

(2) Synthetic medium (marine)

- i) Add approximately 80% of the required volume of distilled water to a beaker.
- ii) Dissolve appropriate quantities of weighed Tris, Nitrilotriacetic acid (known as NTA) and major salts such as NaCl, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, KCl and $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$, while stirring continuously.
- iii) Dispense the other nutrients from previously prepared stock solutions.
- iv) Dilute to the final volume with the distilled water.
- v) Check the pH, which is usually adjusted to 8.0 with 1N HCl.
- vi) Dispense 10 ml of medium into each of the test tubes and sterilize by autoclaving (121°C , 20 min).

(3) Enriched seawater medium

- i) Collect offshore water free from gross pollution and remove particulate matter with Whatman GF/C filters.
- ii) Check the salinity. A salinity of 35‰ is considered normal seawater.
- iii) Add approximately 80-90% of the required volume of seawater to a beaker.
- iv) Dissolve appropriate quantities of weighed Tris (if required).
- v) Dispense the appropriate nutrients from previously prepared stock solutions.
- vi) Dilute to the final volume with seawater.
- vii) Check the pH and adjust to 8.0 with 1N HCl if necessary.
- viii) Dispense 10 ml of medium into each test tube and sterilize by autoclaving (121°C, 20 min).

3. Agar slant

Agar is added usually at concentrations of 1.5% after liquid medium has been prepared, prior to autoclaving.

- i) Add the appropriate quantities of weighed agar to liquid medium and heat to 121°C by autoclaving to melt all the agar.
- ii) After melting, quickly dispense 10 ml of agar medium into each test tube and sterilize by autoclaving (121°C, 20 min).
- iii) After sterilization, lay the upper part of the test-tube on a rod (1 cm ϕ) and cool to form an agar slant.

VI. MEDIA

1) Stock media for algae

1)-1. For freshwater algae

1. AF-6 (163)¹⁾

NaNO ₃	14	mg
NH ₄ NO ₃	2.2	mg
MgSO ₄ · 7H ₂ O	3	mg
KH ₂ PO ₄	1	mg
K ₂ HPO ₄	0.5	mg
CaCl ₂ · 2H ₂ O	1	mg
CaCO ₃ ²⁾	1	mg
Fe-citrate	0.2	mg
Citric acid	0.2	mg
Biotin	0.2	µg
Thiamine HCl	1	µg
Vitamin B ₆	0.1	µg
Vitamin B ₁₂	0.1	µg
Trace metals ²⁾	0.5	ml
Distilled water	99.5	ml
pH 6.6 ³⁾		

1) Reference number in parentheses.

2) In the NIES-Collection, CaCO₃ is removed and PIV metals are used instead of trace metals.

3) pH is adjusted to 6.6 by buffering with 40 mg MES in the NIES-Collection.

2. AF-6 / 2

AF-6 medium is diluted with distilled water to 1 / 2.

3. Allen (1)

(NH ₄) ₂ SO ₄	132	mg
KH ₂ PO ₄	27.2	mg
MgSO ₄ · 7H ₂ O	24.6	mg
CaCl ₂ · 2H ₂ O	7.4	mg
Allen Metals ¹⁾	0.01	ml
Distilled water	99.9	ml
pH 2.5 ²⁾		

1) See 55

2) pH is adjusted to 2.5 with 1 N H₂SO₄.

4. BBM (12)

NaNO ₃	25	mg
KH ₂ PO ₄	17.5	mg
K ₂ HPO ₄	10	mg
MgSO ₄ · 7H ₂ O	7.5	mg
CaCl ₂ · 2H ₂ O	2.5	mg
NaCl	2.5	mg
KOH	3.1	mg
FeSO ₄ · 7H ₂ O	0.498	mg
H ₃ BO ₃	1.142	mg
ZnSO ₄ · 7H ₂ O	0.882	mg
MnCl ₂ · 7H ₂ O	0.144	mg
MoO ₃	0.071	mg
CuSO ₄ · 5H ₂ O	0.157	mg
Co(NO ₃) ₂ · 6H ₂ O	0.049	mg
Na ₂ EDTA	5	mg
Distilled water	100	ml

5. C (90)

Ca(NO ₃) ₂ · 4H ₂ O	15	mg
KNO ₃	10	mg
β -Na ₂ glycerophosphate · 5H ₂ O	5	mg
MgSO ₄ · 7H ₂ O	4	mg
Vitamin B ₁₂	0.01	µg
Biotin	0.01	µg
Thiamine HCl	1	µg
PIV metals ¹⁾	0.3	ml
Tris (hydroxymethyl) aminomethane	50	mg
Distilled water	99.7	ml
pH 7.5		

1) See 62

6. CA (102)

Ca(NO ₃) ₂ · 4H ₂ O	2	mg
KNO ₃	10	mg
NH ₄ NO ₃	5	mg
β -Na ₂ glycerophosphate · 5H ₂ O	3	mg
MgSO ₄ · 7H ₂ O	2	mg
Vitamin B ₁₂	0.01	µg
Biotin	0.01	µg
Thiamine HCl	1	µg
PIV metals ¹⁾	0.1	ml
Fe (as EDTA; 1:1 molar) ²⁾	0.1	mg
HEPES	40	mg
Distilled water	99.9	ml
pH 7.2		

1) See 62

2) See 58

7. CAM

CA medium with pH adjusted to 6.5 by buffering with MES instead of HEPES.

8. Carefoot (16)

NaNO ₃	24.7	mg
CaCl ₂ · 2H ₂ O	1.1	mg
MgSO ₄ · 7H ₂ O	4.7	mg
K ₂ HPO ₄	0.9	mg
KH ₂ PO ₄	2.3	mg
NaCl	1.5	mg
PIV metals ¹⁾	0.5	ml
Distilled water	99.5	ml
pH 7.5		

* In the NIES-Collection, 0.02 µg Vitamin B₁₂, 0.02 µg Biotin and 2 µg Thiamine HCl are added to this medium.

1) See 62

9. CB

C medium with pH adjusted to 9.0 by buffering with Bicine instead of Tris (hydroxymethyl) aminomethane.

10. CC (96)

C medium with pH adjusted to 3.0 by buffering with 1, 2, 3, 4 - cyclopentan tetracarboxylic acid instead of Tris (hydroxymethyl) aminomethane.

11. CSi

C medium with pH adjusted to 7.0 by buffering with 50 mg HEPES instead of Tris (hydroxymethyl) aminomethane. Thereafter, 10 mg Na₂SiO₃ · 9H₂O is added.

12. CSi+Cu

0.25 mg CuSO₄ · 5H₂O is added to CSi medium.

13. CT (522)

C medium with pH adjusted to 8.2 by buffering with 40 mg TAPS instead of Tris (hydroxymethyl) aminomethane.

14. CYT

10 mg Yeast extract and 20 mg Tryptone are added to C medium.

15. C+10%Seawater (N. Tezuka, unpubl.)

C medium with 10% filtrated seawater.

16. D (17)

Ca(SO ₄)·2H ₂ O	6	mg
KNO ₃	10.3	mg
NaNO ₃	68.9	mg
Na ₂ HPO ₄	11.1	mg
NaCl	0.8	mg
MgSO ₄ ·7H ₂ O	10	mg
FeCl ₃ ·6H ₂ O	0.05	mg
NTA	10	mg
D solution ¹⁾	0.05	ml
Distilled water	100	ml

1) See 57

17. DH+Fe (I.I. Brown, unpubl.)

D medium with 1.14 mg FeCl₂·6H₂O and adjusted to pH 8.24-8.26 by buffering with 120mg HAPES.

18. HUT (89)

KH ₂ PO ₄	2	mg
MgSO ₄ ·7H ₂ O	2.5	mg
Sodium acetate	40	mg
Potassium citrate	4	mg
Polypeptone	60	mg
Yeast extract	40	mg
Vitamin B ₁₂	0.05	μg
Thiamine HCl	0.04	mg
Distilled water	100	ml
pH 6.4		

* Add 150 mg agar to 100 ml of the medium for semi-solid medium.

19. M-11 (60), (553)

NaNO ₃	10	mg
K ₂ HPO ₄	1	mg
MgSO ₄ ·7H ₂ O	7.5	mg
CaCl ₂ ·2H ₂ O	4	mg
Na ₂ CO ₃	3	mg
FeSO ₄ ·7H ₂ O	0.1	mg
Na ₂ EDTA·2H ₂ O	0.1	mg
Distilled water	100	ml
pH 8.0		

20. MA (92)

Ca(NO ₃) ₂ ·4H ₂ O	5	mg
KNO ₃	10	mg
NaNO ₃	5	mg
Na ₂ SO ₄	4	mg
MgCl ₂ ·6H ₂ O	5	mg
β-Na ₂ glycerophosphate·5H ₂ O	10	mg
Na ₂ EDTA	0.5	mg
FeCl ₃ ·6H ₂ O	0.05	mg
MnCl ₂ ·4H ₂ O	0.5	mg
ZnCl ₂	0.05	mg
CoCl ₂ ·6H ₂ O	0.5	mg
Na ₂ MoO ₄ ·2H ₂ O	0.08	mg
H ₃ BO ₃	2	mg
Bicine	50	mg
Distilled water	100	ml
pH 8.6		

21. MAF-6

10 mg glucose and 10 mg sodium acetate are added to AF-6 medium.

22. M Chu No. 10 (20)

Ca(NO ₃) ₂ · 4H ₂ O	2.0	mg
KH ₂ PO ₄	0.62	mg
MgSO ₄ · 7H ₂ O	2.5	mg
Na ₂ CO ₃	2	mg
Na ₂ SiO ₃ · 9H ₂ O	2.5	mg
HCl (1N) ¹⁾	0.025	ml
Na ₂ EDTA · 2H ₂ O	0.2	mg
FeCl ₃ · 6H ₂ O	0.1	mg
H ₃ BO ₃	0.248	mg
MnCl ₂ · 4H ₂ O	0.139	mg
(NH ₄) ₆ Mo ₇ O ₂₄ · 4H ₂ O	0.1	mg
Vitamin B ₁₂	1	µg
Thiamine HCl	0.1	µg
Biotin	0.1	µg
Distilled water	100	ml

1) In the NIES-Collection, pH is adjusted to 7.6 with respective volume of 1 N HCl.

23. MDM (491)

KNO ₃	100	mg
MgSO ₄ · 7H ₂ O	25	mg
K ₂ HPO ₄	25	mg
NaCl	10	mg
CaCl ₂ · 2H ₂ O	1	mg
Fe solution ¹⁾	0.1	ml
A ₅ solution ²⁾	0.1	ml
Agar	1.5	g
Distilled water	99.8	ml
pH 8.0		

1) See 59

2) See 54

24. MG (91)

Ca(NO ₃) ₂ · 4H ₂ O	2	mg
KNO ₃	10	mg
β -Na ₂ glycerophosphate · 5H ₂ O	3	mg
MgSO ₄ · 7H ₂ O	2	mg
Vitamin B ₁₂	0.01	µg
Biotin	0.01	µg
Thiamine HCl	1	µg
PIV metals ¹⁾	0.1	ml
Fe (as EDTA; 1:1 molar) ²⁾	0.1	ml
HEPES	40	mg
Distilled water	99.9	ml
pH 7.2		

1) See 62

2) See 58

25. MGM

MG medium with pH adjusted to 6.5 by buffering with MES instead of HEPES.

26. MW (397)

Urea	0.85	mg
NaNO ₃	0.17	mg
NH ₄ Cl	0.042	mg
Ca(NO ₃) ₂ · 4H ₂ O	10	mg
CaCO ₃	1	mg
CaCl ₂ · 2H ₂ O	1.4	mg
KNO ₃	1	mg
KHCO ₃	0.9	mg
β -Na ₂ glycerophosphate · 5H ₂ O	2	mg
MgSO ₄ · 7H ₂ O	1.5	mg
PIV metals ¹⁾	0.05	ml
Vitamin B ₁₂	0.02	µg
Thiamine HCl	2	µg
Biotin	0.02	µg
Glycylglycine	10	mg
Distilled water	99.95	ml
pH 7.2		

1) See 62

27. MW / 5

MW medium is diluted with distilled water to 1 / 5.

28. P 35 (92)

NH ₄ NO ₃	10	mg
MgSO ₄ · 7H ₂ O	4	mg
KCl	5	mg
CaCl ₂ · 2H ₂ O	7.4	mg
β -Na ₂ glycerophosphate · 5H ₂ O	5	mg
Sodium acetate	100	mg
Vitamin B _{1 2}	0.01	µg
Biotin	0.01	µg
Thiamine HCl	1	µg
PIV metals ¹⁾	0.3	ml
Tris (hydroxymethyl) aminomethane	50	mg
Distilled water	99.7	ml
pH 8.0		

1) See 62

29. URO (177), (263)

NH ₄ NO ₃	0.5	mg
β -Na ₂ glycerophosphate · 5H ₂ O	0.4	mg
MgSO ₄ · 7H ₂ O	1	mg
CaCl ₂ · 2H ₂ O	1	mg
KCl	0.1	mg
Thiamine HCl	1	µg
Vitamin B _{1 2}	0.01	µg
Biotin	0.01	µg
Fe-EDTA	0.05	mg
PIV metals ¹⁾	0.1	ml
Distilled water	99.9	ml
pH 7.5 ²⁾		

1) See 62

2) pH is adjusted to 7.5 with 0.1 N HCl.

30. VT (391)

Ca(NO ₃) ₂ · 4H ₂ O	11.78	mg
β -Na ₂ glycerophosphate · 5H ₂ O	5	mg
MgSO ₄ · 7H ₂ O	4	mg
KCl	5	mg
Vitamin B _{1 2}	0.01	µg
Biotin	0.01	µg
Thiamine HCl	1	µg
PIV metals ¹⁾	0.3	ml
Glycylglycine	50	mg
Distilled water	99.7	ml
pH 7.5		

1) See 62

31. VTAC (332)

20 mg sodium acetate is added to VT medium.

32. VTYT (96)

10 mg yeast extract and 20 mg tryptone are added to VT medium.

33. W (519)

Ca(NO ₃) ₂ · 4H ₂ O	10	mg
KNO ₃	1	mg
MgSO ₄ · 7H ₂ O	1.5	mg
β -Na ₂ glycerophosphate · 5H ₂ O	2	mg
Urea	1.7	mg
Thiamine HCl	0.2	µg
Vitamin B _{1 2}	0.002	µg
Biotin	0.002	µg
PIV metals ¹⁾	0.05	ml
Glycylglycine	10	mg
Distilled water	99.95	ml
pH 7.5		

1) See 62

34. SW (386)

A small amount of dried soil is put into a test tube, and 20 ml distilled water is added.

35. SOT (349)

NaHCO ₃	1.68	g
K ₂ HPO ₄	50	mg
NaNO ₃	250	mg
K ₂ SO ₄	100	mg
NaCl	100	mg
MgSO ₄ · 7H ₂ O	20	mg
CaCl ₂ · 2H ₂ O	4	mg
FeSO ₄ · 7H ₂ O	1	mg
Na ₂ EDTA	8	mg
A ₅ solution ¹⁾	0.1	ml
Distilled water	99.9	ml

1) See 54

1)-2. For marine algae

36. ESM (356)

NaNO ₃	12	mg
K ₂ HPO ₄	0.5	mg
Vitamin B _{1 2}	0.1	µg
Biotin	0.1	µg
Thiamine HCl	10	µg
Fe-EDTA	25.9	µg
Mn-EDTA	33.2	µg
Tris (hydroxymethyl) aminomethane	100	mg
Soil extract ¹⁾	5	ml
Sea water pH 8.0	95	ml

1) See 65

37. f / 2 (59)

NaNO ₃	7.5	mg
NaH ₂ PO ₄ · 2H ₂ O	0.6	mg
Vitamin B _{1 2}	0.05	µg
Biotin	0.05	µg
Thiamine HCl	10	µg
Na ₂ SiO ₃ · 9H ₂ O	1	mg
f / 2 metals ¹⁾	0.1	ml
Sea water	99.9	ml

1) See 60

38. M-ASP7 (541)

NaCl	2.5	g
MgSO ₄ · 7H ₂ O	900	mg
KCl	70	mg
CaCl ₂ · 2H ₂ O	30	mg
NaNO ₃	5	mg
NaH ₂ PO ₄ · 2H ₂ O	2	mg
Vitamin B ₁₂	0.1	µg
Vitamin mix S ₃ ¹⁾	1	ml
Na ₂ SiO ₃ · 9H ₂ O	1	mg
P _N metals ²⁾	3	ml
Tris (hydroxymethyl) aminomethane	100	mg
NTA	7	mg
Distilled water	96	ml
pH 8.0		

1) See 64

2) See 63

39. MF

f / 2 medium with Na₂SiO₃ · 9H₂O replaced by 1.0ml soil extract¹⁾ and adjusted to pH 8.0 by buffering with 100mg Tris (hydroxymethyl) aminomethane.

1) See 65

40. MKM (491)

KNO ₃	75	mg
KH ₂ PO ₄	2.5	mg
MgSO ₄ · 7H ₂ O	2	mg
Fe-citrate	250	µg
Agar	1.5	g
Sea water	50	ml
Distilled water	50	ml

41. MNK (297)

NaNO ₃	2	mg
K ₂ HPO ₄	0.1	mg
Na ₂ HPO ₄ · 12H ₂ O	0.028	mg
Vitamin B ₁₂	0.015	µg
Biotin	0.015	µg
Thiamine HCl	2	µg
CoSO ₄ · 7H ₂ O	0.12	µg
ZnSO ₄ · 7H ₂ O	0.24	µg
MnCl ₂ · 4H ₂ O	0.9	µg
CuSO ₄ · 5H ₂ O	0.006	µg
Na ₂ SeO ₃	0.003	µg
Na ₂ MoO ₄ · 2H ₂ O	0.07	µg
Na ₂ EDTA · 2H ₂ O	0.37	µg
Fe-EDTA	2.6	µg
Mn-EDTA	3.3	µg
Sea water	100	ml

42. URO-YT (246)

10 mg yeast extract and 20 mg tryptone are added to URO medium, which is made with seawater instead of distilled water.

43. URO-1/10YT (247)

1 mg yeast extract and 2 mg tryptone are added to URO medium, which is made with seawater instead of distilled water.

44. WESM

ESM medium with 95 ml sea water replaced by 85 ml sea water and 10 ml distilled water.

2) Bacteria-free check media

2)-1. For freshwater algae

45. YT (96)

Stock medium	100	ml
Yeast extract	100	mg
Tryptone	200	mg

46. B - I (103)

Stock medium	100	ml
Proteose peptone	100	mg

47. B - II (103)

Stock medium	100	ml
Yeast extract	500	mg

48. B - III (103)

Stock medium	100	ml
Peptone	500	mg
Beef extract	300	mg

49. B - IV (103)

Stock medium	100	ml
Glucose	100	mg
Peptone	100	mg

50. B - V (103)

Stock medium	100	ml
Sodium acetate	50	mg
Glucose	50	mg
Tryptone	50	mg
Yeast extract	30	mg

2)-2. For marine algae

51. STP (389)

NaNO ₃	20	mg
K ₂ HPO ₄	1	mg
Sodium glutamate	50	mg
Glucose	20	mg
Glycine	10	mg
D, L - Alanine	10	mg
Vitamin mix 8 ¹⁾	0.1	ml
Trypticase	20	mg
Yeast autolysate ²⁾	20	mg
Sucrose	100	mg
Soil extract ³⁾	5	ml
Sea water	80	ml
Distilled water	15	ml

pH 7.5

1) In the NIES-Collection, vitamin mix 8 is replaced by Vitamin mix S₃.

2) In the NIES-Collection, yeast autolysate is replaced by yeast extract.

3) See 65

52. MM23 (M. Tatewaki, pers. comm.)

NaCl	1.8	g
MgSO ₄ · 7H ₂ O	500	mg
KCl	60	mg
NaNO ₃	100	mg
CaCl ₂ · 2H ₂ O	36.7	mg
K ₂ HPO ₄	6	mg
Sucrose	400	mg
PII metals ¹⁾	2	ml
FeCl ₃ · 6H ₂ O	48	µg
Thiamine HCl	10	µg
Biotin	0.1	µg
Vitamin B ₁₂	0.2	µg
C-Source Mix II ²⁾	1	ml
Tris (hydroxymethyl) aminomethane	100	mg
Distilled water	97	ml

pH 8.0

1) See 61

2) See 56

53. Bf / 2 (573)

ASP7 ¹⁾	100	ml
Trypticase	50	mg
Yeast extract	5	mg

1) In the NIES-Collection, ASP7 is replaced by f / 2 medium.

3) Trace metals, vitamin mixes and soil extract**54. A₅ solution (85)**

H ₃ BO ₃	286	mg
MnSO ₄ · 7H ₂ O	250	mg
ZnSO ₄ · 7H ₂ O	22.2	mg
CuSO ₄ · 5H ₂ O	7.9	mg
Na ₂ MoO ₄ · 2H ₂ O	2.1	mg
Distilled water	100	ml

55. Allen metals¹⁾ (1)

Fe-EDTA	30.16	g
MnCl ₂ · 4H ₂ O	1.79	g
H ₃ BO ₃	2.86	g
ZnSO ₄ · 7H ₂ O	220	mg
CuSO ₄ · 5H ₂ O	79	mg
(NH ₄) ₆ MoO ₂₄ · 4H ₂ O	130	mg
NH ₄ VO ₃	23	mg
Distilled water	100	ml

1) In the NIES-Collection, diluted with distilled water to 1 / 1,000.

56. C - Source Mix II (M. Tatewaki, pers. comm.)

Glycine	100	mg
D, L - Alanine	100	mg
L - Asparagine	100	mg
Sodium acetate · 3H ₂ O	200	mg
Glucose	200	mg
L - Glutamic acid	200	mg
Distilled water	100	ml

57. D solution¹⁾ (17)

Conc · H ₂ SO ₄	0.05	ml
MnSO ₄ · H ₂ O	228	mg
ZnSO ₄ · 7H ₂ O	50	mg
H ₃ BO ₃	50	mg
CuSO ₄ · 5H ₂ O	2.5	mg
Na ₂ MoO ₄ · 2H ₂ O	2.5	mg
CoCl ₂ · 6H ₂ O	4.5	mg
Distilled water	99.95	ml

1) Indicated as "Micronutrient solution" in Ref.17.

58. Fe (as EDTA; 1:1 molar) (388)

Fe(NH ₄) ₂ (SO ₄) ₂ · 6H ₂ O	70.2	mg
Na ₂ EDTA · 2H ₂ O	66	mg
Distilled water	100	ml

* 1 ml of this solution contains 0.1 mg Fe.

59. Fe solution (96)

FeSO ₄ · 7H ₂ O	200	mg
Distilled water	100	ml
Conc · H ₂ SO ₄	0.026	ml ¹⁾

1) 2 drops / 500ml (Ref. 96).

60. f / 2 metals (59)

Na ₂ EDTA·2H ₂ O	440	mg
FeCl ₃ ·6H ₂ O	316	mg
CoSO ₄ ·7H ₂ O	1.2	mg
ZnSO ₄ ·7H ₂ O	2.1	mg
MnCl ₂ ·4H ₂ O	18	mg
CuSO ₄ ·5H ₂ O	0.7	mg
Na ₂ MoO ₄ ·2H ₂ O	0.7	mg
Distilled water	100	ml

61. P II metals (387)

H ₃ BO ₃	114	mg
FeCl ₃ ·6H ₂ O	4.9	mg
MnSO ₄ ·4H ₂ O	16.4	mg
ZnSO ₄ ·7H ₂ O	2.2	mg
CoSO ₄ ·7H ₂ O	480	µg
Na ₂ EDTA·2H ₂ O	100	mg
Distilled water	100	ml

62. P IV metals (390)

FeCl ₃ ·6H ₂ O	19.6	mg
MnCl ₂ ·4H ₂ O	3.6	mg
ZnSO ₄ ·7H ₂ O ¹⁾	2.2	mg
CoCl ₂ ·6H ₂ O	0.4	mg
Na ₂ MoO ₄ ·2H ₂ O	0.25	mg
Na ₂ EDTA·2H ₂ O	100	mg
Distilled water	100	ml

1) In the NIES-Collectoin, ZnCl₂ is replaced by ZnSO₄·7H₂O.

63. P_N metals (541)

Na ₂ EDTA·2H ₂ O	100	mg
H ₃ BO ₃	113	mg
FeCl ₃ ·6H ₂ O	6.3	mg
CoSO ₄ ·7H ₂ O	0.093	mg
ZnSO ₄ ·7H ₂ O	4.66	mg
MnCl ₂ ·4H ₂ O	3.2	mg
Distilled water	100	ml

64. Vitamine mix S₃ (387)

Thiamine HCl	5	mg
Nicotinic acid	1	mg
Calcium pantothenate	1	mg
p - Aminobenzoic acid	0.1	mg
Biotin	0.01	mg
Inositol	50	mg
Folic acid	0.02	mg
Thymine	30	mg
Distilled water	100	ml

65. Soil extract (389)

100g soil combined with 100ml distilled water is heated for 2h and then cooled. The supernatant is passed through a GF / C filter and then distilled water added until there is a total of 100ml.

4) Stock medium for protozoa**66. LE**

L Solution: White part of lettuce is dried at 90 °C for 16 - 18 h without scorching. 300 mg of the dried lettuce is added to 100 ml boiling water (9 : 1 distilled water / tap water) and boiled for 30 minutes, while stirring. The supernatant is passed through cottonwool.

E solution: 300 mg of crushed yolk of hardboiled egg is added to 100ml water (9 : 1 distilled water / tap water) and boiled for 30 minutes, while stirring. The supernatant is passed through cottonwool.

Equal quantities of L and E solutions are mixed. The pH is adjusted to 6.8 - 7.0 with 1 N NaOH. 100 ml of the solution is dispensed into each 200ml-Erlenmayer flasks and sterilized by autoclaving (121°C, 15 min).

VII. 保存株データの利用法

系統保存株の学名はアルファベット順に並べてあり、学名が同じ場合は株番号順に並べてある。同定者が記載されていない限り、学名は原則として分離者によってつけられたものである。また、株番号は、数字の前に“NIES-”を付けて使用することとし(例:NIES-1)、株の学名が命名法などの変更で変わった場合や、やむをえない理由で株が消失した場合にも変更したり付け変えたりしないものとする。

個々の項目についての説明は下記の例を参照されたい。

Spirulina platensis (Gomont) Geitler¹⁾

Syn. *Arthrospira platensis* Gomont²⁾

45³⁾

Lake Kasumigaura / Ibaraki⁴⁾ (1975-11)⁵⁾

IAM M-184⁶⁾, Unialgal, Clonal⁷⁾, M.M.Watanabe⁸⁾ (1975-11)⁹⁾

Identified by: M.M.Watanabe¹⁰⁾

Culture conditions: MA, 25° C, 24 μE/m²sec, 1M, [Cryopreserved]¹¹⁾

Characteristics: Water bloom, Freshwater,

Forming water bloom in Inbanuma¹²⁾

KAS-6-50¹³⁾

References: 79, 96, 242, 450, 518, 522, 530, 549, 559¹⁴⁾

- 1) 学名と原著者名：原著者名は学名の後に記した。
- 2) 異名。
- 3) 株番号：数字の前に“NIES-”を付けて使用すること。
- 4) 採集地。
- 5) 採集年月。
- 6) 他の保存機関に保存されている場合の株番号。保存機関名は略号で株番号の前に記されている。

IAM : 東京大学分子細胞生物学研究所

TAC : 国立科学博物館筑波実験植物園

CCAP : 英国 CCAPカルチャーコレクション

NIVA : ノルウェー 水界研究所藻類株保存施設

PCC : フランス パスツール研究所カルチャーコレクション

SAG : ドイツ ゲッチンゲン大学藻類株保存施設

CCMP : 米国 ビゲロウ海洋研究所カルチャーコレクション

UTEX : 米国 テキサス大学藻類株保存施設

- 7) 株の状態。
Axenic の表示があるものは無菌株である。この表示のない場合は無菌ではないので特に注意されたい。
- 8) 分離者。
- 9) 分離年月。
- 10) 同定者。
- 11) 保存条件。培地名、保存温度、保存光強度、継代周期の順である。本施設では明暗周期は12時間明期／12時間暗期に設定されている。培地は特に記さない限り液体である。軟寒天培地：SS、寒天斜面培地：Sの場合は略号を（ ）内に記した。また（ ）内の温度および光強度は前培養が必要な場合、その条件である。なお光強度の表記については、前第6版より $\mu\text{E}/\text{m}^2\text{sec}$ を採用している。現在凍結保存中の株については [**Cryopreserved**] と記した。
- 12) 株の性質。
Unstable; 保存状態が不安定で永続的な維持が困難である株。
Untransportable; 長時間の（航空便での）郵送では、生存状態で受け取るのが困難である株。
- 13) 分離者等の使用している株名。
- 14) 参考文献の番号。

なお、第IX章 2. 分類群別索引（211～224頁）における藻類門・綱の分類および配列は千原光雄（編）「藻類の多様性と系統」（バイオダイバーシティ・シリーズ、裳華房 1999）に掲載された分類表におおむねしたがった。

VII. EXPLANATORY NOTES ABOUT STRAIN DATA

The strains are listed by scientific names in alphabetical order. Strains with the same scientific name are arranged in order of their strain numbers. The scientific name of each strain was designated by the isolator, unless the identifier is described. The number assigned to the given strain remains the same, regardless of any change in nomenclature. The strain number should be used with the initials "NIES-"(e.g. NIES-1). A detailed example of a strain description is presented below.

Spirulina platensis (Gomont) Geitler¹⁾

Syn. *Arthrospira platensis* Gomont²⁾

45³⁾

Lake Kasumigaura / Ibaraki⁴⁾ (1975-11)⁵⁾

IAM M-184⁶⁾, Unialgal, Clonal⁷⁾, M.M.Watanabe⁸⁾ (1975-11)⁹⁾

Identified by: M.M.Watanabe¹⁰⁾

Culture conditions: MA, 25° C, 24 µE/m²sec, 1M, [Cryopreserved]¹¹⁾

Characteristics: Water bloom, Freshwater,

Forming water bloom in Inbanuma¹²⁾

KAS-6-50¹³⁾

References: 79, 96, 242, 450, 518, 522, 530, 549, 559¹⁴⁾

- 1) Scientific name with authority.
- 2) Synonym.
- 3) Strain number (used with the initials "NIES-").
- 4) Collection site.
- 5) Collection date.
- 6) The strain designations in other culture collections or institutions. The following abbreviations are presented before the strain number.

IAM : Institute of Molecular and Cellular Biosciences, University of Tokyo.

TAC : Tsukuba Botanical Garden, National Science Museum.

CCAP : Culture Collection of Algae and Protozoa, U.K.

NIVA : Culture Collection of Algae, Norwegian Institute for Water Research.

PCC : Pasteur Culture Collection of Cyanobacteria, Institute Pasteur, France.

SAG : Culture Collection of Algae at the University of Göttingen, Germany.

CCMP : Provasoli-Guillard Center for Culture of Marine Phytoplankton, U.S.A.

UTEX : Culture Collection of Algae at the University of Texas at Austin, U.S.A.

- 7) Status of the strain (Unialgal or Axenic, Clonal or Non-clonal).
- 8) Isolator.
- 9) Isolation date.
- 10) Identifier.
- 11) Culture condition for maintenance: medium *, temperature, light intensity ** and duration of subculturing ***.

The light-dark cycle is defined as 12 hours light 12 hours dark.

* Unless otherwise noted the phase of the medium is liquid.

The abbreviations in parentheses are SS for semi-solid and S for solid.

** Light intensity is indicated as $\mu\text{E}/\text{m}^2 \text{ sec}$ in this edition.

*** Preculture temperature and light intensity are given in parentheses when preculture is required.

" [Cryopreserved] " indicates that the strain is preserved as a frozen condition at present.

- 12) Characteristics of the strain.

"**Unstable**" indicates that the strain probably cannot be maintained indefinitely, for various reasons including unsuccessful induction of auxospore formation and germination in diatom.

"**Untransportable**" indicates that the strain is not robust enough to be sent by air mail, involving much time.

- 13) Strain designation given by the isolator.
- 14) Reference number. References corresponding to the numbers are listed in pp.135~158.

Special Note. Algal phyla and classes and assignment of strains to each taxon (as shown in Chap. IX. 2. Systematic Index (pp.211~224) are arranged according principally to the system in Chihara (Ed.), "Diversity and Evolution of Algae" (Shokabo, Tokyo, 1999).

VIII. STRAIN DATA

ALGAE

ACHNANTHES Bory: Bacillariophyceae

* *Achnanthes longipes* Agardh

See *Achnanthes subconstricta* (Meister) Toyoda

Achnanthes minutissima Kützing

71

Kosaka River / Akita (1983-04)

Axenic, Clonal, A.Yuri (1983-09)

Identified by: M.Mizuno

Culture conditions: CSi, 20° C, 40 µE/m² sec, 1M

Characteristics: Indicator, Freshwater

A15-6

References: 267, 378, 453, 454, 544, 545

407

Miyata River / Ibaraki (1987-05)

Unialgal, Non-clonal, F.Kasai (1987-06)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

4st-0-8

Reference: 454

408

Ashio / Gunma (1987-08)

Unialgal, Clonal, F.Kasai (1987-09)

Identified by: M.Idei

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

AT5-23

Reference: 454

409

Ashio / Gunma (1987-08)

Unialgal, Clonal, F.Kasai (1987-08)

Identified by: M.Idei

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

Ast-3-3

Reference: 454

410

Ashio / Gunma (1987-08)

Unialgal, Non-clonal, F.Kasai (1987-09)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

AT4-18

Reference: 454

411

Miyata River / Ibaraki (1987-02)

Unialgal, Non-clonal, F.Kasai (1987-03)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

1st-3-17

References: 453, 454

412

Miyata River / Ibaraki (1987-02)

Unialgal, Non-clonal, F.Kasai (1987-03)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

1St-1-1

References: 453, 454

413

Miyata River / Ibaraki (1987-02)

Unialgal, Non-clonal, F.Kasai (1987-03)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

1st-2-8

References: 453, 454

414

Ooe River (Ozegahara) / Fukushima (1987-10)

Unialgal, Non-clonal, F.Kasai (1987-11)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

0-25

Reference: 454

Achnanthes minutissima Kützing

var. *saprophila* Kobayasi et Mayama

372

Lake Kasumigaura / Ibaraki (1985-12)

- Axenic, Clonal, T.Sawaguchi (1985-12)
 Identified by: T.Sawaguchi
 Culture conditions: CSi, M Chu No.10, 20° C,
 40 µE/m² sec, 1M
 Characteristics: Indicator, Freshwater,
 Reidentified by M.Idei
 KAAC-6
- Achnanthes subconstricta*** (Meister) Toyoda
 330
 Kawazu / Shizuoka (1985-05)
 Axenic, Clonal, T.Sawaguchi (1985-05)
 Reidentified by: T.Nagumo
 Culture conditions: f/2, 10° C, 25 µE/m² sec, 2M
 Characteristics: Marine, Formerly identified as
Achnanthes longipes Agardh
 IMHB-5
 Reference: 146
- ACINETOSPORA** Bornet: Phaeophyceae
- Acinetospora crinita*** (Carmichael) Sauvageau
 548
 Tuscan / Italy (1991)
 Unialgal, Clonal, T.Hagiwara (1992)
 Tentatively reidentified by: G.Sartoni
 Culture conditions: f/2, 20° C, 4 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Marine, Formerly identified as
Tribonema marinum J.Feldmann,
COXI gene (AF037996), *tufA* gene (AF038004),
 18S rRNA gene (AF038005)
 References: 26, 402
- ACTINASTRUM** Lagerheim: Trebouxiophyceae
- Actinastrum hantzschii*** Lagerheim
 415
 Lake Kasumigaura / Ibaraki (1983-07)
 Unialgal, Clonal, F.Kasai (1983-07)
 Identified by: M.Watanabe
 Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
 (25° C, 30 µE/m² sec)
 Characteristics: Indicator, Freshwater,
COXI gene (D63660)
 F7-4
 References: 76, 242, 530
- ALEXANDRIUM** Halim: Dinophyceae
- Alexandrium catenella*** (Whedon et Kofoid) Balech
 Syn. *Protogonyaulax catenella*
 (Whedon et Kofoid) Taylor
 220
 Tsuda Bay / Kagawa (1980-06)
 Axenic, Clonal, S.Yoshimatsu
 Culture conditions: ESM, 20° C, 40 µE/m² sec, 2M
 Characteristics: Red tide, Marine, Unstable,
 Untransportable
 KGW-31-1
- 519
 Owase Bay / Mie
 Axenic, Clonal, T.Okaichi
 Culture conditions: ESM, 20° C, 40 µE/m² sec, 2M
 Characteristics: Red tide, Marine, Unstable,
 Untransportable
 KGW-41
- 520
 Hachinohe Harbor / Aomori (1988-08)
 Unialgal, Clonal, T.Sawaguchi (1988-08)
 Identified by: T.Sawaguchi
 Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
 Characteristics: Red tide, Marine, Unstable,
 Untransportable
 88HH-2
 Reference: 283
- 674
 Harima-Nada / Seto Inland Sea (1980-06)
 Axenic, Clonal, S.Yoshimatsu (1980-06)
 Identified by: S.Yoshimatsu
 Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
 Characteristics: Red tide, Marine, Mating type +,
 Untransportable
 Ac 1
- 675
 Harima-Nada / Seto Inland Sea (1980-06)
 Axenic, Clonal, S.Yoshimatsu (1980-06)
 Identified by: S.Yoshimatsu
 Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
 Characteristics: Red tide, Marine, Mating type -,
 Untransportable
 Ac 5
- 677
 Yamakawa Bay / Kagoshima (1988-03)
 Axenic, Clonal, S.Yoshimatsu (1988-04)

Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m²sec, 1M
Characteristics: Red tide, Marine, Untransportable
Acy-6

Alexandrium hiranoi Kita et Fukuyo

612

Jogashima, Misaki / Kanagawa (1984-08)
Unialgal, Clonal, T.Kita (1984-08)
Identified by: T.Kita & Y.Fukuyo
Culture conditions: ESM, 20° C, 40 µE/m²sec, 2M
Characteristics: Toxic, Marine, Untransportable
References: 181, 182, 252

Alexandrium insuetum Balech

678

Uchiumi Bay / Kagawa (1985-06)
Axenic, Clonal, S.Yoshimatsu (1985-06)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m²sec, 1M
Characteristics: Red tide, Marine, Untransportable

AMPHIDINIUM Claparede et Lachman: Dinophyceae

Amphidinium britannicum (Herdman) Lebour

405

Hasaki / Ibaraki (1987-05)
Unialgal, Clonal, T.Sawaguchi (1987-05)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 40 µE/m²sec, 1M
Characteristics: Benthic, Marine, Untransportable
HASS-1

Amphidinium carterae Hulburt

331

Iriomote Isl. / Okinawa (1986-01)
Axenic, Clonal, T.Sawaguchi (1986-02)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 32 µE/m²sec, 1M
Characteristics: Marine, Unstable, Untransportable,
psbA gene (AB025586)
IIDA
Reference: 458

Amphidinium klebsii Coll

613

Aburatsubo Bay / Kanagawa (1993-04)
Unialgal, Clonal, M.Murata (1994-03)
Identified by: Y.Fukuyo
Culture conditions: f/2, ESM, 20° C, 40 µE/m²sec,
1M

Characteristics: Marine, Untransportable
AK-1
References: 86, 248

Amphidinium tetsudo Kofoid et Swezy

1268

Saipan / USA (2002-04)
Unialgal, Clonal, A.Higa
Identified by: A.Higa
Culture conditions: ESM, 20° C, 20 µE/m²sec, 1M
Characteristics: Marine, Untransportable
M-44

ANABAENA Bory: Cyanophyceae

Anabaena affinis Lemmermann

40

Lake Kasumigaura / Ibaraki (1974-08)
IAM M-168, Unialgal, Clonal, M.M.Watanabe
(1974-08)
Identified by: M.M.Watanabe
Culture conditions: CT, 25° C, 24 µE/m²sec, 1M
Characteristics: Water bloom, Freshwater, Unstable
References: 96, 227, 242, 291, 530, 565

Anabaena circinalis Rabenhorst ex Bornet et Flahault

41

Lake Kasumigaura / Ibaraki (1974-08)
IAM M-169, Axenic, Clonal, M.M.Watanabe
(1974-08)
Identified by: M.M.Watanabe
Culture conditions: CB, 25° C, 24 µE/m²sec, 1M
Characteristics: Water bloom, Freshwater, Unstable,
16SrRNA gene (AB042859)
References: 79, 96, 242, 290, 291, 432, 530, 354

Anabaena compacta (Nygaard) Hickel

806

Rostherne Mere, Cheshire / England
CCAP 1403/24, Axenic, Clonal, Jaworski (1978)
Reidentified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m²sec, 2M
Characteristics: Freshwater, Water bloom, Formerly
identified as *Anabaena spiroides* Klebahn

835

Esthwaite Water, Cambria / England
CCAP 1403/29, Unialgal, Clonal, Butterwick (1985)
Reidentified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m²sec, 2M
Characteristics: Freshwater, Water bloom, Formerly

- identified as *Anabaena spiroides* Klebahn
Reference: 83
- Anabaena cylindrica* Lemmermann**
19
IAM M-1, Axenic, Non-clonal
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec)
Characteristics: Freshwater, Nitrogen fixation,
Reidentified by M.M. Watanabe
References: 3, 4, 14, 40, 44, 46, 47, 48, 49, 50, 51, 52,
53, 58, 74, 96, 137, 196, 198, 222, 242, 260, 350,
351, 352, 353, 383, 384, 385, 449, 474, 491, 498,
530, 560, 561, 562, 563, 564, 565
- Anabaena ellipsoides* Bolochonzew**
828
Fishpond, Wuhan / China (1996-01)
Unialgal, Clonal, R.Li (1996-01)
Identified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom
Ana HB
- Anabaena flos-aquae* Brébisson ex Bornet et Flahault**
f. *flos-aquae*
73
Lake Kasumigaura / Ibaraki (1978-08)
TAC 32, Axenic, Clonal, M. Watanabe (1978-08)
Identified by: M. Watanabe
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Indicator, Freshwater,
Unstable, 16SrRNA gene (AB042858)
K-TAN-32
References: 159, 242, 291, 354, 438, 530, 578
- 74
Lake Kasumigaura / Ibaraki (1978-08)
TAC 33, Unialgal, Clonal, M. Watanabe (1978-08)
Identified by: M. Watanabe
Culture conditions: CT, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Indicator, Freshwater,
Unstable
K-TAN-33
References: 19, 242, 257, 258, 259, 530
- 75
Lake Kasumigaura / Ibaraki (1978-12)
TAC 43, Unialgal, Clonal, M. Watanabe (1978-12)
Identified by: M. Watanabe
Culture conditions: CB, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Indicator, Freshwater,
- Unstable
K-TAN-43
References: 242, 265, 530
- Anabaena kisseleviana* Elenkin**
807
Lake Kasumigaura / Ibaraki (1978-08)
TAC 34, Unialgal, Clonal, M. Watanabe (1978-08)
Identified by: R.Li
Culture conditions: MG, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom
- Anabaena lemmermannii* Richter**
833
Lake Steinsfjorden, Buskerud / Norway
NIVA CYA 82, Unialgal, Clonal (1980)
Reidentified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom, Unstable,
Formerly identified as *Anabaena circinalis*
Rabenhorst ex Bornet et Flahault
- Anabaena mendotae* Trelease**
808
Lake Akan / Hokkaido (1990-08)
TAC 437, Unialgal, Clonal, Y. Niiyama (1990-08)
Identified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom
A28
- Anabaena mucosa* Komárková et Eloranta**
809
Lake Toro / Hokkaido (1990-08)
TAC 426, Unialgal, Clonal, Y. Niiyama (1990-08)
Identified by: R.Li
Culture conditions: MG, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom, Unstable
A10
- Anabaena oumiana* Watanabe**
829
Chon Buri / Thailand (1998-05)
Unialgal, Clonal, R.Li (1998-05)
Identified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom
Ana T1
- Anabaena planktonica* Brunthaler**
810
Ohnuma / Hokkaido (1990-08)

- TAC 421, Axenic, Clonal, Y.Niiyama (1990-08)
 Identified by: M.Watanabe
 Culture conditions: MG, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A3
 References: 83, 227
- 811
 Ohnuma / Hokkaido (1990-08)
 TAC 422, Axenic, Clonal, Y.Niiyama (1990-08)
 Identified by: M.Watanabe
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A4
- 812
 Lake Toro / Hokkaido (1990-08)
 TAC 424, Unialgal, Clonal, Y.Niiyama (1990-08)
 Identified by: M.Watanabe
 Culture conditions: MG, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A7
- 813
 Lake Tofutsu / Hokkaido (1990-08)
 TAC 434, Unialgal, Clonal, Y.Niiyama (1990-08)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A25
- 814
 Lake Tofutsu / Hokkaido (1990-08)
 TAC 435, Axenic, Clonal, Y.Niiyama (1990-08)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A26
- 815
 Esthwaite Water, Cambria / England
 CCAP 1403/19, Axenic, Clonal, G.H.M.Jaworski
 (1968)
 Reidentified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *Anabaena solitaria* Klebahn
- 816
 Blelham Tarn, Cambria / England
 CCAP 1403/27, Axenic, Clonal, G.H.M.Jaworski
 (1985)
- Reidentified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *Anabaena solitaria* Klebahn
- 817
 Inba-numa / Chiba (1995-05)
 Unialgal, Clonal, R.Li (1995-05)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom, Offensive
 taste and odor
 Inba 2
- 834
 Lake Langsævatn, Aust-Agder / Norway (1979)
 NIVA CYA 66, Unialgal, Clonal
 Reidentified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *Anabaena solitaria* Klebahn f.
planktonica (Brunnthaler) Komárek
- Anabaena smithii* (Komárek) Watanabe
- 818
 Lake Barato / Hokkaido (1989-08)
 TAC 116, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
- 819
 Lake Barato / Hokkaido (1990-08)
 TAC 428, Unialgal, Clonal, Y.Niiyama (1990-08)
 Identified by: M.Watanabe
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A14
 Reference: 83
- 820
 Hirosaki / Aomori (1990-06)
 TAC 431, Unialgal, Clonal, Y.Niiyama (1990-06)
 Identified by: M.Watanabe
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A18
- 821
 Hirosaki / Aomori (1990-06)
 TAC 432, Unialgal, Clonal, Y.Niiyama (1990-06)
 Identified by: M.Watanabe

- Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A19
 Reference: 227
- 822
 Lake Akan / Hokkaido (1991-07)
 TAC 450, Unialgal, Clonal, Y.Niiyama (1991-07)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 A51
- 823
 Lake Okutama / Tokyo (1991-07)
 TAC 452, Unialgal, Clonal, M.Watanabe (1991-07)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom, Offensive
 taste and odor, Unstable
 210
- 824
 Hasse River, Ogasawara Isl. / Tokyo (1998-03)
 Unialgal, Clonal, R.Li (1998-03)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom, Offensive
 taste and odor
 Ana Ha 1
- 830
 Lam Takong / Thailand (1997-07)
 Unialgal, Clonal, R.Li (1997-07)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 Ana130
- 831
 Chon Buri / Thailand (1998-05)
 Unialgal, Clonal, R.Li (1998-05)
 Identified by: R.Li
 Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
 Characteristics: Freshwater, Water bloom
 Ana T3
- Anabaena solitaria* Klebahn f. *solitaria*
 80
 Lake Kasumigaura / Ibaraki (1978-12)
 TAC 42, Axenic, Clonal, M.Watanabe (1978-12)
 Identified by: M.Watanabe
- Culture conditions: CB, 25° C, 24 µE/m² sec, 20D
 Characteristics: Water bloom, Freshwater, Unstable
 K-TAN-42
 References: 227, 242, 291, 530
- Anabaena spiroides* Klebahn
 76
 Lake Kasumigaura / Ibaraki (1983-06)
 Unialgal, Clonal, S.Suda (1983-06)
 Identified by: S.Suda
 Culture conditions: CA, 25° C, 24 µE/m² sec, 1M
 Characteristics: Water bloom, Indicator, Freshwater,
 Unstable, 16SrRNA gene (AB047104)
 K-A-12
 References: 227, 242, 291, 354, 355, 530
- Anabaena spiroides* Klebahn
 f. *crassa* (Lemmermann) Elenkin
 78
 Lake Kasumigaura / Ibaraki (1978-07)
 TAC 30, Axenic, Clonal, M.Watanabe (1978-07)
 Identified by: M.Watanabe
 Culture conditions: CT, 25° C, 24 µE/m² sec, 1M
 Characteristics: Water bloom, Indicator, Freshwater,
 Unstable
 K-TAN-30
 References: 227, 242, 290, 291
- Anabaena spiroides* Klebahn f. *spiroides*
 77
 Lake Kasumigaura / Ibaraki (1978-08)
 TAC 31, Unialgal, Clonal, M.Watanabe (1978-08)
 Identified by: M.Watanabe
 Culture conditions: CT, 25° C, 24 µE/m² sec, 1M
 Characteristics: Water bloom, Indicator, Freshwater,
 Unstable
 K-TAN-31
 References: 159, 242, 530
- 79
 Lake Kasumigaura / Ibaraki (1978-07)
 TAC 28, Axenic, Clonal, M.Watanabe (1978-07)
 Identified by: M.Watanabe
 Culture conditions: CB, 25° C, 24 µE/m² sec, 1M
 Characteristics: Water bloom, Indicator, Freshwater,
 Unstable
 K-TAN-28
 References: 227, 242
- 263
 Lake Kasumigaura / Ibaraki (1978-07)
 TAC 27, Axenic, Clonal, M.Watanabe (1978-07)

Identified by: M.Watanabe
Culture conditions: CT, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Freshwater, Unstable
K-TAN-27
References: 242, 530

Anabaena ucrainica (Schkorb) Watanabe
825

Lake Sagami / Kanagawa (1991-08)
TAC 448, Unialgal, Clonal, Y.Niiyama (1991-08)
Identified by: M.Watanabe
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom
A48
Reference: 227

826

Lake Sagami / Kanagawa (1991-08)
TAC 449, Unialgal, Clonal, Y.Niiyama (1991-08)
Identified by: M.Watanabe
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom
A50
References: 83, 227

832

Hochimin / Vietnam (1998-12)
Unialgal, Clonal, R.Li (1998-12)
Identified by: R.Li
Culture conditions: CB, MG, 20° C, 22 µE/m² sec,
1M
Characteristics: Freshwater, Water bloom, Unstable
Ana V2

Anabaena variabilis Kützing ex Bornet et Flahault
23

IAM M-2, Axenic, Clonal
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec)
Characteristics: Freshwater, Non-heterocystous
variant
References: 4, 35, 36, 37, 50, 51, 52, 96, 242, 449,
475, 491

Anabaena viguieri Denis et Frémy
827

Shikata-futago-ike / Hyogo (1990-09)
TAC 433, Unialgal, Clonal, Y.Niiyama (1990-09)
Identified by: R.Li
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom

A23

ANABAENOPSIS Woloszynska: Cyanophyceae

Anabaenopsis circularis

(G.S.West) Woloszynska et Miller
21
IAM M-4, Axenic, Clonal, A.Watanabe
Identified by: Hirano
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]
Characteristics: Freshwater, Reidentified by
M.M.Watanabe, 16SrRNA gene (AB043537)
References: 4, 96, 242, 260, 354, 491, 497, 530

APHANIZOMENON Morren: Cyanophyceae

Aphanizomenon flos-aquae (Lemmermann) Ralfs
1258

Lake Suigetsu / Fukui (2000-12)
Unialgal, Clonal, T.Sano (2001-10)
Identified by: S.Otsuka
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
SUI-CT-1

Aphanizomenon flos-aquae (Lemmermann) Ralfs
f. *gracile* (Lemmermann) Elenkin

81
Lake Kasumigaura / Ibaraki (1978-01)
TAC 1, Axenic, Clonal, M.Watanabe (1978-02)
Identified by: M.Watanabe
Culture conditions: CB, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Indicator, Freshwater,
Unstable
K-TAN-1
References: 79, 227, 242, 256, 291, 438, 530, 559,
578

APHANOCAPSA Nägeli: Cyanophyceae

Aphanocapsa montana Cramer

416
Nikko / Tochigi (1987-04)
Unialgal, Non-clonal, F.Kasai (1987-04)
Identified by: M.M.Watanabe
Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
4M, (20° C, 12 µE/m² sec), [Cryopreserved]

- Characteristics: Freshwater
NK-24
References: 242, 454
- APIOCYSTIS** Nägeli in Kützing: Chlorophyceae
- Apiocystis brauniana* Nägeli
1020
Tsuchiura / Ibaraki (2002-02)
Unialgal, Clonal, M.Moriya (2002-03)
Identified by: M.Moriya
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater, Epiphytic
#115
- ARTHROSPIRA** Sitzenberger ex Gomont:
Cyanophyceae
- * *Arthrospira platensis* Gomont
See *Spirulina platensis* (Gomont) Geitler
- ASTERIONELLA** Hassall: Bacillariophyceae
- Asterionella glacialis* Castracane
265
Matoya Bay / Mie (1984-09)
Unialgal, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: f/2, 10° C, 25 µE/m² sec, 1M
Characteristics: Marine
MB-B-1
- 417
Maizuru Bay / Kyoto (1985-10)
Unialgal, Clonal, C.E.Riquelme (1985-10)
Identified by: C.E.Riquelme
Culture conditions: f/2, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine
- ASTEROCHLORIS**
Tschermak-Woess: Trebouxiophyceae
- Asterochloris* cf. *glomerata* (Warén) Friedl
1298
Nyuno, Kochi / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
- Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Cladia aggregata* (lichen) on humus,
Indicator
AYO4871
- 1299
Nyuno, Kochi / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Cladonia macilenta* (lichen) on
wood, Indicator
AYO4872
- 1300
Nyuno, Kochi / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Cladia aggregata* (lichen) on rock,
Indicator
AYO4874
- 1301
Nyuno, Kochi / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: S.Takeshita
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Cladia aggregata* (lichen) on soil,
Indicator
AYO4875
- ASTREPHOMENE** Pocock: Chlorophyceae
- Astrephomene gubernaculifera* Pocock
418
Kaisei / Kanagawa (1981-4)
Axenic, Clonal, H.Nozaki (1981-05)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-419,
atpB gene (AB014022-3), *rbcL* gene (D63428),

- psaA* gene (AB044233-4), *psaB* gene (AB044458),
psbC gene (AB044513-4),
rbcL-462 intron (AB076095)
1520-4 (-)
References: 242, 302, 323, 340, 337, 342, 344
- 419
Kaisei / Kanagawa (1981-4)
Axenic, Clonal, H.Nozaki (1981-05)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 12 µE/m²sec, 1M
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-418
1520-1 (+)
References: 242, 302
- 628
Hayama / Kanagawa (1980-12)
Unialgal, Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m²sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type -
1727-1(-)
Reference: 242
- 853
Emmet Co., Michigan / USA (1961-07)
UTEX 1392, Axenic, Clonal, A.E.Brooks (1962-06)
Reidentified by: H.Nozaki
Culture conditions: CB-V, 20° C, 22 µE/m²sec, 20D
Characteristics: Freshwater, Heterothallic, Reisolated
by H.Nozaki
Reference: 13
- 854
Monro Co., Indiana / USA (1962-10)
UTEX 1394, Unialgal, Clonal, A.E.Brooks (1962-10)
Identified by: A.E.Brooks
Culture conditions: VTAC, 20° C, 22 µE/m²sec, 20D
Characteristics: Freshwater, Heterothallic, Reisolated
by H.Nozaki, *atpB* gene (AB044181), *rbcL* gene
(AB044169-70), *psaA* gene (AB044235), *psaB*
gene (AB044459), *psbC* gene (AB044515-7)
References: 13, 337
- 855
Tulare Co., California / USA (1953-08)
UTEX 1398, Unialgal, Clonal, R.W.Nelson
(1965-04)
Identified by: A.E.Brooks
Culture conditions: VTAC, 20° C, 22 µE/m²sec, 20D
- Characteristics: Freshwater, Heterothallic, Reisolated
by H.Nozaki
Reference: 13
- Astrephomene perforata* Nozaki
564
Hayama / Kanagawa (1980-12)
UTEX 2474, Unialgal, Clonal, H.Nozaki (1981-06)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m²sec, 1M
Characteristics: Freshwater, Type strain,
Heterothallic, Isogamy, Mating type +,
Crosses with NIES-565, *atpB* gene (AB014024),
rbcL gene (D63429), *psaA* gene (AB044236-8),
psaB gene (AB044460), *psbC* gene (AB044518-9)
1620-3-2
References: 242, 302, 323, 337, 340, 342
- 565
Hayama / Kanagawa (1980-12)
UTEX 2475, Unialgal, Clonal, H.Nozaki (1981-06)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m²sec, 1M
Characteristics: Freshwater, Type strain,
Heterothallic, Isogamy, Mating type -,
Crosses with NIES-564
1620-4-1
References: 242, 302, 322
- AULOSIRA* Kirchner: Cyanophyceae
- Aulosira laxa* Kirchner ex Bornet et Flahault
50
Pusa / India
IAM M-128, Axenic, Non-clonal,
G.S.Venkataraman
Culture conditions: MDM(S), 20° C, 4 µE/m²sec,
4M, (25° C, 30 µE/m²sec), [Cryopreserved]
Characteristics: Freshwater, Nitrogen fixation,
M-128 as *Aulosira fertissima* in IAM,
Reidentified by M.M.Watanabe
References: 96, 242, 530
- BASICHLAMYS* Skuja: Chlorophyceae
- Basichlamys sacculifera* (Scherffel) Skuja
Syn. *Gonium sacculiferum* Scherffel
566
Fujisawa / Kanagawa (1983-08)
Unialgal, Clonal, H.Nozaki (1983-09)

Identified by: H.Nozaki

Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M

Characteristics: Freshwater, Akinete forming,
atpB gene (AB014015), *rbcL* gene (D63430),
psaA gene (AB044416), *psaB* gene (AB044467-8),
psbC gene (AB044526)

3907-1

References: 242, 306, 323, 326, 337, 340, 342

BOTRYDIOPSIS Borzi: Xanthophyceae

Botrydiopsis arrhiza Borzi

621

Shelford / England

CCAP 222/1B, Unialgal, George (1947)

Culture conditions: AF-6, 20° C, 32 µE/m² sec, 2M

Characteristics: Freshwater

BOTRYDIUM Wallroth: Xanthophyceae

Botrydium granulatum (L.) Greville

622

CCAP 805/3A, Axenic, Vischer (1939)

Culture conditions: AF-6, 20° C, 32 µE/m² sec, 2M

Characteristics: Freshwater

BOTRYOCOCCUS Kützing: Chlorophyceae

Botryococcus braunii Kützing

836

Imuta-ike Pond / Kagoshima (1997-06)

Unialgal, Clonal, F.Mori (1997-06)

Identified by: F.Mori

Culture conditions: AF-6, 20° C, 24 µE/m² sec, 4M

Characteristics: Freshwater

BRACHIOMONAS Bohlin: Chlorophyceae

Brachiomonas submarina Bohlin

375

Hachinohe Harbor / Aomori (1986-08)

Axenic, Clonal, T.Sawaguchi (1986-08)

Identified by: T.Sawaguchi

Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M

Characteristics: Marine, Brackish

86-SuHH-2

Reference: 242

CACHONINA Loeblich III: Dinophyceae

Cachonina niei Loeblich III

420

Iriomote Isl. / Okinawa (1986-01)

Axenic, Clonal, T.Sawaguchi (1986-02)

Identified by: T.Sawaguchi

Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M

Characteristics: Marine, Untransportable

IID-1

614

Kashiwazaki / Niigata (1986-08)

Unialgal, Clonal, T.Sawaguchi (1986-08)

Identified by: T.Sawaguchi

Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M

Characteristics: Marine, Untransportable

KSTH-29

CALCIDISCUS Kamptner: Prymnesiophyceae

Calcidiscus leptoporus Kamptner

(Murray et Blackman) Lebllich Jr et Tappan

1304

Hachijo Isl. / Tokyo (2002-01)

Unialgal, Clonal, M-H.Noël (2003-08)

Identified by: M-H.Noël

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D

Characteristics: Marine

MH34

1305

East China Sea (Kuroshio Current) (2003-08)

Unialgal, Clonal, M-H.Noël (2003-08)

Identified by: M-H.Noël

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D

Characteristics: Marine

MH68

1306

East China Sea (Kuroshio Current) (2003-08)

Unialgal, Clonal, M-H.Noël (2003-09)

Identified by: M-H.Noël

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D

Characteristics: Marine

MH70

1307

East China Sea (Kuroshio Current) (2003-08)

Unialgal, Clonal, M-H.Noël (2003-09)

Identified by: M-H.Noël

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
MH77

CALOTHRIX Agardh: Cyanophyceae

Calothrix brevis G.S. West
22

Palau Isl. (1941-09)
IAM M-7, Axenic, Non-clonal, A.Watanabe
Identified by: K.Negoro
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]
Characteristics: Freshwater, Nitrogen fixation
Chromatic adaptation
References: 96, 242, 382, 491

Calothrix crustacea Thuret ex Bornet et Flahault
266

Oshoro Bay / Hokkaido (1972-09)
IAM M-171, Unialgal, Clonal, M.M.Watanabe
(1972-09)
Identified by: M.M.Watanabe
Culture conditions: f/2, 20° C, 4 µE/m² sec, 6M,
(20° C, 12 µE/m² sec), [Cryopreserved]
Characteristics: Marine
References: 96, 242, 518, 534

Calothrix parasitica Thuret ex Bornet et Flahault
267

Oshoro Bay / Hokkaido (1972-07)
IAM M-172, Axenic, Clonal, M.M.Watanabe
(1972-07)
Identified by: M.M.Watanabe
Culture conditions: f/2, 20° C, 4 µE/m² sec, 6M,
(20° C, 12 µE/m² sec), [Cryopreserved]
Characteristics: Indicator, Marine, Endophyte
in *Nemalion* (Rhodophyceae)
References: 96, 242

334

Oshoro Bay / Hokkaido (1973-02)
IAM M-173, Unialgal, Clonal, M.M.Watanabe
(1973-02)
Identified by: M.M.Watanabe
Culture conditions: f/2, 20° C, 4 µE/m² sec, 6M,
(20° C, 12 µE/m² sec), [Cryopreserved]
Characteristics: Indicator, Marine, Endophyte
in *Codium* (Ulvophyceae)
References: 96, 242

Calothrix scopulorum Agardh ex Bornet et Flahault
268

Oshoro Bay / Hokkaido (1972-09)
IAM M-174, Unialgal, Clonal, M.M.Watanabe
(1972-09)
Identified by: M.M.Watanabe
Culture conditions: MKM(S), 20° C, 4 µE/m² sec,
6M, (20° C, 12 µE/m² sec), [Cryopreserved]
Characteristics: Indicator, Marine
References: 96, 242, 518, 534

CALYPTROSPHAERA Lohmann: Prymnesiophyceae

Calyptrosphaera sphaeroidea Schiller
997

Hikimoto Bay, Owase / Mie (2001-08)
Unialgal, Clonal, N.Hata (2001-08)
Identified by: M.Kawachi
Culture conditions: MNK, 22° C, 15 µE/m² sec, 10D
Characteristics: Marine
13K
Reference: 297

1308

Choutaro-ike Pond, Miyake Isl. / Tokyo (1999-11)
Unialgal, Clonal, M.Kawachi (1999-12)
Identified by: M.Kawachi
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide
MK18
Reference: 297

1309

Choutaro-ike Pond, Miyake Isl. / Tokyo (1999-11)
Unialgal, Clonal, M.Kawachi (1999-12)
Identified by: M.Kawachi
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide
MK21
Reference: 297

CARTERIA Diesing: Chlorophyceae

Carteria cerasiformis Nozaki et al.
424

Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, S.Suda (1983-08)
Reidentified by: H.Nozaki et al.
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as

- Carteria inversa* (Korshikov) Bourrelly,
rbcL gene (D89767)
Kas-10
References: 242, 319, 327
- 425
Tsukuba / Ibaraki (1985-11)
Axenic, Clonal, S.Suda (1985-11)
Reidentified by: H.Nozaki et al.
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Carteria inversa (Korshikov) Bourrelly, Type
strain of *Carteria cerasiformis* Nozaki et al.,
atpB gene (AB084321), *rbcL* gene (D89768),
psaB gene (AB084359)
w-8-15
References: 242, 319, 327, 342
- Carteria crucifera* Korshikov ex Pascher
421
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: CYT, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB084320),
rbcL gene (D63431), *psaB* gene (AB084358)
SIST3-1
References: 242, 319, 323, 327, 342
- 630
New Haven / USA
UTEX 432, Unialgal, Clonal, R.A.Lewin
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, *rbcL* gene (D89758)
References: 242, 319, 327
- Carteria eugametos* Mitra
631
Saiwai-ku / Kawasaki (1990-10)
Unialgal, Clonal, H.Nozaki (1991-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic, Isogamy,
rbcL gene (D89762)
91-409-1
References: 242, 317, 327
- 632
Saiwai-ku / Kawasaki (1990-10)
Unialgal, Clonal, H.Nozaki (1991-04)
Identified by: H.Nozaki
- Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic, Isogamy,
rbcL gene (D89763)
91-421-4
References: 242, 317, 319, 327
- 633
Shirako / Chiba (1991-03)
Unialgal, Clonal, H.Nozaki (1991-05)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic, Isogamy,
rbcL gene (D89764)
91-504-1
References: 242, 317, 319, 327
- 634
UTEX 2161, Unialgal, Clonal, B.Vandover (1972)
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic, Isogamy,
rbcL gene (D89761)
References: 242, 319, 327
- 635
Allahabad / India
UTEX 233, Unialgal, Clonal, O.Pringsheim
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Type strain of *Carteria
eugametos* Mitra, *rbcL* gene (D89759)
References: 242, 319, 327
- 636
California / USA
UTEX 1032, Unialgal, Clonal, A.Waters
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Formerly identified as
Carteria olivieri G. S. West (Starr and Zeikus
1993), *rbcL* gene (D89760)
References: 242, 319, 327
- Carteria inversa* (Korshikov) Bourrelly
422
Tsukuba / Ibaraki (1982-11)
Axenic, Clonal, F.Kasai (1982-11)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 3M
Characteristics: Freshwater, *rbcL* gene (D89765)
134-4
References: 242, 319, 327

- 423
Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Erata (1983-08)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 3M
Characteristics: Freshwater, *rbcL* gene (D89766)
106
References: 242, 319, 327
- * *Carteria inversa* (Korshikov) Bourrelly
424
See *Carteria cerasiformis* Nozaki et al.
- * *Carteria inversa* (Korshikov) Bourrelly
425
See *Carteria cerasiformis* Nozaki et al.
- Carteria klebsii* (Dangeard) Francé
426
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
SIST7-4
Reference: 242
- Carteria multifilis* (Fresenius) Dill
427
Kashiwa / Chiba (1986)
Axenic, Clonal, M.M.Watanabe (1986)
Identified by: S.Suda
Culture conditions: VT, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
Ca1-2
Reference: 242
- Carteria obtusa* Dill
428
Kashiwa / Chiba (1986-09)
Axenic, Clonal, M.M.Watanabe (1986-09)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB084323),
rbcL gene (D89769), *psaB* gene (AB084361-3)
Ca-2-1
References: 242, 327, 342
- 429
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, M.Kasama (1986-03)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
SIS5-20
Reference: 242
- 430
Kashiwa / Chiba (1986-09)
Axenic, Clonal, M.M.Watanabe (1986-09)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
Ca2-3
Reference: 242
- 431
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
SIST6-3
Reference: 242
- Carteria radiosa* Korshikov ex Pascher
432
Tsukuba / Ibaraki (1985-11)
Axenic, Clonal, S.Suda (1985-11)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB084322),
rbcL gene (D89770), *psaB* gene (AB084360)
w-5-2
References: 242, 327, 342
- CERATIUM** Schrank: Dinophyceae
- Ceratium fusus* (Ehrenberg) Dujardin
899
Tokyo Bay / Tokyo (2000-06)
Unialgal, Clonal, M.Kawachi (2000-07)
Identified by: M.Kawachi
Culture conditions: f/2, 20° C, 40 µE/m² sec, 1M
Characteristics: Marine, Red tide, Untransportable
- Ceratium hirundinella* (O.F.Müller) Schrank
376
Lake Hinuma / Ibaraki (1986-06)
Unialgal, Clonal, M.M.Watanabe (1986-06)
Identified by: M.M.Watanabe
Culture conditions: URO, 20° C, 32 µE/m² sec, 1M
Characteristics: Brackish, Freshwater, Unstable,

Untransportable
860627-10

CHAETOCEROS Ehrenberg: Bacillariophyceae

Chaetoceros didymus Ehrenberg

586
Hitachi / Ibaraki (1990-09)
Unialgal, Non-clonal, S.Ono (1990-10)
Identified by: S.Ono
Culture conditions: f/2, 15° C, 10 µE/m² sec, 1M
Characteristics: Red tide, Marine
St-4

Chaetoceros sociale Lauder

377
Shitaru Harbor / Shizuoka (1985-05)
Unialgal, Clonal, T.Sawaguchi (1985-05)
Identified by: T.Sawaguchi
Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M
Characteristics: Marine
STHB-4

553

Tokyo Bay / Tokyo (1991-10)
Unialgal, Clonal, S.Ono (1991-10)
Identified by: S.Ono
Culture conditions: f/2, 10° C, 25 µE/m² sec, 2M
Characteristics: Red tide, Marine
T-1

CHAMAESIPHON Braun et Grunow emend. Geitler:
Cyanophyceae

Chamaesiphon polymorphus Geitler

433
Lake Mashu / Hokkaido (1987-09)
Unialgal, Non-clonal, F.Kasai (1987-09)
Identified by: M.M.Watanabe
Culture conditions: CSi, 10° C, 6 µE/m² sec, 2M,
(10° C, 15 µE/m² sec)
Characteristics: Freshwater
M-29
References: 242, 454, 455

Chamaesiphon subglobosus Lemmermann

434
Miyata River / Ibaraki (1987-03)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: N.Takamura

Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
3M, (20° C, 12 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater

2st-2-1

References: 242, 453, 454, 455

CHARACIOCHLORIS Pascher: Chlorophyceae

Characiochloris acuminata Lee et Bold

637
E1 Tahin. Prov. Omo-Saber / Egypt
UTEX 2095, Unialgal, Clonal, F.Hindak (1963)
Identified by: K.W.Lee & H.C.Bold
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Type strain
References: 242, 316

Characiochloris sasae Nozaki

567
Saiwai-ku, Kawasaki / Kanagawa (1990-10)
Unialgal, Clonal, H.Nozaki (1991-01)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Type strain,
Aplanospore forming, *atpB* gene (AB084331),
rbcL gene (AB084338), *psaB* gene (AB084376)
91-0106-1
References: 242, 316, 342

638

Saiwai-ku, Kawasaki / Kanagawa (1990-10)
Unialgal, Clonal, H.Nozaki (1991-01)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Aplanospore forming,
Endemic in Japan
91-0106-6
References: 242, 316

CHARACIUM A.Braun: Chlorophyceae

Characium angustum A.Braun

639
Kinu River / Tochigi (1987-08)
Unialgal, F.Kasai (1987-09)
Identified by: F.Kasai
Culture conditions: C, 15° C, 6 µE/m² sec, 4M,
(15° C, 15 µE/m² sec)
Characteristics: Freshwater, 18SrDNA analysis

- showed close relationship to *Lobocharacium*
AK-5-2
References: 242, 454
- Characium maximum*** S.Watanabe
154
Sasebo / Nagasaki (1975-08)
Unialgal, Non-clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Soil, Habitat: Garden Shrine
where *Cryptomeria japonica* was planted
6-EBO-2
References: 242, 548
- Characium polymorphum*** Printz
436
Between Ghorepani and Billethadi / Nepal
(1965-12)
IAM C-340, Unialgal, Clonal, T.Ichimura (1969-07)
Identified by: T.Ichimura
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
N-76-0
References: 96, 242
- CHATTONELLA** Biecheler: Raphidophyceae
- Chattonella antiqua*** (Hada) Ono
1
Harima-Nada / Seto Inland Sea (1978-09)
Axenic, Clonal, M.M.Watanabe (1978-09)
Identified by: M.M.Watanabe
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine, Untransportable,
COXI gene (AF037990)
Ho-1
References: 27, 81, 105, 109, 110, 111, 112, 113, 114,
175, 202, 204, 229, 261, 272, 273, 274, 275, 276,
277, 278, 279, 280, 281, 282, 292, 462, 537, 566,
570
- 2
Osaka Bay / Osaka (1982-09)
Axenic, Clonal, S.Yamochi
Identified by: S.Yamochi
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
- Characteristics: Red tide, Marine, Untransportable
OCH-a
Reference: 81
- 83
Off Hiketa / Seto Inland Sea (1977-08)
Axenic, Clonal, C.Ono
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-2
References: 81, 482
- 84
Off Hiketa / Seto Inland Sea (1972)
Axenic, Clonal, T.Okaichi
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-6-1
Reference: 81
- 85
Shodo Isl. / Kagawa (1978-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine, Untransportable
KGW-8-5
References: 81, 82
- 86
Uranouchi Bay / Kochi (1980-11)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine, Untransportable
KGW-42-4
References: 81, 82, 482
- 113
Naoshima Isl. / Kagawa (1982-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-59-2
References: 6, 81
- 114
Harima-Nada / Seto Inland Sea (1983-08)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-74-8

- References: 81, 557
- 161
Hiroshima Bay / Hiroshima
Axenic, Clonal
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
Hiroshima-70
References: 64, 65
- 557
Hiroshima Bay / Hiroshima (1970-09)
Axenic, Clonal, H.Takayama (1970-09)
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
- 558
Mikawa Bay / Aichi
Axenic, Clonal, S.Toriumi
Identified by: S.Toriumi
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
- Chattonella marina* (Subrahmanyam) Hara et Chihara
3
Osaka Bay / Osaka (1982-08)
Axenic, Clonal, S.Yamochi (1982-08)
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
OCH-m
References: 461, 462, 482
- 14
Harima-Nada / Seto Inland Sea (1983-02)
Axenic, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
H-53-11
References: 81, 557
- 115
Kinko Bay / Kagoshima (1978-06)
Axenic, Clonal, Aramaki/Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine, Untransportable
KGW-9-1
Reference: 81
- 116
Harima-Nada / Seto Inland Sea (1981-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-46-7
Reference: 81
- 117
Naoshima Isl. / Kagawa (1982-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-58-3
Reference: 81
- 118
Harima-Nada / Seto Inland Sea (1983-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-75-2
References: 65, 81, 82, 396, 482
- 121
Kagoshima Bay / Kagoshima (1982)
Axenic, Clonal, T.Aramaki (1982)
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGO-57-1
References: 81, 82, 283, 482
- 559
Maizuru Bay / Kyoto (1975-10)
Axenic, Clonal, H. Takayama (1975-10)
Identified by: S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
- Chattonella minima* Y.Hara et Chihara
848
Kii Channel / Tokushima (1983-09)
Unialgal, Clonal, M.Yoshida (1983-09)
Identified by: Y.Hara
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine, Red tide, Type strain,
Untransportable
Reference: 65
- Chattonella ovata* Hara et Chihara
603
Harima-Nada / Seto Inland Sea (1984-04)
Axenic, Clonal, I.Imai
Identified by: H.Nozaki

Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine, Untransportable
References: 63, 65

671

Harima-Nada / Seto Inland Sea (1982-07)
Axenic, Clonal, S.Yoshimatsu (1982-07)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable

849

Hiroshima Bay / Hiroshima
Unialgal, Clonal, H.Takayama
Identified by: Y.Hara
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine, Red tide, Type strain,
Untransportable
Reference: 65

Chattonella verruculosa Hara et Chihara

670

Harima-Nada / Seto Inland Sea (1987-07)
Unialgal, Clonal, S.Yoshimatsu (1987-07)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
Reference: 65

850

Shodo Isl. / Kagawa (1989-01)
Unialgal, Clonal, S.Yoshimatsu (1989-01)
Identified by: Y.Hara
Culture conditions: f/2, ESM, 15° C, 15 µE/m² sec,
20D
Characteristics: Marine, Red tide, Untransportable

CHILOMONAS Ehrenberg: Cryptophyceae

Chilomonas paramecium Ehrenberg

715

Sugadaira / Nagano (1985-11)
Axenic, Clonal, M.Erata (1985-11)
Identified by: M.Erata
Culture conditions: CYT, 15° C, 6 µE/m² sec, 1M
Characteristics: Freshwater,
18SrRNA gene (AB073108)
#00210
References: 29, 457

766

Lake Jusan-ko / Aomori (1987-07)
Unialgal, Clonal, M.Erata (1987-07)
Identified by: M.Erata
Culture conditions: CYT, 15° C, 6 µE/m² sec, 1M
Characteristics: Freshwater
#00318

767

Lake Jusan-ko / Aomori (1987-07)
Unialgal, Clonal, M.Erata (1987-07)
Identified by: M.Erata
Culture conditions: CYT, 15° C, 6 µE/m² sec, 1M
Characteristics: Freshwater
#00319

CHLAMYDOMONAS Ehrenberg: Chlorophyceae

Chlamydomonas augustae Skuja

var. *ellipsoidea* S.Watanabe

158

Sumatra / Indonesia (1979-08)
Axenic, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Soil
ASE-242
References: 166, 242, 548, 549

Chlamydomonas coccoides Butcher

1021

Osaka Bay, Kobe / Hyogo (2000-11)
Unialgal, Clonal, M.Moriya (2000-12)
Identified by: M.Moriya
Culture conditions: ESM, 20° C, 12 µE/m² sec, 1M
Characteristics: Marine
#95

Chlamydomonas debaryana Goroschankin

var. *crystata* Ettl

884

Nordmähren / Czech
UTEX 1134, Unialgal, Clonal
Culture conditions: C, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Type strain, *atpB* gene
(AB014034), *rbcL* gene (D86838), *psaA* gene
(AB044417-8), *psaB* gene (AB044469), *psbC*
gene (AB044527)
References: 324, 337, 340

Chlamydomonas fasciata Ettl

437

Tsukuba / Ibaraki (1984-05)

Axenic, Clonal, S.Suda (1984-05)

Identified by: S.Suda

Culture conditions: C, 20° C, 22 µE / m² sec, 2M

Characteristics: Freshwater

H-3-4-2

Reference: 242

Chlamydomonas kuwadae Geiloff

968

Lake Nojiri / Nagano (1989-12)

Unialgal, Clonal, H. Nozaki (1990-01)

Identified by: H. Nozaki

Culture conditions: C, 20° C, 22 µE / m² sec, 1M

Characteristics: Freshwater, *atpB* gene (AB084318),

rbcl gene (AB084334), *psaB* gene (AB084356)

92-514-H-13

Reference: 342

Chlamydomonas monadina Stein var. *monadina*

438

Lake Kasumigaura / Ibaraki (1983-07)

Axenic, Clonal, S.Suda (1983-07)

Identified by: S.Suda

Culture conditions: C, 20° C, 22 µE / m² sec, 2M

Characteristics: Freshwater

Kas-7

Reference: 242

Chlamydomonas monticola S.Watanabe

157

Mt. Shiroumadake / Nagano (1980-08)

Unialgal, Clonal, S.Watanabe

Identified by: S.Watanabe

Culture conditions: C(S), 20° C, 4 µE / m² sec, 3M,

(25° C, 30 µE / m² sec)

Characteristics: Soil

KUC80-4

References: 242, 378, 548

* *Chlamydomonas neglecta* (Pascher) Korshikov

See *Chlorogonium neglectum* Pascher

Chlamydomonas noctigama Korschikov

1048

Neuglobsow, Brandenburg / Germany (2001-08)

Unialgal, Clonal, H.Nozaki (2001-08)

Identified by: H.Nozaki

Culture conditions: AF-6, 20° C, 22 µE / m² sec, 2M

Characteristics: Freshwater, *atpB* gene (AB101502),

rbcl gene (AB101506-7), *psaB* gene (AB101513)

2001-814-C10

Reference: 338

Chlamydomonas parkeae Ettl

440

Izumi Bay / Nagasaki (1986-03)

Unialgal, Clonal, S.Suda (1986-03)

Identified by: S.Suda

Culture conditions: f/2, 20° C, 22 µE / m² sec, 2M

Characteristics: Marine

I-29

References: 176, 242, 403, 410

1022

Mitsu Bay, Akitsu / Hiroshima (2001-03)

Unialgal, Clonal, M.Moriya (2001-03)

Identified by: M.Moriya

Culture conditions: ESM, 20° C, 12 µE / m² sec, 1M

Characteristics: Marine

#97

Chlamydomonas pulsatilla Wollenweber

122

Muroran / Hokkaido (1966-05)

IAM C-385, Axenic, Clonal, T.Ichimura (1966-05)

Identified by: T.Ichimura

Culture conditions: P35, 20° C, 4 µE / m² sec, 2M,

(25° C, 30 µE / m² sec)

Characteristics: Freshwater

MKF-50

References: 95, 96, 139, 242, 530, 549

Chlamydomonas tetragama (Bohlin) Ettl

446

Tsuchiura / Ibaraki (1985-04)

Axenic, Clonal, S.Suda (1985-04)

Identified by: S.Suda

Culture conditions: C, 20° C, 22 µE / m² sec, 2M

Characteristics: Freshwater, Neotype strain of

Chlamydomonas tetragama (Bohlin) Ettl,

Formerly identified as *Chlorogonium*

metamorphum Skuja, *atpB* gene (AB084319),

rbcl gene (AJ001880), *psaB* gene (AB084357)

413D4-4

References: 242, 320, 339, 342, 483

CHLORARACHNION Geitler: Chlorarachniophyceae

Chlorarachnion reptans Geitler

624

Puerto Penasco / Mexico

CCAP 815/1, Unialgal, Norris (1966)

Culture conditions: ESM, 20° C, 32 µE/m² sec, 2M

Characteristics: Marine

CHLORELLA Beijerinck: Trebouxiophyceae

* *Chlorella fusca* Shihira et Krauss var. *fusca*

See *Scenedesmus abundans* Kessler et al.

Chlorella protothecoides (Krüger) Kalina

629

Watarase River / Gunma (1987-08)

Unialgal, Clonal, F.Kasai (1987-08)

Identified by: F.Kasai

Culture conditions: C, 15° C, 6 µE/m² sec, 6M,
(15° C, 15 µE/m² sec)

Characteristics: Freshwater, 18SrDNA analysis
showed close relationship to *Lobosphaera*
tirolensis (ASIB S234)

AT1-7

References: 242, 454

* *Chlorella pyrenoidosa* Chick

See *Graesiella emersonii*

(Shihira et Kraus) Nozaki et al.

Chlorella saccharophila (Krueger) Migula

640

Otarunai River / Hokkaido (1987-07)

Unialgal, F.Kasai (1987-07)

Identified by: F.Kasai

Culture conditions: C, 10° C, 6 µE/m² sec, 6M,
(10° C, 15 µE/m² sec)

Characteristics: Freshwater, 18SrDNA analysis
showed close relationship to *C. Saccharophila*
(SAG 211-9a)

Tst-8-2

References: 242, 454

Chlorella vulgaris Beijerinck var. *vulgaris*

227

IAM C-30, Axenic, Clonal, A.Watanabe

Reidentified by: H.Nozaki

Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)

Characteristics: Freshwater, *COXI* gene (D63763,
AB011523)

References: 76, 96, 117, 155, 168, 228, 242, 244, 329,
365, 405, 481, 491, 500, 549, 576

641

Miyata River / Ibaraki (1987-02)

Unialgal, Clonal, F.Kasai (1987-03)

Identified by: F.Kasai

Culture conditions: C, 20° C, 8 µE / m² sec, 6M

Characteristics: Freshwater, 18SrDNA analysis
showed close relationship to NIES-686

1st-3-26

References: 242, 453, 454

642

Miyata River / Ibaraki (1987-02)

Unialgal, Clonal, F.Kasai (1987-03)

Identified by: F.Kasai

Culture conditions: C, 20° C, 8 µE / m² sec, 6M

Characteristics: Freshwater, 18SrDNA analysis
showed close relationship to NIES-686

1st-2-17

References: 242, 453, 454

686

Delft / Holland

IAM C-207 (= CCAP 211/11b = SAG 211-11b),

Unialgal, Clonal, M.W.Beijerinck (1892)

Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)

Characteristics: Freshwater, Type strain

References: 242, 329

Chlorella sp.

1269

Banzu Salt Marsh, Kisarazu / Chiba (2002-05)

Unialgal, Clonal, M.Moriya (2002-06)

Identified by: M.Moriya

Culture conditions: ESM, 20° C, 20 µE/m² sec, 1M

Characteristics: Marine

M-56

CHLOROGONIUM Ehrenberg: Chlorophyceae

Chlorogonium capillatum Nozaki et al.

692

Miyatoko Mire / Fukushima (1992-04)

Axenic, Clonal, H.Nozaki (1992-05)

Identified by: H.Nozaki

Culture conditions: AF-6, 10° C, 25 µE/m² sec, 1M

Characteristics: Freshwater, Type strain,

Monoecious, Isogamy, Paedogamy,

- rbcL* gene (AB010230)
92-912-1
References: 242, 339
- 742
Czechoslovakia
UTEX 201, CCAP 12/4, Unialgal, Clonal, H.Meyer
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium tetragamum Bohlin, *rbcL* gene
(AB010234)
Reference: 339
- 743
Leveret, MA / USA
UTEX 1643, Unialgal, Clonal, P.Kugrens
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium tetragamum Bohlin, *rbcL* gene
(AB010235)
Reference: 339
- 744
Germany
UTEX 2160, Unialgal, Clonal
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010236)
Reference: 339
- 745
Berlin / Germany
CCAP 12/2A, Unialgal, Clonal, Hartmann
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium elongatum Dangeard, *rbcL* gene
(AB010231)
Reference: 339
- 746
Cape Flats / South Africa
CCAP 12/2B, Unialgal, Clonal, George (1948)
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium elongatum Dangeard, *rbcL* gene
(AB010232)
Reference: 339
- 747
CCAP 12/5, Unialgal, Clonal, E.G.Pringsheim
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010233)
Reference: 339
- 748
near Prague / Czechoslovakia
SAG 12-2e, Unialgal, Clonal, E.G.Pringsheim (1936)
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium elongatum (Dangeard) Dangeard,
rbcL gene (AB010237)
Reference: 339
- 749
SAG 47.84, Unialgal, Clonal, L.Provasoli
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium euchlorum Ehrenberg, *rbcL* gene
(AB010238)
Reference: 339
- 750
Leveret, MA / USA
SAG 4.93, Unialgal, Clonal, P.Kugrens
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium tetragamum Bohlin, *rbcL* gene
(AB010239)
Reference: 339
- Chlorogonium elongatum* (Dangeard) Dangeard
751
Caldbeck / U.K.
IAM C-293, UTEX 204, Unialgal, Clonal,
E.G.Pringsheim
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 μE/m² sec, 2M
Characteristics: Freshwater, Formerly identified as
Chlorogonium acus, *rbcL* gene (AJ001881)
Reference: 339
- 752
Austin, TX / USA
UTEX 2571, Unialgal, Clonal, M.Wood (1990)
Reidentified by: H.Nozaki

- Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010240)
 Reference: 339
- 753
 Austin, TX / USA
 UTEX 2572, Unialgal, Clonal, M.Wood (1990)
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010241)
 Reference: 339
- Chlorogonium euchlorum* (Ehrenberg) Ehrenberg
 754
 Schickley, NE / USA
 UTEX 1639, Unialgal, Clonal, P.Kugrens
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium elongatum Dangeard, *rbcL* gene
 (AB010226)
 Reference: 339
- 755
 Germany
 UTEX 2010, Unialgal, Clonal, D.G.Müller
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010227)
 Reference: 339
- 756
 Germany
 UTEX 2011, Unialgal, Clonal, D.G.Müller
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010228)
 Reference: 339
- 757
 Amiens / France
 CCAP 12/2C, Unialgal, Clonal, E.G.Pringsheim
 (1949)
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium elongatum (Dangeard) Dangeard,
rbcL gene (AB010224)
- Reference: 339
- 758
 Hirschberg / former Czechoslovakia
 CCAP 12/3, Unialgal, Clonal, Mainx (1936)
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium euchlorum Ehrenberg, *rbcL* gene
 (AJ001882)
 Reference: 339
- 759
 CCAP 12/6, Unialgal, Clonal, E.G.Pringsheim
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., *rbcL* gene (AB010225)
 Reference: 339
- 760
 Cape Flats / South Africa
 SAG 12-2d, Unialgal, Clonal, E.G.Pringsheim (1951)
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium elongatum (Dangeard) Dangeard,
rbcL gene (AB010229)
 Reference: 339
- Chlorogonium fusiforme* Matvienko
 123
 Niseko / Hokkaido (1964-07)
 IAM C-349, Axenic, Clonal, T.Ichimura (1964-07)
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 4 µE/m² sec, 2M,
 (25° C, 30 µE/m² sec)
 Characteristics: Freshwater, Homothallic, Formerly
 identified as *Chlorogonium metamorphum* Skuja,
atpB gene (AB084329), *rbcL* gene (AB010242),
psaB gene (AB084370)
 MKF-14
 References: 96, 242, 320, 339, 342
- Chlorogonium kasakii* Nozaki
 761
 Cambria / U.K.
 CCAP 12/8, Unialgal, Clonal, Jaworski
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Formerly identified as
Chlorogonium sp., Type strain, *rbcL* gene

(AB010244)
Reference: 339

* *Chlorogonium metamorphum* Skuja
123
See *Chlorogonium fusiforme* Matwienko

* *Chlorogonium metamorphum* Skuja
446
See *Chlamydomonas tetragama* (Bohlin) Ettl

Chlorogonium neglectum Pascher
Syn. *Chlamydomonas neglecta* (Pascher) Korshikov
439

Tsukuba / Ibaraki (1984-05)
Axenic, Clonal, S.Suda (1984-05)
Reidentified by: H.Nozaki
Culture conditions: C, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB084326),
rbcL gene (AB010243), *psaB* gene (AB084366)
T-4-19
References: 129, 242, 339, 342

CHLOROMONAS Gobi emend. Wille: Chlorophyceae

Chloromonas insignis (Anachin) Gerloff et Ettl
447
Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, S.Suda (1983-08)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB084313),
rbcL gene (AB022226), *psaB* gene (AB084348)
Kas-8
References: 242, 245, 342

CHLOROSARCINOPSIS Herndon: Chlorophyceae

Chlorosarcinopsis caeca S.Watanabe
160
Tottori (1972-05)
Unialgal, Non-clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Soil
TOT-24
References: 242, 548

Chlorosarcinopsis delicata S.Watanabe
153
Kyoto / Kyoto (1975-04)
Unialgal, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Soil
KUC3-6
References: 242, 548

CHROOGLOEOCYSTIS I.I.Brown et Cooksey:
Cyanophyceae

Chroogloeoecystis siderophila I.I.Brown et Cooksey
1031
LaDuke Hot Spring, Montana / USA (2001-07)
Unialgal, Clonal, I.I.Brown (2001-12)
Identified by: I.I.Brown and D.Mummey
Culture conditions: DH+Fe, 25° C, 15 µE/m² sec, 3M
Characteristics: Freshwater, Biofilm process,
Thermophilic, 16SrRNA gene (AY380791)
5.2 s.c.1

CHROOMONAS Hansgirg: Cryptophyceae

Chroomonas caudata Geitler
712
Funada-ike / Chiba (1985-09)
Unialgal, Clonal, M.Erata (1985-09)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00171
Reference: 31

Chroomonas coerulea (Geitler) Skuja
713
Sugadaira / Nagano (1985-11)
Unialgal, Clonal, M.Erata (1985-11)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00191
References: 29, 31

714
Sugadaira / Nagano (1985-11)
Unialgal, Clonal, M.Erata (1985-11)
Identified by: M.Erata

Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00217
References: 29, 31, 32

1004

Tomakomai / Hokkaido (1999-11)
Unialgal, Clonal, M.Moriya (1999-11)
Identified by: M.Moriya
Culture conditions: AF-6, 15° C, 20 µE/m² sec, 2M
Characteristics: Freshwater
#74

Chroomonas collegionis Butcher
703

River Thames, Essex / U.K.
CCAP 978/11, Unialgal, Clonal, B.W.Butcher (1961)
Identified by: B.W.Butcher
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine, Type strain

Chroomonas dispersa Butcher
704

Bristol Channel / U.K.
CCAP 978/10, Unialgal, Clonal, B.W.Butcher
(1960-08)
Identified by: B.W.Butcher
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine, Type strain

Chroomonas nordstedtii Hansgirg
706

Sugadaira / Nagano (1976-09)
Axenic, Clonal, I.Inouye (1976-09)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00165
References: 29, 30, 31

707

Funada-ike / Chiba (1985-09)
Unialgal, Clonal, M.Erata (1985-09)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00173
References: 31, 32

708

Sapporo / Hokkaido (1987-09)
Unialgal, Clonal, M.Erata (1987-09)

Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00324
Reference: 31

709

Sapporo / Hokkaido (1987-09)
Unialgal, Clonal, M.Erata (1987-09)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00330
Reference: 31

710

Sapporo / Hokkaido (1987-09)
Unialgal, Clonal, M.Erata (1987-09)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00331
Reference: 31

711

Mitsukaido / Ibaraki (1987-01)
Unialgal, Clonal, S.Suda (1987-12)
Identified by: M.Erata
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00354

Chroomonas placoidea Butcher
705

Yorkshire / U.K.
CCAP 978/8, Unialgal, Clonal, B.W.Butcher (1959)
Identified by: B.W.Butcher
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine, Type strain
Reference: 30

CHRYSOCHROMULINA Lackey: Pymnesiophyceae

Chrysochromulina hirta Manton
741

Chiba Port / Chiba (1986-06)
Unialgal, Clonal, M.Kawachi (1986-07)
Identified by: M.Kawachi
Culture conditions: ESM, 15° C, 35 µE/m² sec, 1M
Characteristics: Marine, Unstable, Untransportable
CH1

Chrysochromulina parva Lackey
562

NIES / Tsukuba (1992-02)
Unialgal, Clonal, N.Hatakeyama (1992-03)
Identified by: M.Kawachi
Culture conditions: AF-6, 15° C, 35 µE/m² sec, 1M
Characteristics: Freshwater, Unstable,
Untransportable

Chrysochromulina quadrikonta Kawachi et Inouye
998

Toba / Mie (2001-01)
Unialgal, Clonal, N.Hata (2001-01)
Identified by: I.Inouye
Culture conditions: MNK, 22° C, 15 µE/m² sec, 10D
Characteristics: Marine, Red tide
CQ13T

CLOSTERIUM Nitzsch: Charophyceae

Closterium acerosum Ehrenberg ex Ralfs
124

Daramshara / Nepal (1965-10)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
N-20-1
References: 91, 242

125

Rukumkot / Nepal (1965-10)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater,
18SrRNA gene (AF352230)
N-25-22
References: 25, 91, 242

127

Sapporo / Hokkaido
IAM C-435, Axenic, Clonal, Y.Nishihama
Identified by: Y.Nishihama
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater, Homothallic
H-2-2

References: 91, 96, 242

448

IAM C-314, UTEX 1075, Axenic, Clonal
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
References: 96, 242

Closterium aciculare T.West
var. *subpronum* W. et G.S.West
258

Lake Biwa / Shiga (1983-12)
Axenic, Clonal, M.M.Watanabe (1983-12)
Identified by: M.M.Watanabe
Culture conditions: CA, 20° C, 32 µE/m² sec, 2M
Characteristics: Water bloom, Freshwater,
Heterothallic, Mating type +, Crosses with
NIES-259 and NIES-260
Bca-25
References: 21, 242

259

Lake Biwa / Shiga (1983-12)
Axenic, Clonal, M.M.Watanabe (1983-12)
Identified by: M.M.Watanabe
Culture conditions: CA, 20° C, 32 µE/m² sec, 2M
Characteristics: Water bloom, Freshwater,
Heterothallic, Mating type -, Crosses with
NIES-258
Bca-26
Reference: 242

Closterium calosporum Wittrock var. *calosporum*
271

Vermont / U.S.A.
IAM C-318, Unialgal, Clonal, P.W.Cook
Culture conditions: AF-6, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater,
18SrRNA gene (AF352225)
References: 25, 96, 102, 242, 502, 503

Closterium calosporum Wittrock
var. *galiciense* Gutwinski

128

Ibaraki
Axenic, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)

Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-162
IB-21-20
Reference: 242

162
Ibaraki
Unialgal, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(25° C, 15 μ E/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-128, NIES-163
and NIES-168
IB-21-21
Reference: 242

163
Ginama / Okinawa (1973-06)
IAM C-455, Axenic, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(20° C, 25 μ E/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-162, NIES-164
and NIES-165
R-5-3
References: 102, 242, 502, 503

164
Ginama / Okinawa (1973-06)
IAM C-454, Unialgal, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(20° C, 25 μ E/m² sec)
Characteristics: Freshwater, Heterothallic
Mating type +, Crosses with NIES-163 and
NIES-166
R-5-2
References: 102, 242, 502, 503

165
Iriomote Isl. / Okinawa (1973-03)
IAM C-457, Axenic, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(25° C, 15 μ E/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-163, NIES-166
and NIES-168, 18SrRNA gene (AF352239)
R-11-6

References: 25, 102, 242, 502, 503

166
Kagawa-cho / Kagawa (1974-09)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(20° C, 25 μ E/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-164, NIES-165
and NIES-167
J5-56-11
Reference: 242

167
Kagawa-cho / Kagawa (1974-09)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(20° C, 25 μ E/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-166
J5-56-12
Reference: 242

168
Iriomote Isl. / Okinawa (1973-03)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(20° C, 25 μ E/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-165
R-11-5
References: 102, 242, 502, 503

Closterium calosporum Wittrock
var. *himalayense* M.Watanabe

169
Shewaden / Nepal (1972-06)
Axenic, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
(20° C, 25 μ E/m² sec)
Characteristics: Freshwater, Homothallic
N-134-5
References: 242, 502, 503

170
Suke / Nepal (1972-06)
Unialgal, Clonal, M.M.Watanabe

Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Homothallic,
18SrRNA gene (AF352229)
N-143-19
References: 25, 242

171

Suke / Nepal (1972-06)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Homothallic
N-147-3
References: 157, 242, 502

336

Suke / Nepal (1972-06)
Axenic, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 22° C, 15 µE/m² sec, 2M
Characteristics: Freshwater, Homothallic
N-147-12
References: 242, 502

Closterium ehrenbergii Meneghini ex Ralfs

228

Ebina / Kanagawa (1975-12)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(25° C, 15 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Mating group B
Crosses with NIES-229
KK-33-1
References: 54, 55, 56, 78, 93, 94, 97, 98, 100, 116,
157, 158, 176, 242, 347

229

Ebina / Kanagawa (1975-12)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type -, Mating group B
Crosses with NIES-228
KK-33-6

References: 54, 55, 56, 78, 93, 94, 97, 98, 100, 157,
158, 242, 347, 348

Closterium gracile Brébisson ex Ralfs

179

Kathmandu / Nepal (1968-05)
IAM C-444, Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-180
N-90-58
References: 91, 96, 242

180

Kathmandu / Nepal (1968-05)
IAM C-445, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type -, Crosses with NIES-179,
18SrRNA gene (AF352237)
N-90-59
References: 25, 91, 96, 242

Closterium incurvum Brébisson

181

Dhorpatan / Nepal (1965-11)
IAM C-438, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Homothallic,
18SrRNA gene (AF352231)
N-34-2
References: 25, 91, 96, 242

337

Nawakot / Nepal (1965-10)
Unialgal, Non-clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Homothallic
N-12-92
References: 91, 242

Closterium moniliferum Ehrenberg ex Ralfs
var. *moniliferum*

172

Nepal

Unialgal, Non-clonal

Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)

Characteristics: Freshwater, Homothallic
N-100-1

Reference: 242

173

Kitaadachi-gun / Saitama (1969-01)

IAM C-432, Axenic, Clonal, T.Ichimura (1969-03)

Identified by: T.Ichimura

Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)

Characteristics: Freshwater, Homothallic
S-1-22

References: 96, 242

174

Ghorepani / Nepal (1965-12)

Unialgal, Clonal, T.Ichimura

Identified by: T.Ichimura

Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)

Characteristics: Freshwater, Homothallic,
18SrRNA gene (AF352233)

N-76-30

References: 25, 91, 242

Closterium moniliferum Ehrenberg ex Ralfs
var. *submoniliferum* (Woronichin) Krieger

182

Kitaadachi-gun / Saitama (1969-01)

IAM C-433, Axenic, Clonal, T.Ichimura (1969-03)

Identified by: T.Ichimura

Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)

Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-183

S-1-13

References: 91, 96, 242, 426

183

Kitaadachi-gun / Saitama (1969-01)

IAM C-434, Unialgal, Clonal, T.Ichimura (1969-03)

Identified by: T.Ichimura

Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)

Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-182

S-1-24

References: 91, 96, 242

Closterium navicula (Brébisson) Lütkemüller

175

Chingkhola / Nepal (1965-11)

IAM C-443, Unialgal, Clonal, T.Ichimura

Identified by: T.Ichimura

Culture conditions: AF-6, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)

Characteristics: Freshwater, Homothallic,
18SrRNA gene (AF352232)

N-49-7

References: 25, 91, 96, 242

176

Ghorepani / Nepal (1965-12)

Axenic, Clonal, T.Ichimura

Identified by: T.Ichimura

Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)

Characteristics: Freshwater, Homothallic
N-75-10

References: 91, 242

177

Billethadi / Nepal (1965-12)

Unialgal, Clonal, T.Ichimura

Identified by: T.Ichimura

Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)

Characteristics: Freshwater, Homothallic
N-79-26

References: 91, 242

178

Shewaden / Nepal (1972-06)

Unialgal, Clonal, M.M.Watanabe (1974)

Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)

Characteristics: Freshwater

N-134-15

Reference: 242

Closterium peracerosum-strigosum-littorale complex

51

Katsuta / Ibaraki (1974-08)

Unialgal, Clonal, M.M.Watanabe (1974-08)

Identified by: M.M.Watanabe

- Culture conditions: CA, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Indicator, Freshwater, Heterothallic,
Mating type +, Group II A
IB-4-2
References: 242, 518, 523, 524, 525
- 52
Katsuta / Ibaraki (1974-08)
Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Indicator, Freshwater, Heterothallic,
Mating type -, Group II A,
18SrRNA gene (AF352226)
IB-4-9
References: 25, 242, 426, 518, 523, 524, 525
- 53
Katsuta / Ibaraki (1974-08)
Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Group II A
IB-6-8
References: 242, 518, 523, 524, 525
- 54
Katsuta / Ibaraki (1974-08)
Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type -, Group II A
IB-6-9
References: 242, 518, 523, 524
- 55
Katsuta / Ibaraki (1975-05)
Axenic, Clonal, M.M.Watanabe (1975-05)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type -, Group II C
IB-8-15
References: 242, 518, 523, 524
- 56
Katsuta / Ibaraki (1975-05)
Axenic, Clonal, M.M.Watanabe (1975-05)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type -, Group II A
IB-8-24
References: 242, 378, 518, 523, 524
- 57
Katsuta / Ibaraki (1975-05)
Axenic, Clonal, M.M.Watanabe (1975-05)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Group II A
IB-8-25
References: 242, 378, 518, 523, 524
- 58
Mito / Ibaraki (1975-06)
Unialgal, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type -, Group II A
IB-10-1
References: 242, 518, 523, 524
- 59
Mito / Ibaraki (1975-06)
Axenic, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Group II A
IB-10-2
References: 242, 518, 523, 524
- 60
Mito / Ibaraki (1975-06)
Axenic, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Heterothallic,

- Mating type +, Group II B
 IB-12-1
 References: 242, 518, 523, 524
- 61
 Mito / Ibaraki (1975-06)
 Axenic, Clonal, M.M.Watanabe (1975-06)
 Identified by: M.M.Watanabe
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Freshwater, Heterothallic,
 Mating type -, Group II B
 IB-12-2
 References: 242, 518, 523, 524
- 62
 Katsuta / Ibaraki (1975-06)
 Axenic, Clonal, M.M.Watanabe (1975-06)
 Identified by: M.M.Watanabe
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Freshwater, Heterothallic,
 Mating type +, Group II A
 IB-13-1
 References: 242, 518, 523, 524
- 63
 Katsuta / Ibaraki (1975-06)
 Unialgal, Clonal, M.M.Watanabe (1975-06)
 Identified by: M.M.Watanabe
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Freshwater, Heterothallic,
 Mating type -, Group II A
 IB-13-2
 References: 242, 518, 523, 524
- 64
 Lake Kasumigaura / Ibaraki (1974-11)
 Axenic, Clonal, M.M.Watanabe (1974-11)
 Identified by: M.M.Watanabe
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Freshwater, Heterothallic,
 Mating type -, Group II B
 KAS-4-29
 References: 160, 161, 162, 242, 285, 413, 420, 518,
 523, 524, 525
- 65
 Lake Kasumigaura / Ibaraki (1974-11)
 Axenic, Clonal, M.M.Watanabe (1974-11)
 Identified by: M.M.Watanabe
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
- 66
 Piuthan / Nepal (1965-10)
 Unialgal, Clonal, T.Ichimura
 Identified by: T.Ichimura
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Indicator, Freshwater, Heterothallic,
 Mating type +, Group I A
 N-13-1
 References: 90, 91, 242, 518
- 67
 Damchan / Nepal (1965-11)
 Unialgal, Clonal, T.Ichimura
 Identified by: T.Ichimura
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Indicator, Freshwater, Heterothallic,
 Mating type +, Group I B
 N-31-19
 References: 91, 242, 299, 411, 412, 413, 414, 415,
 416, 417, 418, 419, 420, 518
- 68
 Damchan / Nepal (1965-11)
 Axenic, Clonal, T.Ichimura
 Identified by: T.Ichimura
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)
 Characteristics: Indicator, Freshwater, Heterothallic,
 Mating type -, Group I B
 N-31-24
 References: 91, 242, 299, 411, 412, 413, 414, 415,
 416, 419, 420, 518
- 69
 Lake Teganuma / Chiba (1974-06)
 Unialgal, Clonal, M.M.Watanabe (1974-06)
 Identified by: M.M.Watanabe
 Culture conditions: C, 15° C, 10 µE/m² sec, 3M,
 (20° C, 25 µE/m² sec)

- Characteristics: Freshwater, Heterothallic,
Mating type +, Group II B
TG-2-21
References: 242, 518, 523, 524
- 70
Lake Teganuma / Chiba (1974-06)
Axenic, Clonal, M.M.Watanabe (1974-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Heterothallic,
Mating type -, Group II B
TG-2-22
References: 242, 518, 523, 524
- 261
Katsuta / Ibaraki (1974-08)
Unialgal, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 10 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Heterothallic,
Mating type +, Group II C
IB-8-14
References: 242, 518, 523, 524
- 262
Piuthan / Nepal (1965-10)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 15° C, 10 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Heterothallic,
Mating type -
N-13-4
References: 90, 91, 242, 518
- Closterium pleurodermatum* West et West
449
Iriomote Isl. / Okinawa (1973-03)
IAM C-518, Unialgal, Clonal, T.Ichimura (1973-12)
Identified by: T.Ichimura
Culture conditions: AF-6, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(25° C, 15 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater,
18SrRNA gene (AF352238)
R-11-20
References: 25, 242
- Closterium praelongum* Brébisson
var. *brevius* (Nordstedt) Krieger
450
Nawakot / Nepal (1965-10)
IAM C-447, Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Homothallic
N-12-3
References: 91, 96, 242
- 451
Billethadi / Nepal (1965-12)
Unialgal, Clonal, , T.Ichimura
Identified by: T.Ichimura
Culture conditions: MG, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Homothallic
N-78-8
References: 91, 242
- Closterium pusillum* Hantzsch var. *maius* Raciborski
185
Billethadi / Nepal (1965-12)
IAM C-449, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Heterothallic,
18SrRNA gene (AF352235)
N-79-19
References: 25, 91, 96, 242
- Closterium rostratum* Ehrenberg ex Ralfs
var. *subrostratum* (Krieger) Krieger
Syn. *Closterium subrostratum* Krieger
338
Kathmandu / Nepal (1968-05)
IAM C-446, Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 12 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Homothallic
N-90-55
References: 91, 96, 242
- Closterium selenastrum* M.Watanabe
339
Mt. Yonahadake / Okinawa (1972-10)
Unialgal, Clonal, T.Ichimura

- Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (25° C, 15 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Homothallic,
 18SrRNA gene (AF352242)
 R-9-40
 References: 25, 102, 242, 502, 503
- 340
 Mt. Yonahadake / Okinawa (1972-10)
 Axenic, Clonal, T.Ichimura
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (25° C, 15 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Homothallic
 R-9-42
 References: 102, 242, 503
- Closterium spinosporum* Hodgetts
 var. *crassum* M.Watanabe
 186
 Lake Akan / Hokkaido (1973-09)
 Axenic, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (20° C, 25 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Homothallic,
 Type strain
 AK-46
 References: 102, 242, 502, 503
- 187
 Mt. Yonahadake / Okinawa (1973-06)
 IAM C-461, Unialgal, Clonal, T.Ichimura (1973-10)
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (20° C, 25 μ E/m² sec)
 Characteristics: Freshwater, Homothallic,
 18SrRNA gene (AF352241)
 R-9-13
 References: 25, 102, 242, 502, 503
- 341
 Mt. Yonahadake / Okinawa (1972-10)
 Axenic, Clonal, T.Ichimura
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (20° C, 25 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Homothallic
 R-9-12
 References: 102, 242, 502, 503
- Closterium spinosporum* Hodgetts
 var. *malaysiense* M.Watanabe
 188
 Penang / Malaysia (1974-01)
 Axenic, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (20° C, 25 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Heterothallic,
 Mating type +, 18SrRNA gene (AF352227)
 M-10-1
 References: 25, 242, 502, 503
- 189
 Penang / Malaysia (1974-01)
 Axenic, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (20° C, 25 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Heterothallic,
 Mating type –
 M-10-4
 References: 242, 502, 503
- Closterium spinosporum* Hodgetts
 var. *ryukyuense* M.Watanabe
 191
 Iriomote Isl. / Okinawa (1973-06)
 Axenic, Clonal, T.Ichimura
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (20° C, 25 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Homothallic,
 18SrRNA gene (AF352240)
 R-12-3
 References: 25, 242, 502, 503
- 192
 Iriomote Isl. / Okinawa (1973-06)
 Axenic, Clonal, T.Ichimura
 Identified by: M.Watanabe
 Culture conditions: CA, 20° C, 8 μ E/m² sec, 3M,
 (25° C, 15 μ E/m² sec)
 Characteristics: Indicator, Freshwater, Homothallic
 R-12-6
 References: 242, 502, 503
- 193
 Iriomote Isl. / Okinawa (1973-06)
 Axenic, Clonal, T.Ichimura
 Identified by: M.Watanabe

- Culture conditions: CA, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Indicator, Freshwater, Homothallic,
Giant cell
R-12-2G3
References: 242, 502
- Closterium spinosporum* Hodgetts var. *spinosporum*
194
Tsukude-mura / Aichi (1972-10)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CAM, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(25° C, 15 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Indicator, Freshwater, Homothallic,
18SrRNA gene (AF352224)
A-2-22
References: 25, 102, 242, 502, 503
- 195
Tsukude-mura / Aichi (1972-10)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CAM, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Indicator, Freshwater, Homothallic
A-7-3
References: 242, 503
- 196
Tsukude-mura / Aichi (1972-10)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CAM, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Indicator, Freshwater, Homothallic
A-7-6
References: 242, 502
- 197
Tsukude-mura / Aichi (1972-10)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Indicator, Freshwater, Homothallic
A-13-4
References: 242, 502, 503
- * *Closterium subrostratum* Krieger
- See *Closterium rostratum* Ehrenberg ex Ralfs
var. *subrostratum* (Krieger) Krieger
- Closterium tumidum* Johnson
198
Billethadi / Nepal (1965-12)
IAM C-450, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Homothallic,
18SrRNA gene (AF352234)
N-79-11
References: 25, 91, 96, 242
- Closterium venus* Kützing ex Ralfs
199
Kathmandu / Nepal (1968)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 25 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater,
18SrRNA gene (AF352236)
N-90-48
References: 25, 242
- Closterium wallichii* Turner
200
Kitaadachi-gun / Saitama (1969-01)
IAM C-451, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 12 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Freshwater, Homothallic,
18SrRNA gene (AF352243)
S-1-0
References: 25, 96, 242
- 201
Lake Kasumigaura / Ibaraki (1983-09)
Axenic, Clonal, F.Kasai (1983-09)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 $\mu\text{E}/\text{m}^2\text{sec}$, 3M,
(20° C, 12 $\mu\text{E}/\text{m}^2\text{sec}$)
Characteristics: Indicator, Freshwater, Homothallic
F60-21
Reference: 242
- 202
Ghasa / Nepal (1965-11)

Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 μE/m² sec, 3M,
(20° C, 12 μE/m² sec)
Characteristics: Freshwater, Homothallic
N-63-0
References: 91, 242

COELASTRUM Nägeli: Chlorophyceae

Coelastrum astroideum De Notaris

129
Lake Shoji / Yamanashi (1981-10)
TAC 56, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 μE/m² sec, 2M,
(25° C, 30 μE/m² sec)
Characteristics: Freshwater
TAN-56-7
Reference: 242

130

Lake Shoji / Yamanashi (1981-08)
TAC 51-9A, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 μE/m² sec, 2M,
(25° C, 30 μE/m² sec)
Characteristics: Freshwater
TAN-51-9A
Reference: 242

244

Lake Kasumigaura / Ibaraki (1983-08)
Unialgal, Clonal, F.Kasai (1983-08)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 μE/m² sec, 3M,
(25° C, 30 μE/m² sec)
Characteristics: Freshwater
Reference: 242

342

Lake Kawaguchi / Yamanashi (1981-10)
TAC 54, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 μE/m² sec, 2M
Characteristics: Freshwater
TAN-54-1
Reference: 242

Coelastrum morus W. et G.S.West
231

Hachijo Isl. / Tokyo (1984-04)
Axenic, Clonal, F.Kasai (1984-05)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 μE/m² sec, 3M,
(25° C, 30 μE/m² sec)
Characteristics: Freshwater
F78-4-2
References: 159, 242

Coelastrum proboscideum Bohlin

131
Near Tukucha / Nepal (1965-11)
IAM C-344, Axenic, Clonal, T.Ichimura (1969-07)
Identified by: T.Ichimura
Culture conditions: C(S), 20° C, 4 μE/m² sec, 3M,
(25° C, 30 μE/m² sec)
Characteristics: Freshwater
N-63-20
References: 96, 242, 530

Coelastrum reticulatum (Dangeard) Senn

132
Lake Yamanaka / Yamanashi (1981-10)
TAC 53-5A, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 μE/m² sec, 2M,
(25° C, 30 μE/m² sec)
Characteristics: Indicator, Freshwater
TAN-53-5A
Reference: 242

Coelastrum reticulatum (Dangeard) Senn
var. *reticulatum*

245
Lake Kasumigaura / Ibaraki (1983-10)
Axenic, Clonal, F.Kasai (1983-10)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 μE/m² sec, 3M,
(25° C, 30 μE/m² sec)
Characteristics: Indicator, Freshwater
F63-3
Reference: 242

COOLIA Meunier: Dinophyceae

Coolia monotis Meunier

343
Hachijo Isl. / Tokyo (1984-04)

Axenic, Clonal, S.Suda (1984-04)
Identified by: S.Suda
Culture conditions: ESM, 20° C, 12 µE/m² sec, 3M
Characteristics: Marine, Tide pool, Unstable,
Untransportable
8-1

615
Motobu / Okinawa (1993-06)
Unialgal, Clonal, H.Kobayashi (1993-06)
Identified by: Y.Fukuyo
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Toxic, Marine, Untransportable
CM-01

COSMARIUM Corda: Charophyceae

Cosmarium askenasyi Schmidle
768
Near Cairns, Queensland / Australia (1988-09)
Unialgal, Clonal, F.Kasai (1988-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Crosses with NIES-769
88-8-37

769
Near Cairns, Queensland / Australia (1988-09)
Unialgal, Clonal, F.Kasai (1988-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Crosses with NIES-768
88-8-38

770
Near Cairns, Queensland / Australia (1988-09)
Unialgal, Clonal, F.Kasai (1988-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Crosses with NIES-771
88-8-39

771
Near Cairns, Queensland / Australia (1988-09)
Unialgal, Clonal, F.Kasai (1988-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,

(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Crosses with NIES-770
88-8-40

Cosmarium contractum Kirchner
133
Lake Yamanaka / Yamanashi (1981-10)
Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 2M,
(20° C, 12 µE/m² sec)
Characteristics: Indicator, Freshwater
TAN-53-2
Reference: 242

Cosmarium dilatatum Lütkenmüller
in Tärnefeld et Grönblad
839
Ryoanji Temple / Kyoto (1998-06)
Unialgal, Clonal, A.Gontcharov (1998-07)
Identified by: A.Gontcharov
Culture conditions: C, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
Reference: 57

Cosmarium hians Borge
452
Lake Yamanaka / Yamanashi (1981-06)
Axenic, Clonal, M.H.Watanabe (1981-06)
Identified by: M.H.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
YAMA-Cos-4
Reference: 242

COSMOCLADIUM Brébisson: Charophyceae

Cosmocladium constrictum (Archer) Archer
248
Lake Biwa / Shiga (1983-12)
Axenic, Clonal, F.Kasai (1983-12)
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
F75-2
Reference: 242

CRICOSPHAERA Braarud: Prymnesiophyceae

#00042

References: 133, 159

Cricosphaera roscoffensis

(Dangeard) Gayral et Fresnel

8

Osaka Bay / Osaka (1978-09)

Axenic, Clonal, S.Yamochi

Identified by: S.Yamochi

Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M

Characteristics: Red tide, Marine,

COXI gene (AB000117)

OCri

References: 75, 364

Cryptomonas platyuris Skuja

276

Higashihiroshima / Hiroshima (1983-08)

Axenic, Clonal, M.Ishimitsu (1983-08)

Identified by: M.Ishimitsu

Culture conditions: VT, 10° C, 25 µE/m² sec, 1M

Characteristics: Freshwater

#00096

Reference: 133

344

Higashihiroshima / Hiroshima (1983-08)

Axenic, Clonal, M.Ishimitsu (1983-08)

Identified by: M.Ishimitsu

Culture conditions: VT, 10° C, 25 µE/m² sec, 2M

Characteristics: Freshwater

#00103

Reference: 133

CRYPTOMONAS Ehrenberg: Cryptophyceae

Cryptomonas acuta Butcher

697

Conway, N. Wales / U.K.

CCAP 979/10, Unialgal, Clonal, B.W.Butcher

Identified by: B.W.Butcher

Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M

Characteristics: Marine, Type strain

Reference: 30

Cryptomonas rostratiformis Skuja

277

Hongo / Hiroshima (1983-10)

Axenic, Clonal, M.Ishimitsu (1983-10)

Identified by: M.Ishimitsu

Culture conditions: VT, 15° C, 20 µE/m² sec, 1M

Characteristics: Freshwater

#00148

Reference: 133

Cryptomonas irregularis Butcher

698

Plymouth, Devon / U.K.

CCAP 979/7, Unialgal, Clonal, B.W.Butcher (1960)

Identified by: B.W.Butcher

Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M

Characteristics: Marine, Type strain

Reference: 30

278

Hongo / Hiroshima (1983-10)

Axenic, Clonal, M.Ishimitsu (1983-10)

Identified by: M.Ishimitsu

Culture conditions: VT, 15° C, 20 µE/m² sec, 1M

Characteristics: Freshwater

#00154

Reference: 133

Cryptomonas ovata Ehrenberg

274

Tsuchiura / Ibaraki (1982-10)

Axenic, Clonal, M.Ishimitsu (1982-10)

Identified by: M.Ishimitsu

Culture conditions: VT, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater, *COXI* gene (AB009419),

18SrRNA gene (AB073109)

#00046

References: 117, 133, 457

345

Sugadaira / Nagano (1982-07)

Axenic, Clonal, M.Ishimitsu (1982-08)

Identified by: M.Ishimitsu

Culture conditions: VT, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

#00006

Reference: 133

275

Tsuchiura / Ibaraki (1982-09)

Axenic, Clonal, M.Ishimitsu (1982-09)

Identified by: M.Ishimitsu

Culture conditions: VT, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

1327

Sugadaira / Nagano (1986-11)

Unialgal, Clonal, M.Erata (1986-11)
Identified by: M.Erata
Culture conditions: VT, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#00266

Cryptomonas tetrapirenoidosa Skuja

279

Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Ishimitsu (1983-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 25 µE/m² sec, 2M
Characteristics: Freshwater
#00099
Reference: 133

280

Sugadaira / Nagano (1982-07)
Axenic, Clonal, M.Ishimitsu (1982-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 25 µE/m² sec, 2M
Characteristics: Freshwater
#00014
References: 133, 159

281

Minamiizu / Shizuoka (1983-05)
Axenic, Clonal, M.Ishimitsu (1983-05)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 25 µE/m² sec, 2M
Characteristics: Freshwater
#00073
Reference: 133

282

Tsuchiura / Ibaraki (1982-09)
Axenic, Clonal, M.Ishimitsu (1982-09)
Identified by: M.Ishimitsu
Culture conditions: VT, 15° C, 20 µE/m² sec, 1M
Characteristics: Freshwater
#00056
References: 9, 10, 11, 133, 219, 230

346

Sugadaira / Nagano (1982-07)
Axenic, Clonal, M.Ishimitsu (1982-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 25 µE/m² sec, 2M
Characteristics: Freshwater
#00009
Reference: 133

347

Minamiizu / Shizuoka (1983-05)
Axenic, Clonal, M.Ishimitsu (1983-05)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 25 µE/m² sec, 2M
Characteristics: Freshwater
#00072
Reference: 133

348

Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Ishimitsu (1983-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 25 µE/m² sec, 2M
Characteristics: Freshwater
#00109
Reference: 133

CYANOPHORA Korshikov: Glaucophyceae

Cyanophora paradoxa Korshikov

547

England
UTEX 555, Axenic, Clonal, E.G.Pringsheim (1943)
Identified by: E.G.Pringsheim
Culture conditions: C, 20° C, 8 µE/m² sec, 2M,
(25° C, 30 µE/m² sec)
Characteristics: Alkaline water,
psaD gene (AJ132477)
References: 104, 208, 427

763

Mitsukaido / Ibaraki (1987-01)
Axenic, Clonal, S.Suda (1991-08)
Identified by: S.Suda
Culture conditions: CSi, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Indicator
S117

Cyanophora tetracyanea Korshikov

764

Mitsukaido / Ibaraki (1987-01)
Axenic, Clonal, S.Suda (1991-08)
Identified by: S.Suda
Culture conditions: CSi, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Indicator
S118

CYCLOTELLA Kützing: Bacillariophyceae

Cyclotella meneghiniana Kützing

803

Mitsukaido / Ibaraki (1993-05)

Unialgal, Clonal, F.Kasai (1993-05)

Identified by: Y.Niiyama

Culture conditions: CSi, 15° C, 15 µE/m² sec, 1M

Characteristics: Freshwater

506-26

Reference: 156

804

Mitsukaido / Ibaraki (1993-05)

Unialgal, Clonal, F.Kasai (1993-05)

Identified by: Y.Niiyama

Culture conditions: CSi, 15° C, 15 µE/m² sec, 1M

Characteristics: Freshwater

518-39

Reference: 156

805

Mitsukaido / Ibaraki (1993-06)

Unialgal, Clonal, F.Kasai (1993-06)

Identified by: Y.Niiyama

Culture conditions: CSi, 15° C, 15 µE/m² sec, 1M

Characteristics: Freshwater

613-2

Reference: 156

CYLINDROCYSTIS Meneghini: Charophyceae

Cylindrocystis brebissonii (Ralfs) De Bary

var. *brebissonii*

349

Lake Onuma / Hokkaido (1967-06)

IAM C-354, Axenic, Clonal, M.Haga (1968-01)

Identified by: M.Haga

Culture conditions: C(S), 20° C, 8 µE/m² sec, 4M,

(25° C, 30 µE/m² sec)

Characteristics: Freshwater, Homothallic

6801-68

Reference: 242

CYLINDROSPERMOPSIS Seenayya et S.Raju

Cyanophyceae

Cylindropermopsis raciborskii

(Woloszynska) Seenayya et S.Raju

930

Shinobazu-no-ike, Taito / Tokyo (2000-07)

Unialgal, Clonal, S.Otsuka (2000-07)

Identified by: S.Otsuka

Culture conditions: CT, 25° C, 24 µE/m² sec, 1M

Characteristics: Freshwater, Water bloom, Planktonic
CYL1

991

Gonoike Pond, Kamisu / Ibaraki (2001-07)

Axenic, Clonal, D.Chonudomkul (2001-07)

Identified by: W.Yongmanitchai

Culture conditions: CT, 23° C, 12 µE/m² sec, 1M

Characteristics: Freshwater, Toxic

KJA1

992

Gonoike Pond, Kamisu / Ibaraki (2001-07)

Axenic, Clonal, D.Chonudomkul (2001-07)

Identified by: W.Yongmanitchai

Culture conditions: CT, 23° C, 12 µE/m² sec, 1M

Characteristics: Freshwater, Toxic

KJA2

993

Gonoike Pond, Kamisu / Ibaraki (2001-07)

Axenic, Clonal, D.Chonudomkul (2001-07)

Identified by: W.Yongmanitchai

Culture conditions: CT, 23° C, 12 µE/m² sec, 1M

Characteristics: Freshwater, Toxic

KJA3

994

Florida / USA (1999-10)

CCMP 1973, Unialgal, Clonal, R.A.Andersen

Identified by: R.A.Andersen

Culture conditions: CT, 23° C, 12 µE/m² sec, 1M

Characteristics: Freshwater, Water bloom

A9298

1040

Shinobazu-no-ike Pond, Taito / Tokyo

Unialgal, Clonal, R.Li

Identified by: W.Yongmanitchai

Culture conditions: CT, 23° C, 12 µE/m² sec, 1M

Characteristics: Freshwater, Toxic

CRJ1

1041

Shinobazu-no-ike Pond, Taito / Tokyo

Axenic, Clonal, R.Li

Identified by: W.Yongmanitchai

Culture conditions: CT, 23° C, 12 µE/m² sec, 1M

Characteristics: Freshwater, Toxic

CRJ2

1042

Shinobazu-no-ike Pond, Taito / Tokyo
Unialgal, Clonal, R.Li
Identified by: W.Yongmanitchai
Culture conditions: CT, 23° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Toxic
CRJ*

1259

Gonoike Pond, Kamisu / Ibaraki (2002-08)
Unialgal, Clonal, T.Sano (2002-09)
Identified by: T.Sano
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
GOU-CR-1

1260

Gonoike Pond, Kamisu / Ibaraki (2002-08)
Unialgal, Clonal, T.Sano (2002-09)
Identified by: T.Sano
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
GOU-CR-2

1261

Shinobazu-no-ike Pond, Taito / Tokyo
Unialgal, Clonal, T.Sano
Identified by: T.Sano
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
SHI-CR-3

1262

Shinobazu-no-ike Pond, Taito / Tokyo
Unialgal, Clonal, T.Sano
Identified by: T.Sano
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
SHI-CR-5

CYLINDROTHECA Rabenhorst: Bacillariophyceae

Cylindrotheca closterium (Ehrenberg)

Reimann et Lewin

1045

Shimoda / Shizuoka (2001-05)
Unialgal, Clonal, Y.Takahashi (2001-05)
Identified by: S.Mayama
Culture conditions: f/2, 15° C, 15 µE/m² sec, 2M

Characteristics: Marine, Epilithic

Cylindrotheca fusiformis Reimann et Lewin

1046

CCMP 343, Unialgal, Clonal
Identified by:
Culture conditions: f/2, 15° C, 15 µE/m² sec, 2M
Characteristics: Marine

Cylindrotheca sp.

1047

Futtsu / Chiba (2001-05)
Unialgal, Clonal, Y.Takahashi (2001-05)
Identified by: S.Mayama
Culture conditions: f/2, 15° C, 15 µE/m² sec, 2M
Characteristics: Marine, Epiphytic

DICTYOCHLOROPSIS Geitler: Trebouxiophyceae

Dictyochloropsis irregularis Nakano et Isagi

378

Akkeshi / Hokkaido (1982-07)
Axenic, Clonal, Y.Isagi (1982-08)
Identified by: T.Nakano
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Aerial on the surface of the
bark of *Picea jezoensis*
CCHU-2227
References: 242, 284

DICTYOSPHAERIUM Nägeli: Trebouxiophyceae

Dictyosphaerium pulchellum Wood

453

Lake Kasumigaura / Ibaraki (1988-12)
Unialgal, Clonal, T.Yanai (1988-12)
Identified by: Y.Niiyama
Culture conditions: MG, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
Reference: 242

DIMORPHOCOCCUS A.Braun: Chlorophyceae

Dimorphococcus lunatus A.Brown

134

Ozegahara / Gunma (1983-08)
Unialgal, Clonal, F.Kasai (1983-09)
Identified by: M.Watanabe

Culture conditions: CA, 20° C, 4 µE/m² sec, 2M,
(25° C, 30 µE/m² sec)

Characteristics: Freshwater
34-5

Reference: 242

135

Tsuchiura / Ibaraki (1983-10)

Axenic, Clonal, F.Kasai (1983-10)

Identified by: M.Watanabe

Culture conditions: CA, 20° C, 4 µE/m² sec, 2M,
(25° C, 30 µE/m² sec)

Characteristics: Freshwater

F-61-4

References: 242, 530

DINOBYRON Ehrenberg: Chrysophyceae

Dinobryon divergens Imhof

284

Lake Biwa / Shiga (1983-12)

Unialgal, Non-clonal, F.Kasai (1983-12)

Identified by: F.Kasai

Culture conditions: AF-6/2, 15° C, 20 µE/m² sec, 4M

Characteristics: Freshwater

F-75-26

DITYLUM L.W.Bailey: Bacillariophyceae

Ditylum brightwellii (T.West) Grunow et Heurck

350

Shimoda / Shizuoka (1985-05)

Unialgal, Clonal, T.Sawaguchi (1985-05)

Identified by: T.Sawaguchi

Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M

Characteristics: Marine

KBB-10

DOCIDIUM Brébisson ex Ralfs: Charophyceae

Docidium undulatum Bailey var. *undulatum*

285

Oze / Fukushima (1983-08)

Unialgal, Clonal, F.Kasai (1983-09)

Identified by: F.Kasai

Culture conditions: SW(Bi), 20° C, 8 µE/m² sec, 3M

Characteristics: Freshwater

41-11

DRAPARNALDIA Bory: Chlorophyceae

Draparnaldia plumosa (Vaucher) Agardh 454

Sapporo / Hokkaido (1987-10)

Unialgal, Non-clonal, F.Kasai (1987-10)

Identified by: F.Kasai

Culture conditions: C, 10° C, 6 µE/m² sec, 3M,
(10° C, 15 µE/m² sec)

Characteristics: Freshwater

2Tst-2-1

References: 242, 454

ECHINOSPHAERIDIUM : Chlorophyceae

Echinospaeridium nordstedtii Lemmermann 137

Lake Kasumigaura / Ibaraki (1983-08)

Axenic, Clonal, F.Kasai (1983-08)

Identified by: M.Watanabe

Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)

Characteristics: Indicator, Freshwater

F-56-3

References: 159, 242, 530

EMILIANA Hay et Mohler: Prymnesiophyceae

Emiliana huxleyi (Lohmann) Hay et Mohler 837

Great Barrier Reef / Australia (1990-11)

Unialgal, Clonal, I.Inouye (1990-11)

Identified by: I.Inouye

Culture conditions: MNK, 20° C, 12 µE/m² sec, 20D

Characteristics: Marine, Red tide

EH-01

References: 408, 421, 422, 423, 424

999

Miyake Isl. / Tokyo (1999-11)

Unialgal, Clonal, M.Kawachi (1999-11)

Identified by: M.Kawachi

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D

Characteristics: Marine, Red tide

MK7

1310

Pacific Ocean (2002-08)

Unialgal, Clonal, M-H.Noël (2002-10)

Identified by: M-H.Noël

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide, Isolated from
ballast water road Japan-Australia
MH9

1311
Bearing Sea (2002-08)
Unialgal, Clonal, M-H.Noël (2002-10)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide
MH27

1312
Bearing Sea (2002-08)
Unialgal, Clonal, M-H.Noël (2002-10)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide
MH28

1313
East China Sea (Kuroshio Current) (2003-08)
Unialgal, Clonal, M-H.Noël (2003-09)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide
MH74

1314
East China Sea (Kuroshio Current) (2003-08)
Unialgal, Clonal, M.Kawachi (2003-08)
Identified by: M.Kawachi
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine, Red tide
YK3-87

EREMOSPHAERA De Bary: Trebouxiophyceae

Eremosphaera gigas (Archer) Fott et Kalina
379
Shinobugaoka / Osaka (1968-11)
IAM C-338, Axenic, Clonal, T.Ichimura (1969-01)
Identified by: T.Nakano
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
O-2
References: 96, 242, 530

Eremosphaera viridis De Bary
380
Oze / Fukushima (1983-08)
Unialgal, Clonal, F.Kasai (1983-09)
Identified by: T.Nakano
Culture conditions: CAM, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
43-23
Reference: 242

643
Miyatoko Mire / Fukushima (1992-04)
Unialgal, Clonal, H.Nozaki (1992-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
92-604-E-5
Reference: 242

644
Miyatoko Mire / Fukushima (1992-04)
Unialgal, Clonal, H.Nozaki (1992-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
92-604-E-3
Reference: 242

ERRERELLA Conrad: Trebouxiophyceae

Errerella bornhemiensis Conrad
455
Between Ghorepani and Billethadi / Nepal
(1965-12)
IAM C-341, Axenic, Clonal, T.Ichimura (1972-05)
Identified by: T.Ichimura
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
N-76-1
References: 96, 242

EUASTRUM Ralfs: Charophyceae

Euastrum biverrucosum
Gontcharov et M.M.Watanabe
Syn. *Euastrum englerii* Schmidle
var. *madagascariense* Bourrelly et Mangium
840

Hirosawa-ike Pond / Kyoto (1998-06)
Unialgal, Clonal, A.Gontcharov (1998-07)
Identified by: A.Gontcharov
Culture conditions: CAM, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
Reference: 57

***Euastrum turgidum* Wallich**
772

Ishigaki Isl / Okinawa (1984-03)
Unialgal, Clonal, T.Ichimura (1984)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-773
84-15-75

773

Ishigaki Isl / Okinawa (1984-03)
Unialgal, Clonal, T.Ichimura (1984)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-772
84-15-76

***EUCAMPIA* Ehrenberg: Bacillariophyceae**

***Eucampia zodiacus* Ehrenberg**

1049

Ise Bay / Mie (2002-05)
Axenic, Clonal, M.Sakabe (2002-05)
Identified by: M.Fukudome (Metocean Environment
Inc.)
Culture conditions: f/2, 15° C, 15 µE/m² sec, 2M
Characteristics: Marine, Red tide, AGP, Not utilize
ammonium salt

***EUDORINA* Ehrenberg: Chlorophyceae**

***Eudorina cylindrica* Korshikov**

722

Iowa / USA
UTEX 1197, Axenic, Clonal, A.W.Coleman
(1957-04)
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater, Heterothallic,
atpB gene (AB014033), *rbcL* gene (D86833),
psaA gene (AB044210), *psaB* gene (AB044441),
psbC gene (AB044493)
References: 242, 324, 337, 340

***Eudorina elegans* Ehrenberg**

351

Lake Biwa / Shiga (1983-12)
Axenic, Clonal, S.Suda (1983-12)
Identified by: S.Suda
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic
B-Eud-6
References: 166, 242, 438

Eudorina elegans* Ehrenberg var. *carteri

721

KY / USA
UTEX 1212, Axenic, Clonal, P.Cock (1960-04)
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Homothallic,
Monoecious, *atpB* gene (AB014012),
rbcL gene (D88806), *psaA* gene (AB044202-3),
psaB gene (AB044438), *psbC* gene (AB044487-8)
References: 242, 325, 337, 340

Eudorina elegans* Ehrenberg var. *elegans

456

Chiyoda-ku / Tokyo (1977-09)
Axenic, Clonal, H.Nozaki (1977-09)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Male,
Crosses with NIES-457, *atpB* gene (AB014009),
rbcL gene (D63432), *psaA* gene (AB044199),
psaB gene (AB044435), *psbC* gene (AB044485)
A-5 (m)
References: 242, 303, 322, 323, 337, 340, 342

457

Chiyoda-ku / Tokyo (1977-09)
Axenic, Clonal, H.Nozaki (1977-09)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Female,
Crosses with NIES-456
I-14 (f)
References: 242, 303

717

Indiana / USA (1959-06)

- UTEX 1193, Axenic, Clonal, M.E.Goldstein
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Heterothallic,
atpB gene (AB047071), *rbcL* gene (D88803)
 References: 242, 325
- 718
 Indiana / USA
 UTEX 1195, Axenic, Clonal, A.W.Coleman
 Culture conditions: VT, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Heterothallic,
atpB gene (AB047072), *rbcL* gene (D88810)
 References: 242, 325
- 719
 Indiana / USA
 UTEX 1199, Axenic, Clonal, A.W.Coleman (1956)
 Culture conditions: VT, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Heterothallic,
atpB gene (AB047073), *rbcL* gene (D88804)
 References: 242, 325
- 720
 Indiana / USA (1959-09)
 UTEX 1205, Axenic, Clonal, M.E.Goldstein
 Culture conditions: VT, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Heterothallic,
atpB gene (AB014010), *rbcL* gene (D88805),
psaA gene (AB044200-1),
psaB gene (AB044436-7), *psbC* gene (AB044486)
 References: 242, 325, 337, 340
- Eudorina elegans* Ehrenberg
 var. *synoica* Goldstein
 458
 Midori-ku / Yokohama / Kanagawa (1980-01)
 Axenic, Clonal, H.Nozaki (1980-04)
 Identified by: H.Nozaki
 Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Homothallic,
 Monoecious, *rbcL* gene (D88807)
 04427-1
 References: 242, 309, 325
- 568
 Kathmandu / Nepal (1986-09)
 Axenic, Clonal, H.Nozaki (1987-09)
 Identified by: H.Nozaki
 Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Homothallic,
 Monoecious, *atpB* gene (AB014011),
rbcL gene (D88808)
- 7914-E-6
 References: 242, 310, 325, 340
- Eudorina illinoisensis* (Kofoid) Pascher
 459
 Saiwai-ku / Kawasaki / Kanagawa (1984-01)
 Axenic, Clonal, H.Nozaki (1985-06)
 Identified by: H.Nozaki
 Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Female,
 Crosses with NIES-460
 5607-E-14 (F)
 References: 242, 307, 336
- 460
 Saiwai-ku / Kawasaki / Kanagawa (1984-01)
 Axenic, Clonal, H.Nozaki (1985-06)
 Identified by: H.Nozaki
 Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Male,
 Crosses with NIES-459, *atpB* gene (AB014013),
rbcL gene (D63433), *psaA* gene (AB044198),
psaB gene (AB044434), *psbC* gene (AB044484)
 5630-E-3 (m)
 References: 242, 307, 322, 323, 337, 340
- 723
 Missouri / USA (1956-11)
 UTEX 808, Axenic, Clonal, J.Stein
 Reidentified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Heterothallic,
atpB gene (AB047069), *rbcL* gene (D88809)
 References: 242, 325
- Eudorina minodii* (Chodat) Nozaki et Knieritz
 856
 Lake Altglobsow, Brandenburg / Germany (1997-07)
 Unialgal, Clonal, H.Nozaki (1997-07)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater, Planktonic, Homothallic,
 Dioecious, Anisogamy, H,h type, *atpB* gene
 (AB047068), *rbcL* gene (AB047074-6)
 970729-E-8
 Reference: 330
- Eudorina unicocca* G.M.Smith
 var. *peripheralis* Goldstein
 726
 British Columbia / Canada (1961-05)
 UTEX 1218, Axenic, Clonal, M.E.Goldstein

Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Heterothallic,
atpB gene (AB047070), *rbcL* gene (D86830)
References: 242, 324

Eudorina unicocca G.M.Smith var. *unicocca*

724

Indiana / USA
UTEX 737, Axenic, Clonal, R.C.Starr
Culture conditions: VT, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Heterothallic,
atpB gene (AB014008), *rbcL* gene (D86829),
psaA gene (AB044204-6), *psaB* gene (AB044439),
psbC gene (AB044489-90)
References: 242, 324, 337, 340

725

Ohio / USA (1961-04)
UTEX 1215, Axenic, Clonal, M.E.Goldstein
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, Heterothallic,
atpB gene (AB014007), *rbcL* gene (D63434),
psaA gene (AB044207-9), *psaB* gene (AB044440),
psbC gene (AB044491-2)
References: 242, 323, 337, 340

EUGLENA Ehrenberg: Euglenophyceae

Euglena clara Skuja

253

Higashiyata River / Ibaraki (1983-07)
Unialgal, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 1M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
USI-21

Euglena gracilis Klebs

47

IAM E-3, Axenic, Clonal
Culture conditions: HUT(SS), 20° C, 4 µE/m² sec,
1M, (25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater, Material for
Vitamin B₁₂ bioassay
References: 96, 144, 491

48

IAM E-6 (Z strain), Axenic, Clonal
Culture conditions: HUT(SS), 20° C, 4 µE/m² sec,

1M, (25° C, 30 µE/m² sec)

Characteristics: Freshwater, Material for Vitamin
B₁₂ bioassay

References: 28, 96, 106, 120, 144, 234, 235, 241, 260,
369, 370, 371, 372, 471, 472, 579

Euglena gracilis Klebs var. *bacillaris* Pringsheim

49

IAM E-2, Axenic, Clonal
Culture conditions: HUT, 20° C, 4 µE/m² sec, 2M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
References: 96, 139, 144, 491

Euglena mutabilis Schmitz

286

Takatori River / Ibaraki (1984-10)
Axenic, Clonal, S.Suda (1984-10)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 1M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater

EUNOTIA Ehrenberg: Bacillariophyceae

Eunotia pectinalis (Kützing) Rabenhorst

var. *minor* (Kützing) Rabenhorst

461

Mt. Tsukuba / Ibaraki (1987-04)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 15 µE/m² sec, 4M
Characteristics: Freshwater
(1)-16
Reference: 454

EUTREPTIELLA da Cunha: Euglenophyceae

Eutreptiella gymnastica Throndsen

381

Yashima Bay / Kagawa (1982-10)
Axenic, Clonal, S.Yoshimatsu
Identified by: S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine,
COXI gene (AB000136)
KGW-63-1
Reference: 118

FIBROCAPSA Toriumi et Takano: Raphidophyceae

Fibrocapsa japonica Toriumi et Takano

136

Tsuda Bay / Kagawa (1978-07)

Axenic, Clonal, K.Yuki

Identified by: K. Yuki

Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M

Characteristics: Red tide, Marine, Untransportable
KGW-20-2

Reference: 486

462

Hasaki / Ibaraki (1987-05)

Axenic, Clonal, T.Sawaguchi (1987-05)

Identified by: T.Sawaguchi

Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M

Characteristics: Red tide, Marine, Untransportable
HASS-8

560

Mikawa bay / Aichi

Axenic, Non-clonal, S.Toriumi

Identified by: T.Honjou

Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M

Characteristics: Red tide, Marine, Untransportable

605

Seto Inland Sea / Yamaguchi (1970-08)

Axenic, Clonal, H.Iwasaki (1970-08)

Identified by: H.Takano

Culture conditions: f/2, 20° C, 40 µE/m² sec, 1M

Characteristics: Red tide, Marine, Untransportable

1303

East China Sea (Kuroshio Current) (2003-08)

Unialgal, Clonal, M.Kawachi (2003-08)

Identified by: M.Kawachi

Culture conditions: MNK, 20° C, 32 µE/m² sec, 14D

Characteristics: Marine, Red tide, Untransportable
YK03-75

FISCHERELLA Gomont: Cyanophyceae

Fischerella major Gomont

592

Yukawa-hot spring / Iwate (1990-09)

Unialgal, Clonal, T.Hagiwara (1990-10)

Identified by: T.Hagiwara

Culture conditions: CB, 20° C, 4 µE/m² sec, 2M,

(25° C, 30 µE/m² sec)

Characteristics: Benthic

Yu-50

References: 79, 242, 559

FRAGILARIA Lyngbye: Bacillariophyceae

Fragilaria capucina Desmazières

391

Lake Kasumigaura / Ibaraki (1985-04)

Unialgal, Clonal, T.Sawaguchi (1985-04)

Identified by: M.Idei

Culture conditions: CSi, M Chu No.10, 15° C,
20 µE/m² sec, 1M

Characteristics: Freshwater

KEB-24

GEPHYROCAPSA Kamptner: Pymnesiophyceae

Gephyrocapsa oceanica Kamptner

353

Tsushima / Nagasaki (1986-03)

Axenic, Clonal, T.Sawaguchi (1986-05)

Identified by: I.Inouye

Culture conditions: ESM, 20° C, 12 µE/m² sec, 20D

Characteristics: Marine, *COXI* gene (AB000118)
TMCO-2

References: 75, 206, 293

838

Mutsu Bay / Aomori (1990-11)

Unialgal, Clonal, M.Kawachi (1990-11)

Identified by: M.Kawachi

Culture conditions: ESM, 20° C, 12 µE/m² sec, 20D

Characteristics: Marine, Red tide

GO-01

Reference: 408

1000

Miyake Isl. / Tokyo (1999-11)

CCMP 2054, Unialgal, Clonal, M.Kawachi
(1999-11)

Identified by: M.Kawachi

Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D

Characteristics: Marine, Red tide

1315

Hachijo Isl. / Tokyo (2002-01)

Unialgal, Clonal, M-H.Noël (2002-02)

Identified by: M-H.Noël

- Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine, Red tide
 MH38
- 1316
 East China Sea (Kuroshiwo Current) (2003-08)
 Unialgal, Clonal, M-H.Noël (2003-09)
 Identified by: M-H.Noël
 Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine, Red tide
 MH63
- 1317
 East China Sea (Kuroshiwo Current) (2003-08)
 Unialgal, Clonal, M-H.Noël (2003-09)
 Identified by: M-H.Noël
 Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine, Red tide
 MH64
- 1318
 East China Sea (Kuroshiwo Current) (2003-08)
 Unialgal, Clonal, M-H.Noël (2003-09)
 Identified by: M-H.Noël
 Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine, Red tide
 MH73
- 1319
 East China Sea (Kuroshiwo Current) (2003-07)
 Unialgal, Clonal, M-H.Noël (2003-08)
 Identified by: M-H.Noël
 Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine, Red tide
 YK3-7
- 1328
 Hachijo Isl. / Tokyo (2002-12)
 Unialgal, Clonal, M.Yoshida (2002-12)
 Identified by: M.Yoshida
 Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine, Red tide
 ym-01
- 1329
 Okayama
 Unialgal, Clonal, M.Yubuki (2003-06)
 Identified by: M.Yoshida
 Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
 Characteristics: Marine
 ym-06
- GLAUCOCYSTIS** Itzigsohn: Glaucophyceae
Glaucocystis nostochinearum Itzigsohn
 966
 Lake Renge-numa, Kitashiobara Vil. / Fukushima
 (1987-08)
 Unialgal, Clonal, F.Kasai (1987-08)
 Identified by: F.Kasai
 Culture conditions: MG, 20° C, 12 µE/m² sec, 2M
 Characteristics: Freshwater
 F⑥-5
- GLENODINIOPSIS** Woloszynska: Dinophyceae
Glenodiniopsis uliginosa (Schilling) Woloszynska
 463
 Shizukuishi / Iwate (1984-09)
 Axenic, Clonal, T.Sawaguchi (1984-09)
 Identified by: T.Sawaguchi
 Culture conditions: AF-6/2, 20° C, 40 µE/m² sec,
 2M
 Characteristics: Freshwater, Unstable,
 Untransportable
 TM3D-6
- GLOEOCAPSA** Kützing: Cyanophyceae
Gloeocapsa decorticans (A.Brown) P.Richter
 931
 Tsukui-gun / Kanagawa (2000-04)
 Unialgal, Clonal, S.Otsuka (2000-05)
 Identified by: S.Otsuka
 Culture conditions: CT, 25° C, 24 µE/m² sec, 1M
 Characteristics: Freshwater, Benthic
 GLC2
- GLOEOMONAS** Klebs: Chlorophyceae
Gloeomonas lateperforata (Skuja) Ettl
 464
 Tsukuba / Ibaraki (1982-11)
 Axenic, Clonal, F.Kasai (1982-11)
 Identified by: S.Suda
 Culture conditions: C, 20° C, 22 µE/m² sec, 2M
 Characteristics: Freshwater
 Reference: 242

GLOSSOMASTIX nom. prov.: Pinguicophyceae

Glossomastix chrysoplata O'Kelly

1002

Phillip Bay, Victoria / Australia
CCMP 1537, Unialgal, Clonal, C.J.O'Kelly
(1992-12)
Identified by: C.J.O'Kelly
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine

1302

Kumano / Mie (2001-03)
Unialgal, Clonal, K.Kogame
Identified by: K.Kogame
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
GLOSSO

GOMPHONEMA Ehrenberg: Bacillariophyceae

Gomphonema angustatum (Kützing) Rabenhorst

var. *obtusatum* (Kützing) Grunow

620

Mt. Tsukuba / Ibaraki (1987-04)
Unialgal, Clonal, F.Kasai (1987-05)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
1-36
Reference: 454

Gomphonema gracile Ehrenberg var. *gracile*

465

Ashio / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-08)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
Ast-1-1
Reference: 454

Gomphonema parvulum Kützing var. *parvulum*

466

Sapporo / Hokkaido (1987-07)
Unialgal, Non-clonal, F.Kasai (1987-07)
Identified by: N.Takamura
Culture conditions: CSi, 10° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
Tst-1-18
Reference: 454

467

Sapporo / Hokkaido (1987-07)
Unialgal, Clonal, F.Kasai (1987-07)
Identified by: N.Takamura
Culture conditions: CSi, 10° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
Tst-4-3
Reference: 454

GONATOZYGON De Bary: Charophyceae

Gonatozygon brebissonii De Bary

138

Lake Kasumigaura / Ibaraki (1974-11)
Axenic, Clonal
Culture conditions: C, 20° C, 8 µE/m² sec, 4M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
KAS-4-43
Reference: 242

139

Lake Shoji / Yamanashi (1981-10)
TAC 56-1, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 4M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
TAN-56-1
Reference: 242

Gonatozygon monotaenium De Bary

247

Tsukiyono / Gunma (1984-06)
Axenic, Clonal, F.Kasai (1984-06)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater, Homothallic
84-25-109

287

Lake Yamanaka / Yamanashi (1981-10)
TAC 53-3, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MG, 20° C, 8 µE/m² sec, 2M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
TAN-53-3
Reference: 242

- GONIUM** Müller: Chlorophyceae
- Gonium multicocum*** Pocock
737
UTEX 2580, Axenic, Clonal, H.Nozaki
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 32 µE/m² sec, 1M
Characteristics: Freshwater, F1 clone of UTEX 2579,
atpB gene (AB014020), *rbcL* gene (D63435),
psaA gene (AB044239-40),
psaB gene (AB044461), *psbC* gene (AB04481)
90-530-F1-5
References: 323, 334, 337, 340
- 885
Lemoncove, California / USA (1956-03)
UTEX 783, Unialgal, Clonal
Identified by: J.R.Stein
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater
References: 314, 334
- 1038
Texas / USA
Unialgal, Clonal, R.C.Starr
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater
GQ-M-Tx-1
- 1039
Texas / USA
Unialgal, Clonal, R.C.Starr
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater
GQ-M-Tx-2
- Gonium octonarium*** Pocock
851
USA
Unialgal, Clonal, R.C.Starr
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB014018),
psaA gene (AB044241), *psaB* gene (AB044462),
psbC gene (AB044520)
GO-LC-1+
References: 337, 340, 342
- 852
USA
- Unialgal, Clonal, R.C.Starr
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater
Reference: 340
- Gonium pectorale*** Müller var. *pectorale*
468
Kohoku-ku / Yokohama / Kanagawa (1979-04)
Axenic, Clonal, H.Nozaki (1979-04)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-469
9406-10
References: 176, 242, 304, 314, 331
- 469
Kohoku-ku / Yokohama / Kanagawa (1979-04)
Axenic, Clonal, H.Nozaki (1979-04)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-468
9406-12
References: 242, 304
- 569
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type +, Crosses with NIES-570,
atpB gene (AB014016-7), *rbcL* gene (D63437),
psaA gene (AB044242), *psaB* gene (AB044463),
psbC gene (AB044521)
88-1113-G-1
References: 166, 242, 323, 337, 340, 342
- 570
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type –, Crosses with NIES-569
88-1113-G-2
Reference: 242
- 645
Near Goshokake Hot Spring / Akita (1985-07)

- Unialgal, Clonal, H.Nozaki (1985-09)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type +
 5912-6(+)
 Reference: 242
- 646
 Near Goshokake Hot Spring / Akita (1985-07)
 Unialgal, Clonal, H.Nozaki (1985-09)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type –
 5912-6(-)
 Reference: 242
- Gonium quadratum* Pringsheim ex Nozaki
 647
 Unialgal, Clonal, H.Nozaki (1990-08)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type –, F1 clone of NIES-652 × NIES-653,
 Sister clone to NIES-648, 649, and 650 from one
 zygote
 90-809-F1-2-1
 Reference: 242
- 648
 Unialgal, Clonal, H.Nozaki (1990-08)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type +, F1 clone of NIES-652 × NIES-653,
 Sister clone to NIES-647, 649, and 650 from one
 zygote
 90-809-F1-2-2
 Reference: 242
- 649
 Unialgal, Clonal, H.Nozaki (1990-08)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type +, F1 clone of NIES-652 × NIES-653,
 Sister clone to NIES-647, 648, and 650 from one
 zygote
 90-809-F1-2-3
 Reference: 242
- 650
 Unialgal, Clonal, H.Nozaki (1990-08)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type –, F1 clone of NIES-652 × NIES-653,
 Sister clone to NIES-647, 648, and 649 from one
 zygote
 90-809-F1-2-4
 Reference: 242
- 651
 Klausen / Italy
 UTEX 956, Unialgal, Clonal, E.G.Pringsheim
 (1957)
 Identified by: E.G.Pringsheim
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Type strain
 Referencess: 242, 314, 315
- 652
 Itahari / Nepal (1989-10)
 Unialgal, Clonal, H.Nozaki (1990-04)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type –, Crosses with NIES-653
 90-423-3
 References: 242, 315
- 653
 Itahari / Nepal (1989-10)
 Unialgal, Clonal, H.Nozaki (1990-04)
 Identified by: H.Nozaki
 Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 Mating type +, Crosses with NIES-652,
atpB gene (AB014019), *rbcL* gene (D63438),
psaA gene (AB044243), *psaB* gene (AB044464),
psbC gene (AB044522-3)
 90-423-2
 References: 242n, 315, 323, 331, 337, 340, 342
- * *Gonium sacculiferum* Scherffel
 See *Basichlamys sacculifera* (Scherffel) Skuja
- * *Gonium sociale* (Dujardin) Warming var. *sociale*
 See *Tetrabaena socialis* (Dujardin) Nozaki et Ito
 var. *socialis*
- Gonium viridistellatum* M.Watanabe
 288

- Okinawa / Okinawa (1973-06)
Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Indicator, Freshwater, Heterothallic,
Mating type –, Crosses with NIES-289 and 290
G4
References: 242, 312, 501
- 289
Okinawa / Okinawa (1973-06)
Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Indicator, Freshwater, Type strain,
Heterothallic, Mating type +, Crosses with
NIES-288, *atpB* gene (AB076118-9),
rbcL gene (AB076091), *psaA* gene (AB076140-1),
psaB gene (AB076156), *psbC* gene (AB076173),
rbcL-462 intron (AB076091)
G3
References: 242, 312, 344, 501
- 290
Okinawa / Okinawa (1973-06)
Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Indicator, Freshwater, Type strain,
Heterothallic, Mating type +, Crosses with
NIES-288
G1
References: 242, 312, 501
- 654
Yokohama / Kanagawa (1980-01)
UTEX 2519, Unialgal, Clonal, H.Nozaki (1985-11)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type +, *atpB* gene (AB014021),
rbcL gene (D86831), *psaA* gene (AB044244),
psaB gene (AB044465), *psbC* gene (AB044524),
rbcL-462 intron (AB076090)
KY-4 (+)
References: 242, 312, 322, 324, 337, 340, 344
- 655
Yokohama / Kanagawa (1980-01)
UTEX 2520, Unialgal, Clonal, H.Nozaki (1985-11)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 22 µE/m² sec, 1M
- Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type –
KY-7 (-)
References: 242, 312
- 857
Gaunslis, Kathmandu / Nepal (1986-09)
Unialgal, Clonal, H.Nozaki (1988-05)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB076117),
rbcL gene (AB076092-3), *psaA* gene (AB076139),
psaB gene (AB076155), *psbC* gene (AB076172),
rbcL-462 intron (AB076092)
88-511-9
Reference: 344
- GONYOSTOMUM** Diesing: Raphidophyceae
Gonyostomum semen (Ehrenberg) Diesing
1009
Lake Ozenuma / Fukushima (2002-08)
Unialgal, Clonal, M.Moriya (2002-10)
Identified by: M.Moriya
Culture conditions: AF-6(pH5.8), 15° C,
15 µE/m² sec, 1M
Characteristics: Freshwater
M-87
- GRAESIELLA** Kalina et Puncochárová:
Chlorophyceae
Graesiella emersonii (Shihira et Krauss) Nozaki et al.
Syn. *Chlorella emersonii* Shihira et Krauss
Chlorella fusca Shihira et Krauss var. *vacuolata*
Shihira et Krauss
226
IAM C-28, Axenic, Clonal, E.G.Pringsheim
Reidentified by: H.Nozaki et al.
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Formerly identified as
Chlorella pyrenoidosa Chick
References: 96, 237, 242, 289, 329, 456, 491, 549,
574, 575, 576, 577
- 687
USA
IAM C-104, CCAP 211/8B, Unialgal, Clonal,
R.Emerson (1923)

Reidentified by: H.Nozaki et al.
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Type strain of
Chlorella fusca Shihira et Krauss var. *vacuolata*
Shihira et Krauss
References: 242, 329

688

CCAP 211/8G, Unialgal, Clonal, R.Emerson
Reidentified by: H.Nozaki et al.
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
References: 242, 329

689

CCAP 211/8H, Unialgal, Clonal, R.Emerson
Reidentified by: H.Nozaki et al.
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
References: 242, 329

690

CCAP 211/11N, Unialgal, Clonal, R.Emerson
(1939)
Reidentified by: H.Nozaki et al.
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Type strain of
Chlorella emersonii Shihira et Krauss
References: 242, 329

GYMNODINIUM Stein: Dinophyceae

Gymnodinium mikimotoi Miyake et Kominami
ex Oda
Syn. *Gymnodinium nagasakiense*
Takayama et Adachi

680

Uchiumi Bay / Kagawa (1992-10)
Axenic, Clonal, S.Yoshimatsu (1992-10)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable

* *Gymnodinium nagasakiense* Takayama et Adachi
See *Gymnodinium mikimotoi*
Miyake et Kominami ex Oda

HAEMATOCOCCUS C.Agardh: Chlorophyceae

Haematococcus lacustris

(Girod-Chantrans) Rostafinski
Syn. *Haematococcus pluvialis* Flotow
144
Sapporo / Hokkaido (1964-07)
IAM C-392, Axenic, Clonal, T.Ichimura (1964-07)
Identified by: T.Ichimura
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic, Isogamy,
atpB gene (AB084325), *rbcL* gene (AB084336-7),
psaB gene (AB084365)
MKF-8
References: 96, 147, 148, 185, 186, 187, 188, 189,
190, 191, 192, 193, 194, 195, 242, 342, 463, 464,
465, 530

* *Haematococcus pluvialis* Flotow

See *Haematococcus lacustris*
(Girod-Chantrans) Rostafinski

HAFNIOMONAS Ettl et Moestrup: Chlorophyceae

Hafniomonas montana (Geitler) Ettl et Moestrup 257

Tsukuba / Ibaraki (1983-10)
Axenic, Clonal, S.Suda (1983-10)
Identified by: I.Inouye
Culture conditions: C, 20° C, 12 µE/m² sec, 1M,
(20° C, 25 µE/m² sec)
Characteristics: Freshwater, Unstable,
atpB gene (AB101504), *rbcL* gene (AB101509-10),
psaB gene (AB101515)
OUT-5
References: 242, 338, 441, 530

656

Tsukuba / Ibaraki (1986-04)
Unialgal, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, *atpB* gene (AB101505),
rbcL gene (AB101511-2), *psaB* gene (AB101516)
430M3-3
References: 242, 338

HANTZSCHIA Grunow: Bacillariophyceae

Hantzschia amphioxys (Ehrenberg) Grunow
var. *compacta* Hustedt
587
Tsukuba / Ibaraki (1990-04)
Unialgal, Clonal, T.Hagiwara (1990-04)
Identified by: T.Hagiwara
Culture conditions: CSi, 15° C, 35 µE/m² sec, 1M
Characteristics: Freshwater
Wn-24

HARAMONAS Horiguchi: Raphidophyceae

Haramonas dimorpha Horiguchi
716
Daintree River / Australia (1991-09)
Unialgal, Clonal, T.Horiguchi (1991-10)
Identified by: T.Horiguchi
Culture conditions: f/2, ESM, 20° C, 40 µE/m² sec,
1M
Characteristics: Brackish, Type strain,
Untransportable
Reference: 87

HEMIDINIUM Stein: Dinophyceae

Hemidinium nasutum Stein
471
Tsuchiura / Ibaraki (1987-08)
Unialgal, Clonal, T.Sawaguchi (1987-08)
Identified by: T.Sawaguchi
Culture conditions: AF-6/2, 20° C, 40 µE/m² sec,
1M
Characteristics: Freshwater, Untransportable
87SPD-1

HETEROCAPSA Stein: Dinophyceae

Heterocapsa pygmaea Loeblich III et al.
472
Kashiwazaki / Niigata (1986-08)
Unialgal, Clonal, T.Sawaguchi (1986-08)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Marine, Untransportable
KSTH-23
Reference: 80

473

Izuhara / Nagasaki (1986-03)

Unialgal, Clonal, T.Sawaguchi (1986-03)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Marine, Untransportable
TMUD-2
Reference: 80

Heterocapsa triquetra Stein

7

Osaka Bay / Osaka (1981-04)
Axenic, Clonal, S.Yamochi
Identified by: S.Yamochi
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine, Untransportable
OHet
References: 80, 206, 220, 221, 293

235

Harima-Nada / Seto Inland Sea (1982-03)
Axenic, Clonal, S.Yoshimatsu
Identified by: S.Yoshimatsu
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-57
References: 80, 486

HETEROSIGMA Hada: Raphidophyceae

Heterosigma akashiwo (Hada) Hada

4

Fukuyama Bay / Hiroshima (1966-06)
Axenic, Clonal, H.Iwasaki et al.
Identified by: H.Iwasaki et al.
Culture conditions: f/2, M-ASP7, 20° C,
32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
FHE
References: 23, 68, 142, 184, 405, 410, 462

5

Gokasho Bay / Mie (1966)
Axenic, Clonal, H.Iwasaki et al.
Identified by: Y.Hara
Culture conditions: f/2, M-ASP7, 20° C,
32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
GHE
References: 143, 396

- 6
Osaka Bay / Osaka (1979-08)
Axenic, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: f/2, M-ASP7, 20° C,
32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
OHE-1
References: 67, 70, 172, 173, 174, 199, 200, 201, 203,
206, 207, 212, 239, 240, 243, 261, 268, 293, 345,
357, 407, 436, 437, 446, 487, 488, 489, 504, 506,
507, 508, 509, 510, 511, 512, 533, 535, 536, 537,
538, 539, 546, 567, 570
- 9
Harima-Nada / Seto Inland Sea (1983-02)
Axenic, Clonal, M.M.Watanabe (1983-05)
Identified by: M.M.Watanabe
Culture conditions: f/2, M-ASP7, 20° C,
32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
H-28
- 10
Harima-Nada / Seto Inland Sea (1983-02)
Axenic, Clonal, M.M.Watanabe (1983-05)
Identified by: M.M.Watanabe
Culture conditions: f/2, M-ASP7, 20° C,
32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
H-40
- 145
Nomaike / Kagoshima (1978-05)
Axenic, Clonal, S.Yoshimatsu
Identified by: S.Yoshimatsu
Culture conditions: f/2, M-ASP7, 20° C,
32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-11-5
Reference: 486
- 146
Shido Bay / Kagawa (1978-06)
Axenic, Clonal, K.Yuki
Identified by: K.Yuki
Culture conditions: f/2, M-ASP7, 20° C,
32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-21-2
- 293
Onagawa Bay / Miyagi (1984-08)
Axenic, Clonal, S.Suda (1984-09)
Identified by: S.Suda
Culture conditions: f/2, 20° C, 32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
8280G21-1
Reference: 23
- 561
Mikawa Bay / Aichi
Axenic, Clonal, S.Toriumi
Culture conditions: f/2, 20° C, 32 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Red tide, Marine, Untransportable
References: 392, 393, 466
- HYALOTHECA* Ehrenberg: Charophyceae
- Hyalotheca dissiliens* Brébisson ex Ralfs
- 147
Nagatoro / Saitama (1969-11)
IAM C-510, Unialgal, Clonal, T.Ichimura (1972-06)
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 $\mu\text{E}/\text{m}^2\text{ sec}$, 3M,
(20° C, 12 $\mu\text{E}/\text{m}^2\text{ sec}$)
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-148
S-9-18
Reference: 242
- 148
Nagatoro / Saitama (1969-11)
IAM C-511, Axenic, Clonal, T.Ichimura (1972-06)
Identified by: T.Ichimura
Culture conditions: C, 20° C, 8 $\mu\text{E}/\text{m}^2\text{ sec}$, 3M,
(20° C, 12 $\mu\text{E}/\text{m}^2\text{ sec}$)
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-147
S-9-22
Reference: 242
- 149
Lake Kasumigaura / Ibaraki (1975-12)
IAM C-512, Axenic, Clonal, T.Ichimura (1975-12)
Identified by: T.Ichimura
Culture conditions: VT, 20° C, 8 $\mu\text{E}/\text{m}^2\text{ sec}$, 1M
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-150, Unstable
KAS-7-3
Reference: 242

150

Lake Kasumigaura / Ibaraki (1975-12)
IAM C-513, Axenic, Clonal, T.Ichimura (1975-12)
Identified by: T.Ichimura
Culture conditions: VT, 20° C, 8 μ E/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-149
KAS-7-8
Reference: 242

Hyalotheca dissiliens Brébisson ex Ralfs
var. *dissiliens* f. *tridentula* (Nordstedt) Bold
294

Tsukuba / Ibaraki (1982)
Unialgal, Clonal, F.Kasai (1983-02)
Identified by: F.Kasai
Culture conditions: VT, 20° C, 8 μ E/m² sec, 3M,
(20° C, 12 μ E/m² sec)
Characteristics: Freshwater, Homothallic
H-1
Reference: 242

HYDROCOCCUS Kützing: Cyanophyceae

Hydrococcus rivularis Kützing
593

Yukawa-hot spring / Iwate (1990-09)
Unialgal, Clonal, T.Hagiwara (1990-10)
Identified by: T.Hagiwara
Culture conditions: CB, 20° C, 4 μ E/m² sec, 4M,
(25° C, 30 μ E/m² sec), [Cryopreserved]
Characteristics: Benthic
Yu-52
Reference: 242

HYDRODICTYON Roth: Chlorophyceae

Hydrodictyon reticulatum (Lagerheim) Lagerheim
295

Kitakawachi-gun / Osaka (1968-11)
IAM C-335, Unialgal, Clonal, T.Ichimura (1969-01)
Identified by: T.Ichimura
Culture conditions: C(S), 20° C, 4 μ E/m² sec, 3M,
(25° C, 30 μ E/m² sec)
Characteristics: Freshwater, Homothallic
O-2
References: 96, 242

HYMENOMONAS von Stein: Prymnesiophyceae

Hymenomonas coronata Mills

1016
Taira / Okinawa (2002-03)
Unialgal, Clonal, M.Moriya (2002-05)
Identified by: M.H.Nöel
Culture conditions: ESM, 15° C, 15 μ E/m² sec, 1M
Characteristics: Marine
M-27

IMANTONIA Reynolds: Prymnesiophyceae

Imantonia rotunda Reynolds emend. Green et Pienaar

1001
Chiba Port / Chiba (1990-10)
Unialgal, Clonal, M.Kawachi (1990-11)
Identified by: M.Kawachi
Culture conditions: MNK, 22° C, 15 μ E/m² sec, 14D
Characteristics: Marine, Red tide, Unstable
Iman2

KATODINIUM Fott: Dinophyceae

Katodinium rotundatum (Lohmann) Loeblich III
356

Hachinohe Harbor / Aomori (1985-01)
Axenic, Clonal, T.Sawaguchi (1985-01)
Identified by: T.Sawaguchi
Culture conditions: f/2, ESM, 5° C, 6 μ E/m² sec,
1M (10° C, 15 μ E/m² sec)
Characteristics: Marine, Unstable, Untransportable
HHD-1

LAGERHEIMIA Chodat: Trebouxiophyceae

Lagerheimia ciliata (Lagerheim) Chodat
382

Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, F.Kasai (1983-08)
Identified by: Y.Niiyama
Culture conditions: C, 20° C, 4 μ E/m² sec, 3M,
(25° C, 30 μ E/m² sec)
Characteristics: Freshwater
F37-1
Reference: 242

LIMNOTHRIX Meffert: Cyanophyceae

Limnothrix redekei Meffert

847

Lake Mälaren / Sweden (1990)

NIVA CYA277/1, Axenic, Clonal, R.Skulberg
(1990)

Identified by: S.Suda

Culture conditions: CT, 15° C, 20 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045929)

Reference: 444

LITHODESMIUM Ehrenberg: Bacillariophyceae

Lithodesmium variabile Takano

588

Hitachi / Ibaraki (1990-09)

Unialgal, Non-clonal, S.Ono (1990-10)

Identified by: S.Ono

Culture conditions: f/2, 15° C, 10 µE/m² sec, 1M

Characteristics: Red tide, Marine
St-12

LOBOMONAS Dangeard: Chlorophyceae

Lobomonas monstrosa Korshikov

474

Iwaki / Fukushima (1984-08)

Axenic, Clonal, S.Suda (1984-08)

Identified by: S.Suda

Culture conditions: C, 20° C, 22 µE/m² sec, 2M

Characteristics: Freshwater, *atpB* gene (AB044533),
rbcl gene (AB044171), *psaA* gene (AB044421),
psaB gene (AB044472), *psbC* gene (AB044530)

FL

Reference: 242, 337, 342

LYNGBYA Agardh: Cyanophyceae

Lynghya hieronymusii Lemmermann
var. *hieronymusii*

929

Lake Dalai, Inner Mongolia / China (1996-07)

Axenic, Clonal, S.Suda (1976-07)

Identified by: S.Suda

Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045906)

CN4-3

Reference: 401, 444

MELOSIRA Agardh: Bacillariophyceae

Melosira granulata (Ehrenberg) Ralfs

var. *angustissima* Müller f. *spiralis* Müller

333

Lake Kasumigaura / Ibaraki (1983-05)

Axenic, Clonal, T.Hiwatari (1983-05)

Identified by: M.Mizuno

Culture conditions: CSi, 15° C, 10 µE/m² sec, 1M,
(20° C, 25 µE/m² sec)

Characteristics: Indicator, Freshwater, Unstable
K-Melo

Reference: 438

MERISMOPEDIA Meyen: Cyanophyceae

Merismopedia tenuissima Lemmermann

230

Tsukuba / Ibaraki (1984-05)

Unialgal, Clonal, F.Kasai (1984-05)

Identified by: M.M.Watanabe

Culture conditions: C, 20° C, 12 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Freshwater

F98-2

References: 79, 159, 242, 559, 578

MESOSTIGMA Lauterborn: Prasinophyceae

Mesostigma viride Lauterborn

296

Mitsukaido / Ibaraki (1985-07)

Axenic, Clonal, S.Suda (1985-07)

Identified by: I.Inouye

Culture conditions: C, 20° C, 40 µE/m² sec, 1M

Characteristics: Freshwater, Plastid complete DNA
(AF166114), Mitochondrial complete DNA
(AF353999)

KY-14

References: 141, 225, 480

475

Mitsukaido / Ibaraki (1986-01)

Axenic, Clonal, S.Suda (1987-12)

Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic,
Mating type +
KY-Mes-2

476

Mitsukaido / Ibaraki (1986-01)
Axenic, Clonal, S.Suda (1986-12)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic,
Mating type –
KY-Mes-1
Reference: 236

477

Mitsukaido / Ibaraki (1986-01)
Axenic, Clonal, S.Suda (1986-12)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic,
Mating type –
KY-Mes-3
Reference: 236

995

Hojo Pond, Tsukuba / Ibaraki (1995-11)
Unialgal, Clonal, S.Watanabe (1995-11)
Identified by: S.Watanabe
Culture conditions: C, 20° C, 40 µE/m² sec, 1M
Characteristics: Freshwater, Indicator, Phototaxis
Hojo1

MESOTAENIUM Nägeli: Charophyceae

Mesotaenium kramstae Lemmermann

657

IAM C-330, Unialgal, Clonal
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-658
Reference: 242

658

IAM C-331, Unialgal, Clonal
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses

with NIES-657
Reference: 242

MICRACTINIUM Fresenius: Trebouxiophyceae

Micractinium pusillum Fresenius

151

Lake Kasumigaura / Ibaraki (1983-07)
Axenic, Clonal, F.Kasai (1983-07)
Identified by: F.Kasai
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
F-19-4
References: 159, 242, 530

MICRASTERIAS C.Agardh: Charophyceae

Micrasterias anomala Turner

774

Cairns, Queensland / Australia (1988-09)
Unialgal, Clonal, T.Ichimura (1988)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
88-95-12

776

Near Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic
85-30-38

Micrasterias crux-melitensis Ralfs

152

Kathmandu / Nepal (1968-05)
IAM C-427, Unialgal, Clonal, T.Ichimura (1970-12)
Identified by: T.Ichimura
Culture conditions: VT, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
N-90-27
References: 96, 242

Micrasterias foliacea Bailey ex Ralfs

777

2 km southeast of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-778
M2-1

778

2 km southeast of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-777
M2-2

Micrasterias foliacea Bailey ex Ralfs var. *foliacea*

297

Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, F.Kasai (1983-10)
Identified by: F.Kasai
Culture conditions: MG, 20° C, 8 µE/m² sec, 3M,
(25° C, 15 µE/m² sec)
Characteristics: Freshwater
83-24-24
Reference: 242

Micrasterias mahabuleshwarensis Hobson

779

2 km southeast of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-780
M2-6

780

2 km southeast of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-779

M2-7

Micrasterias thomasiana Archer

var. *notata* (Nordstedt) Grönblad

781

2 km southeast of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-782
85-28-14

782

2 km southeast of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-781
85-28-57

Micrasterias truncata (Corda) Brébisson ex Ralfs

var. *pusilla* G.S.West

783

Centennial Park, Sydney / Australia (1988-09)
Unialgal, Clonal, F.Kasai (1988-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-784
88-7-2

784

Near Cairns, Queensland / Australia (1988-09)
Unialgal, Clonal, F.Kasai (1988-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-783
88-8-5

MICROCYSTIS Lemmermann: Cyanophyceae

- Microcystis aeruginosa* (Kützing) Lemmermann
Syn. *Microcystis ichtyoblabe* Kützing
Microcystis novacekii (Komárek) Compère
Microcystis viridis (A. Brown) Lemmermann
Microcystis wesenbergii Komárek
- 44
Lake Kasumigaura / Ibaraki (1974-08)
IAM M-176, Axenic, Clonal, M.H. Watanabe
(1974-08)
Reidentified by: S. Otsuka
Culture conditions: CB, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. aeruginosa* f. *aeruginosa*,
16SrRNA gene (AB015361), 16S-23S ITS region
(AB015361)
References: 5, 19, 61, 96, 103, 145, 151, 152, 159,
227, 242, 291, 376, 438, 459, 530, 542, 565
- 87
Lake Kasumigaura / Ibaraki (1982-09)
Axenic, Clonal, M.H. Watanabe (1982-09)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. aeruginosa* f. *aeruginosa*,
16SrRNA gene (D89031)
K-MA-11
References: 129, 145, 210, 211, 212, 213, 215, 227,
242, 265, 266, 267, 291, 365, 468, 530, 572, 578
- 88
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H. Watanabe (1981-06)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Toxic,
Freshwater, Formerly identified as *M. aeruginosa* f.
aeruginosa, 16SrRNA gene (AB023255)
KW-MA1-3
References: 122, 124, 126, 145, 169, 210, 211, 212,
213, 438, 473, 530, 572, 578
- 89
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H. Watanabe (1981-06)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Toxic,
Freshwater, Formerly identified as *M. aeruginosa* f.
aeruginosa, 16SrRNA gene (U03403)
KW-MA2-5
References: 132, 210, 211, 212, 213, 215, 227, 242,
290, 291, 530, 543, 572, 578
- 90
Lake Kawaguchi / Yamanashi (1981-06)
Axenic, Clonal, M.H. Watanabe (1981-06)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Toxic,
Freshwater, Formerly identified as *M. aeruginosa* f.
aeruginosa, 16SrRNA gene (AB023256)
KW-MB-2
References: 125, 130, 210, 211, 212, 213, 242, 530,
542, 572, 578
- 91
Lake Kasumigaura / Ibaraki (1982-09)
Unialgal, Clonal, M.H. Watanabe (1982-09)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. aeruginosa* f. *aeruginosa*,
16SrRNA gene (AB023257)
K-MB-13
References: 210, 211, 212, 213, 242, 530, 578
- 98
Lake Kasumigaura / Ibaraki (1982-09)
Axenic, Clonal, M.H. Watanabe (1982-09)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. aeruginosa* f. *flos-aquae*,
16SrRNA gene (D89032)
K-MF-K-3
References: 2, 107, 108, 132, 180, 210, 211, 212, 213,
215, 227, 242, 249, 291, 515, 530, 578
- 99
Lake Suwa / Nagano (1982-08)
Unialgal, Clonal, M.H. Watanabe (1982-08)
Reidentified by: S. Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. aeruginosa* f. *aeruginosa*,

- 16SrRNA gene (AB023258)
S-MA-S5
References: 123, 145, 210, 211, 212, 213, 242, 530, 565, 578
- 100
Lake Suwa / Nagano (1982-08)
Unialgal, Clonal, M.H.Watanabe (1982-08)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D, [Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater, Formerly identified as *M. aeruginosa* f. *aeruginosa*, 16SrRNA gene (AB023259)
S-MB-S7
References: 210, 211, 212, 213, 242, 360, 362, 394, 515, 530, 557, 578
- 101
Lake Suwa / Nagano (1982-10)
TAC 48, Unialgal, Clonal, M.Watanabe (1982-10)
Reidentified by: S.Otsuka
Culture conditions: CB, 25° C, 24 µE/m² sec, 20D, [Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater, 16SrRNA gene (AB023260)
S-TAN-48
References: 34, 210, 211, 212, 213, 242, 269, 515, 530, 578
- 102
Lake Kasumigaura / Ibaraki (1982-09)
Axenic, Clonal, M.H.Watanabe (1982-09)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Indicator, Toxic, Freshwater, Formerly identified as *M. viridis*, 16SrRNA gene (D89033)
K-MV-20
References: 79, 115, 116, 119, 134, 140, 159, 170, 210, 211, 212, 213, 215, 218, 227, 232, 242, 290, 291, 368, 394, 447, 448, 520, 543, 557, 558, 559, 565, 572, 578
- 103
Lake Kasumigaura / Ibaraki (1978-12)
TAC 44, Unialgal, Clonal, M.Watanabe (1978-12)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Water bloom, Indicator, Toxic, Freshwater, Formerly identified as *M. viridis*
- K-TAN-44
References: 197, 242, 251, 515
- 104
Chiyoda-ku / Tokyo (1982-11)
Axenic, Clonal, M.H.Watanabe (1982-11)
Reidentified by: S.Otsuka
Culture conditions: CB, MA, 25° C, 24 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater, Formerly identified as *M. wesenbergii*, 16SrRNA gene (AB015387, AB023266, AJ133174), 16S-23S ITS region (AB015387), *gyrB* gene (AB074771), *rpoC1* gene (AB074794), *rpoD1* gene (AB074821)
MW-H1
References: 210, 211, 212, 213, 215, 227, 242, 376, 425, 438, 557, 572, 578
- 105
Lake Kasumigaura / Ibaraki (1982-09)
Unialgal, Clonal, M.H.Watanabe (1982-09)
Reidentified by: M.H.Watanabe
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater, Formerly identified as *M. wesenbergii*, 16SrRNA gene (AB023267)
K-MW-K4
References: 210, 211, 212, 213, 242, 572, 578
- 106
Lake Kasumigaura / Ibaraki (1982-09)
Unialgal, Clonal, M.H.Watanabe (1982-09)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater, (A) large size, Formerly identified as *M. wesenbergii*, 16SrRNA gene (AB023268)
K-MW-19
References: 210, 211, 212, 213, 242, 394, 572, 578
- 107
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H.Watanabe (1981-06)
Reidentified by: S.Otsuka
Culture conditions: CB, MA, 25° C, 24 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Water bloom, Indicator, Toxic, Freshwater, Formerly identified as *M. wesenbergii*, 16SrRNA gene (U40333)

- KW-MW-7
References: 213, 214, 242, 290, 291, 543
- 108
Lake Suwa / Nagano (1982-08)
Unialgal, Clonal, M.H.Watanabe (1982-08)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. wesenbergii*, 16SrRNA
gene (AB023269)
S-MW-52
References: 210, 211, 212, 213, 242, 572, 578
- 109
Lake Yogo / Shiga (1982-07)
Unialgal, Clonal, M.H.Watanabe (1982-07)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. wesenbergii*, 16SrRNA
gene (AB023270)
Y-MW-24
References: 210, 211, 212, 213, 242, 572, 578
- 110
Lake Kasumigaura / Ibaraki (1978-08)
TAC 36, Unialgal, Clonal, M.Watanabe (1978-08)
Reidentified by: S.Otsuka
Culture conditions: CT, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. wesenbergii*, 16SrRNA
gene (AB023271)
K-TAN-36
References: 210, 211, 212, 213, 242, 572, 578
- 111
Lake Kasumigaura / Ibaraki (1978-08)
TAC 37, Axenic, Clonal, M.Watanabe (1978-08)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. wesenbergii*, 16SrRNA
gene (D89034, AB015388), 16S-23S ITS region
(AB015388)
K-TAN-37
References: 210, 211, 212, 213, 215, 227, 242, 290,
291, 376, 438, 543, 572, 578
- 112
Lake Suwa / Nagano (1982-10)
TAC 52, Axenic, Clonal, M.Watanabe (1982-10)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Water bloom, Indicator, Freshwater,
Formerly identified as *M. wesenbergii*, 16SrRNA
gene (U40334, AB023272)
S-TAN-52
References: 210, 211, 212, 213, 214, 215, 227, 242,
291, 515, 565, 572, 578
- 298
Lake Kasumigaura / Ibaraki (1982-09)
TAC 47, Axenic, Clonal, M.Watanabe (1982-09)
Reidentified by: S.Otsuka
Culture conditions: CB, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Toxic, Freshwater,
Formerly identified as *M. aeruginosa* f. *aeruginosa*,
16SrRNA gene (AB023261)
K-TAN-47
References: 34, 61, 79, 115, 131, 132, 159, 210, 211,
212, 213, 215, 223, 224, 227, 242, 253, 291, 294,
361, 394, 515, 543, 559, 572, 578
- 299
Lake Kasumigaura / Ibaraki (1979-08)
Unialgal, Clonal, N.Takamura (1979-08)
Reidentified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 20D,
[Cryopreserved]
Characteristics: Water bloom, Freshwater, Formerly
identified as *M. aeruginosa* f. *aeruginosa*,
16SrRNA gene (AB023262)
KN1133
References: 61, 123, 127, 210, 211, 212, 213, 242,
572, 578
- 478
Lake Kasumigaura / Ibaraki (1977-09)
Unialgal, Non-clonal, O.Yagi (1978-04)
Reidentified by: S.Otsuka
Culture conditions: MA, 20° C, 4 µE/m² sec, 3M,
(25° C, 15 µE/m² sec), [Cryopreserved]
Characteristics: Toxic, Freshwater, Formerly
identified as *M. aeruginosa* f. *flos-aquae*
K-5
References: 128, 242, 550, 551, 552

- 604
Lake Kasumigaura / Ibaraki (1977-09)
Axenic, Clonal, O.Yagi (1978-04)
Reidentified by: S.Otsuka
Culture conditions: MA, 20° C, 4 µE/m² sec, 3M,
(25° C, 15 µE/m² sec), [Cryopreserved]
Characteristics: Water bloom, Freshwater, 16SrRNA
gene (AB023273)
K-3A
References: 60, 210, 211, 212, 213, 215, 217, 227,
242, 262, 428, 550, 572, 578
- 843
Lake Kasumigaura / Ibaraki (1997-08)
Axenic, Clonal, S.Otsuka (1997-08)
Identified by: S.Otsuka
Culture conditions: MA, 25° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Offensive
taste and odor, Toxic, 16SrRNA gene
(AB035549)
NC7
References: 373, 377
- 901
Dundee, Scotland / U.K. (1997-08)
Axenic, Clonal, S.Otsuka (1997-08)
Identified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Offensive
taste and odor, Toxic
BC18
Reference: 373
- 902
Chon Buri / Thailand (1997-01)
Axenic, Clonal, R.Li (1997-02)
Identified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Offensive
taste and odor, Toxic
TL2
Reference: 373
- 903
Hubei / China (1996-07)
Axenic, Clonal, S.Otsuka (1996-07)
Identified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
- Characteristics: Freshwater, Water bloom, Offensive
taste and odor, Toxic
CC9
Reference: 373
- 904
Bangkok / Thailand (1996-10)
Axenic, Clonal, S.Otsuka (1996-10)
Identified by: S.Otsuka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Offensive
taste and odor, Toxic
TC7
Reference: 373
- 933
Little Rideau Lake, Ontario / Canada
PCC 7941, Unialgal, Clonal, P.R.Gorham &
W.W.Carmichael (1954)
Identified by: R.Rippka
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic,
Type strain
- 1025
Sapporo / Hokkaido (2000-06)
Unialgal, Clonal, T.Sano (2000-06)
Identified by: S.Otsuka
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic,
Formerly identified as *Microcystis ichtyoblabe*
Doutyou-1-3
- 1026
Sapporo / Hokkaido (2000-06)
Unialgal, Clonal, T.Sano (2000-06)
Identified by: S.Otsuka
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic,
Formerly identified as *Microcystis ichtyoblabe*
Doutyou-1-4
- 1027
Lake Kasumigaura / Ibaraki (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: T.Sano
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]

- Characteristics: Freshwater, Water bloom, Toxic
Takahama-Ma-2
- 1028
Lake Teganuma / Chiba (2000-09)
Unialgal, Clonal, T.Sano (2000-09)
Identified by: T.Sano
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic
TEGA-Mv-1
- 1029
Neuglobsow, Brandenburg / Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: S.Otsuka
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic
DU-MA-4-1
- 1043
Neuglobsow, Brandenburg / Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: T.Sano
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic
DU-MA-4-1
- 1050
Lake Kasumigaura / Ibaraki (1978-02)
TAC 4, Unialgal, Clonal, M.Watanabe (1978-02)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1051
Lake Kasumigaura / Ibaraki (1978-02)
TAC 6, Unialgal, Clonal, M.Watanabe (1978-02)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1052
Lake Kasumigaura / Ibaraki (1978-02)
TAC 15, Unialgal, Clonal, M.Watanabe (1978-02)
Identified by: M.Watanabe
- Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1053
Lake Kasumigaura / Ibaraki (1978-02)
TAC 19, Unialgal, Clonal, M.Watanabe (1978-02)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. novaceckii*
References: 379, 505, 514, 515, 517
- 1054
Lake Kasumigaura / Ibaraki (1978-02)
TAC 20, Unialgal, Clonal, M.Watanabe (1978-02)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom,
16SrRNA gene (AB012336, AB015374)
References: 375, 376, 379, 505, 514, 515, 517
- 1055
Lake Kasumigaura / Ibaraki (1978-08)
TAC 38-1, Unialgal, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*, Reisolated from TAC
38, 16SrRNA gene (AB012334, AB015389,
AB023274)
References: 164, 210, 211, 212, 375, 376, 379, 473,
515, 578 [Both for TAC 38 and 38-1 are included]
- 1056
Lake Kasumigaura / Ibaraki (1978-08)
TAC 39, Unialgal, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1057
Lake Kasumigaura / Ibaraki (1978-08)
TAC 40, Unialgal, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,

[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
Reference: 394

1058

Lake Kasumigaura / Ibaraki (1978-12)
TAC 45-1, Unialgal, Clonal, M.Watanabe (1978-12)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. viridis*, Reisolated from TAC 45,
16SrRNA gene (AB015400)
References: 164, 376, 515, 578 [Both for TAC 45
and 45-1 are included]

1059

Lake Kasumigaura / Ibaraki (1978-12)
TAC 46, Unialgal, Clonal, M.Watanabe (1978-12)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. viridis*
References: 379, 513, 514, 515

1060

Lake Suwa / Nagano (1982-10)
TAC 50, Unialgal, Clonal, M.Watanabe (1982-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 517

1061

Lake Suwa / Nagano (1982-10)
TAC 51, Unialgal, Clonal, M.Watanabe (1982-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. ichthyoblabe*, 16SrRNA gene
(AB023281)
References: 164, 210, 211, 212, 296, 379, 394, 473,
505, 514, 517, 578

1062

Lake Suwa / Nagano (1982-10)
TAC 57-1, Unialgal, Clonal, M.Watanabe (1982-10)
Identified by: M.Watanabe

Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*, Reisolated from TAC
57, 16SrRNA gene (AB015391, AB023276)
References: 210, 376, 578 [Both for TAC 57 and
57-1 are included]

1063

Lake Shirakaba / Nagano (1982-09)
TAC 60, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
References: 164, 367, 379, 380, 381, 505, 514, 517,
578

1064

Lake Shirakaba / Nagano (1982-09)
TAC 61, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic
References: 164, 379, 505, 514, 516, 517, 578

1065

Lake Kutsuzawa / Nagano (1982-09)
TAC 62, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505

1066

Lake Kutsuzawa / Nagano (1982-09)
TAC 63, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
References: 379, 394, 505, 514, 516, 517

1067

Chikato-ike Pond, Matsumoto / Nagano (1982-09)
TAC 65-2, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*, Reisolated from TAC

65, 16SrRNA gene (AB012337, AB023285)
References: 164, 210, 296, 375, 376, 379, 505, 514,
515, 517, 578 [Both for TAC 65 and 65-2 are
included]

1068

Rokusuke-ike Pond, Matsumoto / Nagano (1982-09)
TAC 66-1, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. novacekii*, Reisolated from TAC
66, 16SrRNA gene (AB015376, AB023286)
References: 164, 210, 211, 212, 296, 367, 376, 379,
505, 514, 517, 578 [Both for TAC 66 and 66-1 are
included]

1069

Rokusuke-ike Pond, Matsumoto / Nagano (1982-09)
TAC 67, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom

1070

Rokusuke-ike Pond, Matsumoto / Nagano (1982-09)
TAC 69-1, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic,
Formerly identified as *M. ichthyoblabe*, Reisolated
from TAC 69
References: 164, 379, 505, 514, 516, 517, 569, 578
[Both for TAC 69 and 69-1 are included]

1071

Fukui / Ishikawa (1982-09)
TAC 70-1, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic,
Reisolated from TAC 70
References: 164, 379, 505, 514, 516, 517, 578 [Both
for TAC 70 and 70-1 are included]

1072

Fukui / Ishikawa (1982-09)
TAC 71-1, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe

Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Freshwater, Water bloom, Toxic,
Reisolated from TAC 71, 16SrRNA gene
(AB012332, AB015362)

References: 375, 376, 379, 505, 514, 517 [Both for
TAC 71 and 71-1 are included]

1073

Fukui / Ishikawa (1982-09)
TAC 72, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom

1074

Lake Yogo / Shiga (1984-09)
TAC 73-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 73
References: 164, 379, 380, 381, 505, 514, 517 [Both
for TAC 73 and 73-1 are included]

1075

Lake Yogo / Shiga (1984-09)
TAC 74-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 74
Reference: 505 [For TAC 74]

1076

Lake Yogo / Shiga (1984-09)
TAC 75-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 75, 16SrRNA gene (AB023287)
References: 210, 211, 212, 296, 379, 505, 514, 517,
578 [Both for TAC 75 and 75-1 are included]

1077

Lake Yogo / Shiga (1984-09)
TAC 76, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Freshwater, Water bloom, Toxic
References: 164, 296, 379, 505, 514, 516, 517

1078

Lake Mikata / Fukui (1984-09)
TAC 79, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom

1079

Lake Suigetsu / Fukui (1984-09)
TAC 80-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. ichthyoblabe*, Reisolated from
TAC 80
References: 164, 367, 379, 380, 381, 505, 514, 517,
578 [Both for TAC 80 and 80-1 are included]

1080

Lake Suigetsu / Fukui (1984-09)
TAC 81-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 81
References: 379, 394, 473, 505, 517 [Both for TAC
81 and 81-1 are included]

1081

Koyama-ike Pond, Tottori / Tottori (1984-09)
TAC 82-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 82
References: 164, 379, 473, 505, 514, 517 [Both for
TAC 82 and 82-1 are included]

1082

Koyama-ike Pond, Tottori / Tottori (1984-09)
TAC 83-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 83

Reference: 505 [For TAC 83]

1083

Ukiginu-ike Pond, Ooda / Shimane (1984-09)
TAC 84, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
References: 379, 473, 505, 514, 517

1084

Ukiginu-ike Pond, Ooda / Shimane (1984-09)
TAC 85, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
References: 164, 367, 379, 578

1085

Koshi-ike Pond, Matsue / Shimane (1984-09)
TAC 86-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic,
Reisolated from TAC 86, 16SrRNA gene
(AB012333, AB015363)
References: 375, 376, 379, 380, 381, 505, 514, 517
[Both for TAC 86 and 86-1 are included]

1086

Koshi-ike Pond, Matsue / Shimane (1984-09)
TAC 87-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic,
Reisolated from TAC 87, 16SrRNA gene
(AB015364)
References: 164, 374, 376, 379, 380, 381, 505, 514,
516, 517, 578 [Both for TAC 87 and 87-1 are
included]

1087

Koshi-ike Pond, Matsue / Shimane (1984-09)
TAC 88, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505

- 1088
Koshi-ike Pond, Matsue / Shimane (1984-09)
TAC 89, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1089
Koshi-ike Pond, Matsue / Shimane (1984-09)
TAC 90, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1090
Lake Barato / Hokkaido (1984-08)
TAC 91-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. ichthyoblabe*, Reisolated from
TAC 91, 16SrRNA gene (AB012339, AB015367,
AB023282)
References: 164, 210, 211, 212, 296, 367, 375, 376,
379, 380, 381, 505, 514, 517, 578 [Both for TAC
91 and 91-1 are included]
- 1091
Lake Barato / Hokkaido (1984-08)
TAC 92-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. viridis*, Reisolated from TAC 92,
16SrRNA gene (AB015402, AB023278)
References: 164, 210, 211, 212, 296, 376, 379, 511,
513, 514, 569, 578 [Both for TAC 92 and 92-1 are
included]
- 1092
Lake Barato / Hokkaido (1984-08)
TAC 93-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 93, 16SrRNA gene (AB015403)
- Reference: 376 [For TAC 93]
- 1093
Lake Barato / Hokkaido (1984-08)
TAC 95-1, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 95
Reference: 164, 367, 379, 505, 514, 516, 517, 578
[Both for TAC 95 and 95-1 are included]
- 1094
Lake Shirakaba / Nagano (1984-09)
TAC 96, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
- 1095
Lake Shirakaba / Nagano (1984-09)
TAC 97, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic
References: 164, 379, 505, 514, 516, 517
- 1096
Lake Shirakaba / Nagano (1984-09)
TAC 98, Unialgal, Clonal, M.Watanabe (1984-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
- 1097
Ogasahara / Tokyo (1984-11)
TAC 109, Unialgal, Clonal, M.Watanabe (1984-12)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
References: 164, 379, 505, 514, 517, 578
- 1098
Ogasahara / Tokyo (1984-11)
TAC 110-1, Unialgal, Clonal, M.Watanabe
(1984-12)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]

- Characteristics: Freshwater, Water bloom, Reisolated from TAC 110
References: 164, 379, 473, 505, 514, 517, 578 [Both for TAC 110 and 110-1 are included]
- 1099
Noborio-ike Pond, Misho / Ehime (1988-10)
TAC 113-1, Unialgal, Clonal, M.Watanabe (1988-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Toxic, Reisolated from TAC 113
References: 367, 379, 505, 514, 516, 517 [Both for TAC 113 and 113-1 are included]
- 1100
Kathmandu / Nepal (1988-11)
TAC 114-1, Unialgal, Clonal, M.Watanabe (1988-11)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated from TAC 114
- 1101
Kathmandu / Nepal (1988-11)
TAC 115-1, Unialgal, Clonal, M.Watanabe (1988-11)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated from TAC 115
- 1102
Lake Barato / Hokkaido (1989-08)
TAC 122, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly identified as *M. viridis*
- 1103
Lake Barato / Hokkaido (1989-08)
TAC 123, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
- Characteristics: Freshwater, Water bloom, Formerly identified as *M. viridis*
- 1104
Lake Barato / Hokkaido (1989-08)
TAC 124, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly identified as *M. viridis*
Reference: 473
- 1105
Lake Barato / Hokkaido (1989-08)
TAC 125-1, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly identified as *M. ichthyoblabe*, Reisolated from TAC 125, 16SrRNA gene (AB015368, AB023283)
References: 210, 211, 212, 296, 376, 505, 578 [Both for TAC 125 and 125-1 are included]
- 1106
Shin-ike Pond, Matsumoto / Nagano (1989-08)
TAC 126, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1107
Kamisawa-ike Pond, Matsumoto / Nagano (1989-08)
TAC 128, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom
References: 505, 569
- 1108
Kamisawa-ike Pond, Matsumoto / Nagano (1989-08)
TAC 129, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom

- Reference: 505
- 1109
Dazaifu / Fukuoka (1989-07)
TAC 130, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1110
Dazaifu / Fukuoka (1989-07)
TAC 131, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Reference: 505
- 1111
Dazaifu / Fukuoka (1989-07)
TAC 132, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1112
Dazaifu / Fukuoka (1989-07)
TAC 133, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1113
Lake Suwa / Nagano (1989-07)
TAC 134, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1114
Lake Suwa / Nagano (1989-07)
TAC 135, Unialgal, Clonal, M.Watanabe (1989-07)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
- identified as *M. viridis*
- 1115
Showa-tameike Pond, Yame / Fukuoka (1989-08)
TAC 136-1, Unialgal, Clonal, M.Watanabe
(1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 136, 16SrRNA gene (AB015369)
References: 376, 505 [Both for TAC 136 and 136-1
are included]
- 1116
Showa-tameike Pond, Yame / Fukuoka (1989-08)
TAC 137, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1117
Showa-tameike Pond, Yame / Fukuoka (1989-08)
TAC 138-1, Unialgal, Clonal, M.Watanabe
(1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated
from TAC 138, 16SrRNA gene (AB015370)
References: 376, 505 [Both for TAC 138 and 138-1
are included]
- 1118
Showa-tameike Pond, Yame / Fukuoka (1989-08)
TAC 141, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. viridis*
- 1119
Showa-tameike Pond, Yame / Fukuoka (1989-08)
TAC 143, Unialgal, Clonal, M.Watanabe (1989-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*

- 1120
 Showa-tameike Pond, Yame / Fukuoka (1989-08)
 TAC 144, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. wesenbergii*
- 1121
 Showa-tameike Pond, Yame / Fukuoka (1989-08)
 TAC 145, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. wesenbergii*
- 1122
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 146-1, Unialgal, Clonal, M.Watanabe
 (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. ichthyoblabe*, Reisolated from
 TAC 146, 16SrRNA gene (AB023284)
 References: 210, 211, 212, 296, 505, 578 [Both for
 TAC 146 and 146-1 are included]
- 1123
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 147, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1124
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 148, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1125
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 149, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1126
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 150, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1127
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 151, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1128
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 152, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. wesenbergii*
- 1129
 Ohnuma, Nanae / Hokkaido (1989-09)
 TAC 153, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. wesenbergii*
- 1130
 Lake Teganuma / Chiba (1989-09)
 TAC 154-1, Unialgal, Clonal, M.Watanabe
 (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Reisolated
 from TAC 154
 Reference: 505 [For TAC 154]
- 1131
 Lake Teganuma / Chiba (1989-09)
 TAC 155, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom

- 1132
Lake Teganuma / Chiba (1989-09)
TAC 156-1, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Freshwater, Water bloom, Reisolated from TAC 156
Reference: 505 [For TAC 156]
- 1133
Lake Teganuma / Chiba (1989-09)
TAC 157-2, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated from TAC 157, 16SrRNA gene (AB023263)
References: 210, 211, 212, 213, 296, 505, 578 [Both for TAC 157 and 157-2 are included]
- 1134
Lake Teganuma / Chiba (1989-09)
TAC 159-1, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated from TAC 159
Reference: 505 [For TAC 159]
- 1135
Lake Teganuma / Chiba (1989-09)
TAC 160-1, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Reisolated from TAC 160
- 1136
Lake Teganuma / Chiba (1989-09)
TAC 162, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. viridis*
- 1137
Lake Teganuma / Chiba (1989-09)
TAC 163, Unialgal, Clonal, M.Watanabe (1989-09)
- Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
Reference: 473
- 1138
Lake Teganuma / Chiba (1989-09)
TAC 164-1, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*, Reisolated from TAC 164
- 1139
Lake Okutama / Tokyo (1989-09)
TAC 165, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1140
Lake Okutama / Tokyo (1989-09)
TAC 166, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
References: 165, 379, 505, 514, 517
- 1141
Lake Okutama / Tokyo (1989-09)
TAC 167, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
References: 165, 505
- 1142
Lake Okutama / Tokyo (1989-09)
TAC 169, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, 16SrRNA gene (AB023264)
References: 210, 211, 212, 296, 505, 517, 578
- 1143
Lake Okutama / Tokyo (1989-09)
TAC 170-1, Unialgal, Clonal, M.Watanabe

- (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. novacekii*, Reisolated from TAC
 170, 16SrRNA gene (AB012340, AB015365)
 References: 375, 376 [For TAC170]
- 1144
 Lake Okutama / Tokyo (1989-09)
 TAC 171, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. wesenbergii*
- 1145
 Lake Okutama / Tokyo (1989-09)
 TAC 172, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly
 identified as *M. wesenbergii*
 Reference: 165
- 1146
 Lake Shirakaba / Nagano (1989-08)
 TAC 173, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1147
 Lake Shirakaba / Nagano (1989-08)
 TAC 174, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1148
 Lake Shirakaba / Nagano (1989-08)
 TAC 175, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1149
 Lake Shirakaba / Nagano (1989-08)
 TAC 176, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
- Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1150
 Lake Shirakaba / Nagano (1989-08)
 TAC 177, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1151
 Lake Shirakaba / Nagano (1989-08)
 TAC 178, Unialgal, Clonal, M.Watanabe (1989-08)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1152
 Lake Okutama / Tokyo (1989-09)
 TAC 179, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 References: 165, 505
- 1153
 Lake Okutama / Tokyo (1989-09)
 TAC 180, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1154
 Lake Okutama / Tokyo (1989-09)
 TAC 181, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 References: 379, 380, 505
- 1155
 Lake Teganuma / Chiba (1989-09)
 TAC 182, Unialgal, Clonal, M.Watanabe (1989-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505

- 1156
Lake Shirakaba / Nagano (1989-09)
TAC 183, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1157
Lake Teganuma / Chiba (1989-09)
TAC 185, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1158
Yame / Fukuoka (1989-09)
TAC 186, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1159
Okutama / Tokyo (1989-09)
TAC 187, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
References: 165, 505
- 1160
Lake Okutama / Tokyo (1989-09)
TAC 188, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
References: 165, 505
- 1161
Lake Okutama / Tokyo (1989-09)
TAC 189, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
References: 165, 505
- 1162
Lake Okutama / Tokyo (1989-09)
TAC 190, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1163
Lake Okutama / Tokyo (1989-09)
TAC 191, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
References: 165, 505
- 1164
Lake Okutama / Tokyo (1989-09)
TAC 192, Unialgal, Clonal, M.Watanabe (1989-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom,
16SrRNA gene (AB023265)
References: 210, 211, 212, 296, 505, 578
- 1165
Tsuruoka / Yamagata (1990-08)
TAC 193, Unialgal, Clonal, Y.Niiyama (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1166
Tsuruoka / Yamagata (1990-08)
TAC 194, Unialgal, Clonal, Y.Niiyama (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1167
Tsuruoka / Yamagata (1990-08)
TAC 195, Unialgal, Clonal, Y.Niiyama (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1168
Tsuruoka / Yamagata (1990-08)
TAC 196, Unialgal, Clonal, Y.Niiyama (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*

- 1169
Tsuruoka / Yamagata (1990-08)
TAC 197, Unialgal, Clonal, Y.Niiyama (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1170
Lake Barato / Hokkaido (1990-08)
TAC 198, Unialgal, Clonal, M.Watanabe (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1171
Lake Barato / Hokkaido (1990-08)
TAC 199, Unialgal, Clonal, M.Watanabe (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1172
Lake Barato / Hokkaido (1990-08)
TAC 200, Unialgal, Clonal, M.Watanabe (1990-08)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1173
Saburo-ike Pond, Takamatsu / Kagawa (1990-09)
TAC 311, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1174
Saburo-ike Pond, Takamatsu / Kagawa (1990-09)
TAC 312, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1175
Saburo-ike Pond, Takamatsu / Kagawa (1990-09)
TAC 313, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
- Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1176
Saburo-ike Pond, Takamatsu / Kagawa (1990-09)
TAC 314, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1177
Saburo-ike Pond, Takamatsu / Kagawa (1990-09)
TAC 315, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1178
Shin-ike Pond, Kagawa / Kagawa (1990-09)
TAC 316, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1179
Shin-ike Pond, Kagawa / Kagawa (1990-09)
TAC 317, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1180
Shin-ike Pond, Kagawa / Kagawa (1990-09)
TAC 319, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. viridis*
- 1181
Shin-ike Pond, Kagawa / Kagawa (1990-09)
TAC 320, Unialgal, Clonal, M.Watanabe (1990-09)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1182
Sakase-ike Pond / Kagawa (1990-09)
TAC 321, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe

- Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly identified as *M. ichthyoblabe*
 Reference: 505
- 1183
 Sakase-ike Pond / Kagawa (1990-09)
 TAC 322, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly identified as *M. ichthyoblabe*
 Reference: 505
- 1184
 Sakase-ike Pond / Kagawa (1990-09)
 TAC 323, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1185
 Sakase-ike Pond / Kagawa (1990-09)
 TAC 325, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1186
 Sakase-ike Pond / Kagawa (1990-09)
 TAC 326, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1187
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 327, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1188
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 328, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1189
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 329, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1190
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 330, Unialgal, Clonal, M.Watanabe (1990-10)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1191
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 331, Unialgal, Clonal, M.Watanabe (1990-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1192
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 332, Unialgal, Clonal, M.Watanabe (1990-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1193
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 333, Unialgal, Clonal, M.Watanabe (1990-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1194
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 335, Unialgal, Clonal, M.Watanabe (1990-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1195
 Lake Heiso, Kakogawa / Hyogo (1990-09)
 TAC 336, Unialgal, Clonal, M.Watanabe (1990-09)
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom

- 1196
Lake Heiso, Kakogawa / Hyogo (1990-09)
TAC 337, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1197
Lake Heiso, Kakogawa / Hyogo (1990-09)
TAC 338, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1198
Futago-ike Pond, Kakogawa / Hyogo (1990-09)
TAC 339, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1199
Futago-ike Pond, Kakogawa / Hyogo (1990-09)
TAC 340, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1200
Shinji-aika-ike Pond, Matsue / Shimane (1990-09)
TAC 341, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1201
Shinji-aika-ike Pond, Matsue / Shimane (1990-09)
TAC 342, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1202
Shinji-aika-ike Pond, Matsue / Shimane (1990-09)
TAC 343, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1203
Shinji-aika-ike Pond, Matsue / Shimane (1990-09)
TAC 344, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1204
Shinji-aika-ike Pond, Matsue / Shimane (1990-09)
TAC 345, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1205
Johoku-ike Pond, Matsue / Shimane (1990-09)
TAC 346, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1206
Johoku-ike Pond, Matsue / Shimane (1990-09)
TAC 347, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505
- 1207
Johoku-ike Pond, Matsue / Shimane (1990-09)
TAC 348, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1208
Johoku-ike Pond, Matsue / Shimane (1990-09)
TAC 349, Unialgal, Clonal, M.Watanabe (1990-10)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly
identified as *M. wesenbergii*
- 1209
Lake Toro / Hokkaido (1990-09)
TAC 350, Unialgal, Clonal, M.Watanabe

Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1210
Lake Toro / Hokkaido (1990-09)
TAC 351, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1211
Lake Tofutsu / Hokkaido (1990-09)
TAC 352, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1212
Lake Tofutsu / Hokkaido (1990-09)
TAC 353, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1213
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 355, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
References: 209, 505

1214
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 356, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1215
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 357, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1216
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 358, Unialgal, Clonal, M.Watanabe

Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1217
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 359, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1218
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 360, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1219
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 361, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1220
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 362, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1221
Kunma Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 363, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1222
Tatsugami Dam, Yonaguni Isl. / Okinawa (1990-10)
TAC 364, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1223
Tatsugami Dam, Yonaguni Isl. / Okinawa (1990-10)

- TAC 365, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1224
 Tatsugami Dam, Yonaguni Isl. / Okinawa (1990-10)
 TAC 368, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1225
 Tatsugami Dam, Yonaguni Isl. / Okinawa (1990-10)
 TAC 369, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1226
 Tatsugami Dam, Yonaguni Isl. / Okinawa (1990-10)
 TAC 370, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1227
 Fukuchi Dam, Higashi Vil. / Okinawa (1990-10)
 TAC 371, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1228
 Fukuchi Dam, Higashi Vil. / Okinawa (1990-10)
 TAC 372, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1229
 Fukuchi Dam, Higashi Vil. / Okinawa (1990-10)
 TAC 373, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1230
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 374, Unialgal, Clonal, M.Watanabe
- Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1231
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 375, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1232
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 376, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1233
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 377, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1234
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 378, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
 Reference: 505
- 1235
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 379, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1236
 Ishigaki Dam, Ishigaki / Okinawa (1990-10)
 TAC 380, Unialgal, Clonal, M.Watanabe
 Identified by: M.Watanabe
 Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom
- 1237
 Tengan Dam, Ishikawa / Okinawa (1990-10)

TAC 381, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1238

Tengan Dam, Ishikawa / Okinawa (1990-10)
TAC 382, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1239

Tengan Dam, Ishikawa / Okinawa (1990-10)
TAC 383, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1240

Tengan Dam, Ishikawa / Okinawa (1990-10)
TAC 384, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1241

Tengan Dam, Ishikawa / Okinawa (1990-10)
TAC 385, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1242

Tengan Dam, Ishikawa / Okinawa (1990-10)
TAC 386, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1243

Maesato Dam, Ishigaki / Okinawa (1990-10)
TAC 387, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1244

Maesato Dam, Ishigaki / Okinawa (1990-10)
TAC 388, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1245

Maesato Dam, Ishigaki / Okinawa (1990-10)
TAC 389, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1246

Hyotan-ike Pond, Minamidaito Isl. / Okinawa
(1990-10)
TAC 390, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
Reference: 505

1247

Hyotan-ike Pond, Minamidaito Isl. / Okinawa
(1990-10)
TAC 391, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1248

Hyotan-ike Pond, Minamidaito Isl. / Okinawa
(1990-10)
TAC 392, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1249

Hyotan-ike Pond, Minamidaito Isl. / Okinawa
(1990-10)
TAC 393, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom

1250

Hyotan-ike Pond, Minamidaito Isl. / Okinawa
(1990-10)
TAC 394, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe

- Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- 1251
Lake Suwa / Nagano (1990-03)
TAC 395, Unialgal, Clonal, M.Watanabe (1990-04)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1252
Lake Suwa / Nagano (1990-03)
TAC 396, Unialgal, Clonal, M.Watanabe (1990-04)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1253
Lake Suwa / Nagano (1990-03)
TAC 401, Unialgal, Clonal, M.Watanabe (1990-04)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1254
Lake Suwa / Nagano (1990-03)
TAC 402, Unialgal, Clonal, M.Watanabe (1990-04)
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1255
Lake Tsukui / Kanagawa (1990-08)
TAC 405, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1256
Lake Tsukui / Kanagawa (1990-08)
TAC 406, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Formerly identified as *M. wesenbergii*
- 1257
Nakagusuku Vil. / Okinawa (1990-12)
TAC 407, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: MA, 20° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom
- * *Microcystis ichtyoblabe* Kützing
See *Microcystis aeruginosa* (Kützing) Lemmermann
- * *Microcystis novacekii* (Komárek) Compère
See *Microcystis aeruginosa* (Kützing) Lemmermann
- * *Microcystis viridis* (A.Brown) Lemmermann
See *Microcystis aeruginosa* (Kützing) Lemmermann
- * *Microcystis wesenbergii* Komárek
See *Microcystis aeruginosa* (Kützing) Lemmermann
- MICROTHAMNION** Nägeli: Trebouxiophyceae
- Microthamnion kützingianum* Nägeli
479
Toyohira River, Sapporo / Hokkaido (1987-07)
Unialgal, Clonal, F.Kasai (1987-07)
Identified by: F.Kasai
Culture conditions: C, 10° C, 6 µE/m² sec, 6M,
(10° C, 15 µE/m² sec)
Characteristics: Freshwater
Tst11-6
References: 242, 454, 455
- MONOMASTIX** Scherffel: Prasinophyceae
- Monomastix minuta* Skuja
255
Tsuchiura / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 40 µE/m² sec, 1M
Characteristics: Freshwater
SIS-Mono
Reference: 159
- 256
Oze / Gunma (1983-08)
Axenic, Clonal, S.Suda (1983-11)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 40 µE/m² sec, 1M

Characteristics: Freshwater
Oz-35-m

MONORAPHIDIUM Komarkova-Legnerova:
Chlorophyceae

* *Monoraphidium capricornutum* (Printz) Nygaard
See *Selenastrum capricornutum* Printz

Monoraphidium circinale (Nygaard) Nygaard
480
Tsuchiura / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: F.Kasai
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
SIS-1-M
Reference: 242

Monoraphidium contortum
(Thuret) Komárková-Legnerová
384
Lake Unagiike / Kagoshima (1985-02)
Unialgal, Clonal, T.Sawaguchi (1985-02)
Identified by: Y.Niiyama
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
Ep-i
Reference: 242

Monoraphidium griffithii
(Berkeley) Komárková-Legnerová
385
Urizura / Ibaraki (1984-10)
Axenic, Clonal, T.Sawaguchi (1984-12)
Identified by: Y.Niiyama
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
AWA
Reference: 242

MYXOSARCINA Printz: Cyanophyceae

Myxosarcina burmensis Skuja
481
Mt.Tsukuba / Ibaraki (1987-04)

Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: M.M.Watanabe
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
5M, (20° C, 12 µE/m² sec), [Cryopreserved]
Characteristics: Freshwater
(1)-45
References: 242, 454

NANOCHLORUM Wilhelm et al.: Trebouxiophyceae

Nanochlorum sp.
1270
Banshu Salt Marsh, Kisarazu / Chiba (2002-05)
Unialgal, Clonal, M.Moriya (2002-06)
Identified by: M.Moriya
Culture conditions: ESM, 20° C, 20 µE/m² sec, 1M
Characteristics: Marine
M-66

NEPHROSELMIS Stein: Prasinophyceae

Nephroselmis astigmatica Inouye et Pienaar
252
Tateyama Harbor / Chiba (1983-08)
Axenic, Clonal, I.Inouye (1983-08)
Identified by: I.Inouye
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M
Characteristics: Red tide, Marine
810-13

Nephroselmis olivacea Stein
483
Tsuchiura / Ibaraki (1986-02)
Unialgal, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic,
Mating type +
S-N-2-1
References: 231, 442

484
Tsuchiura / Ibaraki (1986-02)
Unialgal, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic,
Mating type -, Plastid complete DNA (AF137379),
Mitochondrial complete DNA (AF110138)

S-N-5-8

References: 478, 479

485

Tsuchiura / Ibaraki (1986-02)

Unialgal, Clonal, S.Suda (1986-05)

Identified by: S.Suda

Culture conditions: AF-6, 20° C, 22 µE/m² sec, 20D

Characteristics: Freshwater, Heterothallic,

Mating type –

S-N-3-4

References: 231, 442

Nephroselmis spinosa Suda et M.M.Watanabe

934

Port Hedland / Australia (1991-10)

Unialgal, Clonal, S.Suda (1992-11)

Identified by: S.Suda

Culture conditions: ESM, 20° C, 12 µE/m² sec, 2M

Characteristics: Marine, Indicator, Eurythermal

S222

Reference: 439

935

Hamerin Pool / Australia (1991-10)

Unialgal, Clonal, S.Suda (1992-12)

Identified by: S.Suda

Culture conditions: ESM, 20° C, 12 µE/m² sec, 2M

Characteristics: Marine, Indicator, Eurythermal

SD959-3

Reference: 439

Nephroselmis viridis Inouye, nom. nud.

486

Harima-Nada / Seto Inland Sea (1983-02)

Axenic, Clonal, S.Suda (1983-09)

Identified by: I.Inouye

Culture conditions: ESM, 20° C, 12 µE/m² sec, 1M

Characteristics: Red tide, Marine, Type strain

H-70-2

NITZSCHIA Hassall: Bacillariophyceae

Nitzschia palea (Kützinger) W.Smith

487

Miyata River / Ibaraki (1987-04)

Unialgal, Non-clonal, F.Kasai (1987-05)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

3st-0-57

Reference: 454

488

Miyata River / Ibaraki (1987-02)

Unialgal, Non-clonal, F.Kasai (1987-03)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 2M

Characteristics: Freshwater

1st-3-39

Reference: 454

489

Ashio / Gunma (1987-08)

Unialgal, Clonal, F.Kasai (1987-08)

Identified by: N.Takamura

Culture conditions: CSi, 15° C, 15 µE/m² sec, 1M

Characteristics: Freshwater

Ast-2-2

References: 267, 454, 455

NOSTOC Vaucher ex Bornet et Flahault:

Cyanophyceae

Nostoc commune Vaucher ex Bornet et Flahault

24

Kurobe Valley / Toyama

IAM M-13, Unialgal, Non-clonal, A.Watanabe

Identified by: H.Fukushima

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,

4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, Reidentified by

M.M.Watanabe

References: 96, 242, 291, 451, 491, 530

38

Marble Point

IAM M-115, Unialgal, Non-clonal, O.Holm-Hansen

Identified by: M.M.Watanabe

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,

4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, From dry lichens and

algae in sand

M-48-a

References: 96, 242

Nostoc linckia Bornet ex Bornet et Flahault

25

Kagoshima / Kagoshima

IAM M-16, Axenic, Non-clonal, M.Ishikawa

Identified by: M.M.Watanabe

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec)
Characteristics: Freshwater
References: 242, 491

Nostoc linckia Bornet ex Bornet et Flahault
var. *arvense* C.B.Rao

28

Kagoshima / Kagoshima
IAM M-30, Axenic, Non-clonal, M.Ishikawa
Identified by: Fukushima/Mariyama
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]
Characteristics: Freshwater, Reidentified by
M.M.Watanabe
References: 96, 242, 491

Nostoc minutum Desmazières ex Bornet et Flahault
26

Ishigaki Isl. / Okinawa
IAM M-17, Unialgal, Non-clonal, M.Ishikawa
Identified by: M.M.Watanabe
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec)
Characteristics: Freshwater, Chromatic adaptation
References: 242, 255, 363, 491, 530

29

Ishigaki Isl. / Okinawa
IAM M-31, Unialgal, Non-clonal, M.Ishikawa
Identified by: M.M.Watanabe
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec)
Characteristics: Freshwater
References: 242, 491, 530

ODONTELLA Agardh: Bacillariophyceae

Odontella aurita Agardh

589

Penzance / England (1991-03)
Unialgal, Non-clonal, S.Ono (1991-04)
Identified by: S.Ono
Culture conditions: f/2, 15° C, 10 µE/m² sec, 1M
Characteristics: Red tide, Marine
St-22
Reference: 469

Odontella longicuris (Greville) Hoban
590

Hitachi / Ibaraki (1990-09)
Unialgal, Non-clonal, S.Ono (1990-10)
Identified by: S.Ono
Culture conditions: f/2, 15° C, 10 µE/m² sec, 1M
Characteristics: Red tide, Marine
St-11

OEDOGONIUM Link: Chlorophyceae

Oedogonium obesum Wittrock ex Hirn
203

IAM C-348, Axenic, Clonal, E.Saito
Identified by: E.Saito
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
807
References: 96, 242

OLISTHODISCUS Carter: Raphidophyceae

Olisthodiscus luteus Carter

15

Tamano / Okayama / Seto Inland Sea
Axenic, Clonal, I.Inouye
Identified by: I.Inouye
Culture conditions: f/2, 20° C, 12 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
Olisth
References: 66, 171, 173, 261, 346, 486, 570

OLTMANNSELLOPSIS Inouye et Chihara:
Ulvophyceae

Oltmannsiellopsis geminata Inouye et Chihara
672

Harima-Nada / Seto Inland Sea (1986-06)
Axenic, Clonal, S.Yoshimatsu (1986-06)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Marine, Mutant
Reference: 242

Oltmannsiellopsis unicellularis Inouye et Chihara
359

Ieshima Isls. / Hyogo (1984-08)
Axenic, Clonal, S.Suda (1984-08)
Identified by: I.Inouye
Culture conditions: ESM, 20° C, 32 µE/m² sec, 2M

Characteristics: Red tide, Marine, Type strain
810YB-6
References: 18, 242

Oltmannsiellopsis viridis

(Hargraves et Steele) Chihara et Inouye
360

Onagawa Bay / Miyagi (1984-08)
Axenic, Clonal, S.Suda (1984-09)
Identified by: S.Suda
Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine, 18S rDNA gene (D86495)
8280G41-2
References: 18, 242, 286

***OOCYSTIS* Nägeli: Trebouxiophyceae**

***Oocystis borgei* Snow**

659
Watarase River / Gunma (1987-08)
Unialgal, F.Kasai (1987-09)
Identified by: F.Kasai
Culture conditions: C, 15° C, 6 µE/m² sec, 6M,
(15° C, 15 µE/m² sec)
Characteristics: Freshwater
AT2-26
References: 242, 454

***Oocystis lacustris* Chodat**

660
Watarase River / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-08)
Identified by: F.Kasai
Culture conditions: C, 15° C, 6 µE/m² sec, 6M,
(15° C, 15 µE/m² sec)
Characteristics: Freshwater
Ast-3-1
References: 242, 454

661

Miyata River / Ibaraki (1987-05)
Axenic, Clonal, F.Kasai (1987-06)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 6M
Characteristics: Freshwater
4st-3-9
References: 242, 454

662

Miyata River / Ibaraki (1987-02)
Unialgal, Clonal, F.Kasai (1987-03)

Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 6M
Characteristics: Freshwater
1st-2-9
References: 242, 453, 454

***OOLITHOTUS* : Prymnesiophyceae**

***Oolithotus fragilis* (Lohmann) Reinhardt**

1320
Hachijo Isl. / Tokyo (2002-01)
Unialgal, Clonal, M-H.Noël (2002-02)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
MH35

1321

Hachijo Isl. / Tokyo (2003-01)
Unialgal, Clonal, M-H.Noël (2003-02)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
MH59

1322

East China Sea (Kuroshio Current) (2003-08)
Unialgal, Clonal, M-H.Noël (2003-09)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
MH80

***OPHIOCYTIUM* Nägeli: Xanthophyceae**

***Ophiocytium capitatum* Wolle**

1011
Tsuchiura / Ibaraki (2000-05)
Unialgal, Clonal, M.Moriya (2000-05)
Identified by: M.Moriya
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#86

***OSCILLATORIA* Vaucher ex Gomont: Cyanophyceae**

*** *Oscillatoria agardhii* Gomont**

See *Planktothrix agardhii* Anagnostidis et Komárek

Oscillatoria amphibia Agardh ex Gomont

361

Asaji Bay / Nagasaki (1985-07)

Unialgal, Clonal, M.M.Watanabe (1985-07)

Identified by: M.M.Watanabe

Culture conditions: f/2, 20° C, 12 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Marine, Benthic

Oa

Reference: 242

Oscillatoria animalis Agardh ex Gomont

206

IAM M-75, Unialgal, Clonal, F.Murano

Identified by: H.Fukushima

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, Reidentified by
M.M.Watanabe

References: 96, 242

Oscillatoria laetevirens Gomont

31

Kawaji / Tochigi

IAM M-42, Unialgal, Clonal, M.Ishikawa

Identified by: H.Fukushima

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec)

Characteristics: Freshwater, Hot spring, Reidentified
by M.M.Watanabe

References: 96, 242, 530

Oscillatoria limnetica Lemmermann

36

Nakano / Tokyo

IAM M-92, Unialgal, Clonal, F.Murano

Identified by: H.Fukushima

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, Reidentified by
M.M.Watanabe

References: 4, 96, 242, 355

* ***Oscillatoria raciborskii*** Woloszynska

See *Planktothricoides raciborskii*

Suda et M.M.Watanabe

Oscillatoria rosea Utermöhl

208

Asaji Bay / Nagasaki (1983-08)

Axenic, Clonal, Y.Ichimura (1983-08)

Identified by: M.M.Watanabe

Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M,
[Cryopreserved]

Characteristics: Indicator, Marine

NGS-1

References: 242, 410

* ***Oscillatoria rubescens*** DC. ex Gomont

See *Planktothrix rubescens* Anagnostidis et Komárek

Oscillatoria tenuis Agardh ex Gomont

33

Setagaya / Tokyo

IAM M-50, Unialgal, Clonal, M.Ishikawa

Identified by: K.Maruyama

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Indicator, Freshwater, Reidentified
by M.M.Watanabe, 16SrRNA gene (AB042844)

References: 96, 242, 354

OXYRRHIS Dujardin: Dinophyceae

Oxyrrhis marina Dujardin

494

Hachinohe / Aomori (1988-08)

Mixed, Clonal, T.Sawaguchi (1989-01)

Identified by: T.Sawaguchi

Culture conditions: f/2, 20° C, 40 µE/m² sec, 1M

Characteristics: Predator, Marine, Feeds on
NIES-254, Untransportable
3700X

PANDORINA Bory: Chlorophyceae

Pandorina colemaniae Nozaki

572

Kourakuen / Okayama (1988-10)

Unialgal, Clonal, H.Nozaki (1988-10)

Identified by: H.Nozaki

Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M

Characteristics: Freshwater, Type strain, Isogamy,

Mating type +, Crosses with NIES-573,

atpB gene (AB014027), *rbcL* gene (D63441),

psaA gene (AB044232), *psaB* gene (AB044457),

psbC gene (AB044512)

88-1025-1

References: 242, 323, 335, 340, 337

- 573
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki (1989-01)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Type strain, Isogamy,
Mating type –, Crosses with NIES-572
89-0131-P-3
References: 242, 335
- Pandorina morum*** (O. F. Müller) Bory
242
Lake Ozenuma / Fukushima (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: S.Suda
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Indicator, Freshwater, Heterothallic,
Mating type +, Crosses with NIES-243 and 362
Oz-Pa-2
Reference: 242
- 243
Lake Ozenuma / Fukushima (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: S.Suda
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-242
Oz-Pa-3
Reference: 242
- 362
Lake Ozenuma / Fukushima (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: S.Suda
Culture conditions: CA, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-242
Oz-Pa-1
Reference: 242
- 886
Bloomington, Indiana / USA (1955-09)
UTEX 854, Unialgal, Clonal, A.W.Coleman
Identified by: A.W.Coleman
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
H,h type, *atpB* gene (AB044180), *rbcL* gene
(AB044167), *psaA* gene (AB044231), *psaB* gene
(AB044456), *psbC* gene (AB044510-1)
References: 22, 337
- 887
Tulare Co., California / USA (1951-02)
UTEX 880, Unialgal, Clonal, A.W.Coleman
Identified by: A.W.Coleman
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
H,h type, *atpB* gene (AB044179), *rbcL* gene
(AB044166), *psaA* gene (AB044229-30), *psaB*
gene (AB044455), *psbC* gene (AB044509)
Reference: 22, 337
- 888
Kimberley / South Africa (1967-07)
UTEX 1726, Unialgal, Clonal, E.Palmer
Identified by: E.Palmer
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
H,h type, Mating type +, Crosses with NIES-889
Reference: 337
- 889
Kimberley / South Africa (1967-07)
UTEX 1727, Unialgal, Clonal, E.Palmer
Identified by: E.Palmer
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
H,h type, Mating type -, Crosses with NIES-888,
atpB gene (AB044178), *rbcL* gene (AB044165),
psaA gene (AB044228), *psaB* gene (AB044454),
psbC gene (AB044508)
Reference: 337
- 890
Kawai Dam, Yamanaka / Ishikawa (1997-09)
UTEX 2326, Unialgal, Clonal, H.Nozaki
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
H,h type, *atpB* gene (AB044177), *rbcL* gene
(AB044164), *psaA* gene (AB044227), *psaB* gene
(AB044453), *psbC* gene (AB044506-7)
References: 328, 337
- Pandorina morum*** (O. F. Müller) Bory var. *morum*
574
Nepal (1986-09)
Unialgal, Clonal, H.Nozaki (1987-09)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type +, Crosses with NIES-575,
atpB gene (AB014025-6), *rbcL* gene (D63442),

psaA gene (AB044226), *psaB* gene (AB044452),
psbC gene (AB044505)
7916-P-7
References: 242, 310, 323, 337, 340, 342

575

Nepal (1986-09)
Unialgal, Clonal, H.Nozaki (1987-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type -, Crosses with NIES-574
7916-P-8
References: 242, 310

* *Pandorina unicocca* Rayburn et Starr
See *Yamagishiella unicocca*
(Rayburn et Starr) Nozaki

PAULSCHULZIA Skuja: Chlorophyceae

Paulschulzia pseudovolvox Skuja
727

Tvärminne / Finland
UTEX 167, Axenic, Clonal, M.R.Droop (1951)
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB014040),
rbcL gene (D86837), *psaA* gene (AB044422-3),
psaB gene (AB044473), *psbC* gene (AB044531-2)
References: 31, 242, 337, 340

PAVLOVA Butcher: Pavlovophyceae

Pavlova gyrans Butcher
623

Matoya Bay / Mie (1984-09)
Unialgal, Clonal, T.Sawaguchi (1984-09)
Identified by: S.Suda
Culture conditions: ESM, 20° C, 22 µE/m² sec, 2M
Characteristics: Marine
MB-D-24

PEDIASTRUM Meyen: Chlorophyceae

Pediastrum angulosum Meneghini
var. *angulosum*

300
Higashihiroshima / Hiroshima (1983-10)
Axenic, Clonal, F.Kasai (1983-10)

Identified by: M.Watanabe
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
83-24-1-7
Reference: 242

Pediastrum boryanum (Turpin) Meneghini
209

Lake Kasumigaura / Ibaraki (1982-12)
Axenic, Clonal, M.H.Watanabe (1982-12)
Identified by: M.H.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 2M
Characteristics: Indicator, Freshwater,
COXI gene (D63659)
K-P-40
References: 76, 242

301

Lake Shoji / Yamanashi (1981-10)
TAC 56-3A, Axenic, Clonal, M.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater
TAN-56-3A
References: 242, 270, 271

Pediastrum duplex Meyen

212
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H.Watanabe (1981-06)
Identified by: M.H.Watanabe
Culture conditions: C, 20° C, 8 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
KW-P-1
References: 242, 484

Pediastrum duplex Meyen var. *duplex*

210
Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, A.Yuri (1983-05)
Identified by: A.Yuri
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater, Reidentified
by M.Watanabe
Pe-16
Reference: 242

213

Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, T.Hiwatari (1983-06)

Identified by: T.Hiwatari
Culture conditions: C, 20° C, 8 µE/m²sec, 2M
Characteristics: Indicator, Freshwater, Reidentified
by M.Watanabe, *atpB* gene (AB084306),
rbcL gene (AB084333), *psaB* gene (AB084340)
AQ-P-1
References: 84, 242, 342, 530

***Pediastrum duplex* Meyen**

var. *gracillimum* W. et G.S.West

211

Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, F.Kasai (1983-08)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m²sec, 3M,
(25° C, 30 µE/m²sec)
Characteristics: Indicator, Freshwater
F50-1
Reference: 242

214

Tsukuba / Ibaraki (1983-08)
Axenic, Clonal, T.Hiwatari (1983-08)
Identified by: T.Hiwatari
Culture conditions: C, 20° C, 8 µE/m²sec, 2M
Characteristics: Indicator, Freshwater, Reidentified
by M.Watanabe
KR-P-2
Reference: 242

***Pediastrum simplex* Meyen**

215

Lake Biwa / Shiga (1982-07)
Axenic, Clonal, M.H.Watanabe (1982-07)
Identified by: M.H.Watanabe
Culture conditions: C, 20° C, 8 µE/m²sec, 2M
Characteristics: Indicator, Freshwater
B-P-18
Reference: 242

302

Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, F.Kasai (1983-08)
Culture conditions: C, 20° C, 4 µE/m²sec, 3M,
(25° C, 30 µE/m²sec)
Characteristics: Indicator, Freshwater
F-26-4
Reference: 242

***Pediastrum tetras* (Ehrenberg) Ralfs**

216

Lake Kasumigaura / Ibaraki (1982-12)
Axenic, Clonal, M.H.Watanabe (1982-12)
Identified by: M.H.Watanabe
Culture conditions: C, 20° C, 8 µE/m²sec, 2M
Characteristics: Indicator, Freshwater
K-P-30
Reference: 242

***PEDINELLA* Vysotskij: Dictyochophyceae**

***Pedinella squamata* Sekiguchi et al.**

1008

Nakagusuku Bay, Okinawa / Okinawa (2002-03)
Unialgal, Clonal, M.Moriya (2002-04)
Identified by: M.Moriya
Culture conditions: ESM, 20° C, 32 µE/m²sec, 2M
Characteristics: Marine, Unstable
M-11

***PEDINOMONAS* Korshikov: Pedinophyceae**

***Pedinomonas minor* Korshikov**

363

Tsukuba / Ibaraki (1984-05)
Axenic, Clonal, S.Suda (1984-05)
Identified by: S.Suda
Culture conditions: C(S), 20° C, 4 µE/m²sec, 3M,
(25° C, 30 µE/m²sec)
Characteristics: Freshwater
H31P4

***PELAGOMONAS* Andersen et Saunders:
Pelagophyceae**

***Pelagomonas calceolata* Andersen et Saunders**

1003

North Pacific Central Gyre (1973-02)
CCMP 1214, Unialgal, Clonal, R.Lewin
Identified by: R.A.Andersen
Culture conditions: MNK, 22° C, 15 µE/m²sec, 14D
Characteristics: Marine, Unstable

***PENIUM* Brébisson: Charophyceae**

***Penium margaritaceum* Brébisson**

217

Rumalbhara / Nepal (1965-11)
IAM C-397, Axenic, Clonal, T.Ichimura (1972-05)

Identified by: T. Ichimura
Culture conditions: C, 20° C, 8 µE/m² sec, 2M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater, Heterothallic
N-76-20
References: 96, 242

303

Tsukiyono / Gunma (1984-06)
Axenic, Clonal, F.Kasai (1984-06)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
84-25-1
Reference: 242

PERIDINIUM Ehrenberg emend. Stein: Dinophyceae

Peridinium bipes Stein f. ***globosum*** Lindermann

495

Lake Onogawa / Fukushima (1985-07)
Unialgal, Clonal, T.Sawaguchi (1985-08)
Identified by: T.Sawaguchi
Culture conditions: AF-6, 15° C, 35 µE/m² sec, 2M
Characteristics: Freshwater, Untransportable
LOND-9

Peridinium bipes Stein

f. ***occultatum*** (Lindermann) Lefèvre

497

Lake Kizaki / Nagano (1988-04)
Unialgal, Clonal, T.Sawaguchi (1988-04)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 35 µE/m² sec,
2M
Characteristics: Red tide, Freshwater,
Untransportable
LK420

Peridinium bipes Stein var. ***tabulatum***

(Ehrenberg) Lefèvre

600

Shishizuka / Tsuchiura / Ibaraki (1990-04)
Unialgal, Clonal, T.Hagiwara (1990-04)
Identified by: T.Hagiwara
Culture conditions: URO, 15° C, 35 µE/m² sec, 3M
Characteristics: Red tide, Freshwater, Planktonic,
Untransportable
CCZ-1

Peridinium inconspicuum Lemmermann

subsp. ***remotum*** (Lefèvre) Lefèvre

499

Iwai / Ibaraki (1985-10)
Unialgal, Clonal, T.Sawaguchi (1985-11)
Identified by: T.Sawaguchi
Culture conditions: MW/5, 15° C, 35 µE/m² sec,
2M
Characteristics: Freshwater, Untransportable
TOM-1

Peridinium volzii Lemmermann

365

Ajiro / Iwate (1984-09)
Axenic, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 35 µE/m² sec,
2M
Characteristics: Freshwater, Untransportable
HND-1

501

Tsuchiura / Ibaraki (1986-04)
Unialgal, Clonal, T.Sawaguchi (1986-05)
Culture conditions: Carefoot, 15° C, 35 µE/m² sec,
2M
Characteristics: Freshwater, Homothallic,
Untransportable
SPSP-2

Peridinium willei Huitfeldt-Kaas

304

Tsukiyono / Gunma (1984-06)
Axenic, Clonal, T.Sawaguchi (1984-06)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 35 µE/m² sec,
2M
Characteristics: Freshwater, Homothallic,
Untransportable
8423-P

366

Tsuchiura / Ibaraki (1985-04)
Axenic, Clonal, T.Sawaguchi (1985-04)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 35 µE/m² sec,
2M
Characteristics: Freshwater, Homothallic,
Untransportable
SPD-1

PHACOTUS Perty: Chlorophyceae

Phacotus lenticularis (Ehrenberg) Stein

858

Germany

Unialgal, Clonal

Identified by: L.Knieritz

Culture conditions: C, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater, *atpB* gene (AB014039),
rbcL gene (AJ001883), *psaB* gene (AB084373-4),
18SrRNA gene (X91628)

KR 91/1

References: 77, 340, 342

859

Germany

SAG 61-1, Unialgal, Clonal

Culture conditions: C, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater, *rbcL* gene (AJ001884)

Reference: 77

PHACUS Dujardin: Euglenophyceae

Phacus agilis Skuja

387

Kashiwa / Chiba (1986-09)

Axenic, Clonal, M.M.Watanabe (1986-09)

Identified by: M.M.Watanabe

Culture conditions: MAF-6, AF-6, 20° C,
32 µE/m² sec, 1M

Characteristics: Freshwater, Umetatechi-
shinshutsusui lagoon

PhD-3

PHAEOCYSTIS Lagerheim: Prymnesiophyceae

Phaeocystis globosa Scherffel

388

Hachijo Isl. / Tokyo (1984-04)

Unialgal, Non-clonal, T.Sawaguchi (1984-04)

Reidentified by: M.Kawachi

Culture conditions: ESM, 15° C, 20 µE/m² sec, 20D,
(20° C, 40 µE/m² sec)

Characteristics: Red tide, Marine, Formerly
identified as *Phaeocystis pouchetii*, Unstable,
Untransportable, *COXI* gene (AB000120)

8-P

Reference: 75

* **Phaeocystis pouchetii** (Hariot) Lagerheim

See *Phaeocystis globosa* Scherffel

PHORMIDIUM Kützing: Cyanophyceae

Phormidium foveolarum Gomont

32

Lake Shirakaba / Nagano

IAM M-43, Unialgal, Non-clonal, M.Ishikawa

Identified by: H.Fukushima

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, Reidentified by
M.M.Watanabe

References: 96, 242, 467, 481

34

Sendai / Miyagi

IAM M-59, Unialgal, Non-clonal, M.Ishikawa

Identified by: K.Maruyama

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, Reidentified by
M.M.Watanabe

References: 96, 242

503

Mt. Tsukuba / Ibaraki (1987-04)

Unialgal, Non-clonal, F.Kasai (1987-05)

Identified by: M.M.Watanabe

Culture conditions: CSi, CSi+Cu, 20° C,
4 µE/m² sec, 3M, (20° C, 12 µE/m² sec)

Characteristics: Freshwater
(1)-48

References: 242, 454

504

Miyata River / Ibaraki (1987-03)

Unialgal, Non-clonal, F.Kasai (1987-05)

Identified by: M.M.Watanabe

Culture conditions: CSi, CSi+Cu, 20° C,
4 µE/m² sec, 3M, (20° C, 12 µE/m² sec)

Characteristics: Freshwater

2st-2-4

References: 242, 453, 454, 455

505

Watarase River / Gunma (1987-08)

Unialgal, Non-clonal, F.Kasai (1987-10)

Identified by: M.M.Watanabe

- Culture conditions: CSi, CSi+Cu, 20° C,
4 µE/m² sec, 2M, (20° C, 12 µE/m² sec)
Characteristics: Freshwater
AT4-17
References: 242, 454, 455
- Phormidium jenkelianum*** G.Schmid
506
Watarase River / Gunma (1987-08)
Unialgal, Non-clonal, F.Kasai (1987-09)
Identified by: M.M.Watanabe
Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
2M, (20° C, 12 µE/m² sec)
Characteristics: Freshwater
AT5-37
References: 242, 454
- 507
Watarase River / Gunma (1987-08)
Unialgal, Non-clonal, F.Kasai (1987-08)
Identified by: M.M.Watanabe
Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
2M, (20° C, 12 µE/m² sec)
Characteristics: Freshwater
Ast-1-4
References: 242, 454, 455
- Phormidium molle*** Gomont
509
Watarase River / Gunma (1987-08)
Unialgal, Non-clonal, F.Kasai (1987-08)
Identified by: M.M.Watanabe
Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
2M, (20° C, 12 µE/m² sec)
Characteristics: Freshwater
AT2-17
References: 242, 454, 455
- Phormidium mucicola*** Huber-Pestalozzi et Naum
510
Mt.Tsukuba / Ibaraki (1987-04)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: M.M.Watanabe
Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
4M, (20° C, 12 µE/m² sec)
Characteristics: Freshwater
(1)-23
References: 242, 454
- Phormidium ramosum*** Boye-Petersen
305
Takatori River / Ibaraki (1984-12)
Unialgal, Clonal, S.Suda (1984-12)
Identified by: S.Suda
Culture conditions: CSi, CSi+Cu, 20° C, 4 µE/m² sec,
4M, (20° C, 12 µE/m² sec)
Characteristics: Freshwater
841211St5-1
References: 242, 453, 454
- Phormidium tenue*** Gomont
30
Akita / Akita
IAM M-40, Unialgal, Non-clonal, M.Ishikawa
Identified by: H.Fukushima
Culture conditions: MDM(S), 20° C, 4 µE/m² sec,
4M, (25° C, 30 µE/m² sec), [Cryopreserved]
Characteristics: Freshwater, Reidentified by
M.M.Watanabe, 16SrRNA gene (AB042857)
References: 96, 242, 354, 435
- 512
Nagoya / Aichi (1981-11)
Axenic, Clonal, N.Yamada (1985-05)
Identified by: N.Yamada
Culture conditions: CT, 20° C, 4 µE/m² sec, 20D,
(20° C, 12 µE/m² sec), [Cryopreserved]
Characteristics: Offensive taste and odor,
Freshwater, Nakaku Honmaru (a moat of the
Nagoya Castle), 16SrRNA gene (AB042838)
PM-81A
References: 223, 224, 242, 265, 267, 354, 355, 555,
556
- 611
Lake Biwa / Shiga (1987-06)
Unialgal, Clonal, S.Ichise (1987-06)
Identified by: M.M.Watanabe
Culture conditions: CT, 25° C, 30 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, 16SrRNA gene
(AB042842)
Bpt
References: 242, 354
- PLANCTONEMA** Schmidle: Chlorophyceae
- Planctonema lauterbornii*** Schmidle
514
Lake Kasumigaura / Ibaraki (1988-08)
Axenic, Clonal, Y.Niiyama (1988-08)

Identified by: Y.Niiyama
Culture conditions: C, 20° C, 8 µE/m² sec, 2M
Characteristics: Freshwater
K880818
Reference: 242

PLANKTOTHRICOIDES Suda et M.M.Watanabe:
Cyanophyceae

Planktothricoides raciborskii Suda et M.M.Watanabe
Syn. *Oscillatoria raciborskii* Woloszynska
207

Lake Kasumigaura / Ibaraki (1983-06)
Axenic, Clonal, S.Suda (1983-06)
Reidentified by: S.Suda
Culture conditions: CB, CT, 25° C, 24 µE/m² sec,
20D
Characteristics: Water bloom, Offensive taste and
odor, Freshwater, Unstable
K-O-R
References: 227, 242, 291, 444, 530

917

Lake Inba / Chiba (1995-08)
Axenic, Clonal, R.Li (1995-08)
Identified by: R.Li
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045953)
INBaOR
Reference: 444

918

Bangkok / Thailand (1996-01)
Axenic, Clonal, S.Suda (1996-01)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045967)
T1-6-2
Reference: 444

919

Bangkok / Thailand (1996-01)
Axenic, Clonal, R.Li (1996-01)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045964)
OR1-1
Reference: 444

920

Chang-Mai / Thailand (1996-10)
Axenic, Clonal, S.Suda (1996-10)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic
Kase1-2

921

Chang-Mai / Thailand (1996-10)
Axenic, Clonal, S.Suda (1996-10)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic
Kase3-5

922

Wohan / China (1997-07)
Axenic, Clonal, S.Suda (1997-07)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic
Wohan1-5

923

Taifu / China (1997-07)
Axenic, Clonal, S.Suda (1997-07)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic
Taiko726-1

924

Phatchanbari Dam / Thailand (1998-11)
Unialgal, Clonal, S.Suda (1998-11)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic
P1

925

Phatchanbari Dam / Thailand (1998-11)
Unialgal, Clonal, S.Suda (1998-11)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Planktonic
P2

926

Vietnam (1998-12)
Unialgal, Clonal, S.Suda (1998-12)
Identified by: S.Suda

- Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Planktonic
 Ho12-3 Or-4
- 927
 Vietnam (1998-12)
 Unialgal, Clonal, S.Suda (1998-12)
 Identified by: S.Suda
 Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
 Characteristics: Freshwater, Water bloom, Planktonic
 Ho12-3 Or-9
- PLANKTOTHRIX** Anagnostidis et Komárek
- Planktothrix agardhii* Anagnostidis et Komárek
 Syn. *Oscillatoria agardhii* Gomont
- 204
 Lake Kasumigaura / Ibaraki (1983-08)
 Axenic, Clonal, S.Suda (1983-08)
 Reidentified by: S.Suda
 Culture conditions: CB, 25° C, 24 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Water bloom, Indicator, Freshwater,
 16SrRNA gene (AB045954)
 K-O-A
 References: 19, 79, 136, 227, 242, 254, 291, 406,
 429, 431, 433, 434, 444, 530, 549, 578
- 205
 Lake Kasumigaura / Ibaraki (1982-09)
 TAC 53, Unialgal, Clonal, M.Watanabe (1982-09)
 Reidentified by: S.Suda
 Culture conditions: MA, 25° C, 24 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Water bloom, Indicator, Freshwater,
 16SrRNA gene (AB045955)
 K-TAN-53
 References: 136, 227, 242, 250, 430, 444
- 594
 North Ireland / U.K.
 Axenic, Clonal
 Reidentified by: S.Suda
 Culture conditions: CT, 20° C, 4 µE/m² sec, 2M,
 (20° C, 12 µE/m² sec), [Cryopreserved]
 Characteristics: Freshwater,
 16SrRNA gene (AB045956)
 k-8
 References: 242, 444
- 595
 North Ireland / U.K.
 Axenic, Clonal
 Reidentified by: S.Suda
 Culture conditions: CT, 20° C, 4 µE/m² sec, 2M,
 (20° C, 12 µE/m² sec), [Cryopreserved]
 Characteristics: Freshwater,
 16SrRNA gene (AB045957)
 3A②
 References: 138, 242, 444
- 596
 Veluwemeer / Holland
 Axenic, Clonal
 Reidentified by: S.Suda
 Culture conditions: CT, 20° C, 4 µE/m² sec, 2M,
 (20° C, 12 µE/m² sec), [Cryopreserved]
 Characteristics: Freshwater,
 16SrRNA gene (AB045958)
 VLOA7
 References: 33, 136, 242, 250, 444
- 905
 Windermere, Cumbria / U.K. (1975)
 CCAP 1459/11A, Axenic, Clonal, Jaworski (1975)
 Reidentified by: S.Suda
 Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Planktonic,
 Toxic, 16SrRNA gene (AB045896)
 References: 401, 444
- 906
 Kuming / China (1996-02)
 Axenic, Clonal, S.Suda (1996-02)
 Identified by: S.Suda
 Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Planktonic,
 16SrRNA gene (AB045904)
 C1-12
 Reference: 444
- 907
 Kuming / China (1996-02)
 Axenic, Clonal, S.Suda (1996-02)
 Identified by: S.Suda
 Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, Planktonic,
 16SrRNA gene (AB045905)

- C1-17
Reference: 444
- 908
Kumming / China (1996-02)
Axenic, Clonal, S.Suda (1996-02)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic
C1-18
- 909
Taifu / China (1997-07)
Axenic, Clonal, S.Suda (1997-07)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic
Taiko3-12
- 910
Phatchanbari Dam / Thailand (1998-11)
Unialgal, Clonal, S.Suda (1998-11)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic
P3-5
- 989
Lake Mikata / Fukui (2000-12)
Unialgal, Clonal, T.Sano (2001-08)
Identified by: M.Kawachi
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Mikata1-3
- 990
Lake Mikata / Fukui (2000-12)
Unialgal, Clonal, T.Sano (2001-08)
Identified by: M.Kawachi
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom
Mikata1-6
- 1263
Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: S.Otsuka
- Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
DU-Oa-2-3
- 1264
Neuglobsow, Brandenburg / Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: S.Otsuka
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
DU-Oa-3-3
- 1265
Neuglobsow, Brandenburg / Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: S.Otsuka
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
DU-Oa-5-5
- Planktothrix mougeotii* Anagnostidis et Komárek
Syn. *Oscillatoria mougeotii* Kützing ex Lemmermann
844
Nakhon Pathom / Thailand (1996-03)
Axenic, Clonal, R.Li (1996-03)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045971)
TR1-5
Reference: 444
- 911
Nakhon Pathom / Thailand (1996-03)
Axenic, Clonal, R.Li (1996-03)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045972)
TR2-4
Reference: 444
- 912
Bangkok / Thailand (1996-03)
Axenic, Clonal, S.Suda (1996-03)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045969)

- TK4-5
Reference: 444
- 913
Bangkok / Thailand (1996-03)
Axenic, Clonal, S.Suda (1996-03)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045970)
TK5-1
Reference: 444
- Planktothrix pseudoagardhii* Suda et M.M.Watanabe
845
Bangkok / Thailand (1996-01)
Axenic, Clonal, S.Suda (1996-01)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045968)
T1-8-4
Reference: 444
- 914
Lake Dalai, Inner Mongolia / China (1996-07)
Axenic, Clonal, S.Suda (1996-07)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic
16SrRNA gene (AB045907)
CW4-5
Reference: 444
- 915
Bangkok / Thailand (1996-03)
Axenic, Clonal, S.Suda (1996-03)
Identified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045965)
T19-6'-6-1
Reference: 444
- 916
Bangkok / Thailand (1996-03)
Axenic, Clonal, S.Suda (1996-03)
Identified by: S.Suda
- Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
16SrRNA gene (AB045966)
T19-6'-8-2-3
Reference: 444
- Planktothrix rubescens* Anagnostidis et Komárek
Syn. *Oscillatoria rubescens* DC.ex Gomont
610
Lake Gjersjoen / Norway
CCAP 1459/22, Axenic, Romstad (1971)
Reidentified by: S.Suda
Culture conditions: CB, MA, 20° C, 40 µE/m² sec,
1M, [Cryopreserved]
Characteristics: Freshwater, Formerly identified as
Oscillatoria agardhii Gomont,
16SrRNA gene (AB045959)
NIVA CYA 18
References: 242, 398, 399, 400, 444
- 928
Cambria / U.K. (1975)
CCAP 1459/14, Unialgal, Clonal, Jaworski (1975)
Reidentified by: S.Suda
Culture conditions: CT, 20° C, 20 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
Toxic
Reference: 401
- 1266
Neuglobsow, Brandenburg / Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: T.Sano
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
DU-Oa-4-1
- 1267
Neuglobsow, Brandenburg / Germany (2000-08)
Unialgal, Clonal, T.Sano (2000-08)
Identified by: T.Sano
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom, Toxic
DU-Oa-4-2
- PLATYDORINA** Kofoid: Chlorophyceae
- Platydorina caudata* Kofoid
728

Kansas / USA (1965-09)
UTEX 1658, Unialgal, Clonal, D.O.Harris
Culture conditions: MG, 20° C, 12 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB014032),
rbcL gene (D86828), *psaA* gene (AB044211-2),
psaB gene (AB044442), *psbC* gene (AB044494)
References: 242, 324, 337, 340

729

Kansas / USA (1965-09)
UTEX 1661, Unialgal, Clonal, D.O.Harris
Culture conditions: MG, 23° C, 48 µE/m² sec, 1M
Characteristics: Freshwater, *rbcL* gene (D86827)
References: 242, 324

PLECTONEMA Thuret ex Gomont: Cyanophyceae

Plectonema radiosum Gomont

515

Nikko / Tochigi (1987-04)
Axenic, Clonal, F.Kasai (1987-04)
Identified by: M.M.Watanabe
Culture conditions: CSi, 20° C, 4 µE/m² sec, 3M,
(20° C, 12 µE/m² sec)
Characteristics: Freshwater
NK-12
References: 233, 242, 454, 455

PLEODORINA Shaw: Chlorophyceae

Pleodorina californica Shaw

576

Hachiman / Gifu (1990-08)
Axenic, Clonal, Y.Ogasawara (1990-08)
Identified by: Y.Ogasawara
Culture conditions: VT, 25° C, 30 µE/m² sec, 1M
Characteristics: Freshwater
Reference: 242

735

Indiana / USA
UTEX 809, Axenic, Clonal, R.C.Starr
Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, *atpB* gene (AB014004),
rbcL gene (D63439), *psaA* gene (AB044190-2),
psaB gene (AB044430), *psbC* gene (AB044480)
References: 323, 337, 340

Pleodorina indica (Iyengar) Nozaki

736

Mexico

UTEX 1990, Unialgal, Clonal, S.Morro
Reidentified by: H.Nozaki
Culture conditions: AF-6, 23° C, 48 µE/m² sec, 1M
Characteristics: Freshwater, *atpB* gene (AB014006),
rbcL gene (D86834), *psaA* gene (AB044195-7),
psaB gene (AB044432-3), *psbC* gene (AB044483)
References: 324, 337, 340

Pleodorina japonica Nozaki

577

Fuji / Shizuoka (1986-07)
UTEX 2523, Unialgal, Clonal, H.Nozaki (1986-07)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Type strain, Homothallic,
Dioecious, Anisogamy, *rbcL* gene (D63440)
6715-7
References: 242, 323, 332, 337, 340

PLEUROTAENIUM Nägeli: Charophyceae

Pleurotaenium cylindricum (Turner) Schmidle

var. *stuhlmannii* (Hieronymus) Krieger

306

Niimi / Okayama (1983-09)
Unialgal, Clonal, F.Kasai (1983-09)
Identified by: F.Kasai
Culture conditions: MG, 22° C, 15 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic
F57-18-4
Reference: 242

Pleurotaenium ehrenbergii (Ralfs) De Bary

var. *curtum* Krieger

307

Naka-gun / Wakayama (1969-10)
IAM C-378, Axenic, Clonal, T.Ichimura (1969-11)
Identified by: T.Ichimura
Culture conditions: MG, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-308
W-1-1
Reference: 242

308

Naka-gun / Wakayama (1969-10)
IAM C-379, Axenic, Clonal, T.Ichimura (1969-11)
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 8 µE/m² sec, 3M,

(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-307
W-1-3
Reference: 242

311

Iriomote Isl. / Okinawa (1973-06)
IAM C-430, Unialgal, Clonal, T.Ichimura (1973-11)
Culture conditions: MG, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +
R-13-19
Reference: 242

Pleurotaenium ehrenbergii (Ralfs) De Bary
var. *ehrenbergii*

309

Iriomote Isl. / Okinawa (1973-06)
IAM C-467, Unialgal, Clonal, T.Ichimura (1973-10)
Culture conditions: MG, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-310
R-13-27
References: 96, 242

310

Iriomote Isl. / Okinawa (1973-06)
IAM C-468, Unialgal, Clonal, T.Ichimura (1973-10)
Culture conditions: MG, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-309
R-13-30
References: 96, 242

Pleurotaenium nodosum (Bailey ex Ralfs) Lundell
var. *borgei* Grönblad

663

Miyatoko Mire / Fukushima (1993-09)
Unialgal, Clonal, H.Nozaki (1993-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
93-913-Gon-1
Reference: 242

664

Miyatoko Mire / Fukushima (1993-09)

Unialgal, Clonal, H.Nozaki (1993-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater
93-913-Gon-3
Reference: 242

Pleurotaenium nodosum (Bailey ex Ralfs) Lundell
var. *gutwinskii* Krieger

787

4 km northwest of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-788
85-30-9

788

4 km northwest of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T.Ichimura (1985)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-787
85-30-56

Pleurotaenium nodosum (Bailey ex Ralfs) Lundell
var. *nodosum*

312

Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, F.Kasai (1983-10)
Identified by: F.Kasai
Culture conditions: CAM, 20° C, 8 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
83-24-3
Reference: 242

785

Imuta-ike Pond / Kagoshima (1986-10)
Unialgal, Clonal, T.Ichimura (1986)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-786
86-7-15

786

Imuta-ike Pond / Kagoshima (1986-10)
Unialgal, Clonal, T.Ichimura (1986)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 μ E/m² sec, 3M,
(25° C, 30 μ E/m² sec)
Characteristics: Freshwater, Heterothallic, Crosses
with NIES-785
86-7-16

Pleurotaenium ovatum Nordstedt

313

Niimi / Okayama (1983-09)
Unialgal, Clonal, F.Kasai (1983-09)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 μ E/m² sec, 3M,
(25° C, 30 μ E/m² sec)
Characteristics: Freshwater
F57-17-8
Reference: 242

POLYEDRIOPSIS Schmidle: Chlorophyceae

Polyedriopsis spinulosa (Schmidle) Schmidle

232

Tsukuba / Ibaraki (1984-05)
Unialgal, Clonal, F.Kasai (1984-05)
Identified by: F.Kasai
Culture conditions: C, 20° C, 4 μ E/m² sec, 3M,
(25° C, 30 μ E/m² sec)
Characteristics: Freshwater
F128
Reference: 242

PORPHYRIDIDIUM Greville: Rhodophyceae

Porphyridium sp.

1032

Iriomote Isl. / Okinawa (1990-10)
Unialgal, Clonal, N.Hatakeyama-Ishida (1990-11)
Identified by: N.Hatakeyama-Ishida
Culture conditions: ESM, 20° C, 12 μ E/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, Mangrove
M-1

1033

Iriomote Isl. / Okinawa (1990-10)
Unialgal, Clonal, N.Hatakeyama-Ishida (1990-11)

Identified by: N.Hatakeyama-Ishida

Culture conditions: ESM, 20° C, 12 μ E/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, Mangrove
M-7

1034

Florida / USA (1991-08)
Unialgal, Clonal, N.Hatakeyama-Ishida (1991-09)
Identified by: N.Hatakeyama-Ishida
Culture conditions: ESM, 20° C, 12 μ E/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, Mangrove
AM-31

1035

Florida / USA (1991-08)
Unialgal, Clonal, N.Hatakeyama-Ishida (1991-09)
Identified by: N.Hatakeyama-Ishida
Culture conditions: ESM, 20° C, 12 μ E/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine
AM-31

PROROCENTRUM Ehrenberg: Dinophyceae

Prorocentrum dentatum Stein

682

Hiuchi-Nada / Seto Inland Sea (1979-12)
Unialgal, Clonal, S.Yoshimatsu (1980-01)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 μ E/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable

900

Off Cape Irago / Aichi (2000-07)
Unialgal, Clonal, K.Yumoto (2000-08)
Identified by: M.Kawachi
Culture conditions: ESM, 20° C, 40 μ E/m² sec, 1M
Characteristics: Marine, Red tide, Untransportable

Prorocentrum gracile Schütt

315

Harima-Nada / Seto Inland Sea
Axenic, Clonal, S.Yoshimatsu (1984-08)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 32 μ E/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
80

- Prorocentrum lima*** (Ehrenberg) Dodge
617
Motobu / Okinawa (1993-06)
Unialgal, Clonal, H.Kobayashi (1993-06)
Identified by: Y.Fukuyo
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Toxic, Marine, Untransportable
PL-03
- Prorocentrum mexicanum*** Osorio Tafall
618
Motobu / Okinawa (1993-06)
Unialgal, Clonal, H.Kobayashi (1993-06)
Identified by: Y.Fukuyo
Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine, Untransportable
PX-01
- Prorocentrum micans*** Ehrenberg
12
Osaka Bay / Osaka (1981-07)
Axenic, Clonal, S.Yamochi
Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable,
COXI gene (AB000133-4), psbA gene
(AB025585)
OPm
References: 117, 118, 261, 458, 486, 570
- 218
Yashima Bay / Kagawa (1978-08)
Axenic, Clonal, K.Yuki
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-13-7
- 316
Matoya Bay / Mie (1984-09)
Axenic, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec, 2M
Characteristics: Red tide, Marine, Untransportable
MB-D-4
- 601
Mikawa bay / Aichi
Unialgal, Clonal, S.Toriumi
Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine, Untransportable
- 608
Ise Bay / Mie (1978-06)
Unialgal, Clonal, H.Iwasaki (1978-06)
Identified by: K.Steidnger
Culture conditions: ESM, 20° C, 40 µE/m² sec, 2M
Characteristics: Red tide, Marine, Untransportable
- Prorocentrum minimum*** (Pavillard) Schiller
237
Osaka Bay / Osaka (1982-08)
Axenic, Clonal, M.M.Watanabe (1982-08)
Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
OPmin
- 238
Harima-Nada / Seto Inland Sea (1983-04)
Unialgal, Clonal, S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Red tide, Marine, Unstable,
Untransportable
KGW-14-2-5
- Prorocentrum sigmoides*** Bohm
683
Uchiumi Bay / Kagawa (1985-10)
Axenic, Clonal, S.Yoshimatsu (1985-10)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable
- Prorocentrum triestinum*** Schiller
219
Nomi Bay / Kochi (1980-04)
Unialgal, Clonal, S.Yoshimatsu
Culture conditions: ESM, 20° C, 32 µE/m² sec, 2M
Characteristics: Red tide, Marine, Untransportable
KGW-28-1
Reference: 486
- PROTOCERATIUM** (Claparede et Lachmann)
Butschli: Dinophyceae
- Protoceratium reticulatum***
(Claparède et Lachmann) Bütschli
318
Matoya Bay / Mie (1984-09)
Axenic, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M

Characteristics: Red tide, Marine, Unstable,
Untransportable
MB-D-25

319

Naoshima Isl. / Kagawa (1982-07)
Axenic, Clonal, S. Yoshimatsu
Identified by: S. Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 40 µE/m² sec,
1M
Characteristics: Red tide, Marine, Unstable,
Untransportable
KGW-62
Reference: 486

PROTOGONYAULAX Taylor: Dinophyceae

* *Protogonyaulax catenella* (Whedon et Kofoid)
Taylor
See *Alexandrium catenella*
(Whedon et Kofoid) Balech

PRYMNESIUM Conrad: Prymnesiophyceae

Prymnesium calathiferum Chang et Ryan
1330
Awase / Okinawa
Unialgal, Clonal, A.Kai (2003-04)
Identified by: M. Yoshida
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
ym-07

Prymnesium parvum

Carter emend. J.C.Green, DJ.Hibberd et Pienaar
1017
Jogashima, Miura / Kanagawa (1997-04)
Unialgal, Clonal, M.Moriya (1997-04)
Identified by: M.Moriya
Culture conditions: ESM, 15° C, 15 µE/m² sec, 2M
Characteristics: Marine
#22

1018

Taira / Okinawa (2002-03)
Unialgal, Clonal, M.Moriya (2002-05)
Identified by: M.Moriya
Culture conditions: ESM, 15° C, 15 µE/m² sec, 1M
Characteristics: Brackish
M-25

PSEUDOCARTERIA Ettl: Chlorophyceae

Pseudocarteria mucosa (Korshikov) Ettl
522

Izumi / Miyagi (1985-08)
Unialgal, Clonal, S.Suda (1985-08)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic,
atpB gene (AB084324), *rbcL* gene (AB084335),
psaB gene (AB084364)
M-2
References: 242, 342, 443

523

Higashiyata River / Ibaraki (1983-07)
Unialgal, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic
USI-8
References: 242, 440, 443

524

Izumi / Miyagi (1985-08)
Unialgal, Clonal, S.Suda (1985-08)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic
M-4
References: 242, 443

PSEUDOKIRCHNERIELLA Hindák: Chlorophyceae

Pseudokirchneriella subcapitata (Korshikov) Hindák
35

Nitelva River / Norway
Axenic, Clonal, O.M.Skulberg (1959)
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: AGP, Freshwater, Formerly
identified as *Selenastrum capricornutum* (Printz)
Nygaard
P-26
References: 69, 88, 149, 150, 155, 159, 168, 216, 242,
264, 267, 269, 295, 298, 358, 366, 445, 476, 551,
552, 554

PSEUDOPLEUROCOCCUS Snow: Chlorophyceae

Pseudopleurococcus printzii Vischer
var. *longissimus* S.Watanabe

159

Kyoto (1975-03)

Unialgal, Clonal, S.Watanabe (1975-03)

Identified by: S.Watanabe

Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)

Characteristics: Indicator, Soil

KUC6-2

References: 242, 548

PTEROMONAS Seligo: Chlorophyceae

Pteromonas aculeata Lemmermann

738

Shinobazu-no-ike, Ueno Park / Tokyo (1996-10)

Unialgal, Clonal, S.Tanaka (1996-10)

Identified by: S.Tanaka

Culture conditions: MG, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater

970603-PtAcl

Reference: 460

860

Dorfteich, Darstein / Germany (1997-07)

Unialgal, Clonal, H.Nozaki (1997-08)

Identified by: H.Nozaki

Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater, Planktonic

970801-2

Pteromonas angulosa (Carter) Lemmermann

739

Shinobazu-no-ike, Ueno Park / Tokyo (1996-11)

Axenic, Clonal, S.Tanaka (1996-11)

Identified by: S.Tanaka

Culture conditions: MG, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater

970603-PtAng

Reference: 460

861

Germany

Unialgal, Clonal

Identified by: L.Knieritz

Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater, Planktonic,

atpB gene (AB014038), *rbcL* gene (AJ001887),

psaB gene (AB084371-2)

KR 91/2

References: 77, 342, 340

862

Germany

Unialgal, Clonal

Identified by: L.Knieritz

Culture conditions: AF-6, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater, Planktonic, *rbcL* gene
(AJ001888)

KR 91/3

Reference: 77

Pteromonas multipyrenoidea Iyenger

740

Shinobazu-no-ike, Ueno Park / Tokyo (1996-11)

Axenic, Clonal, S.Tanaka (1996-11)

Identified by: S.Tanaka

Culture conditions: MG, 20° C, 12 µE/m² sec, 2M

Characteristics: Freshwater

970603-PtMul

Reference: 460

PTEROSPERMA Pouchet: Prasinophyceae

Pterosperma cristatum Schiller

221

Harima-Nada / Seto Inland Sea (1983-02)

Axenic, Clonal, S.Suda (1983-09)

Identified by: I.Inouye

Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec,
1M

Characteristics: Red tide, Marine, Untransportable
H-88-1

References: 231, 486

626

Seto Inland Sea / Kagawa (1989-02)

Unialgal, Clonal, T.Sawaguchi (1989)

Identified by: I.Inouye

Culture conditions: ESM, 15° C, 20 µE/m² sec, 20D

Characteristics: Marine, Untransportable
89KGW-1

936

Oku-matsushima / Miyagi (1998-03)

Unialgal, Clonal, Y.Yoshii (1999-04)

Identified by: I.Inouye

Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M

Characteristics: Marine

Pt

PYRAMIMONAS Schmarda: Prasinophyceae

Pyramimonas aff. *amylifera* Conrad

251

Yashima Bay / Kagawa (1982-10)

Axenic, Clonal, S.Yoshimatsu

Identified by: S.Suda

Culture conditions: f/2, ESM, 20° C, 32 µE/m² sec, 1M

Characteristics: Red tide, Marine

KGW-64-3

Reference: 486

320

Onagawa Bay / Miyagi (1984-08)

Axenic, Clonal, S.Suda (1984-09)

Identified by: S.Suda

Culture conditions: f/2, 20° C, 32 µE/m² sec, 1M

Characteristics: Red tide, Marine

8280G47-5

Pyramimonas *parkeae* Norris et Pearson

254

Hachijo Isl. / Tokyo (1984-04)

Axenic, Clonal, S.Suda (1984-04)

Identified by: S.Suda

Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M

Characteristics: Indicator, Red tide, Marine, Tide pool, Collected from Senjo-jiki Yaene Hachijo

8-25-2

References: 176, 205, 206, 404

PYROCYSTIS Murray ex Haeckel: Dinophyceae

Pyrocystis *lunura* (Schütt) Schütt

609

Unialgal, Non-Clonal

Culture conditions: f/2, 20° C, 40 µE/m² sec, 1M

Characteristics: Marine

PYROPHACUS Stein: Dinophyceae

Pyrophacus *steinii* (Schiller) Wall et Dale

321

Matoya Bay / Mie (1984-09)

Unialgal, Clonal, T.Sawaguchi (1984-09)

Identified by: T.Sawaguchi

Culture conditions: ESM, 20° C, 40 µE/m² sec, 2M

Characteristics: Red tide, Marine, Untransportable

MB-D-27

RAPHIDIOPSIS F.E.Fritsch et F.Rich: Cyanophyceae

Raphidiopsis *curvata* F.E.Fritsch et F.Rich

932

Shinobazu-no-ike, Taito / Tokyo (2000-07)

Unialgal, Clonal, S.Otsuka (2000-07)

Identified by: S.Otsuka

Culture conditions: CT, 25° C, 24 µE/m² sec, 1M

Characteristics: Freshwater, Water bloom, Planktonic RAP1

RHODELLA Evans: Rhodophyceae

Rhodella sp.

1036

Iriomote Isl. / Okinawa (1990-10)

Unialgal, Clonal, N.Hatakeyama-Ishida (1990-11)

Identified by: N.Hatakeyama-Ishida

Culture conditions: ESM, 20° C, 12 µE/m² sec, 1M,

[Cryopreserved]

Characteristics: Marine, Mangrove

O4-3

1037

Iriomote Isl. / Okinawa (1990-10)

Unialgal, Clonal, N.Hatakeyama-Ishida (1990-11)

Identified by: N.Hatakeyama-Ishida

Culture conditions: ESM, 20° C, 12 µE/m² sec, 1M,

[Cryopreserved]

Characteristics: Marine, Mangrove

M-4

RHODOMONAS Karsten: Cryptophyceae

Rhodomonas *atrorosea* Butcher ex Hill et Wetherbee

699

Isle of Wight / U.K.

CCAP 978/6a, Unialgal, Clonal, B.W.Butcher

Identified by: B.W.Butcher

Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M

Characteristics: Marine, Type strain

Reference: 30

Rhodomonas *baltica* Karsten

700

Channel Islands / U.K.

CCAP 979/9, Unialgal, Clonal, B.W.Butcher (1961)

Identified by: B.W.Butcher

Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M

Characteristics: Marine

- Reference: 30
- Rhodomonas chrysoidea*** Butcher ex Hill et Wetherbee
701
River Colne, Essex / U.K.
CCAP 979/8, Unialgal, Clonal, B.W.Butcher (1953)
Identified by: B.W.Butcher
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Brackish, Type strain
Reference: 30
- 1005
Miyako Isl. / Okinawa (2002-03)
Unialgal, Clonal, M.Moriya (2002)
Identified by: M.Moriya
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine
M-23
- Rhodomonas duplex*** Hill et Wetherbee
765
Yaka, Kin / Okinawa (1986)
Unialgal Clonal, I. Inouye (1986)
Identified by: M.Erata
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine
M014
- Rhodomonas falcata*** Butcher ex Hill et Wetherbee
702
Aberystwyth, Wales / U.K.
CCAP 978/5a, Unialgal, Clonal, B.W.Butcher (1956)
Identified by: B.W.Butcher
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine, Type strain
Reference: 30
- Rhodomonas salina*** (Wislouch) Hill et Wetherbee
1006
Taira / Okinawa (2002-03)
Unialgal, Clonal, M.Moriya (2002-05)
Identified by: M.Moriya
Culture conditions: ESM, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine
M-40
- SCENEDESMUS** Meyen: Chlorophyceae
- Scenedesmus abundans*** (Kirchner) Chodat
685
IAM C-101, Unialgal, Clonal, R.A.Lewin
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Type strain, Formerly
identified as *Chlorella fusca* var. *fusca*
Reference: 242
- Scenedesmus acuminatus*** (Lagerheim) Chodat
var. *tetradesmoides* G.M.Smith
92
Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, T.Hiwatari (1983-08)
Identified by: M.Watanabe
Culture conditions: CT, 20° C, 8 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
K-S-1
References: 242, 549
- Scenedesmus acutus*** Meyen
94
Kosaka River / Akita (1983-04)
Axenic, Clonal, A.Yuri (1983-05)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
2-2-3-1
References: 242, 549
- 95
Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, S.Suda (1983-05)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater, Collected
from an artificial pond beside Aquatron at the
NIES
Aq-S-1
References: 84, 242, 530
- 120
Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, S.Suda (1983-05)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater, Collected
from an artificial pond beside Aquatron at the
NIES
Aq-S-2
References: 242, 530

- Scenedesmus dimorphus* (Turpin) Kützing
93
Lake Kasumigaura / Ibaraki (1983-07)
Axenic, Clonal, F.Kasai (1983-07)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
F-18-1
References: 242, 530
- 119
Ozegahara / Gunma (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: T.Hiwatari
Culture conditions: C, 20° C, 8 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
OZ-29
Reference: 242
- Scenedesmus gutwinskii* Chodat
var. *heterospina* Bodföközy
797
Lake Kasumigaura / Ibaraki (1992-06)
Unialgal, Clonal, F.Kasai (1992-07)
Identified by: T.Nakano
Culture conditions: C, 20° C, 4 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Herbicide (simetryn)
susceptible
B8-7
Reference: 154
- 798
Lake Kasumigaura / Ibaraki (1992-06)
Unialgal, Clonal, F.Kasai (1992-07)
Identified by: T.Nakano
Culture conditions: C, 20° C, 4 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Herbicide (simetryn)
susceptible
B8-16
Reference: 154
- 799
Lake Kasumigaura / Ibaraki (1992-06)
Unialgal, Clonal, F.Kasai (1992-07)
Identified by: T.Nakano
Culture conditions: C, 20° C, 4 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Herbicide (simetryn)
- susceptible
B8-23
Reference: 154
- 800
Lake Kasumigaura / Ibaraki (1992-06)
Unialgal, Clonal, F.Kasai (1992-07)
Identified by: T.Nakano
Culture conditions: C, 20° C, 4 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Herbicide (simetryn)
tolerant
B3-12
Reference: 154
- 801
Lake Kasumigaura / Ibaraki (1992-06)
Unialgal, Clonal, F.Kasai (1992-07)
Identified by: T.Nakano
Culture conditions: C, 20° C, 4 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Herbicide (simetryn)
tolerant
B3-15
Reference: 154
- 802
Lake Kasumigaura / Ibaraki (1992-06)
Unialgal, Clonal, F.Kasai (1992-07)
Identified by: T.Nakano
Culture conditions: C, 20° C, 4 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Herbicide (simetryn)
tolerant
B12-2
References: 153, 154
- Scenedesmus quadricauda*
(Turpin) Brébisson sensu Chodat
96
Lake Shoji / Yamanashi (1981-08)
TAC 51-3B, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater,
COXI gene (D63658, AB011524),
atpB gene (AB084305), *rbcL* gene (AB084332),
psaB gene (AB084339)
TAN-51-3B
References: 76, 242, 267, 342, 500, 568

Scenedesmus serratus (Corda) Bohlin

97

Lake Shoji / Yamanashi (1981-08)
TAC 51-3C, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Indicator, Freshwater
TAN-51-3C
Reference: 242

SCHIZOCLADIA Henry, Okuda et Kawai:

Schizocladiphyceae

Schizocladia ischiensis Henry, Okuda et Kawai

1044

Ischia Isl., Naples / Italy (1987-10)
Unialgal, Clonal, E.C.Henry (1987)
Identified by: H.Kawai
Culture conditions: ESM, 20° C, 4 µE/m² sec, 3M
Characteristics: Marine, Type strain, 18SrRNA gene
(AB085614), *rbcL* gene (AB085615)
KU-333
Reference: 167

SCHROEDERIA Lemmermann: Chlorophyceae

Schroederia setigera (Schröder) Lemmermann

246

Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, F.Kasai (1983-08)
Identified by: M.Watanabe
Culture conditions: C, 25° C, 30 µE/m² sec, 20D
Characteristics: Indicator, Freshwater
F47-3
Reference: 242

SCRIPPSIELLA Balech: Dinophyceae

Scrippsiella sweeneyae Balech

684

Bisan-Seto / Seto Inland Sea (1982-07)
Unialgal, Clonal, S.Yoshimatsu (1982-07)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M
Characteristics: Red tide, Marine, Untransportable

Scrippsiella trochoidea (Stein) Loeblich III

369

Hachinohe Harbor / Aomori (1985-08)

Axenic, Clonal, T.Sawaguchi (1985-08)

Identified by: T.Sawaguchi

Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M

Characteristics: Red tide, Marine, Homothallic,

Unstable, Untransportable,

COXI gene (AB000135)

HHSS-1

References: 118, 261, 293, 570

SELENASTRUM Reinsch: Chlorophyceae

* *Selenastrum capricornutum* Printz

See *Pseudokirchineriella subcapitata* (Korshikov)

Hindák

SKELETONEMA Greville: Bacillariophyceae

Skeletonema costatum (Greville) Cleve

16

Harima-Nada / Seto Inland Sea (1982-02)

Unialgal, Clonal, M.M.Watanabe (1982-05)

Identified by: M.M.Watanabe

Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M

Characteristics: Red tide, Marine,

Collected from St. 53 Harima-Nada

H-53-3

References: 184, 378, 410

17

Harima-Nada / Seto Inland Sea (1983-02)

Unialgal, Clonal, M.M.Watanabe (1983-05)

Identified by: M.M.Watanabe

Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M

Characteristics: Red tide, Marine,

Collected from St. 90 Harima-Nada

H-90-2

Reference: 248

223

Shodo Isl. / Kagawa (1979-07)

Unialgal, Clonal, K.Yuki

Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M

Characteristics: Red tide, Marine

KGW-26

323

Off Kishiwada / Osaka Bay (1985-01)

Axenic, Clonal, S.Yamochi (1985-01)

Identified by: S.Yamochi

Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M
Characteristics: Red tide, Marine, *petG,psbK,D,psaI*
etc. (AJ132266), *psaC,psbA* etc. (AJ132264),
psbC,D,petB,D etc. (AJ132263), *trnD,I,T* etc.
(AJ132265), *ycf24*,parietal (AJ132267)
Sk-85w
References: 135, 206, 452

324

Off Kobe / Osaka Bay (1985-07)
Axenic, Clonal, S.Yamochi (1985-07)
Identified by: S.Yamochi
Culture conditions: f/2, 5° C, 15 µE/m² sec, 2M
Characteristics: Red tide, Marine
Sk-85su
Reference: 359

SPINOCLOSTERIUM Bernard: Charophyceae

Spinoclosterium cuspidatum (Bailey ex Ralfs) Hirano
325

Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, T.Ichimura (1983-10)
Identified by: T.Ichimura
Culture conditions: SW(Bi), 20° C, 8 µE/m² sec, 4M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
83-24-19
Reference: 99

SPIROGYRA Link: Charophyceae

Spirogyra sp.

1023
Tsukuba / Ibaraki (2002-04)
Unialgal, Clonal, M.Moriya (2002-05)
Identified by: M.Moriya
Culture conditions: C, 20° C, 12 µE/m² sec, 3M
Characteristics: Freshwater
M-42

SPIRULINA Turpin: Cyanophyceae

Spirulina platensis (Gomont) Geitler
Syn. *Arthrospira platensis* Gomont
39

Lake Chad / Chad
IAM M-135, Axenic, Clonal
Culture conditions: SOT, 20° C, 4 µE/m² sec, 4M,

(25° C, 15 µE/m² sec)

Characteristics: Salt water, Hydrogen evolution,
Contains good quality of proteins
References: 4, 96, 222, 238, 242, 450, 470, 499, 518,
522, 530

45

Lake Kasumigaura / Ibaraki (1975-11)
IAM M-184, Unialgal, Clonal, M.M.Watanabe
(1975-11)
Identified by: M.M.Watanabe
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M
Characteristics: Water bloom, Freshwater,
Forming water bloom in Inbanuma
KAS-6-50
References: 79, 96, 242, 450, 518, 522, 530, 549, 559

46

Lake Texcoco / Mexico
IAM M-185, Axenic, Clonal
Culture conditions: SOT, 20° C, 4 µE/m² sec, 4M
(25° C, 15 µE/m² sec)
Characteristics: Water bloom, Salt water,
Hydrogen evolution
References: 2, 4, 7, 8, 96, 222, 242, 450, 518, 522,
530

597

Lake Teganuma / Chiba (1990-07)
Unialgal, Non-clonal, T.Hagiwara (1990-07)
Identified by: T.Hagiwara
Culture conditions: MA, 20° C, 4 µE/m² sec, 2M,
(25° C, 15 µE/m² sec)
Characteristics: Water bloom, Freshwater, Planktonic
T-43
Reference: 242

Spirulina subsalsa Oersted ex Gomont

27
IAM M-183, Axenic, Clonal
Culture conditions: MA, 25° C, 24 µE/m² sec, 1M
Characteristics: Freshwater
References: 96, 227, 242, 549

527

Shikabe / Hokkaido (1976-04)
IAM M-182, Unialgal, Clonal, M.M.Watanabe
(1976-04)
Identified by: M.M.Watanabe
Culture conditions: f/2, 25° C, 24 µE/m² sec, 1M
Characteristics: Indicator, Marine

References: 96, 242

598

Chiyoda-ku / Tokyo (1989-10)

Unialgal, Non-clonal, T.Hagiwara (1989-10)

Identified by: T.Hagiwara

Culture conditions: CB, CT, Csi, 20° C, 4 µE/m² sec, 2M, (25° C, 15 µE/m² sec)

Characteristics: Freshwater, Planktonic
KO-39

Reference: 242

STAUSTRUM Meyen: Charophyceae

Staurastrum dejectum Brébisson ex Ralfs
224

Lake Yamanaka / Yamanashi (1981-10)

TAC 53-1, Axenic, Clonal, M.Watanabe

Identified by: M.Watanabe

Culture conditions: AF-6, 20° C, 8 µE/m² sec, 2M, (20° C, 25 µE/m² sec)

Characteristics: Freshwater

TAN-53-1

Reference: 242

Staurastrum dorcidentiferum W. et G.S.West
665

Lake Biwa / Shiga (1986-09)

Unialgal, Clonal, S.Ohara (1986-09)

Identified by: M.Nakanishi

Culture conditions: AF-6, 25° C, 30 µE/m² sec, 2M

Characteristics: Freshwater

NB

Reference: 242

Staurastrum inconspicuum Nordstedt
390

Oze / Gunma (1983-08)

Axenic, Clonal, F.Kasai (1983-09)

Culture conditions: CAM, 20° C, 8 µE/m² sec, 3M, (20° C, 12 µE/m² sec)

Characteristics: Freshwater

34-10'

Reference: 242

Staurastrum levanderi Grönblad
841

Namiki-ike Pond, Tsukuba / Ibaraki (1998-07)

Unialgal, Clonal, A.Gontcharov (1998-07)

Identified by: A.Gontcharov

Culture conditions: C, 20° C, 8 µE/m² sec, 3M, (25° C, 30 µE/m² sec)

Characteristics: Freshwater

Reference: 57

Staurastrum paradoxum Meyen
528

Lake Kasumigaura / Ibaraki (1982-12)

Axenic, Clonal, M.H.Watanabe (1982-12)

Culture conditions: C, 20° C, 8 µE/m² sec, 2M, (20° C, 25 µE/m² sec)

Characteristics: Indicator, Freshwater

Kas-K-3

Reference: 242

Staurastrum tsukubicum

Gontcharov et M.M.Watanabe

842

Tsukuba / Ibaraki (1997-12)

Unialgal, Clonal, A.Gontcharov (1997-12)

Identified by: A.Gontcharov

Culture conditions: C, 20° C, 8 µE/m² sec, 3M, (25° C, 30 µE/m² sec)

Characteristics: Freshwater, Type strain

Reference: 57

STICHOCOCCUS Nägeli: Trebouxiophyceae

Stichococcus ampulliformis S.Handa
996

Taishaku Valley, Jinseki / Hiroshima (1987-12)

Unialgal, Clonal, S.Handa (1988-01)

Identified by: S.Handa

Culture conditions: C(S), 20° C, 4 µE/m² sec, 4M, (25° C, 30 µE/m² sec)

Characteristics: Freshwater, Epiphytic, Type strain, 18SrRNA gene (AB087559)

Handa-299(f)

Reference: 62

Stichococcus bacillaris Nägeli
529

Watarase River / Gunma (1987-08)

Unialgal, Non-clonal, F.Kasai (1987-08)

Identified by: F.Kasai

Culture conditions: C, 15° C, 15 µE/m² sec, 3M

Characteristics: Freshwater

AT2-16

References: 242, 454

530

Watarase River / Gunma (1987-08)
Unialgal, Non-clonal, F.Kasai (1987-09)
Identified by: F.Kasai
Culture conditions: C, 15° C, 15 µE/m² sec, 3M
Characteristics: Freshwater
AT5-17
References: 242, 454, 455

STIGEOCLONIUM Kützing: Chlorophyceae

Stigeoclonium aestivale (Hazen) Collins

531

Miyata River / Ibaraki (1987-03)
Unialgal, Non-clonal, F.Kasai (1987-04)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 3M
Characteristics: Freshwater
2st-3-12
References: 242, 453, 454

Stigeoclonium fasciculare Kützing var. *fasciculare*

532

Lake Mashu / Hokkaido (1987-08)
Unialgal, Clonal, F.Kasai (1987-09)
Identified by: F.Kasai
Culture conditions: C, 10° C, 6 µE/m² sec, 3M,
(10° C, 15 µE/m² sec)
Characteristics: Freshwater
M-2
References: 242, 454

SYNECHOCOCCUS Nägeli: Cyanophyceae

Synechococcus sp.

937

Junsai-numa / Hokkaido (1991-06)
Unialgal, Clonal, N.Takamura
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223433)
JUS1
Reference: 391

938

Lake Harutori / Hokkaido (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura

Culture conditions: CB, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, Euryhaline, *cpcBA*-IGS
gene (AF223434)
HAR3
Reference: 391

939

Lake Harutori / Hokkaido (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: CB, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, Euryhaline, *cpcBA*-IGS
gene (AF223438)
HAR10
Reference: 391

940

Himenuma / Hokkaido (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223452)
HIM1
Reference: 391

941

Lake Teganuma / Chiba (1991-06)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223439)
TEG1
Reference: 391

942

Lake Ushikunuma / Ibaraki (1991-06)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223440)
USK1
Reference: 391

- 943
Lake Kojima / Okayama (1991-07)
Unialgal, Clonal, N.Takamura (1991-10)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223441)
USK1
Reference: 391
- 944
Lake Abashiri / Hokkaido (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223453)
ABS1
Reference: 391
- 945
Lake Biwa / Shiga (1990-09)
Unialgal, Clonal, N.Takamura (1990-11)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223428), 16SrRNA gene (AF216951)
B1
Reference: 391
- 946
Lake Kasumigaura / Ibaraki (1991-02)
Unialgal, Clonal, N.Takamura (1991-04)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223443)
2K11
Reference: 391
- 947
Lake Sagami / Kanagawa (1991-04)
Unialgal, Clonal, N.Takamura (1991-05)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223444)
- SA1
Reference: 391
- 948
Lake Abashiri / Hokkaido (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223454)
ABS11
Reference: 391
- 949
Lake Ushikunuma / Ibaraki (1991-06)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: CB, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223455)
USK2
Reference: 391
- 950
Lough Neagh, North Ireland / U.K. (1991-03)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223448)
LN3
Reference: 391
- 951
Lake Akan / Hokkaido (1991-05)
Unialgal, Clonal, N.Takamura (1991-09)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223429), 16SrRNA gene (AF216952)
AKN3
Reference: 391
- 952
Lake Kizaki / Nagano (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: CB, 15° C, 15 µE/m² sec, 2M,

- [Cryopreserved]
 Characteristics: Freshwater, *cpcBA*-IGS gene (AF223449)
 KIZ5/3
 Reference: 391
- 953
 Lake Biwa / Shiga (1990-09)
 Unialgal, Clonal, N.Takamura (1990-10)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, *cpcBA*-IGS gene (AF223430), 16SrRNA gene (AF216953)
 B10
 Reference: 391
- 954
 Lake Biwa / Shiga (1990-09)
 Unialgal, Clonal, N.Takamura (1990-10)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, *cpcBA*-IGS gene (AF223456)
 B8
 Reference: 391
- 955
 Lake Kizaki / Nagano (1991-05)
 Unialgal, Clonal, N.Takamura (1991-07)
 Identified by: N.Takamura
 Culture conditions: CB, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, *cpcBA*-IGS gene (AF223445)
 KIZ5/1
 Reference: 391
- 956
 Lake Nojiri / Nagano (1991-05)
 Unialgal, Clonal, N.Takamura (1991-07)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, *cpcBA*-IGS gene (AF223450)
 NOJ1
 Reference: 391
- 957
 Lake Biwa / Shiga (1991-06)
 Unialgal, Clonal, N.Takamura (1991-09)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, *cpcBA*-IGS gene (AF223431), 16SrRNA gene (AF216954)
 B11
 Reference: 391
- 958
 Lake Biwa / Shiga (1990-09)
 Unialgal, Clonal, N.Takamura (1990-11)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, *cpcBA*-IGS gene (AF223435)
 B4
 Reference: 391
- 959
 Lake Biwa / Shiga (1990-09)
 Unialgal, Clonal, N.Takamura (1990-10)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, Water bloom, *cpcBA*-IGS gene (AF223432), 16SrRNA gene (AF216955)
 B3
 Reference: 391
- 960
 Lake Tsukui / Kanagawa (1991-04)
 Unialgal, Clonal, N.Takamura (1991-06)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, *cpcBA*-IGS gene (AF223436)
 TSU3
 Reference: 391
- 961
 Lake Kasumigaura / Ibaraki (1991-02)
 Unialgal, Clonal, N.Takamura (1991-03)
 Identified by: N.Takamura
 Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
 [Cryopreserved]
 Characteristics: Freshwater, *cpcBA*-IGS gene (AF223446)

- 2K12
Reference: 391
- 962
Lake Onuma / Hokkaido (1991-06)
Unialgal, Clonal, N.Takamura (1991-09)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223442)
ONM3
Reference: 391
- 963
Lake Nakatsuna / Nagano (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223447)
NT5
Reference: 391
- 964
Lake Megami / Nagano (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223437)
Me5
Reference: 391
- 965
Lake Misuzu / Nagano (1991-05)
Unialgal, Clonal, N.Takamura (1991-07)
Identified by: N.Takamura
Culture conditions: C, 15° C, 15 µE/m² sec, 2M,
[Cryopreserved]
Characteristics: Freshwater, *cpcBA*-IGS gene
(AF223451)
MSZ2
Reference: 391
- 969
East China Sea (1998-06)
Axenic, Clonal, N.Teزuka (1998-09)
Identified by: N.Teزuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, 16SrRNA gene (AF448060),
rpoC1 gene (AF448082)
1002
- 970
Tokunoshima Isl. / Kagoshima (1998-08)
Axenic, Clonal, N.Teزuka (1998-10)
Identified by: N.Teزuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, 16SrRNA gene (AF448073)
T71
- 971
Tokunoshima Isl. / Kagoshima (1998-08)
Axenic, Clonal, N.Teزuka (1998-10)
Identified by: N.Teزuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, Euryhaline, 16SrRNA gene
(AF448061), *rpoC1* gene (AF448083)
T7cc1
- 972
Iriomote Isl. / Okinawa (1998-11)
Axenic, Clonal, N.Teزuka (1999-02)
Identified by: N.Teزuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, Euryhaline, 16SrRNA gene
(AF448079), *rpoC1* gene (AF448117)
IR11
- 973
Iriomote Isl. / Okinawa (1998-11)
Unialgal, Clonal, N.Teزuka (1999-01)
Identified by: N.Teزuka
Culture conditions: C+10%Seawater, 20° C,
40 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Brackish, 16SrRNA gene
(AF448062)
48
- 974
Iriomote Isl. / Okinawa (1998-11)
Unialgal, Clonal, N.Teزuka (1999-01)
Identified by: N.Teزuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448101)
58E8

- 975
Iriomote Isl. / Okinawa (1998-11)
Unialgal, Clonal, N.Tezuka (1999-01)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448099)
58g6
- 976
Iriomote Isl. / Okinawa (1998-11)
Unialgal, Clonal, N.Tezuka (1999-01)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448100)
59
- 977
Taiyo Vil. / Ibaraki (1999-01)
Unialgal, Clonal, N.Tezuka (1999-03)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448105)
taiyo
- 978
Iriomote Isl. / Okinawa (1999-02)
Unialgal, Clonal, N.Tezuka (1999-04)
Identified by: N.Tezuka
Culture conditions: C+10%Seawater, 20° C,
40 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Brackish, Euryhaline, 16SrRNA
gene (AF448063), *rpoC1* gene (AF448084)
UBR
- 979
Iriomote Isl. / Okinawa (1999-02)
Unialgal, Clonal, N.Tezuka (1999-04)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, 16SrRNA gene (AF448074),
rpoC1 gene (AF448109)
UH7
- 980
Iriomote Isl. / Okinawa (1999-06)
Unialgal, Clonal, N.Tezuka (1999-08)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448097)
kom
- 981
Iriomote Isl. / Okinawa (1999-07)
Axenic, Clonal, N.Tezuka (1999-09)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, 16SrRNA gene (AF448064),
rpoC1 gene (AF448085)
Hos
- 982
Iriomote Isl. / Okinawa (1999-07)
Unialgal, Clonal, N.Tezuka (1999-09)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448113)
Hosso
- 983
Sagami Bay / Shizuoka (1999-07)
Unialgal, Clonal, N.Tezuka (1999-09)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448104)
St235
- 984
Tagosato River / Nagasaki (1999-08)
Axenic, Clonal, N.Tezuka (1999-10)
Identified by: N.Tezuka
Culture conditions: C+10%Seawater, 20° C,
40 µE/m² sec, 1M, [Cryopreserved]
Characteristics: Brackish, 16SrRNA gene
(AF448066), *rpoC1* gene (AF448087)
TAG
- 985
Miyake Isl. / Tokyo (1999-11)
Unialgal, Clonal, N.Tezuka (2000-01)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine, *rpoC1* gene (AF448102)
miyaR

986
Iriomote Isl. / Okinawa (1998-11)
Unialgal, Clonal, N.Tezuka (1999-01)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine
74

987
Futtsu / Chiba (1999-06)
Unialgal, Clonal, N.Tezuka (1999-08)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine
FUT

988
Miyake Isl. / Tokyo (1998-11)
Unialgal, Clonal, N.Tezuka (1999-01)
Identified by: N.Tezuka
Culture conditions: ESM, 20° C, 40 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Marine
miyaY

SYNURA Ehrenberg: Chrysophyceae

Synura petersenii Korshikov
233
Higashiyata River / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 12 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
USI-10
Reference: 438

1007
Tomakomai / Hokkaido (1999-11)
Unialgal, Clonal, M.Moriya (1999-11)
Identified by: M.Moriya
Culture conditions: AF-6, 15° C, 15 µE/m² sec, 2M
Characteristics: Freshwater
#73

Synura sphagnicola (Korshikov) Korshikov
695
Miyatoko Mire / Fukushima (1992-04)
Unialgal, Clonal, H.Nozaki (1992-04)

Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater
92-520-s-6

696
Miyatoko Mire / Fukushima (1992-10)
Unialgal, Clonal, H.Nozaki (1992-10)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater
92-1001-s-2

Synura spinosa Korshikov

234
Tsuchiura / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 12 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
SIS-1
Reference: 438

TABELLARIA Ehrenberg ex Kützing:
Bacillariophyceae

Tabellaria flocculosa (Roth) Kützing
225
Oze / Fukushima (1983-08)
Unialgal, Clonal, M.M.Watanabe (1983-09)
Identified by: M.M.Watanabe
Culture conditions: CSi, 15° C, 20 µE/m² sec, 2M
Characteristics: Indicator, Freshwater
OZ-43-4
Reference: 378

TETRABAENA Fromentel: Chlorophyceae

Tetrabaena socialis (Dujardin) Nozaki et Ito
Syn. *Gonium sociale* (Dujardin) Warming
691
King George Isl. / Antarctic (1990-12)
Axenic, Clonal, S.Ohtani (1990-12)
Identified by: H.Nozaki
Culture conditions: AF-6, 10° C, 25 µE/m² sec, 1M
Characteristics: Freshwater, Psychrophilic
KG-4-8th
References: 242, 341

Tetrabaena socialis (Dujardin) Nozaki et Ito
var. *socialis*
Syn. *Gonium sociale* (Dujardin) Warming var. *sociale*
571
Kohoku-ku / Yokohama / Kanagawa (1982-08)
Unialgal, Clonal, H.Nozaki (1982-10)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic, Isogamy,
atpB gene (AB014014), *rbcL* gene (D63443),
psaA gene (AB044415), *psaB* gene (AB044466),
psbC gene (AB044525)
21028-4
References: 242, 308, 322, 323, 337, 340, 341, 342

TETRACYSTIS Brown et Bold: Chlorophyceae

Tetracystis chlorococcoides (Korshikov) S.Watanabe
155
Mt. Eboshidake / Nagasaki (1975-08)
Axenic, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Soil
3-EBO-1
References: 242, 548

TETRAËDRON Kützing: Chlorophyceae

Tetraëdron incus (Teiling) G.M.Smith
392
Tsukuba / Ibaraki (1984-05)
Axenic, Clonal, F.Kasai (1984-05)
Identified by: M.Watanabe
Culture conditions: C, 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
F115
References: 242, 438

TETRASELMIS Stein: Prasinophyceae

Tetraselmis cordiformis (Carter) Stein
18
Oniishi / Gunma (1980-04)
Axenic, Clonal, M.M.Watanabe (1980-04)
Identified by: I.Inouye
Culture conditions: C, 20° C, 32 µE/m² sec, 1M

Characteristics: Water bloom, Freshwater
SM-6-9
Reference: 530

533
Mitsukaido / Ibaraki (1985-07)
Axenic, Clonal, S.Suda (1985-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 22 µE/m² sec, 20D
Characteristics: Freshwater
KY-20-1

Tetraselmis striata Butcher

1019
Miyajima Isl. / Hiroshima (2001-03)
Unialgal, Clonal, M.Moriya (2001-04)
Identified by: M.Moriya
Culture conditions: ESM, 20° C, 32 µE/m² sec, 1M
Characteristics: Marine
#96

THALASSIONEMA Grunow: Bacillariophyceae

Thalassionema nitzschioides (Grunow) Hustedt
534
Matoya Bay / Mie (1984-09)
Unialgal, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: f/2, 15° C, 20 µE/m² sec, 1M
Characteristics: Marine
MBB-6
Reference: 378

THORACOSPHAERA Kamptner: Dinophyceae

Thoracosphaera heimii (Lohmann) Kamptner
1325
Hachijo Isl. / Tokyo (2002-01)
Unialgal, Clonal, M-H.Noël (2002-02)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
MH36

1326
East China Sea (Kuroshio Current) (2003-08)
Unialgal, Clonal, M-H.Noël (2003-09)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine

MH78

TOLYPOTHRIX Kützing: Cyanophyceae

Tolypothrix tenuis Kützing ex Bornet et Flahault
37

Borneo

IAM M-29, Unialgal, Non-clonal, A.Watanabe

Identified by: K.Negoro

Culture conditions: MDM(S), 20° C, 4 µE/m² sec,

4M, (25° C, 30 µE/m² sec), [Cryopreserved]

Characteristics: Freshwater, Nitrogen fixation,
Chromatic adaptation, Heterotrophic, Reidentified
by M.M.Watanabe, Material for studying on
phycobilin production

References: 24, 38, 39, 40, 41, 42, 43, 45, 71, 72, 73,
96, 183, 242, 260, 409, 477, 485, 490, 491, 492,
493, 494, 495, 496, 498, 571

TREBOUXIA de Puymaly: Trebouxiophyceae

Trebouxia anticipata Archibald

1271

Mt.Tsukuba / Ibaraki (2002-01)

Axenic, Clonal, Y.Ohmura (2002-02)

Identified by: S.Takeshita

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Punctelia rudecta* (lichen) on rock,
Indicator

AYO4776

1272

Mt.Tsukuba / Ibaraki (2002-01)

Axenic, Clonal, Y.Ohmura (2002-03)

Identified by: S.Takeshita

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Punctelia rudecta* (lichen) on bark,
Indicator

AYO4780

1273

Nyuno, Kochi / Hiroshima (2002-03)

Axenic, Clonal, Y.Ohmura (2002-04)

Identified by: Y.Ohmura

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Flavoparmelia caperata* (lichen) on
bark, Indicator

AYO4870

Trebouxia arboricola Puymaly

1274

Mt.Tsukuba / Ibaraki (2002-01)

Axenic, Clonal, Y.Ohmura (2002-02)

Identified by: S.Takeshita

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Ramalina yasudae* (lichen) on rock,
Indicator

AYO4775

1275

Mt.Tsukuba / Ibaraki (2002-01)

Axenic, Clonal, Y.Ohmura (2002-02)

Identified by: S.Takeshita

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Ramalina yasudae* (lichen) on rock,
Indicator

AYO4779

1276

Okuniwa, Mt.Fuji / Yamanashi (2003-05)

Axenic, Clonal, Y.Ohmura (2003-05)

Identified by: Y.Ohmura

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Usnea longissima* (lichen) on bark,
Indicator

AYO5316

1277

Ochudo, Mt.Fuji / Yamanashi (2003-05)

Axenic, Clonal, Y.Ohmura (2003-05)

Identified by: Y.Ohmura

Culture conditions: BBM(S), 20° C, 20 µE/m² sec,

6M

Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Usnea trichodeoides* (lichen) on bark,
Indicator

AYO5321

Trebouxia corticola (Archibald) Gärtner

1278

- Mt. Tsukuba / Ibaraki (2002-01)
 Axenic, Clonal, Y. Ohmura (2002-01)
 Identified by: S. Takeshita
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Usnea bismolliuschula* (lichen) on
 rock, Indicator
 AYO4774
- 1279
 Mt. Tsukuba / Ibaraki (2002-01)
 Axenic, Clonal, Y. Ohmura (2002-02)
 Identified by: S. Takeshita
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Rimelia clavurifera* (lichen) on rock,
 Indicator
 AYO4777
- 1280
 Suki Vil. / Miyazaki (2002-02)
 Axenic, Clonal, Y. Ohmura (2002-03)
 Identified by: S. Takeshita
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Ramalina peruviana* (lichen) on bark,
 Indicator
 AYO4860
- 1281
 Nyuno, Kochi / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: S. Takeshita
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Usnea baileyi* (lichen) on bark,
 Indicator
 AYO4863
- 1282
 Nyuno, Kochi / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: Y. Ohmura
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Usnea rubrotincta* (lichen) on bark,
 Indicator
- AYO4864
- 1283
 Nyuno, Kochi / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: Y. Ohmura
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Usnea ceratina* (lichen) on bark,
 Indicator
 AYO4865
- 1284
 Nyuno, Kochi / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: S. Takeshita
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Usnea ceratina* (lichen) on bark,
 Indicator
 AYO4867
- 1285
 Nyuno, Kochi / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: Y. Ohmura
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Usnea baileyi* (lichen) on bark,
 Indicator
 AYO4868
- 1286
 Higashihiroshima / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: Y. Ohmura
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M
 Characteristics: Freshwater, Terrestrial, Symbiotic,
 Isolated from *Dirinaria applanata* (lichen) on bark,
 Indicator
 AYO4882
- 1287
 Higashihiroshima / Hiroshima (2002-03)
 Axenic, Clonal, Y. Ohmura (2002-04)
 Identified by: Y. Ohmura
 Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
 6M

- Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Rimelia clavulifera* (lichen) on bark,
Indicator
AYO4884
- 1288
Aokigahara, Mt.Fuji / Yamanashi (2003-05)
Axenic, Clonal, Y.Ohmura (2003-05)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Usnea rubrotincta* (lichen) on bark,
Indicator
AYO5330
- Trebouxia higginsiae* (Hildreth et Ahmadjian) Gärtner
1289
Mt. Tsukuba / Ibaraki (2002-01)
Axenic, Clonal, Y.Ohmura (2002-02)
Identified by: S.Takeshita
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Parmotrema tinctorum* (lichen) on
bark, Indicator
AYO4781
- 1290
Mt. Tsukuba / Ibaraki (2002-01)
Axenic, Clonal, Y.Ohmura (2002-03)
Identified by: S.Takeshita
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Dirinaria applanata* (lichen) on bark,
Indicator
AYO4782
- 1291
Nyuno, Kochi / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Parmotrema tinctorum* (lichen) on
bark, Indicator
AYO4866
- 1292
Higashihiroshima / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Myelochroa aurulenta* (lichen) on
bark, Indicator
AYO4877
- 1293
Higashihiroshima / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Parmotrema tinctorum* (lichen) on
bark, Indicator
AYO4879
- 1294
Higashihiroshima / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Dirinaria applanata* (lichen) on bark,
Indicator
AYO4880
- 1295
Higashihiroshima / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: S.Takeshita
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Parmotrema tinctorum* (lichen) on
bark, Indicator
AYO4887
- 1296
Higashihiroshima / Hiroshima (2002-03)
Axenic, Clonal, Y.Ohmura (2002-04)
Identified by: Y.Ohmura
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Parmotrema austrosinense* (lichen)
on bark, Indicator
AYO4885

Trebouxia showmanii (Hildreth et Ahmadjian) Gärtner
1297

Mt. Tsukuba / Ibaraki (2002-01)
Axenic, Clonal, Y. Ohmura (2002-02)
Identified by: S. Takeshita
Culture conditions: BBM(S), 20° C, 20 µE/m² sec,
6M
Characteristics: Freshwater, Terrestrial, Symbiotic,
Isolated from *Xanthoparmelia coreana* (lichen) on
rock, Indicator
AYO4778

TRENTEPOHLLIA Martius: Chlorophyceae

Trentepohlia sp.
967

Nozawa-onsen Vil. / Nagano (1989-12)
Unialgal, Clonal, T. Hagiwara (1990-01)
Identified by: T. Hagiwara
Culture conditions: C, 20° C, 22 µE/m² sec, 6M
Characteristics: Freshwater
TP-5

TREUBARIA Bernard: Chlorophyceae

Treubaria triappendiculata Bernard
394

Lake Kasumigaura / Ibaraki (1983-10)
Axenic, Clonal, F. Kasai (1983-10)
Identified by: Y. Niiyama
Culture conditions: C, 20° C, 4 µE/m² sec, 2M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater
F67-5
Reference: 242

TRICERATIUM Ehrenberg: Bacillariophyceae

Triceratium dubium Brightwell
556

Okinawa (1990)
Unialgal, Clonal, S. Ono (1990)
Identified by: S. Ono
Culture conditions: f/2, 20° C, 40 µE/m² sec, 1M
Characteristics: Marine
No.20
Reference: 395

TRIPLOCERAS Bailey: Charophyceae

Triploceras gracile Bailey
789

2 km east of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T. Ichimura (1985)
Identified by: T. Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
85-28-1
Reference: 101

790

2 km east of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T. Ichimura (1985)
Identified by: T. Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
85-28-2
Reference: 101

791

2 km east of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T. Ichimura (1985)
Identified by: T. Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
85-28-3
Reference: 101

792

2 km east of Melaka / Malaysia (1985-08)
Unialgal, Clonal, T. Ichimura (1985)
Identified by: T. Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Homothallic
85-28-4
Reference: 101

793

Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, T. Ichimura (1983)
Identified by: T. Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +

83-24-2
Reference: 101

794
Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, T.Ichimura (1983)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type +
83-24-7
Reference: 101

795
Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, T.Ichimura (1983)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –
83-24-3
Reference: 101

796
Higashihiroshima / Hiroshima (1983-10)
Unialgal, Clonal, T.Ichimura (1983)
Identified by: T.Ichimura
Culture conditions: MG, 22° C, 24 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Freshwater, Heterothallic,
Mating type –
83-24-6
Reference: 101

TYCHONEMA Anagnostidis et Komárek:
Cyanophyceae

Tychonema bourrellyi Anagnostidis et Komárek
846
Loughgall, North Ireland / U.K.
CCAP 1459/11B, Axenic, Clonal, Fitzsimons
Reidentified by: S.Suda
Culture conditions: CT, 20° C, 12 µE/m² sec, 1M,
[Cryopreserved]
Characteristics: Freshwater, Water bloom, Planktonic,
Formerly identified as *Oscillatoria bounetii* f.
tenuis Skuja, 16SrRNA gene (AB045897)
Reference: 444

ULOTHRIX Kützing: Ulvophyceae

Ulothrix variabilis Kützing
329
Takatori River / Ibaraki (1984-12)
Unialgal, Clonal, S.Suda (1984-12)
Identified by: M.M.Watanabe
Culture conditions: C, 20° C, 12 µE/m² sec, 3M
Characteristics: Freshwater
References: 242, 453, 454

Ulothrix zonata (Weber et Mohr) Kützing
536
Hitachi / Ibaraki (1987-05)
Unialgal, Non-clonal, F.Kasai (1987-06)
Identified by: F.Kasai
Culture conditions: C, 10° C, 6 µE/m² sec, 3M,
(10° C, 15 µE/m² sec)
Characteristics: Freshwater
4st-1'-24
References: 242, 454

537
Sapporo / Hokkaido (1987-10)
Unialgal, Non-clonal, F.Kasai (1987-10)
Identified by: F.Kasai
Culture conditions: C, 10° C, 15 µE/m² sec, 1M
Characteristics: Freshwater
2Tst-1-1
References: 242, 454

UMBILICOSPHAERA Lohmann: Prymnesiophyceae

Umbilicosphaera sibogae (Weber-van Bosse) Gaarder
var. *foliosa* Kamptner
1323
Hachijo Isl. / Tokyo (2002-07)
Unialgal, Clonal, M-H.Noël (2002-08)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine
MH51

Umbilicosphaera sibogae (Weber-van Bosse) Gaarder
var. *sibogae*
1324
East China Sea (Kuroshio Current) (2003-08)
Unialgal, Clonal, M-H.Noël (2003-09)
Identified by: M-H.Noël
Culture conditions: MNK, 22° C, 15 µE/m² sec, 14D
Characteristics: Marine

- MH67
- URNELLA** Playfair: Chlorophyceae
- Urnella terrestris* Playfair
156
Pokhara / Nepal (1975-10)
Unialgal, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 4 µE/m² sec, 3M,
(25° C, 30 µE/m² sec)
Characteristics: Soil
NPL-111
References: 242, 547
- UROGLENA** Ehrenberg: Chrysophyceae
- Uroglena americana* Calkins
395
Lake Biwa / Shiga (1978-05)
Unialgal, Clonal, Monoxenic, Y.Ishida (1978-05)
Identified by: Y.Ishida
Culture conditions: URO, 15° C, 20 µE/m² sec, 1M
Characteristics: Water bloom, Phagotrophic,
Freshwater, Untransportable
Strain 78
References: 121, 178, 179
- URONEMA** Lagerheim: Chlorophyceae
- Uronema confervicolum* Lagerheim
538
Miyata River / Ibaraki (1987-05)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 3M
Characteristics: Freshwater
4st-2-10
References: 242, 453, 454
- Uronema gigas* Vischer
539
Miyata River / Ibaraki (1987-05)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 3M
Characteristics: Freshwater
4st-3-5
References: 242, 454
- 540
Miyata River / Ibaraki (1987-05)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: F.Kasai
Culture conditions: C, 20° C, 8 µE/m² sec, 3M
Characteristics: Freshwater
4st-0-16
References: 242, 454
- VITREOCHLAMYS** Batko: Chlorophyceae
- Vitreochlamys aulata* (Pascher) Batko
875
Atsugi / Kanagawa (1998-02)
Unialgal, Clonal, A.Nakazawa (1998-03)
Identified by: A.Nakazawa
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic,
atpB gene (AB076121), *rbcL* gene (AB050486-7),
psaA gene (AB076143), *psaB* gene (AB076158),
psbC gene (AB076175-7),
rbcL-462 intron (AB076097)
Spha-5/1998-3-9
References: 287, 288, 342, 344
- 876
Habikino / Osaka (1998-03)
Unialgal, Clonal, A.Nakazawa (1998-07)
Identified by: A.Nakazawa
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, *rbcL* gene
(AB050488-9)
Spha-8/1998-7-14
Reference: 287
- 877
South Bohemia / Czech
SAG 69.72, Unialgal, Clonal
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, *rbcL* gene
(AB050492)
Reference: 287
- 878
Zool / Slovakia
SAG 80.81, Unialgal, Clonal
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, formerly
identified as *Sphaerellopsis aulata*, *rbcL* gene
(AB050493)
Reference: 287

Vitreochlamys fluviatilis (Stein) Batko
879

Nerima / Tokyo (1997-11)
Unialgal, Clonal, A.Nakazawa (1997-12)
Identified by: A.Nakazawa
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, *rbcL* gene
(AB050484)
Spha-1/1997-12-5
Reference: 287

Vitreochlamys gloeocystiformis (Dill) Nakazawa
Syn. *Sphaerellopsis gloeocystiformis* (Dill) Gerloff
880

Lake Altglobsow, Brandenburg / Germany (1997-08)
Unialgal, Clonal, H.Nozaki (1997-08)
Identified by: A.Nakazawa
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, *rbcL* gene
(AB050485)
970805-u-4
Reference: 287

Vitreochlamys nekrassovii (Korshikov) Nakazawa
Syn. *Sphaerellopsis nekrassovii* (Korshikov) Ettl
881

River Elbe near Čelakovice / Czech
SAG 11-10, Unialgal, Clonal
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, *rbcL* gene
(AB050494)
Reference: 287

Vitreochlamys ordinata (Skuja) Nakazawa
Syn. *Sphaerellopsis ordinata* Skuja
882

Lake Altglobsow, Brandenburg / Germany (1997-08)
Unialgal, Clonal, H.Nozaki (1997-08)
Identified by: A.Nakazawa
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, *atpB* gene
(AB014036), *rbcL* gene (AB014041), *psaA* gene
(AB044420), *psaB* gene (AB044471), *psbC* gene
(AB044529)
Nozaki S-4
References: 287, 337, 340, 342

Vitreochlamys pinguis Nakazawa
883

Nerima / Tokyo (1998-06)
Unialgal, Clonal, A.Nakazawa (1998-07)
Identified by: A.Nakazawa

Culture conditions: AF-6, 20° C, 22 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic, Type strain,
atpB gene (AB076120), *rbcL* gene (AB050490-1),
psaA gene (AB076142), *psaB* gene (AB076157),
psbC gene (AB076174)
References: 287, 342, 344

VOLVOX L.: Chlorophyceae

Volvox africanus G.S.West
863

UTEX 1891, Unialgal, Clonal
Identified by: R.C.Starr
Culture conditions: AF-6/2, 23° C, 48 µE/m² sec,
20D
Characteristics: Freshwater, Planktonic, Heterothallic,
Dioecious, Oogamy, H,h type, Mating type female,
Reisolated by H.Nozaki

Volvox aureus Ehrenberg
241

Nagatoro / Saitama (1969-11)
IAM C-419, Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: VT, 25° C, 30 µE/m² sec, 20D
Characteristics: Freshwater, Fertility lost,
Untransportable
S-9-8
References: 96, 242

396

Koshokugun / Nagano (1983-08)
Axenic, Clonal, Y.Ogasawara (1983-08)
Identified by: Y.Ogasawara
Culture conditions: VT, 20° C, 12 µE/m² sec, 20D
Characteristics: Freshwater, Homothallic,
Untransportable
Reference: 242

693

Meguro / Tokyo (1977-06)
Axenic, Clonal, H.Nozaki (1977-06)
Identified by: H.Nozaki
Culture conditions: VT, 23° C, 48 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom,
Homothallic, Dioecious, Oogamy, Untransportable
k-5
Reference: 242

694

Sakyo / Kyoto (1983-10)

Axenic, Clonal, H.Nozaki (1983-10)
Identified by: H.Nozaki
Culture conditions: VT, 23° C, 48 µE/m² sec, 1M
Characteristics: Freshwater, Water bloom,
Homothallic, Dioecious, Oogamy, Untransportable
31202-2-9
Reference: 242

864

Neuglobsow / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-07)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 35 µE/m² sec, 2M
Characteristics: Freshwater, Planktonic

891

Neuglobsow / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-07)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 35 µE/m² sec, 2M
Characteristics: Freshwater, *atpB* gene (AB076104),
rbcL gene (AB076096), *psaA* gene (AB076123),
psaB gene (AB076145), *psbC* gene (AB076160)
970717-2
Reference: 344

892

Lake Sagami / Kanagawa (1999-06)
Unialgal, Clonal, H.Nozaki (1999-06)
Identified by: H.Nozaki
Culture conditions: MG, 15° C, 35 µE/m² sec, 2M
Characteristics: Freshwater, Water bloom,
Homothallic, Dioecious, Oogamy, H,h type,
atpB gene (AB076105), *rbcL* gene (AB076086),
psaA gene (AB076124), *psaB* gene (AB076146),
psbC gene (AB076161),
rbcL-462 intron (AB076086)
990601-1V-9
Reference: 344

Volvox aureus Ehrenberg var. *aureus*

541

Lake Yamanaka / Yamanashi (1981)
Axenic, Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VT, 23° C, 48 µE/m² sec, 1M
Characteristics: Freshwater, *atpB* gene (AB013998),
rbcL gene (D63445), *psaA* gene (AB044182),
psaB gene (AB044424), *psbC* gene (AB044474)
Untransportable
1706-2
References: 242, 305, 318, 322, 323, 337, 340

542

Lake Yamanaka / Yamanashi (1981)
Axenic, Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
Characteristics: Freshwater, Untransportable
1706-4
References: 242, 305

Volvox barberi Shaw

730

California / USA (1965-09)
UTEX 164n, Unialgal, Clonal, J.Stein (1957-04)
Culture conditions: C, 23° C, 48 µE/m² sec, 20D
Characteristics: Freshwater, *atpB* gene (AB014001),
rbcL gene (D86835), *psaA* gene (AB044186),
psaB gene (AB044427), *psbC* gene (AB044477),
Untransportable
References: 324, 337, 340

Volvox carteri Stein

397

Ichinomiya / Aichi (1983-06)
Axenic, Clonal, Y.Ogasawara (1983-06)
Culture conditions: VT, 25° C, 30 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic, Female,
Crosses with NIES-398, Untransportable
V-4
Reference: 242

398

Ichinomiya / Aichi (1983-06)
Axenic, Clonal, Y.Ogasawara (1983-06)
Culture conditions: VT, 25° C, 30 µE/m² sec, 20D
Characteristics: Freshwater, Heterothallic, Male,
Crosses with NIES-397, Untransportable
V-11
Reference: 242

Volvox carteri Stein f. *kawasakiensis* Nozaki

580

Kawasaki / Kanagawa (1984-01)
Unialgal, Clonal, H.Nozaki (1986-06)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic,
Dioecious, Oogamy, Female, Crosses with
NIES-581, Untransportable
6823-♀-2
References: 242, 311

- 581
Kawasaki / Kanagawa (1990-10)
Unialgal, Clonal, H.Nozaki (1990-11)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m²sec, 1M
Characteristics: Freshwater, Heterothallic, Dioecious,
Oogamy, Male, Crosses with NIES-580,
Untransportable
90-1111-5
References: 242, 311
- 732
Kawasaki / Kanagawa (1984-01)
Axenic, Clonal, H.Nozaki (1984-02)
Identified by: H.Nozaki
Culture conditions: VT, 23° C, 48 µE/m²sec, 1M
Characteristics: Freshwater, Heterothallic, Dioecious,
Oogamy, Female, Crosses with NIES-733,
Type strain, *atpB* gene (AB013999),
rbcl gene (D63446), *psaA* gene (AB044184-5),
psaB gene (AB044425), *psbC* gene (AB044475),
Untransportable
KK-3
References: 311, 318, 323, 337, 340, 342
- 733
Kawasaki / Kanagawa (1984-01)
Axenic, Clonal, H.Nozaki (1984-02)
Identified by: H.Nozaki
Culture conditions: C, 23° C, 48 µE/m²sec, 1M
Characteristics: Freshwater, Heterothallic, Dioecious,
Oogamy, Male, Crosses with NIES-732,
Untransportable
KK-5
Reference: 311
- Volvox carteri* Stein f. *nagariensis* Iyengar
865
Kobe / Hyogo
UTEX 1885, Unialgal, Clonal, R.C.Starr
Identified by: R.C.Starr
Culture conditions: MG, 23° C, 48 µE/m²sec, 20D
Characteristics: Freshwater, Planktonic, Heterothallic,
Dioecious, Oogamy, H,h type, Mating type female
- Volvox carteri* Stein f. *weismannia* (Powers) Iyengar
866
Waterford / Australia
UTEX 1875, Unialgal, Clonal, R.C.Starr
Identified by: R.C.Starr
Culture conditions: VTAC, 23° C, 48 µE/m²sec, 20D
Characteristics: Freshwater, Planktonic, Heterothallic,
Dioecious, Oogamy, H,h type, Mating type male
- Dioecious, Oogamy, H,h type, Mating type male,
Reisolated by H.Nozaki
- Volvox dissipatrix* (Shaw) Printz
731
UTEX 2184, Unialgal, Clonal, R.C.Starr
Culture conditions: MG, 23° C, 48 µE/m²sec, 14D
Characteristics: Freshwater, *atpB* gene (AB014000),
rbcl gene (D63447), *psaA* gene (AB044183),
psaB gene (AB044426), *psbC* gene (AB044476),
Unstable, Untransportable
References: 323, 337, 340
- Volvox gigas* Pocock
867
UTEX 1895, Unialgal, Clonal, R.C.Starr
Identified by: R.C.Starr
Culture conditions: MG, 23° C, 48 µE/m²sec, 14D
Characteristics: Freshwater, Planktonic, Heterothallic,
Dioecious, Oogamy, H,h type, Mating type female
- Volvox obversus* (Shaw) Printz
868
UTEX 1865, Unialgal, Clonal, R.C.Starr
Identified by: R.C.Starr
Culture conditions: MG, 23° C, 48 µE/m²sec, 14D
Characteristics: Freshwater, Planktonic, Heterothallic,
Dioecious, Oogamy, H,h type, Mating type male
- Volvox prolificus* Iyengar
543
Axenic, Clonal, Y.Ogasawara
Identified by: S.Suda
Culture conditions: VT, 23° C, 48 µE/m²sec, 1M
Characteristics: Freshwater, Untransportable
V-sp
Reference: 242
- Volvox rousseletii* G.S.West
734
UTEX 1862, Unialgal, Clonal, R.C.Starr
Culture conditions: AF-6, 23° C, 48 µE/m²sec, 1M
Characteristics: Freshwater, *atpB* gene (AB014003),
rbcl gene (D63448), *psaA* gene (AB044188),
psaB gene (AB044429), *psbC* gene (AB044479),
Untransportable
References: 323, 337, 340
- Volvox tertius* Meyer
544
Kisofukushima / Nagano (1986-08)
Axenic, Clonal, Y.Ogasawara (1986-08)

- Identified by: Y.Ogasawara
 Culture conditions: MG, 20° C, 12 µE/m² sec, 20D
 Characteristics: Freshwater, Homothallic,
 Untransportable
 Reference: 242
- 869
 Queen's Ditch, Cambridge / U.K. (1947)
 Axenic, Clonal, E.A.George (1947)
 Identified by: R.C.Starr
 Culture conditions: MG, 23° C, 48 µE/m² sec, 14D
 Characteristics: Freshwater, Planktonic, Reisolated
 by H.Nozaki
- VOLVULINA** Playfair: Chlorophyceae
- Volvulina boldii* O'Neil et Starr. nom.nud.
 893
 Peurith, North Carolina / USA
 UTEX 2185, Unialgal, Clonal, R.C.Starr
 Identified by: R.C.Starr
 Culture conditions: MG, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 H,h type, Mating type +, *atpB* gene (AB044176),
rbcL gene (AB044162-3), *psaA* gene (AB044225),
psaB gene (AB044451), *psbC* gene (AB044504)
 Reference: 337
- 894
 Peurith, North Carolina / USA
 UTEX 2186, Unialgal, Clonal, R.C.Starr
 Identified by: R.C.Starr
 Culture conditions: MG, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
 H,h type, Mating type -
- Volvulina compacta* Nozaki
 582
 Birtamod / Nepal (1988-10)
 Axenic, Clonal, H.Nozaki (1989-08)
 Identified by: H.Nozaki
 Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic,
 Mating type +, Crosses with NIES-583,
atpB gene (AB014029), *rbcL* gene (D86832),
psaA gene (AB044217-9), *psaB* gene (AB044446),
psbC gene (AB044498),
rbcL-462 intron (AB076089)
 89-804-4
 References: 242, 324, 333, 337, 340, 342, 344
- 583
 Birtamod / Nepal (1988-10)
 Axenic, Clonal, H.Nozaki (1989-08)
 Identified by: H.Nozaki
 Culture conditions: VT, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic,
 Mating type -, Crosses with NIES-582
 89-804-7
 References: 242, 333
- Volvulina pringsheimii* Starr
 895
 Fredricksburg, Texas / USA (1960)
 UTEX 1020, Unialgal, Clonal, R.C.Starr (1960-11)
 Identified by: R.C.Starr
 Culture conditions: MG, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,
atpB gene (AB014028), *rbcL* gene (D63444), *psaA*
 gene (AB044220), *psaB* gene (AB044447), *psbC*
 gene (AB044499)
 References: 323, 337, 340
- Volvulina steinii* Playfair
 545
 Hayama / Kanagawa (1980-12)
 Axenic, Clonal, H.Nozaki (1981-01)
 Identified by: H.Nozaki
 Culture conditions: VTAC, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic,
 Mating type -, Crosses with NIES-546,
atpB gene (AB044713), *rbcL* gene (AB044159),
psaA gene (AB044221-2), *psaB* gene (AB044448),
psbC gene (AB044500)
 1107-5 (-)
 References: 242, 301, 321, 337
- 546
 Hayama / Kanagawa (1980-12)
 Axenic, Clonal, H.Nozaki (1981-01)
 Identified by: H.Nozaki
 Culture conditions: VTAC, 20° C, 12 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic,
 Mating type +, Crosses with NIES-545
 1107-8 (+)
 References: 166, 242, 301
- 584
 Bahrabise / Nepal (1988-09)
 Unialgal, Clonal, H.Nozaki (1989-03)
 Identified by: H.Nozaki
 Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
 Characteristics: Freshwater, Heterothallic, Isogamy,

- Mating type +, Crosses with NIES-585
89-306-1
References: 242, 313
- 585
Bahrabise / Nepal (1988-09)
Unialgal, Clonal, H.Nozaki (1989-04)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type –, Crosses with NIES-584
89-423-1
References: 242, 313
- 896
Farmington, California / USA
UTEX 1525, Unialgal, Clonal
Identified by: R.J.Carefoot
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Mixotrophic,
Heterothallic, Isogamy, H,h type, *atpB* gene
(AB044174), *rbcL* gene (AB044160), *psaA* gene
(AB044223), *psaB* gene (AB044449), *psbC* gene
(AB044501)
References: 15, 301, 321, 337
- 897
Bloomington, Indiana / USA
UTEX 1527, Unialgal, Clonal
Identified by: R.J.Carefoot
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Mixotrophic,
Heterothallic, Isogamy, H,h type
References: 15, 301, 321
- 898
Wilson Co., Texas / USA
UTEX 1531, Unialgal, Clonal
Identified by: R.J.Carefoot
Culture conditions: AF-6, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Mixotrophic,
Heterothallic, Isogamy, H,h type, *atpB* gene
(AB044175), *rbcL* gene (AB044161), *psaA* gene
(AB044224), *psaB* gene (AB044450), *psbC* gene
(AB044502-3)
References: 15, 301, 321, 337

WOLOSZYNSKIA Thompson: Dinophyceae

Woloszynskia leopoliense (Woloszynska)Thompson
619

- Mitsukaido / Ibaraki (1985-04)
Unialgal, Clonal, T.Sawaguchi (1985-04)
Identified by: T.Sawaguchi
Culture conditions: MW1/5, 20° C, 40 µE/m² sec, 1M
Characteristics: Freshwater, Homothallic,
Untransportable
KRYZ-3

YAMAGISHIELLA Nozaki: Chlorophyceae

Yamagishiella unicocca (Rayburn et Starr) Nozaki
Syn. *Pandorina unicocca* Rayburn et Starr
578

- Kamogawa / Chiba (1980-10)
Unialgal, Clonal, H.Nozaki (1980-12)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type +, Crosses with NIES-579,
rbcL gene (AB000811)
01209-1
References: 242, 343

- 579
Kamogawa / Chiba (1980-10)
Unialgal, Clonal, H.Nozaki (1980-12)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type –, Crosses with NIES-578
01209-7
Reference: 242

- 666
Nobi / Kanagawa (1979-05)
UTEX 2428, Unialgal, Clonal, S.Kato (1979-05)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 22 µE/m² sec, 1M
Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type +, Crosses with NIES-667,
atpB gene (AB014030), *rbcL* gene (D86823),
psaA gene (AB044213), *psaB* gene (AB044443),
psbC gene (AB044495)
X-441
References: 176, 242, 300, 324, 336, 337, 340

- 667
Nobi / Kanagawa (1979-05)
UTEX 2429, Unialgal, Clonal, S.Kato (1979-05)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 22 µE/m² sec, 1M

- Characteristics: Freshwater, Heterothallic, Isogamy,
Mating type –, Crosses with NIES-666
X-443
References: 242, 300
- 762
China
CCFA 646, Unialgal, Clonal
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 12 $\mu\text{E}/\text{m}^2 \text{ sec}$, 2M
Characteristics: Freshwater, Formerly identified as
Eudorina sp., *rbcL* gene (AB000810)
Reference: 343
- 870
Lake Röblin, Fürstenberg / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-07)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 20 $\mu\text{E}/\text{m}^2 \text{ sec}$, 2M
Characteristics: Freshwater, Planktonic, Heterothallic,
Isogamy, H,h type, Mating type +
970730-E-1
- 871
Lake Röblin, Fürstenberg / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-07)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 20 $\mu\text{E}/\text{m}^2 \text{ sec}$, 2M
Characteristics: Freshwater, Planktonic, Heterothallic,
Isogamy, H,h type, Mating type –
970730-E-7
- 872
Brandenburg / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 20 $\mu\text{E}/\text{m}^2 \text{ sec}$, 2M
Characteristics: Freshwater, Planktonic, Heterothallic,
Isogamy, H,h type, Mating type +, *atpB* gene
(AB044172), *rbcL* gene (AB044168), *psaA* gene
(AB044216), *psaB* gene (AB044445), *psbC* gene
(AB044497)
Nozaki-E-5
Reference: 337
- 873
Brandenburg / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 20 $\mu\text{E}/\text{m}^2 \text{ sec}$, 2M
Characteristics: Freshwater, Planktonic, Heterothallic,
Isogamy, H,h type, Mating type –
- 970730-E-9
- 874
Brandenburg / Germany (1997-07)
Unialgal, Clonal, H.Nozaki (1997-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 15° C, 20 $\mu\text{E}/\text{m}^2 \text{ sec}$, 2M
Characteristics: Freshwater, Planktonic, Heterothallic,
Isogamy, H,h type, Mating type –
970730-E-10

PROTOZOA

CAFETERIA Fenchel et Patterson: Bicoecia

Cafeteria roenbergensis Fenchel et Patterson
1012

Isonoura, Wakayama / Wakayama (2002-01)
Unialgal, Clonal, M.Moriya (2002-01)
Identified by: M.Moriya
Culture conditions: swURO-1/10YT, 15° C,
6 μ E/m² sec, 1M
Characteristics: Marine
#106

PARAMECIUM Müller: Oligohymenophorea

Paramecium bursaria Focke
668

Miyatoko Mire / Fukushima (1993-05)
Xenic, Clonal, H.Nozaki (1993-05)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 22 μ E/m² sec, 1M
Characteristics: Freshwater, Symbiotic
93-527-Pa-1

PLACIDIA Moriya et al.: Placididea

Placidia cafeteriposis Moriya et al.

1013
Yokohama / Kanagawa (1998-01)
Unialgal, Clonal, M.Moriya (1998-01)
Identified by: M.Moriya
Culture conditions: swURO-1/10YT, 15° C,
6 μ E/m² sec, 1M
Characteristics: Marine, Phagotrophic, Heterotrophic,
18SrRNA gene (AB061218)
#51
Reference: 247

1014
Kamaishi / Iwate (1999-01)
Unialgal, Clonal, M.Moriya (1999-01)
Identified by: M.Moriya
Culture conditions: swURO-1/10YT, 15° C,
6 μ E/m² sec, 1M
Characteristics: Marine, Phagotrophic, Heterotrophic
#69
Reference: 247

TETRAHYMENA Furgason: Oligohymenophorea

Tetrahymena pyriformis Ehrenberg
403

Tsuchiura Harbor / Lake Kasumigaura / Ibaraki
(1976-08)
Xenic, Non-clonal, R.Sudo (1976-08)
Identified by: R.Sudo
Culture conditions: LE, 10° C, 20D, (20° C)
Characteristics: Freshwater, Water bloom,
Untransportable
Tetra-1
Reference: 139

WOBBLIA Moriya et al.: Placididea

Wobblia lunata Moriya et al.

1015
Rikuzen-Takada / Iwate (1996-08)
Unialgal, Clonal, M.Moriya (1996-10)
Identified by: M.Moriya
Culture conditions: swURO-YT, 15° C,
6 μ E/m² sec, 1M
Characteristics: Marine, Phagotrophic, Heterotrophic,
Type strain, 18SrRNA gene (AB032606)
#1
Reference: 246

Appendix I. List of cryopreserved strains

Cyanophyceae

<i>Anabaenopsis circularis</i>	21	<i>Microcystis aeruginosa</i>	1052
<i>Aphanocapsa montana</i>	416	<i>Microcystis aeruginosa</i>	1053
<i>Aulosira laxa</i>	50	<i>Microcystis aeruginosa</i>	1054
<i>Calothrix brevissima</i>	22	<i>Microcystis aeruginosa</i>	1055
<i>Calothrix crustacea</i>	266	<i>Microcystis aeruginosa</i>	1056
<i>Calothrix parasitica</i>	267	<i>Microcystis aeruginosa</i>	1057
<i>Calothrix parasitica</i>	334	<i>Microcystis aeruginosa</i>	1058
<i>Calothrix scopulorum</i>	268	<i>Microcystis aeruginosa</i>	1059
<i>Chamaesiphon subglobosus</i>	434	<i>Microcystis aeruginosa</i>	1060
<i>Limnothrix redekei</i>	847	<i>Microcystis aeruginosa</i>	1061
<i>Lyngbya hieronymusii</i> var. <i>hieronymusii</i>	929	<i>Microcystis aeruginosa</i>	1062
<i>Merismopedia tenuissima</i>	230	<i>Microcystis aeruginosa</i>	1063
<i>Microcystis aeruginosa</i>	44	<i>Microcystis aeruginosa</i>	1064
<i>Microcystis aeruginosa</i>	87	<i>Microcystis aeruginosa</i>	1065
<i>Microcystis aeruginosa</i>	88	<i>Microcystis aeruginosa</i>	1066
<i>Microcystis aeruginosa</i>	89	<i>Microcystis aeruginosa</i>	1069
<i>Microcystis aeruginosa</i>	90	<i>Microcystis aeruginosa</i>	1070
<i>Microcystis aeruginosa</i>	91	<i>Microcystis aeruginosa</i>	1071
<i>Microcystis aeruginosa</i>	98	<i>Microcystis aeruginosa</i>	1072
<i>Microcystis aeruginosa</i>	99	<i>Microcystis aeruginosa</i>	1073
<i>Microcystis aeruginosa</i>	100	<i>Microcystis aeruginosa</i>	1074
<i>Microcystis aeruginosa</i>	101	<i>Microcystis aeruginosa</i>	1077
<i>Microcystis aeruginosa</i>	298	<i>Microcystis aeruginosa</i>	1078
<i>Microcystis aeruginosa</i>	299	<i>Microcystis aeruginosa</i>	1079
<i>Microcystis aeruginosa</i>	478	<i>Microcystis aeruginosa</i>	1080
<i>Microcystis aeruginosa</i>	103	<i>Microcystis aeruginosa</i>	1081
<i>Microcystis aeruginosa</i>	104	<i>Microcystis aeruginosa</i>	1083
<i>Microcystis aeruginosa</i>	105	<i>Microcystis aeruginosa</i>	1084
<i>Microcystis aeruginosa</i>	106	<i>Microcystis aeruginosa</i>	1087
<i>Microcystis aeruginosa</i>	107	<i>Microcystis aeruginosa</i>	1088
<i>Microcystis aeruginosa</i>	108	<i>Microcystis aeruginosa</i>	1089
<i>Microcystis aeruginosa</i>	109	<i>Microcystis aeruginosa</i>	1090
<i>Microcystis aeruginosa</i>	110	<i>Microcystis aeruginosa</i>	1091
<i>Microcystis aeruginosa</i>	111	<i>Microcystis aeruginosa</i>	1094
<i>Microcystis aeruginosa</i>	112	<i>Microcystis aeruginosa</i>	1095
<i>Microcystis aeruginosa</i>	604	<i>Microcystis aeruginosa</i>	1096
<i>Microcystis aeruginosa</i>	843	<i>Microcystis aeruginosa</i>	1098
<i>Microcystis aeruginosa</i>	901	<i>Microcystis aeruginosa</i>	1099
<i>Microcystis aeruginosa</i>	902	<i>Microcystis aeruginosa</i>	1100
<i>Microcystis aeruginosa</i>	903	<i>Microcystis aeruginosa</i>	1101
<i>Microcystis aeruginosa</i>	904	<i>Microcystis aeruginosa</i>	1102
<i>Microcystis aeruginosa</i>	1025	<i>Microcystis aeruginosa</i>	1103
<i>Microcystis aeruginosa</i>	1026	<i>Microcystis aeruginosa</i>	1104
<i>Microcystis aeruginosa</i>	1027	<i>Microcystis aeruginosa</i>	1105
<i>Microcystis aeruginosa</i>	1028	<i>Microcystis aeruginosa</i>	1106
<i>Microcystis aeruginosa</i>	1029	<i>Microcystis aeruginosa</i>	1107
<i>Microcystis aeruginosa</i>	1043	<i>Microcystis aeruginosa</i>	1108
<i>Microcystis aeruginosa</i>	1050	<i>Microcystis aeruginosa</i>	1109
<i>Microcystis aeruginosa</i>	1051	<i>Microcystis aeruginosa</i>	1110
		<i>Microcystis aeruginosa</i>	1111
		<i>Microcystis aeruginosa</i>	1112

Appendix II. List of toxic strains

Cyanophyceae

<i>Cylindrospermopsis raciborskii</i>	991
<i>Cylindrospermopsis raciborskii</i>	992
<i>Cylindrospermopsis raciborskii</i>	993
<i>Cylindrospermopsis raciborskii</i>	1040
<i>Cylindrospermopsis raciborskii</i>	1041
<i>Cylindrospermopsis raciborskii</i>	1042
<i>Cylindrospermopsis raciborskii</i>	1259
<i>Cylindrospermopsis raciborskii</i>	1260
<i>Cylindrospermopsis raciborskii</i>	1261
<i>Cylindrospermopsis raciborskii</i>	1262
<i>Microcystis aeruginosa</i>	88
<i>Microcystis aeruginosa</i>	89
<i>Microcystis aeruginosa</i>	90
<i>Microcystis aeruginosa</i>	102
<i>Microcystis aeruginosa</i>	103
<i>Microcystis aeruginosa</i>	107
<i>Microcystis aeruginosa</i>	298
<i>Microcystis aeruginosa</i>	478
<i>Microcystis aeruginosa</i>	843
<i>Microcystis aeruginosa</i>	901
<i>Microcystis aeruginosa</i>	902
<i>Microcystis aeruginosa</i>	903
<i>Microcystis aeruginosa</i>	904
<i>Microcystis aeruginosa</i>	933
<i>Microcystis aeruginosa</i>	1025
<i>Microcystis aeruginosa</i>	1026
<i>Microcystis aeruginosa</i>	1027
<i>Microcystis aeruginosa</i>	1028
<i>Microcystis aeruginosa</i>	1029
<i>Microcystis aeruginosa</i>	1043
<i>Microcystis aeruginosa</i>	1064
<i>Microcystis aeruginosa</i>	1070
<i>Microcystis aeruginosa</i>	1071
<i>Microcystis aeruginosa</i>	1072
<i>Microcystis aeruginosa</i>	1077
<i>Microcystis aeruginosa</i>	1085
<i>Microcystis aeruginosa</i>	1086
<i>Microcystis aeruginosa</i>	1095
<i>Microcystis aeruginosa</i>	1097
<i>Microcystis aeruginosa</i>	1099
<i>Microcystis aeruginosa</i>	1140
<i>Microcystis aeruginosa</i>	1141
<i>Planktothrix agardhii</i>	905

<i>Planktothrix agardhii</i>	1263
<i>Planktothrix agardhii</i>	1264
<i>Planktothrix agardhii</i>	1265
<i>Planktothrix rubescens</i>	928
<i>Planktothrix rubescens</i>	1266
<i>Planktothrix rubescens</i>	1267

Dinophyceae

<i>Alexandrium hiranoi</i>	612
<i>Coolia monotis</i>	615
<i>Prorocentrum lima</i>	617

Appendix III. List of gene data

16S rRNA gene

Cyanophyceae

41	<i>Anabaena circinalis</i>	AB042859	1067	<i>Microcystis aeruginosa</i>	AB023285
73	<i>Anabaena flos-aquae</i>		1068	<i>Microcystis aeruginosa</i>	AB015376
	f. <i>flos-aquae</i>	AB042858	1068	<i>Microcystis aeruginosa</i>	AB023286
76	<i>Anabaena spiroides</i>	AB047104	1072	<i>Microcystis aeruginosa</i>	AB012332
21	<i>Anabaenopsis circularis</i>	AB043537	1072	<i>Microcystis aeruginosa</i>	AB015362
1031	<i>Chroogloeocystis siderophila</i>	AY380791	1076	<i>Microcystis aeruginosa</i>	AB023287
847	<i>Limnothrix redekei</i>	AB045929	1085	<i>Microcystis aeruginosa</i>	AB012333
929	<i>Lyngbya hieronymusii</i>		1085	<i>Microcystis aeruginosa</i>	AB015363
	var. <i>hieronymusii</i>	AB045906	1086	<i>Microcystis aeruginosa</i>	AB015364
44	<i>Microcystis aeruginosa</i>	AB015361	1090	<i>Microcystis aeruginosa</i>	AB012339
87	<i>Microcystis aeruginosa</i>	D89031	1090	<i>Microcystis aeruginosa</i>	AB015367
88	<i>Microcystis aeruginosa</i>	AB023255	1090	<i>Microcystis aeruginosa</i>	AB023282
89	<i>Microcystis aeruginosa</i>	U03403	1091	<i>Microcystis aeruginosa</i>	AB015402
90	<i>Microcystis aeruginosa</i>	AB023256	1091	<i>Microcystis aeruginosa</i>	AB023278
91	<i>Microcystis aeruginosa</i>	AB023257	1092	<i>Microcystis aeruginosa</i>	AB015403
98	<i>Microcystis aeruginosa</i>	D89032	1105	<i>Microcystis aeruginosa</i>	AB015368
99	<i>Microcystis aeruginosa</i>	AB023258	1105	<i>Microcystis aeruginosa</i>	AB023283
100	<i>Microcystis aeruginosa</i>	AB023259	1115	<i>Microcystis aeruginosa</i>	AB015369
101	<i>Microcystis aeruginosa</i>	AB023260	1117	<i>Microcystis aeruginosa</i>	AB015370
102	<i>Microcystis aeruginosa</i>	D89033	1122	<i>Microcystis aeruginosa</i>	AB023284
104	<i>Microcystis aeruginosa</i>	AB015387	1133	<i>Microcystis aeruginosa</i>	AB023263
104	<i>Microcystis aeruginosa</i>	AB023266	1142	<i>Microcystis aeruginosa</i>	AB023264
104	<i>Microcystis aeruginosa</i>	AJ133174	1143	<i>Microcystis aeruginosa</i>	AB012340
105	<i>Microcystis aeruginosa</i>	AB023267	1143	<i>Microcystis aeruginosa</i>	AB015365
106	<i>Microcystis aeruginosa</i>	AB023268	1164	<i>Microcystis aeruginosa</i>	AB023265
107	<i>Microcystis aeruginosa</i>	U40333	33	<i>Oscillatoria tenuis</i>	AB042844
108	<i>Microcystis aeruginosa</i>	AB023269	30	<i>Phormidium tenue</i>	AB042857
109	<i>Microcystis aeruginosa</i>	AB023270	512	<i>Phormidium tenue</i>	AB042838
110	<i>Microcystis aeruginosa</i>	AB023271	611	<i>Phormidium tenue</i>	AB042842
111	<i>Microcystis aeruginosa</i>	D89034	917	<i>Planktothricoides raciborskii</i>	AB045953
111	<i>Microcystis aeruginosa</i>	AB015388	918	<i>Planktothricoides raciborskii</i>	AB045967
112	<i>Microcystis aeruginosa</i>	U40334	919	<i>Planktothricoides raciborskii</i>	AB045964
112	<i>Microcystis aeruginosa</i>	AB023272	204	<i>Planktothrix agardhii</i>	AB045954
298	<i>Microcystis aeruginosa</i>	AB023261	205	<i>Planktothrix agardhii</i>	AB045955
299	<i>Microcystis aeruginosa</i>	AB023262	594	<i>Planktothrix agardhii</i>	AB045956
604	<i>Microcystis aeruginosa</i>	AB023273	595	<i>Planktothrix agardhii</i>	AB045957
843	<i>Microcystis aeruginosa</i>	AB035549	596	<i>Planktothrix agardhii</i>	AB045958
1054	<i>Microcystis aeruginosa</i>	AB012336	905	<i>Planktothrix agardhii</i>	AB045896
1054	<i>Microcystis aeruginosa</i>	AB015374	906	<i>Planktothrix agardhii</i>	AB045904
1055	<i>Microcystis aeruginosa</i>	AB012334	907	<i>Planktothrix agardhii</i>	AB045905
1055	<i>Microcystis aeruginosa</i>	AB015389	844	<i>Planktothrix mougeotii</i>	AB045971
1055	<i>Microcystis aeruginosa</i>	AB023274	911	<i>Planktothrix mougeotii</i>	AB045972
1058	<i>Microcystis aeruginosa</i>	AB015400	912	<i>Planktothrix mougeotii</i>	AB045969
1061	<i>Microcystis aeruginosa</i>	AB023281	913	<i>Planktothrix mougeotii</i>	AB045970
1062	<i>Microcystis aeruginosa</i>	AB015400	845	<i>Planktothrix pseudoagardhii</i>	AB045968
1062	<i>Microcystis aeruginosa</i>	AB023276	914	<i>Planktothrix pseudoagardhii</i>	AB045907
1067	<i>Microcystis aeruginosa</i>	AB012337	915	<i>Planktothrix pseudoagardhii</i>	AB045965
			916	<i>Planktothrix pseudoagardhii</i>	AB045966
			610	<i>Planktothrix rubescens</i>	AB045959
			945	<i>Synechococcus</i> sp.	AF216951
			951	<i>Synechococcus</i> sp.	AF216952

953	<i>Synechococcus</i> sp.	AF216953	185	<i>Closterium pusillum</i>	AF352235
957	<i>Synechococcus</i> sp.	AF216954	339	<i>Closterium selenastrum</i>	AF352242
959	<i>Synechococcus</i> sp.	AF216955	187	<i>Closterium spinosporum</i>	
969	<i>Synechococcus</i> sp.	AF448060		var. <i>crassum</i>	AF352241
970	<i>Synechococcus</i> sp.	AF448073	188	<i>Closterium spinosporum</i>	
971	<i>Synechococcus</i> sp.	AF448061		var. <i>malaysiense</i>	AF352227
972	<i>Synechococcus</i> sp.	AF448079	191	<i>Closterium spinosporum</i>	
973	<i>Synechococcus</i> sp.	AF448062		var. <i>ryukyuense</i>	AF352240
978	<i>Synechococcus</i> sp.	AF448063	194	<i>Closterium spinosporum</i>	
979	<i>Synechococcus</i> sp.	AF448074		var. <i>spinosporum</i>	AF352224
981	<i>Synechococcus</i> sp.	AF448064	198	<i>Closterium tumidum</i>	AF352234
984	<i>Synechococcus</i> sp.	AF448066	199	<i>Closterium venus</i>	AF352236
846	<i>Tychonema bourrellyi</i>	AB045897	200	<i>Closterium wallichii</i>	AF352243

Placididea

1015	<i>Wobblia lunata</i>	AB032606
------	-----------------------	----------

16S-23S ITS region

Cyanophyceae

44	<i>Microcystis aeruginosa</i>	AB015361
104	<i>Microcystis aeruginosa</i>	AB015387
111	<i>Microcystis aeruginosa</i>	AB015388

18S rRNA gene

Cryptophyceae

715	<i>Chilomonas paramecium</i>	AB073108
274	<i>Cryptomonas ovata</i>	AB073109

Phaeophyceae

548	<i>Acinetospora crinita</i>	AF038005
-----	-----------------------------	----------

Schizocladiophyceae

1044	<i>Schizocladia ischiensis</i>	AB085614
------	--------------------------------	----------

Ulvophyceae

360	<i>Oltmannsiellopsis viridis</i>	D86495
-----	----------------------------------	--------

Trebouxiophyceae

996	<i>Stichococcus ampulliformis</i>	AB087559
-----	-----------------------------------	----------

Chlorophyceae

858	<i>Phacotus lenticularis</i>	X91628
-----	------------------------------	--------

Charophyceae

125	<i>Closterium acerosum</i>	AF352230
271	<i>Closterium calosporum</i>	
	var. <i>calosporum</i>	AF352225
165	<i>Closterium calosporum</i>	
	var. <i>galiciense</i>	AF352239
170	<i>Closterium calosporum</i>	
	var. <i>himalayense</i>	AF352229
180	<i>Closterium gracile</i>	AF352237
181	<i>Closterium incurvum</i>	AF352231
174	<i>Closterium moniliferum</i>	
	var. <i>moniliferum</i>	AF352233
175	<i>Closterium navicula</i>	AF352232
52	<i>Closterium peracerosum-</i>	
	<i>strigosum-littorale</i> complex	AF352226
449	<i>Closterium pleurodermatum</i>	AF352238

atpB gene

Chlorophyceae

418	<i>Astrephomene gubernaculifera</i>	AB014022-3
854	<i>Astrephomene gubernaculifera</i>	AB044181
564	<i>Astrephomene perforata</i>	AB014024
566	<i>Basichlamys sacculifera</i>	AB014015
425	<i>Carteria cerasiformis</i>	AB084321
421	<i>Carteria crucifera</i>	AB084320
428	<i>Carteria obtusa</i>	AB084323
432	<i>Carteria radiosa</i>	AB084322
567	<i>Characiochloris sasae</i>	AB084331
884	<i>Chlamydomonas debaryana</i>	
	var. <i>cristata</i>	AB014034
968	<i>Chlamydomonas kuwadae</i>	AB084318
1048	<i>Chlamydomonas noctigama</i>	AB101502
446	<i>Chlamydomonas tetragama</i>	AB084319
123	<i>Chlorogonium fusiforme</i>	AB084329
439	<i>Chlorogonium neglectum</i>	AB084326
447	<i>Chloromonas insignis</i>	AB084313
722	<i>Eudorina cylindrica</i>	AB014033
721	<i>Eudorina elegans</i> var. <i>carteri</i>	AB014012
456	<i>Eudorina elegans</i> var. <i>elegans</i>	AB014009
717	<i>Eudorina elegans</i> var. <i>elegans</i>	AB047071
718	<i>Eudorina elegans</i> var. <i>elegans</i>	AB047072
719	<i>Eudorina elegans</i> var. <i>elegans</i>	AB047073
720	<i>Eudorina elegans</i> var. <i>elegans</i>	AB014010
568	<i>Eudorina elegans</i> var. <i>synoica</i>	AB014011
460	<i>Eudorina illinoisensis</i>	AB014013
723	<i>Eudorina illinoisensis</i>	AB047069
856	<i>Eudorina minodii</i>	AB047068
726	<i>Eudorina unicocca</i>	
	var. <i>peripheralis</i>	AB047070
724	<i>Eudorina unicocca</i>	
	var. <i>unicocca</i>	AB014008
725	<i>Eudorina unicocca</i>	
	var. <i>unicocca</i>	AB014007
737	<i>Gonium multicoccum</i>	AB014020
851	<i>Gonium octonarium</i>	AB014018

569	<i>Gonium pectorale</i> var. <i>pectorale</i>	AB014016-7
653	<i>Gonium quadratum</i>	AB014019
289	<i>Gonium viridistellatum</i>	AB076118-9
654	<i>Gonium viridistellatum</i>	AB014021
857	<i>Gonium viridistellatum</i>	AB076117
144	<i>Haematococcus lacustris</i>	AB084325
257	<i>Hafniomonas montana</i>	AB101504
656	<i>Hafniomonas montana</i>	AB101505
474	<i>Lobomonas monstrosa</i>	AB044533
572	<i>Pandorina colemaniae</i>	AB014027
886	<i>Pandorina morum</i>	AB044180
887	<i>Pandorina morum</i>	AB044179
889	<i>Pandorina morum</i>	AB044178
890	<i>Pandorina morum</i>	AB044177
574	<i>Pandorina morum</i> var. <i>morum</i>	AB014025-6
727	<i>Paulschulzia pseudovolvox</i>	AB014040
213	<i>Pediastrum duplex</i>	AB084306
858	<i>Phacotus lenticularis</i>	AB014039
728	<i>Platydorina caudata</i>	AB014032
735	<i>Pleodorina californica</i>	AB014004
736	<i>Pleodorina indica</i>	AB014006
522	<i>Pseudocarteria mucosa</i>	AB084324
861	<i>Pteromonas angulosa</i>	AB014038
96	<i>Scenedesmus quadricauda</i>	AB084305
571	<i>Tetrabaena socialis</i> var. <i>socialis</i>	AB014014
875	<i>Vitreochlamys aulata</i>	AB076121
882	<i>Vitreochlamys ordinata</i>	AB014036
883	<i>Vitreochlamys pinguis</i>	AB076120
541	<i>Volvox aureus</i> var. <i>aureus</i>	AB013998
891	<i>Volvox aureus</i>	AB076104
892	<i>Volvox aureus</i>	AB076105
730	<i>Volvox barberi</i>	AB014001
732	<i>Volvox carteri</i> f. <i>kawasakiensis</i>	AB013999
731	<i>Volvox dissipatrix</i>	AB014000
734	<i>Volvox rousseletii</i>	AB014003
893	<i>Volvulina boldii</i>	AB044176
582	<i>Volvulina compacta</i>	AB014029
895	<i>Volvulina pringsheimii</i>	AB014028
545	<i>Volvulina steinii</i>	AB044713
896	<i>Volvulina steinii</i>	AB044174
898	<i>Volvulina steinii</i>	AB044175
666	<i>Yamagishiella unicocca</i>	AB014030
872	<i>Yamagishiella unicocca</i>	AB044172

COXI gene

Cryptophyceae

274 *Cryptomonas ovata* AB009419

Raphidophyceae

1 *Chattonella antiqua* AF037990

Phaeophyceae

548 *Acinetospora crinita* AF037996

Prymnesiophyceae

8 *Cricosphaera roscoffensis* AB000117

353 *Gephyrocapsa oceanica* AB000118

388 *Phaeocystis globosa* AB000120

Dinophyceae

12 *Prorocentrum micans* AB000133-4

369 *Scrippsiella trochoidea* AB000135

Euglenophyceae

381 *Eutreptiella gymnastica* AB000136

Trebouxiophyceae

415 *Actinastrum hantzschii* D63660

227 *Chlorella vulgaris* var. *vulgaris* D63763

227 *Chlorella vulgaris* var. *vulgaris* AB011523

Chlorophyceae

209 *Pediastrum boryanum* D63659

96 *Scenedesmus quadricauda* D63658

96 *Scenedesmus quadricauda* AB011524

cpcBA-IGS gene

Cyanophyceae

937 *Synechococcus* sp. AF223433

938 *Synechococcus* sp. AF223434

939 *Synechococcus* sp. AF223438

940 *Synechococcus* sp. AF223452

941 *Synechococcus* sp. AF223439

942 *Synechococcus* sp. AF223440

943 *Synechococcus* sp. AF223441

944 *Synechococcus* sp. AF223453

945 *Synechococcus* sp. AF223428

946 *Synechococcus* sp. AF223443

947 *Synechococcus* sp. AF223444

948 *Synechococcus* sp. AF223454

949 *Synechococcus* sp. AF223455

950 *Synechococcus* sp. AF223448

951 *Synechococcus* sp. AF223429

952 *Synechococcus* sp. AF223449

953 *Synechococcus* sp. AF223430

954 *Synechococcus* sp. AF223456

955 *Synechococcus* sp. AF223445

956 *Synechococcus* sp. AF223450

957 *Synechococcus* sp. AF223431

958 *Synechococcus* sp. AF223435

959 *Synechococcus* sp. AF223432

960 *Synechococcus* sp. AF223436

961 *Synechococcus* sp. AF223446

962 *Synechococcus* sp. AF223442

963 *Synechococcus* sp. AF223447

964 *Synechococcus* sp. AF223437

965 *Synechococcus* sp. AF223451

gyrB gene

Cyanophyceae

104 *Microcystis aeruginosa* AB074771

Mitochondrial complete DNA

Prasinophyceae

296 <i>Mesostigma viride</i>	AF353999
484 <i>Nephroselmis olivacea</i>	AF110138

petG, *psbK*, *D*, *psaI* etc.

Bacillariophyceae

323 <i>Skeletonema costatum</i>	AJ132266
---------------------------------	----------

Plastid complete DNA

Prasinophyceae

296 <i>Mesostigma viride</i>	AF166114
484 <i>Nephroselmis olivacea</i>	AF137379

psaA gene

Chlorophyceae

418 <i>Astrephomene gubernaculifera</i>	AB044233-4
854 <i>Astrephomene gubernaculifera</i>	AB044235
564 <i>Astrephomene perforata</i>	AB044236-8
566 <i>Basichlamys sacculifera</i>	AB044416
884 <i>Chlamydomonas debaryana</i> var. <i>cristata</i>	AB044417-8
722 <i>Eudorina cylindrica</i>	AB044210
721 <i>Eudorina elegans</i> var. <i>carteri</i>	AB044202-3
456 <i>Eudorina elegans</i> var. <i>elegans</i>	AB044199
720 <i>Eudorina elegans</i> var. <i>elegans</i>	AB044200-1
460 <i>Eudorina illinoisensis</i>	AB044198
724 <i>Eudorina unicocca</i> var. <i>unicocca</i>	AB044204-6
725 <i>Eudorina unicocca</i> var. <i>unicocca</i>	AB044207-9
737 <i>Gonium multicoccum</i>	AB044239-40
851 <i>Gonium octonarium</i>	AB044241
569 <i>Gonium pectorale</i> var. <i>pectorale</i>	AB044242
653 <i>Gonium quadratum</i>	AB044243
289 <i>Gonium viridistellatum</i>	AB076140-1
654 <i>Gonium viridistellatum</i>	AB044244
857 <i>Gonium viridistellatum</i>	AB076139
474 <i>Lobomonas monstrosa</i>	AB044421
572 <i>Pandorina colemaniae</i>	AB044232
886 <i>Pandorina morum</i>	AB044231
887 <i>Pandorina morum</i>	AB044229-30
889 <i>Pandorina morum</i>	AB044228
890 <i>Pandorina morum</i>	AB044227
574 <i>Pandorina morum</i> var. <i>morum</i>	AB044226
727 <i>Paulschulzia pseudovolvox</i>	AB044422-3
728 <i>Platydorina caudata</i>	AB044211-2
735 <i>Pleodorina californica</i>	AB044190-2

736 <i>Pleodorina indica</i>	AB044195-7
571 <i>Tetrabaena socialis</i> var. <i>socialis</i>	AB044415
875 <i>Vitreochlamys aulata</i>	AB076143
882 <i>Vitreochlamys ordinata</i>	AB044420
883 <i>Vitreochlamys pinguis</i>	AB076142
891 <i>Volvox aureus</i>	AB076123
892 <i>Volvox aureus</i>	AB076124
541 <i>Volvox aureus</i> var. <i>aureus</i>	AB044182
730 <i>Volvox barberi</i>	AB044186
732 <i>Volvox carteri</i> f. <i>kawasakiensis</i>	AB044184-5
731 <i>Volvox dissipatrix</i>	AB044183
734 <i>Volvox rousseletii</i>	AB044188
893 <i>Volvulina boldii</i>	AB044225
582 <i>Volvulina compacta</i>	AB044217-9
895 <i>Volvulina pringsheimii</i>	AB044220
545 <i>Volvulina steinii</i>	AB044221-2
896 <i>Volvulina steinii</i>	AB044223
898 <i>Volvulina steinii</i>	AB044224
666 <i>Yamagishiella unicocca</i>	AB044213
872 <i>Yamagishiella unicocca</i>	AB044216

psaB gene

Chlorophyceae

418 <i>Astrephomene gubernaculifera</i>	AB044458
854 <i>Astrephomene gubernaculifera</i>	AB044459
564 <i>Astrephomene perforata</i>	AB044460
566 <i>Basichlamys sacculifera</i>	AB044467-8
425 <i>Carteria cerasiformis</i>	AB084359
421 <i>Carteria crucifera</i>	AB084358
428 <i>Carteria obtusa</i>	AB084361-3
432 <i>Carteria radiosa</i>	AB084360
567 <i>Characiochloris sasae</i>	AB084376
884 <i>Chlamydomonas debaryana</i> var. <i>cristata</i>	AB044469
968 <i>Chlamydomonas kuwadae</i>	AB084356
1048 <i>Chlamydomonas noctigama</i>	AB101513
446 <i>Chlamydomonas tetragama</i>	AB084357
123 <i>Chlorogonium fusiforme</i>	AB084370
439 <i>Chlorogonium neglectum</i>	AB084366
447 <i>Chloromonas insignis</i>	AB084348
722 <i>Eudorina cylindrica</i>	AB044441
721 <i>Eudorina elegans</i> var. <i>carteri</i>	AB044438
456 <i>Eudorina elegans</i> var. <i>elegans</i>	AB044435
720 <i>Eudorina elegans</i> var. <i>elegans</i>	AB044436-7
460 <i>Eudorina illinoisensis</i>	AB044434
724 <i>Eudorina unicocca</i> var. <i>unicocca</i>	AB044439
725 <i>Eudorina unicocca</i> var. <i>unicocca</i>	AB044440
737 <i>Gonium multicoccum</i>	AB044461
851 <i>Gonium octonarium</i>	AB044462
569 <i>Gonium pectorale</i> var. <i>pectorale</i>	AB044463
653 <i>Gonium quadratum</i>	AB044464
289 <i>Gonium viridistellatum</i>	AB076156

654	<i>Gonium viridistellatum</i>	AB044465
857	<i>Gonium viridistellatum</i>	AB076155
144	<i>Haematococcus lacustris</i>	AB084365
257	<i>Hafniomonas montana</i>	AB101515
656	<i>Hafniomonas montana</i>	AB101516
474	<i>Lobomonas monstrosa</i>	AB044472
572	<i>Pandorina colemaniae</i>	AB044457
886	<i>Pandorina morum</i>	AB044456
887	<i>Pandorina morum</i>	AB044455
889	<i>Pandorina morum</i>	AB044454
890	<i>Pandorina morum</i>	AB044453
574	<i>Pandorina morum</i> var. <i>morum</i>	AB044452
727	<i>Paulschulzia pseudovolvox</i>	AB044473
213	<i>Pediastrum duplex</i>	AB084340
858	<i>Phacotus lenticularis</i>	AB084373-4
728	<i>Platydorina caudata</i>	AB044442
735	<i>Pleodorina californica</i>	AB044430
736	<i>Pleodorina indica</i>	AB044432-3
522	<i>Pseudocarteria mucosa</i>	AB084364
861	<i>Pteromonas angulosa</i>	AB084371-2
96	<i>Scenedesmus quadricauda</i>	AB084339
571	<i>Tetrabaena socialis</i> var. <i>socialis</i>	AB044466
875	<i>Vitreochlamys aulata</i>	AB076158
882	<i>Vitreochlamys ordinata</i>	AB044471
883	<i>Vitreochlamys pinguis</i>	AB076157
891	<i>Volvox aureus</i>	AB076145
892	<i>Volvox aureus</i>	AB076146
541	<i>Volvox aureus</i> var. <i>aureus</i>	AB044424
730	<i>Volvox barberi</i>	AB044427
732	<i>Volvox carteri</i> f. <i>kawasakienis</i>	AB044425
731	<i>Volvox dissipatrix</i>	AB044426
734	<i>Volvox rousseletii</i>	AB044429
893	<i>Volvulina boldii</i>	AB044451
582	<i>Volvulina compacta</i>	AB044446
895	<i>Volvulina pringsheimii</i>	AB044447
545	<i>Volvulina steinii</i>	AB044448
896	<i>Volvulina steinii</i>	AB044449
898	<i>Volvulina steinii</i>	AB044450
666	<i>Yamagishiella unicocca</i>	AB044443
872	<i>Yamagishiella unicocca</i>	AB044445

psaC, *psbA* etc.

Bacillariophyceae

323	<i>Skeletonema costatum</i>	AJ132264
-----	-----------------------------	----------

psaD gene

Glaucoephyceae

547	<i>Cyanophora paradoxa</i>	AJ132477
-----	----------------------------	----------

psbA gene

Dinophyceae

331	<i>Amphidinium carterae</i>	AB025586
12	<i>Prorocentrum micans</i>	AB025585

psbC gene

Chlorophyceae

418	<i>Astrephomene gubernaculifera</i>	AB044513-4
854	<i>Astrephomene gubernaculifera</i>	AB044515-7
564	<i>Astrephomene perforata</i>	AB044518-9
566	<i>Basichlamys sacculifera</i>	AB044526
884	<i>Chlamydomonas debaryana</i>	
	var. <i>cristata</i>	AB044527
722	<i>Eudorina cylindrica</i>	AB044493
721	<i>Eudorina elegans</i> var. <i>carteri</i>	AB044487-8
456	<i>Eudorina elegans</i> var. <i>elegans</i>	AB044485
720	<i>Eudorina elegans</i> var. <i>elegans</i>	AB044486
460	<i>Eudorina illinoisensis</i>	AB044484
724	<i>Eudorina unicocca</i>	
	var. <i>unicocca</i>	AB044489-90
725	<i>Eudorina unicocca</i>	
	var. <i>unicocca</i>	AB044491-2
737	<i>Gonium multicoccum</i>	AB044481
851	<i>Gonium octonarium</i>	AB044520
569	<i>Gonium pectorale</i> var. <i>pectorale</i>	AB044521
653	<i>Gonium quadratum</i>	AB044522-3
289	<i>Gonium viridistellatum</i>	AB076173
654	<i>Gonium viridistellatum</i>	AB044524
857	<i>Gonium viridistellatum</i>	AB076172
474	<i>Lobomonas monstrosa</i>	AB044530
572	<i>Pandorina colemaniae</i>	AB044512
886	<i>Pandorina morum</i>	AB044510-1
887	<i>Pandorina morum</i>	AB044509
889	<i>Pandorina morum</i>	AB044508
890	<i>Pandorina morum</i>	AB044506-7
574	<i>Pandorina morum</i> var. <i>morum</i>	AB044505
727	<i>Paulschulzia pseudovolvox</i>	AB044531-2
728	<i>Platydorina caudata</i>	AB044494
735	<i>Pleodorina californica</i>	AB044480
736	<i>Pleodorina indica</i>	AB044483
571	<i>Tetrabaena socialis</i> var. <i>socialis</i>	AB044525
875	<i>Vitreochlamys aulata</i>	AB076175-7
882	<i>Vitreochlamys ordinata</i>	AB044529
883	<i>Vitreochlamys pinguis</i>	AB076174
891	<i>Volvox aureus</i>	AB076160
892	<i>Volvox aureus</i>	AB076161
541	<i>Volvox aureus</i> var. <i>aureus</i>	AB044474
730	<i>Volvox barberi</i>	AB044477
732	<i>Volvox carteri</i> f. <i>kawasakienis</i>	AB044475
731	<i>Volvox dissipatrix</i>	AB044476
734	<i>Volvox rousseletii</i>	AB044479
893	<i>Volvulina boldii</i>	AB044504
582	<i>Volvulina compacta</i>	AB044498

895	<i>Volvulina pringsheimii</i>	AB044499
545	<i>Volvulina steinii</i>	AB044500
896	<i>Volvulina steinii</i>	AB044501
898	<i>Volvulina steinii</i>	AB044502-3
666	<i>Yamagishiella unicocca</i>	AB044495
872	<i>Yamagishiella unicocca</i>	AB044497

psbC, D, petB, D etc.

Bacillariophyceae

323	<i>Skeletonema costatum</i>	AJ132263
-----	-----------------------------	----------

rbcL gene

Schizocladiphyceae

1044	<i>Schizocladia ischiensis</i>	AB085615
------	--------------------------------	----------

Chlorophyceae

418	<i>Astrephomene gubernaculifera</i>	D63428
854	<i>Astrephomene gubernaculifera</i>	AB044169-70
564	<i>Astrephomene perforata</i>	D63429
566	<i>Basichlamys sacculifera</i>	D63430
424	<i>Carteria cerasiformis</i>	D89767
425	<i>Carteria cerasiformis</i>	D89768
421	<i>Carteria crucifera</i>	D63431
630	<i>Carteria crucifera</i>	D89758
631	<i>Carteria eugametos</i>	D89762
632	<i>Carteria eugametos</i>	D89763
633	<i>Carteria eugametos</i>	D89764
634	<i>Carteria eugametos</i>	D89761
635	<i>Carteria eugametos</i>	D89759
636	<i>Carteria eugametos</i>	D89760
422	<i>Carteria inversa</i>	D89765
423	<i>Carteria inversa</i>	D89766
428	<i>Carteria obtusa</i>	D89769
432	<i>Carteria radiosa</i>	D89770
567	<i>Characiochloris sasae</i>	AB084338
884	<i>Chlamydomonas debaryana</i> var. <i>cristata</i>	D86838
968	<i>Chlamydomonas kuwadae</i>	AB084334
1048	<i>Chlamydomonas noctigama</i>	AB101506-7
446	<i>Chlamydomonas tetragama</i>	AJ001880
692	<i>Chlorogonium capillatum</i>	AB010230
742	<i>Chlorogonium capillatum</i>	AB010234
743	<i>Chlorogonium capillatum</i>	AB010235
744	<i>Chlorogonium capillatum</i>	AB010236
745	<i>Chlorogonium capillatum</i>	AB010231
746	<i>Chlorogonium capillatum</i>	AB010232
747	<i>Chlorogonium capillatum</i>	AB010233
748	<i>Chlorogonium capillatum</i>	AB010237
749	<i>Chlorogonium capillatum</i>	AB010238
750	<i>Chlorogonium capillatum</i>	AB010239
751	<i>Chlorogonium elongatum</i>	AJ001881
752	<i>Chlorogonium elongatum</i>	AB010240

753	<i>Chlorogonium elongatum</i>	AB010241
754	<i>Chlorogonium euchlorum</i>	AB010226
755	<i>Chlorogonium euchlorum</i>	AB010227
756	<i>Chlorogonium euchlorum</i>	AB010228
757	<i>Chlorogonium euchlorum</i>	AB010224
758	<i>Chlorogonium euchlorum</i>	AJ001882
759	<i>Chlorogonium euchlorum</i>	AB010225
760	<i>Chlorogonium euchlorum</i>	AB010229
123	<i>Chlorogonium fusiforme</i>	AB010242
761	<i>Chlorogonium kasakii</i>	AB010244
439	<i>Chlorogonium neglectum</i>	AB010243
447	<i>Chloromonas insignis</i>	AB022226
722	<i>Eudorina cylindrica</i>	D86833
721	<i>Eudorina elegans</i> var. <i>carteri</i>	D88806
456	<i>Eudorina elegans</i> var. <i>elegans</i>	D63432
717	<i>Eudorina elegans</i> var. <i>elegans</i>	D88803
718	<i>Eudorina elegans</i> var. <i>elegans</i>	D88810
719	<i>Eudorina elegans</i> var. <i>elegans</i>	D88804
720	<i>Eudorina elegans</i> var. <i>elegans</i>	D88805
458	<i>Eudorina elegans</i> var. <i>synoica</i>	D88807
568	<i>Eudorina elegans</i> var. <i>synoica</i>	D88808
460	<i>Eudorina illinoisensis</i>	D63433
723	<i>Eudorina illinoisensis</i>	D88809
856	<i>Eudorina minodii</i>	AB047074-6
726	<i>Eudorina unicocca</i> var. <i>peripheralis</i>	D86830
724	<i>Eudorina unicocca</i> var. <i>unicocca</i>	D86829
725	<i>Eudorina unicocca</i> var. <i>unicocca</i>	D63434
737	<i>Gonium multicocccum</i>	D63435
569	<i>Gonium pectorale</i> var. <i>pectorale</i>	D63437
653	<i>Gonium quadratum</i>	D63438
289	<i>Gonium viridistellatum</i>	AB076091
654	<i>Gonium viridistellatum</i>	D86831
857	<i>Gonium viridistellatum</i>	AB076092-3
144	<i>Haematococcus lacustris</i>	AB084336-7
257	<i>Hafniomonas montana</i>	AB101509-10
656	<i>Hafniomonas montana</i>	AB101511-2
474	<i>Lobomonas monstrosa</i>	AB044171
572	<i>Pandorina colemaniae</i>	D63441
886	<i>Pandorina morum</i>	AB044167
887	<i>Pandorina morum</i>	AB044166
889	<i>Pandorina morum</i>	AB044165
890	<i>Pandorina morum</i>	AB044164
574	<i>Pandorina morum</i> var. <i>morum</i>	D63442
727	<i>Paulschulzia pseudovolvox</i>	D86837
213	<i>Pediastrum duplex</i>	AB084333
858	<i>Phacotus lenticularis</i>	AJ001883
859	<i>Phacotus lenticularis</i>	AJ001884
728	<i>Platydorina caudata</i>	D86828
729	<i>Platydorina caudata</i>	D86827
735	<i>Pleodorina californica</i>	D63439
736	<i>Pleodorina indica</i>	D86834
577	<i>Pleodorina japonica</i>	D63440
522	<i>Pseudocarteria mucosa</i>	AB084335
861	<i>Pteromonas angulosa</i>	AJ001887

862	<i>Pteromonas angulosa</i>	AJ001888	979	<i>Synechococcus</i> sp.	AF448109
96	<i>Scenedesmus quadricauda</i>	AB084332	980	<i>Synechococcus</i> sp.	AF448097
571	<i>Tetrabaena socialis</i> var. <i>socialis</i>	D63443	981	<i>Synechococcus</i> sp.	AF448085
875	<i>Vitreochlamys aulata</i>	AB050486-7	982	<i>Synechococcus</i> sp.	AF448113
876	<i>Vitreochlamys aulata</i>	AB050488-9	983	<i>Synechococcus</i> sp.	AF448104
877	<i>Vitreochlamys aulata</i>	AB050492	984	<i>Synechococcus</i> sp.	AF448087
878	<i>Vitreochlamys aulata</i>	AB050493	985	<i>Synechococcus</i> sp.	AF448102
879	<i>Vitreochlamys fluviatilis</i>	AB050484			
880	<i>Vitreochlamys gloeocystiformis</i>	AB050485			
881	<i>Vitreochlamys nekrašovii</i>	AB050494			
882	<i>Vitreochlamys ordinata</i>	AB014041			
883	<i>Vitreochlamys pinguis</i>	AB050490-1			
891	<i>Volvox aureus</i>	AB076096			
892	<i>Volvox aureus</i>	AB076086			
541	<i>Volvox aureus</i> var. <i>aureus</i>	D63445			
730	<i>Volvox barberi</i>	D86835			
732	<i>Volvox carteri</i> f. <i>kawasakiensis</i>	D63446			
731	<i>Volvox dissipatrix</i>	D63447			
734	<i>Volvox rousseletii</i>	D63448			
893	<i>Volvulina boldii</i>	AB044162-3			
582	<i>Volvulina compacta</i>	D86832			
895	<i>Volvulina pringsheimii</i>	D63444			
545	<i>Volvulina steinii</i>	AB044159			
896	<i>Volvulina steinii</i>	AB044160			
898	<i>Volvulina steinii</i>	AB044161			
578	<i>Yamagishiella unicocca</i>	AB000811			
666	<i>Yamagishiella unicocca</i>	D86823			
762	<i>Yamagishiella unicocca</i>	AB000810			
872	<i>Yamagishiella unicocca</i>	AB044168			

rbcL-462 intron

Chlorophyceae

418	<i>Astrephomene gubernaculifera</i>	AB076095
289	<i>Gonium viridistellatum</i>	AB076091
654	<i>Gonium viridistellatum</i>	AB076090
857	<i>Gonium viridistellatum</i>	AB076092
875	<i>Vitreochlamys aulata</i>	AB076097
892	<i>Volvox aureus</i>	AB076086
582	<i>Volvulina compacta</i>	AB076089

rpoC1 gene

Cyanophyceae

104	<i>Microcystis aeruginosa</i>	AB074794
969	<i>Synechococcus</i> sp.	AF448082
971	<i>Synechococcus</i> sp.	AF448083
972	<i>Synechococcus</i> sp.	AF448117
974	<i>Synechococcus</i> sp.	AF448101
975	<i>Synechococcus</i> sp.	AF448099
976	<i>Synechococcus</i> sp.	AF448100
977	<i>Synechococcus</i> sp.	AF448105
978	<i>Synechococcus</i> sp.	AF448084

rpoD1 gene

Cyanophyceae

104	<i>Microcystis aeruginosa</i>	AB074821
-----	-------------------------------	----------

trnD, *I*, *T* etc.

Bacillariophyceae

323	<i>Skeletonema costatum</i>	AJ132265
-----	-----------------------------	----------

tufA gene

Phaeophyceae

548	<i>Acinetospora crinita</i>	AF038004
-----	-----------------------------	----------

ycf24, partial

Bacillariophyceae

323	<i>Skeletonema costatum</i>	AJ132267
-----	-----------------------------	----------

IX. INDEXES

1. Numerical index

- | | | | |
|----|---|----|---|
| 1 | <i>Chattonella antiqua</i> | 49 | <i>Euglena gracilis</i> var. <i>bacillaris</i> |
| 2 | <i>Chattonella antiqua</i> | 50 | <i>Aulosira laxa</i> |
| 3 | <i>Chattonella marina</i> | 51 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 4 | <i>Heterosigma akashiwo</i> | 52 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 5 | <i>Heterosigma akashiwo</i> | 53 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 6 | <i>Heterosigma akashiwo</i> | 54 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 7 | <i>Heterocapsa triquetra</i> | 55 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 8 | <i>Cricosphaera roscoffensis</i> | 56 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 9 | <i>Heterosigma akashiwo</i> | 57 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 10 | <i>Heterosigma akashiwo</i> | 58 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 12 | <i>Prorocentrum micans</i> | 59 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 14 | <i>Chattonella marina</i> | 60 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 15 | <i>Olisthodiscus luteus</i> | 61 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 16 | <i>Skeletonema costatum</i> | 62 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 17 | <i>Skeletonema costatum</i> | 63 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 18 | <i>Tetraselmis cordiformis</i> | 64 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 19 | <i>Anabaena cylindrica</i> | 65 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 21 | <i>Anabaenopsis circularis</i> | 66 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 22 | <i>Calothrix brevissima</i> | 67 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 23 | <i>Anabaena variabilis</i> | 68 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 24 | <i>Nostoc commune</i> | 69 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 25 | <i>Nostoc linckia</i> | 70 | <i>Closterium peracerosum-strigosum-littorale</i> complex |
| 26 | <i>Nostoc minutum</i> | | |
| 27 | <i>Spirulina subsalsa</i> | | |
| 28 | <i>Nostoc linckia</i> var. <i>arvense</i> | | |
| 29 | <i>Nostoc minutum</i> | | |
| 30 | <i>Phormidium tenue</i> | | |
| 31 | <i>Oscillatoria laetevirens</i> | | |
| 32 | <i>Phormidium foveolarum</i> | | |
| 33 | <i>Oscillatoria tenuis</i> | | |
| 34 | <i>Phormidium foveolarum</i> | | |
| 35 | <i>Pseudokirchneriella subcaiptata</i> | | |
| 36 | <i>Oscillatoria limnetica</i> | | |
| 37 | <i>Tolypothrix tenuis</i> | | |
| 38 | <i>Nostoc commune</i> | | |
| 39 | <i>Spirulina platensis</i> | | |
| 40 | <i>Anabaena affinis</i> | | |
| 41 | <i>Anabaena circinalis</i> | | |
| 44 | <i>Microcystis aeruginosa</i> | | |
| 45 | <i>Spirulina platensis</i> | | |
| 46 | <i>Spirulina platensis</i> | | |
| 47 | <i>Euglena gracilis</i> | | |
| 48 | <i>Euglena gracilis</i> | | |

71	<i>Achnanthes minutissima</i>	123	<i>Chlorogonium fusiforme</i>
73	<i>Anabaena flos-aquae</i> f. <i>flos-aquae</i>	124	<i>Closterium acerosum</i>
74	<i>Anabaena flos-aquae</i> f. <i>flos-aquae</i>	125	<i>Closterium acerosum</i>
75	<i>Anabaena flos-aquae</i> f. <i>flos-aquae</i>	127	<i>Closterium acerosum</i>
76	<i>Anabaena spiroides</i>	128	<i>Closterium calosporum</i> var. <i>galiciense</i>
77	<i>Anabaena spiroides</i> f. <i>spiroides</i>	129	<i>Coelastrum astroideum</i>
78	<i>Anabaena spiroides</i> f. <i>crassa</i>	130	<i>Coelastrum astroideum</i>
79	<i>Anabaena spiroides</i> f. <i>spiroides</i>	131	<i>Coelastrum proboscideum</i>
80	<i>Anabaena solitaria</i> f. <i>solitaria</i>	132	<i>Coelastrum reticulatum</i>
81	<i>Aphanizomenon flos-aquae</i> f. <i>gracile</i>	133	<i>Cosmarium contractum</i>
83	<i>Chattonella antiqua</i>	134	<i>Dimorphococcus lunatus</i>
84	<i>Chattonella antiqua</i>	135	<i>Dimorphococcus lunatus</i>
85	<i>Chattonella antiqua</i>	136	<i>Fibrocapsa japonica</i>
86	<i>Chattonella antiqua</i>	137	<i>Echinospaeridium nordstedtii</i>
87	<i>Microcystis aeruginosa</i>	138	<i>Gonatozygon brebissonii</i>
88	<i>Microcystis aeruginosa</i>	139	<i>Gonatozygon brebissonii</i>
89	<i>Microcystis aeruginosa</i>	144	<i>Haematococcus lacustris</i>
90	<i>Microcystis aeruginosa</i>	145	<i>Heterosigma akashiwo</i>
91	<i>Microcystis aeruginosa</i>	146	<i>Heterosigma akashiwo</i>
92	<i>Scenedesmus acuminatus</i> var. <i>tetradesmoides</i>	147	<i>Hyalotheca dissiliens</i>
93	<i>Scenedesmus dimorphus</i>	148	<i>Hyalotheca dissiliens</i>
94	<i>Scenedesmus acutus</i>	149	<i>Hyalotheca dissiliens</i>
95	<i>Scenedesmus acutus</i>	150	<i>Hyalotheca dissiliens</i>
96	<i>Scenedesmus quadricauda</i>	151	<i>Micractinium pusillum</i>
97	<i>Scenedesmus serratus</i>	152	<i>Micrasterias crux-melitensis</i>
98	<i>Microcystis aeruginosa</i>	153	<i>Chlorosarcinopsis delicata</i>
99	<i>Microcystis aeruginosa</i>	154	<i>Characium maximum</i>
100	<i>Microcystis aeruginosa</i>	155	<i>Tetracystis chlorococcoides</i>
101	<i>Microcystis aeruginosa</i>	156	<i>Urnella terrestris</i>
102	<i>Microcystis aeruginosa</i>	157	<i>Chlamydomonas monticola</i>
103	<i>Microcystis aeruginosa</i>	158	<i>Chlamydomonas augustae</i> var. <i>ellipsoidea</i>
104	<i>Microcystis aeruginosa</i>	159	<i>Pseudopleurococcus printzii</i> var. <i>longissimus</i>
105	<i>Microcystis aeruginosa</i>	160	<i>Chlorosarcinopsis caeca</i>
106	<i>Microcystis aeruginosa</i>	161	<i>Chattonella antiqua</i>
107	<i>Microcystis aeruginosa</i>	162	<i>Closterium calosporum</i> var. <i>galiciense</i>
108	<i>Microcystis aeruginosa</i>	163	<i>Closterium calosporum</i> var. <i>galiciense</i>
109	<i>Microcystis aeruginosa</i>	164	<i>Closterium calosporum</i> var. <i>galiciense</i>
110	<i>Microcystis aeruginosa</i>	165	<i>Closterium calosporum</i> var. <i>galiciense</i>
111	<i>Microcystis aeruginosa</i>	166	<i>Closterium calosporum</i> var. <i>galiciense</i>
112	<i>Microcystis aeruginosa</i>	167	<i>Closterium calosporum</i> var. <i>galiciense</i>
113	<i>Chattonella antiqua</i>	168	<i>Closterium calosporum</i> var. <i>galiciense</i>
114	<i>Chattonella antiqua</i>	169	<i>Closterium calosporum</i> var. <i>himalayense</i>
115	<i>Chattonella marina</i>	170	<i>Closterium calosporum</i> var. <i>himalayense</i>
116	<i>Chattonella marina</i>	171	<i>Closterium calosporum</i> var. <i>himalayense</i>
117	<i>Chattonella marina</i>	172	<i>Closterium moniliferum</i> var. <i>moniliferum</i>
118	<i>Chattonella marina</i>	173	<i>Closterium moniliferum</i> var. <i>moniliferum</i>
119	<i>Scenedesmus dimorphus</i>	174	<i>Closterium moniliferum</i> var. <i>moniliferum</i>
120	<i>Scenedesmus acutus</i>	175	<i>Closterium navicula</i>
121	<i>Chattonella marina</i>	176	<i>Closterium navicula</i>
122	<i>Chlamydomonas pulsatilla</i>	177	<i>Closterium navicula</i>

- 178 *Closterium navicula*
179 *Closterium gracile*
180 *Closterium gracile*
181 *Closterium incurvum*
182 *Closterium moniliferum* var. *submoniliferum*
183 *Closterium moniliferum* var. *submoniliferum*
185 *Closterium pusillum* var. *maius*
186 *Closterium spinosporum* var. *crassum*
187 *Closterium spinosporum* var. *crassum*
188 *Closterium spinosporum* var. *malaysiense*
189 *Closterium spinosporum* var. *malaysiense*
191 *Closterium spinosporum* var. *ryukyuense*
192 *Closterium spinosporum* var. *ryukyuense*
193 *Closterium spinosporum* var. *ryukyuense*
194 *Closterium spinosporum* var. *spinosporum*
195 *Closterium spinosporum* var. *spinosporum*
196 *Closterium spinosporum* var. *spinosporum*
197 *Closterium spinosporum* var. *spinosporum*
198 *Closterium tumidum*
199 *Closterium venus*
200 *Closterium wallichii*
201 *Closterium wallichii*
202 *Closterium wallichii*
203 *Oedogonium obesum*
204 *Planktothrix agardhii*
205 *Planktothrix agardhii*
206 *Oscillatoria animalis*
207 *Planktothricoides raciborskii*
208 *Oscillatoria rosea*
209 *Pediastrum boryanum*
210 *Pediastrum duplex* var. *duplex*
211 *Pediastrum duplex* var. *gracillimum*
212 *Pediastrum duplex*
213 *Pediastrum duplex* var. *duplex*
214 *Pediastrum duplex* var. *gracillimum*
215 *Pediastrum simplex*
216 *Pediastrum tetras*
217 *Penium margaritaceum*
218 *Prorocentrum micans*
219 *Prorocentrum triestinum*
220 *Alexandrium catenella*
221 *Pterosperma cristatum*
223 *Skeletonema costatum*
224 *Staurastrum dejectum*
225 *Tabellaria flocculosa*
226 *Graesiella emersonii*
227 *Chlorella vulgaris* var. *vulgaris*
228 *Closterium ehrenbergii*
229 *Closterium ehrenbergii*
230 *Merismopedia tenuissima*
231 *Coelastrum morus*
232 *Polyedriopsis spinulosa*
233 *Synura petersenii*
234 *Synura spinosa*
235 *Heterocapsa triquetra*
237 *Prorocentrum minimum*
238 *Prorocentrum minimum*
241 *Volvox aureus*
242 *Pandorina morum*
243 *Pandorina morum*
244 *Coelastrum astroideum*
245 *Coelastrum reticulatum* var. *reticulatum*
246 *Schroederia setigera*
247 *Gonatozygon monotaenium*
248 *Cosmocladium constrictum*
251 *Pyramimonas* aff. *amylifera*
252 *Nephroselmis astigmatica*
253 *Euglena clara*
254 *Pyramimonas parkeae*
255 *Monomastix minuta*
256 *Monomastix minuta*
257 *Hafniomonas montana*
258 *Closterium aciculare* var. *subpronum*
259 *Closterium aciculare* var. *subpronum*
261 *Closterium peracerosum-strigosum-littorale* complex
262 *Closterium peracerosum-strigosum-littorale* complex
263 *Anabaena spiroides* f. *spiroides*
265 *Asterionella glacialis*
266 *Calothrix crustacea*
267 *Calothrix parasitica*
268 *Calothrix scopulorum*
271 *Closterium calosporum* var. *calosporum*
274 *Cryptomonas ovata*
275 *Cryptomonas ovata*
276 *Cryptomonas platyuris*
277 *Cryptomonas rostratiformis*
278 *Cryptomonas rostratiformis*
279 *Cryptomonas tetrapyrenoidosa*
280 *Cryptomonas tetrapyrenoidosa*
281 *Cryptomonas tetrapyrenoidosa*
282 *Cryptomonas tetrapyrenoidosa*
284 *Dinobryon divergens*
285 *Docidium undulatum* var. *undulatum*
286 *Euglena mutabilis*
287 *Gonatozygon monotaenium*
288 *Gonium viridistellatum*
289 *Gonium viridistellatum*
290 *Gonium viridistellatum*

- 293 *Heterosigma akashiwo*
 294 *Hyalotheca dissiliens*
 var. *dissiliens* f. *tridentula*
 295 *Hydrodictyon reticulatum*
 296 *Mesostigma viride*
 297 *Micrasterias foliacea* var. *foliacea*
 298 *Microcystis aeruginosa*
 299 *Microcystis aeruginosa*
 300 *Pediastrum angulosum* var. *angulosum*
 301 *Pediastrum boryanum*
 302 *Pediastrum simplex*
 303 *Penium margaritaceum*
 304 *Peridinium willei*
 305 *Phormidium ramosum*
 306 *Pleurotaenium cylindricum* var. *stuhlmannii*
 307 *Pleurotaenium ehrenbergii* var. *curtum*
 308 *Pleurotaenium ehrenbergii* var. *curtum*
 309 *Pleurotaenium ehrenbergii* var. *ehrenbergii*
 310 *Pleurotaenium ehrenbergii* var. *ehrenbergii*
 311 *Pleurotaenium ehrenbergii* var. *curtum*
 312 *Pleurotaenium nodosum* var. *nodosum*
 313 *Pleurotaenium ovatum*
 315 *Prorocentrum gracile*
 316 *Prorocentrum micans*
 318 *Protoceratium reticulatum*
 319 *Protoceratium reticulatum*
 320 *Pyramimonas* aff. *amylifera*
 321 *Pyrophacus steinii*
 323 *Skeletonema costatum*
 324 *Skeletonema costatum*
 325 *Spinoclosterium cuspidatum*
 329 *Ulothrix variabilis*
 330 *Achnanthes subconstricta*
 331 *Amphidinium carterae*
 333 *Melosira granulata*
 var. *angustissima* f. *spiralis*
 334 *Calothrix parasitica*
 336 *Closterium calosporum* var. *himalayense*
 337 *Closterium incurvum*
 338 *Closterium rostratum* var. *subrostratum*
 339 *Closterium selenastrum*
 340 *Closterium selenastrum*
 341 *Closterium spinosporum* var. *crassum*
 342 *Coelastrum astroideum*
 343 *Coolia monotis*
 344 *Cryptomonas platyuris*
 345 *Cryptomonas rostratiformis*
 346 *Cryptomonas tetrapyrenoidosa*
 347 *Cryptomonas tetrapyrenoidosa*
 348 *Cryptomonas tetrapyrenoidosa*
 349 *Cylindrocystis brebissonii* var. *brebissonii*
 350 *Ditylum brightwellii*
 351 *Eudorina elegans*
 353 *Gephyrocapsa oceanica*
 356 *Katodinium rotundatum*
 359 *Oltmannsiellopsis unicellularis*
 360 *Oltmannsiellopsis viridis*
 361 *Oscillatoria amphibia*
 362 *Pandorina morum*
 363 *Pedinomonas minor*
 365 *Peridinium volzii*
 366 *Peridinium willei*
 369 *Scrippsiella trochoidea*
 372 *Achnanthes minutissima* var. *saprophila*
 375 *Brachiomonas submarina*
 376 *Ceratium hirundinella*
 377 *Chaetoceros sociale*
 378 *Dictyochloropsis irregularis*
 379 *Eremosphaera gigas*
 380 *Eremosphaera viridis*
 381 *Eutreptiella gymnastica*
 382 *Lagerheimia ciliata*
 384 *Monoraphidium contortum*
 385 *Monoraphidium griffithii*
 387 *Phacus agilis*
 388 *Phaeocystis globosa*
 390 *Staurastrum inconspicuum*
 391 *Fragilaria capucina*
 392 *Tetraëdron incus*
 394 *Treubaria triappendiculata*
 395 *Uroglena americana*
 396 *Volvox aureus*
 397 *Volvox carteri*
 398 *Volvox carteri*
 403 *Tetrahymena pyriformis*
 405 *Amphidinium britannicum*
 407 *Achnanthes minutissima*
 408 *Achnanthes minutissima*
 409 *Achnanthes minutissima*
 410 *Achnanthes minutissima*
 411 *Achnanthes minutissima*
 412 *Achnanthes minutissima*
 413 *Achnanthes minutissima*
 414 *Achnanthes minutissima*
 415 *Actinastrum hantzschii*
 416 *Aphanocapsa montana*
 417 *Asterionella glacialis*
 418 *Astrephomene gubernaculifera*
 419 *Astrephomene gubernaculifera*
 420 *Cachonina niei*

421	<i>Carteria crucifera</i>	478	<i>Microcystis aeruginosa</i>
422	<i>Carteria inversa</i>	479	<i>Microthamnion kützingianum</i>
423	<i>Carteria inversa</i>	480	<i>Monoraphidium circinale</i>
424	<i>Carteria cerasiformis</i>	481	<i>Myxosarcina burmensis</i>
425	<i>Carteria cerasiformis</i>	483	<i>Nephroselmis olivacea</i>
426	<i>Carteria klebsii</i>	484	<i>Nephroselmis olivacea</i>
427	<i>Carteria multifilis</i>	485	<i>Nephroselmis olivacea</i>
428	<i>Carteria obtusa</i>	486	<i>Nephroselmis viridis</i>
429	<i>Carteria obtusa</i>	487	<i>Nitzschia palea</i>
430	<i>Carteria obtusa</i>	488	<i>Nitzschia palea</i>
431	<i>Carteria obtusa</i>	489	<i>Nitzschia palea</i>
432	<i>Carteria radiosa</i>	494	<i>Oxyrrhis marina</i>
433	<i>Chamaesiphon polymorphus</i>	495	<i>Peridinium bipes</i> f. <i>globosum</i>
434	<i>Chamaesiphon subglobosus</i>	497	<i>Peridinium bipes</i> f. <i>occultatum</i>
436	<i>Characium polymorphum</i>	499	<i>Peridinium inconspicuum</i> subsp. <i>remotum</i>
437	<i>Chlamydomonas fasciata</i>	501	<i>Peridinium volzii</i>
438	<i>Chlamydomonas monadina</i> var. <i>monadina</i>	503	<i>Phormidium foveolarum</i>
439	<i>Chlorogonium neglectum</i>	504	<i>Phormidium foveolarum</i>
440	<i>Chlamydomonas parkeae</i>	505	<i>Phormidium foveolarum</i>
446	<i>Chlamydomonas tetragama</i>	506	<i>Phormidium jenkelianum</i>
447	<i>Chloromonas insignis</i>	507	<i>Phormidium jenkelianum</i>
448	<i>Closterium acerosum</i>	509	<i>Phormidium molle</i>
449	<i>Closterium pleurodermatum</i>	510	<i>Phormidium mucicola</i>
450	<i>Closterium praelongum</i> var. <i>brevius</i>	512	<i>Phormidium tenue</i>
451	<i>Closterium praelongum</i> var. <i>brevius</i>	514	<i>Planctonema lauterbornii</i>
452	<i>Cosmarium hians</i>	515	<i>Plectonema radiosum</i>
453	<i>Dictyosphaerium pulchellum</i>	519	<i>Alexandrium catenella</i>
454	<i>Draparnaldia plumosa</i>	520	<i>Alexandrium catenella</i>
455	<i>Errerella bornhemiensis</i>	522	<i>Pseudocarteria mucosa</i>
456	<i>Eudorina elegans</i> var. <i>elegans</i>	523	<i>Pseudocarteria mucosa</i>
457	<i>Eudorina elegans</i> var. <i>elegans</i>	524	<i>Pseudocarteria mucosa</i>
458	<i>Eudorina elegans</i> var. <i>synoica</i>	527	<i>Spirulina subsalsa</i>
459	<i>Eudorina illinoisensis</i>	528	<i>Staurastrum paradoxum</i>
460	<i>Eudorina illinoisensis</i>	529	<i>Stichococcus bacillaris</i>
461	<i>Eunotia pectinalis</i> var. <i>minor</i>	530	<i>Stichococcus bacillaris</i>
462	<i>Fibrocapsa japonica</i>	531	<i>Stigeoclonium aestivale</i>
463	<i>Glenodiniopsis uliginosa</i>	532	<i>Stigeoclonium fasciculare</i> var. <i>fasciculare</i>
464	<i>Gloeomonas lateperforata</i>	533	<i>Tetrasetmis cordiformis</i>
465	<i>Gomphonema gracile</i> var. <i>gracile</i>	534	<i>Thalassionema nitzschioides</i>
466	<i>Gomphonema parvulum</i> var. <i>parvulum</i>	536	<i>Ulothrix zonata</i>
467	<i>Gomphonema parvulum</i> var. <i>parvulum</i>	537	<i>Ulothrix zonata</i>
468	<i>Gonium pectorale</i> var. <i>pectorale</i>	538	<i>Uronema confervicolum</i>
469	<i>Gonium pectorale</i> var. <i>pectorale</i>	539	<i>Uronema gigas</i>
471	<i>Hemidinium nasutum</i>	540	<i>Uronema gigas</i>
472	<i>Heterocapsa pygmaea</i>	541	<i>Volvox aureus</i> var. <i>aureus</i>
473	<i>Heterocapsa pygmaea</i>	542	<i>Volvox aureus</i> var. <i>aureus</i>
474	<i>Lobomonas monstrosa</i>	543	<i>Volvox prolificus</i>
475	<i>Mesostigma viride</i>	544	<i>Volvox tertius</i>
476	<i>Mesostigma viride</i>	545	<i>Volvulina steinii</i>
477	<i>Mesostigma viride</i>	546	<i>Volvulina steinii</i>

- 547 *Cyanophora paradoxa*
548 *Acinetospora crinita*
553 *Chaetoceros sociale*
556 *Triceratium dubium*
557 *Chattonella antiqua*
558 *Chattonella antiqua*
559 *Chattonella marina*
560 *Fibrocapsa japonica*
561 *Heterosigma akashiwo*
562 *Chrysochromulina parva*
564 *Astrephomene perforata*
565 *Astrephomene perforata*
566 *Basichlamys sacculifera*
567 *Characiochloris sasae*
568 *Eudorina elegans* var. *synoica*
569 *Gonium pectorale* var. *pectorale*
570 *Gonium pectorale* var. *pectorale*
571 *Tetrabaena socialis* var. *socialis*
572 *Pandorina colemaniae*
573 *Pandorina colemaniae*
574 *Pandorina morum* var. *morum*
575 *Pandorina morum* var. *morum*
576 *Pleodorina californica*
577 *Pleodorina japonica*
578 *Yamagishiella unicocca*
579 *Yamagishiella unicocca*
580 *Volvox carteri* f. *kawasakiensis*
581 *Volvox carteri* f. *kawasakiensis*
582 *Volvulina compacta*
583 *Volvulina compacta*
584 *Volvulina steinii*
585 *Volvulina steinii*
586 *Chaetoceros didymus*
587 *Hantzschia amphioxys* var. *compacta*
588 *Lithodesmium variabile*
589 *Odontella aurita*
590 *Odontella longicruris*
592 *Fischerella major*
593 *Hydrococcus rivularis*
594 *Planktothrix agardhii*
595 *Planktothrix agardhii*
596 *Planktothrix agardhii*
597 *Spirulina platensis*
598 *Spirulina subsalsa*
600 *Peridinium bipes* var. *tabulatum*
601 *Prorocentrum micans*
603 *Chattonella ovata*
604 *Microcystis aeruginosa*
605 *Fibrocapsa japonica*
608 *Prorocentrum micans*
609 *Pyrocystis lunura*
610 *Planktothrix rubescens*
611 *Phormidium tenue*
612 *Alexandrium hiranoi*
613 *Amphidinium klebsii*
614 *Cachonina niei*
615 *Coolia monotis*
617 *Prorocentrum lima*
618 *Prorocentrum mexicanum*
619 *Woloszynskia leopoliense*
620 *Gomphonema angustatum* var. *obtusatum*
621 *Botrydiopsis arrhiza*
622 *Botrydium granulatum*
623 *Pavlova gyrans*
624 *Chlorarachnion reptans*
626 *Pterosperma cristatum*
628 *Astrephomene gubernaculifera*
629 *Chlorella protothecoides*
630 *Carteria crucifera*
631 *Carteria eugametos*
632 *Carteria eugametos*
633 *Carteria eugametos*
634 *Carteria eugametos*
635 *Carteria eugametos*
636 *Carteria eugametos*
637 *Characiochloris acuminata*
638 *Characiochloris sasae*
639 *Characium angustum*
640 *Chlorella saccharophila*
641 *Chlorella vulgaris* var. *vulgaris*
642 *Chlorella vulgaris* var. *vulgaris*
643 *Eremosphaera viridis*
644 *Eremosphaera viridis*
645 *Gonium pectorale* var. *pectorale*
646 *Gonium pectorale* var. *pectorale*
647 *Gonium quadratum*
648 *Gonium quadratum*
649 *Gonium quadratum*
650 *Gonium quadratum*
651 *Gonium quadratum*
652 *Gonium quadratum*
653 *Gonium quadratum*
654 *Gonium viridistellatum*
655 *Gonium viridistellatum*
656 *Hafniomonas montana*
657 *Mesotaenium kramstae*
658 *Mesotaenium kramstae*
659 *Oocystis borgei*
660 *Oocystis lacustris*
661 *Oocystis lacustris*

662	<i>Oocystis lacustris</i>	717	<i>Eudorina elegans</i> var. <i>elegans</i>
663	<i>Pleurotaenium nodosum</i> var. <i>borgei</i>	718	<i>Eudorina elegans</i> var. <i>elegans</i>
664	<i>Pleurotaenium nodosum</i> var. <i>borgei</i>	719	<i>Eudorina elegans</i> var. <i>elegans</i>
665	<i>Staurastrum dorcidentiferum</i>	720	<i>Eudorina elegans</i> var. <i>elegans</i>
666	<i>Yamagishiella unicocca</i>	721	<i>Eudorina elegans</i> var. <i>carteri</i>
667	<i>Yamagishiella unicocca</i>	722	<i>Eudorina cylindrica</i>
668	<i>Paramecium bursaria</i>	723	<i>Eudorina illinoisensis</i>
670	<i>Chattonella verruculosa</i>	724	<i>Eudorina unicocca</i> var. <i>unicocca</i>
671	<i>Chattonella ovata</i>	725	<i>Eudorina unicocca</i> var. <i>unicocca</i>
672	<i>Oltmannsiellopsis geminata</i>	726	<i>Eudorina unicocca</i> var. <i>peripheralis</i>
674	<i>Alexandrium catenella</i>	727	<i>Paulschulzia pseudovolvox</i>
675	<i>Alexandrium catenella</i>	728	<i>Platydorina caudata</i>
677	<i>Alexandrium catenella</i>	729	<i>Platydorina caudata</i>
678	<i>Alexandrium insuetum</i>	730	<i>Volvox barberi</i>
680	<i>Gymnodinium mikimotoi</i>	731	<i>Volvox dissipatrix</i>
682	<i>Prorocentrum dentatum</i>	732	<i>Volvox carteri</i> f. <i>kawasakiensis</i>
683	<i>Prorocentrum sigmoides</i>	733	<i>Volvox carteri</i> f. <i>kawasakiensis</i>
684	<i>Scrippsiella sweeneyae</i>	734	<i>Volvox rousseletii</i>
685	<i>Scenedesmus abundans</i>	735	<i>Pleodorina californica</i>
686	<i>Chlorella vulgaris</i> var. <i>vulgaris</i>	736	<i>Pleodorina indica</i>
687	<i>Graesiella emersonii</i>	737	<i>Gonium multicocum</i>
688	<i>Graesiella emersonii</i>	738	<i>Pteromonas aculeata</i>
689	<i>Graesiella emersonii</i>	739	<i>Pteromonas angulosa</i>
690	<i>Graesiella emersonii</i>	740	<i>Pteromonas multipyrenoidea</i>
691	<i>Tetraebaena socialis</i>	741	<i>Chrysochromulina hirta</i>
692	<i>Chlorogonium capillatum</i>	742	<i>Chlorogonium capillatum</i>
693	<i>Volvox aureus</i>	743	<i>Chlorogonium capillatum</i>
694	<i>Volvox aureus</i>	744	<i>Chlorogonium capillatum</i>
695	<i>Synura sphagnicola</i>	745	<i>Chlorogonium capillatum</i>
696	<i>Synura sphagnicola</i>	746	<i>Chlorogonium capillatum</i>
697	<i>Cryptomonas acuta</i>	747	<i>Chlorogonium capillatum</i>
698	<i>Cryptomonas irregularis</i>	748	<i>Chlorogonium capillatum</i>
699	<i>Rhodomonas atrorosea</i>	749	<i>Chlorogonium capillatum</i>
700	<i>Rhodomonas baltica</i>	750	<i>Chlorogonium capillatum</i>
701	<i>Rhodomonas chrysoidea</i>	751	<i>Chlorogonium elongatum</i>
702	<i>Rhodomonas falcata</i>	752	<i>Chlorogonium elongatum</i>
703	<i>Chroomonas collegionis</i>	753	<i>Chlorogonium elongatum</i>
704	<i>Chroomonas dispersa</i>	754	<i>Chlorogonium euchlorum</i>
705	<i>Chroomonas placoidea</i>	755	<i>Chlorogonium euchlorum</i>
706	<i>Chroomonas nordstedtii</i>	756	<i>Chlorogonium euchlorum</i>
707	<i>Chroomonas nordstedtii</i>	757	<i>Chlorogonium euchlorum</i>
708	<i>Chroomonas nordstedtii</i>	758	<i>Chlorogonium euchlorum</i>
709	<i>Chroomonas nordstedtii</i>	759	<i>Chlorogonium euchlorum</i>
710	<i>Chroomonas nordstedtii</i>	760	<i>Chlorogonium euchlorum</i>
711	<i>Chroomonas nordstedtii</i>	761	<i>Chlorogonium kasakii</i>
712	<i>Chroomonas caudata</i>	762	<i>Yamagishiella unicocca</i>
713	<i>Chroomonas coerulea</i>	763	<i>Cyanophora paradoxa</i>
714	<i>Chroomonas coerulea</i>	764	<i>Cyanophora tetracyanea</i>
715	<i>Chilomonas paramecium</i>	765	<i>Rhodomonas duplex</i>
716	<i>Haramonas dimorpha</i>	766	<i>Chilomonas paramecium</i>

767	<i>Chilomonas paramecium</i>	818	<i>Anabaena smithii</i>
768	<i>Cosmarium askenasyi</i>	819	<i>Anabaena smithii</i>
769	<i>Cosmarium askenasyi</i>	820	<i>Anabaena smithii</i>
770	<i>Cosmarium askenasyi</i>	821	<i>Anabaena smithii</i>
771	<i>Cosmarium askenasyi</i>	822	<i>Anabaena smithii</i>
772	<i>Euastrum turgidum</i>	823	<i>Anabaena smithii</i>
773	<i>Euastrum turgidum</i>	824	<i>Anabaena smithii</i>
774	<i>Micrasterias anomala</i>	825	<i>Anabaena ucrainica</i>
776	<i>Micrasterias anomala</i>	826	<i>Anabaena ucrainica</i>
777	<i>Micrasterias foliacea</i>	827	<i>Anabaena viguieri</i>
778	<i>Micrasterias foliacea</i>	828	<i>Anabaena ellipsoides</i>
779	<i>Micrasterias mahabuleshwarensis</i>	829	<i>Anabaena oumiana</i>
780	<i>Micrasterias mahabuleshwarensis</i>	830	<i>Anabaena smithii</i>
781	<i>Micrasterias thomasi</i> var. <i>notata</i>	831	<i>Anabaena smithii</i>
782	<i>Micrasterias thomasi</i> var. <i>notata</i>	832	<i>Anabaena ucrainica</i>
783	<i>Micrasterias truncata</i> var. <i>pusilla</i>	833	<i>Anabaena lemmermannii</i>
784	<i>Micrasterias truncata</i> var. <i>pusilla</i>	834	<i>Anabaena planktonica</i>
785	<i>Pleurotaenium nodosum</i> var. <i>nodosum</i>	835	<i>Anabaena compacta</i>
786	<i>Pleurotaenium nodosum</i> var. <i>nodosum</i>	836	<i>Botryococcus braunii</i>
787	<i>Pleurotaenium nodosum</i> var. <i>gutwinski</i>	837	<i>Emiliana huxleyi</i>
788	<i>Pleurotaenium nodosum</i> var. <i>gutwinski</i>	838	<i>Gephyrocapsa oceanica</i>
789	<i>Triploceras gracile</i>	839	<i>Cosmarium dilatatum</i>
790	<i>Triploceras gracile</i>	840	<i>Euastrum biverrucosum</i>
791	<i>Triploceras gracile</i>	841	<i>Staurastrum levanderi</i>
792	<i>Triploceras gracile</i>	842	<i>Staurastrum tsukubicum</i>
793	<i>Triploceras gracile</i>	843	<i>Microcystis aeruginosa</i>
794	<i>Triploceras gracile</i>	844	<i>Planktothrix mougeotii</i>
795	<i>Triploceras gracile</i>	845	<i>Planktothrix pseudagardhii</i>
796	<i>Triploceras gracile</i>	846	<i>Tychonema bourrellyi</i>
797	<i>Scenedesmus gutwinski</i> var. <i>heterospina</i>	847	<i>Limnothrix redekei</i>
798	<i>Scenedesmus gutwinski</i> var. <i>heterospina</i>	848	<i>Chattonella minima</i>
799	<i>Scenedesmus gutwinski</i> var. <i>heterospina</i>	849	<i>Chattonella ovata</i>
800	<i>Scenedesmus gutwinski</i> var. <i>heterospina</i>	850	<i>Chattonella verruculosa</i>
801	<i>Scenedesmus gutwinski</i> var. <i>heterospina</i>	851	<i>Gonium octonarium</i>
802	<i>Scenedesmus gutwinski</i> var. <i>heterospina</i>	852	<i>Gonium octonarium</i>
803	<i>Cyclotella meneghiniana</i>	853	<i>Astrephomene gubernaculifera</i>
804	<i>Cyclotella meneghiniana</i>	854	<i>Astrephomene gubernaculifera</i>
805	<i>Cyclotella meneghiniana</i>	855	<i>Astrephomene gubernaculifera</i>
806	<i>Anabaena compacta</i>	856	<i>Eudorina minodii</i>
807	<i>Anabaena kisseleviana</i>	857	<i>Gonium viridistellatum</i>
808	<i>Anabaena mendotae</i>	858	<i>Phacotus lenticularis</i>
809	<i>Anabaena mucosa</i>	859	<i>Phacotus lenticularis</i>
810	<i>Anabaena planktonica</i>	860	<i>Pteromonas aculeata</i>
811	<i>Anabaena planktonica</i>	861	<i>Pteromonas angulosa</i>
812	<i>Anabaena planktonica</i>	862	<i>Pteromonas angulosa</i>
813	<i>Anabaena planktonica</i>	863	<i>Volvox africanus</i>
814	<i>Anabaena planktonica</i>	864	<i>Volvox aureus</i>
815	<i>Anabaena planktonica</i>	865	<i>Volvox carteri</i> f. <i>nagariensis</i>
816	<i>Anabaena planktonica</i>	866	<i>Volvox carteri</i> f. <i>weismannia</i>
817	<i>Anabaena planktonica</i>	867	<i>Volvox gigas</i>

868	<i>Volvox obversus</i>	918	<i>Planktothricoides raciborskii</i>
869	<i>Volvox tertius</i>	919	<i>Planktothricoides raciborskii</i>
870	<i>Yamagishiella unicocca</i>	920	<i>Planktothricoides raciborskii</i>
871	<i>Yamagishiella unicocca</i>	921	<i>Planktothricoides raciborskii</i>
872	<i>Yamagishiella unicocca</i>	922	<i>Planktothricoides raciborskii</i>
873	<i>Yamagishiella unicocca</i>	923	<i>Planktothricoides raciborskii</i>
874	<i>Yamagishiella unicocca</i>	924	<i>Planktothricoides raciborskii</i>
875	<i>Vitreochlamys aulata</i>	925	<i>Planktothricoides raciborskii</i>
876	<i>Vitreochlamys aulata</i>	926	<i>Planktothricoides raciborskii</i>
877	<i>Vitreochlamys aulata</i>	927	<i>Planktothricoides raciborskii</i>
878	<i>Vitreochlamys aulata</i>	928	<i>Planktothrix rubescens</i>
879	<i>Vitreochlamys fluviatilis</i>	929	<i>Lyngbya hieronymusii</i> var. <i>hieronymusii</i>
880	<i>Vitreochlamys gloeocystiformis</i>	930	<i>Cylindrospermopsis raciborskii</i>
881	<i>Vitreochlamys nekrassovii</i>	931	<i>Gloeocapsa decorticans</i>
882	<i>Vitreochlamys ordinata</i>	932	<i>Raphidiopsis curvata</i>
883	<i>Vitreochlamys pinguis</i>	933	<i>Microcystis aeruginosa</i>
884	<i>Chlamydomonas debaryana</i> var. <i>cristata</i>	934	<i>Nephroselmis spinosa</i>
885	<i>Gonium multicoecum</i>	935	<i>Nephroselmis spinosa</i>
886	<i>Pandorina morum</i>	936	<i>Pterosperma cristatum</i>
887	<i>Pandorina morum</i>	937	<i>Synechococcus</i> sp.
888	<i>Pandorina morum</i>	938	<i>Synechococcus</i> sp.
889	<i>Pandorina morum</i>	939	<i>Synechococcus</i> sp.
890	<i>Pandorina morum</i>	940	<i>Synechococcus</i> sp.
891	<i>Volvox aureus</i>	941	<i>Synechococcus</i> sp.
892	<i>Volvox aureus</i>	942	<i>Synechococcus</i> sp.
893	<i>Volvulina boldii</i>	943	<i>Synechococcus</i> sp.
894	<i>Volvulina boldii</i>	944	<i>Synechococcus</i> sp.
895	<i>Volvulina pringsheimii</i>	945	<i>Synechococcus</i> sp.
896	<i>Volvulina steinii</i>	946	<i>Synechococcus</i> sp.
897	<i>Volvulina steinii</i>	947	<i>Synechococcus</i> sp.
898	<i>Volvulina steinii</i>	948	<i>Synechococcus</i> sp.
899	<i>Ceratium fusus</i>	949	<i>Synechococcus</i> sp.
900	<i>Prorocentrum dentatum</i>	950	<i>Synechococcus</i> sp.
901	<i>Microcystis aeruginosa</i>	951	<i>Synechococcus</i> sp.
902	<i>Microcystis aeruginosa</i>	952	<i>Synechococcus</i> sp.
903	<i>Microcystis aeruginosa</i>	953	<i>Synechococcus</i> sp.
904	<i>Microcystis aeruginosa</i>	954	<i>Synechococcus</i> sp.
905	<i>Planktothrix agardhii</i>	955	<i>Synechococcus</i> sp.
906	<i>Planktothrix agardhii</i>	956	<i>Synechococcus</i> sp.
907	<i>Planktothrix agardhii</i>	957	<i>Synechococcus</i> sp.
908	<i>Planktothrix agardhii</i>	958	<i>Synechococcus</i> sp.
909	<i>Planktothrix agardhii</i>	959	<i>Synechococcus</i> sp.
910	<i>Planktothrix agardhii</i>	960	<i>Synechococcus</i> sp.
911	<i>Planktothrix mougeotii</i>	961	<i>Synechococcus</i> sp.
912	<i>Planktothrix mougeotii</i>	962	<i>Synechococcus</i> sp.
913	<i>Planktothrix mougeotii</i>	963	<i>Synechococcus</i> sp.
914	<i>Planktothrix pseudagardhii</i>	964	<i>Synechococcus</i> sp.
915	<i>Planktothrix pseudagardhii</i>	965	<i>Synechococcus</i> sp.
916	<i>Planktothrix pseudagardhii</i>	966	<i>Glaucocystis nostochinearum</i>
917	<i>Planktothricoides raciborskii</i>	967	<i>Trentepohlia</i> sp.

- 968 *Chlamydomonas kuwadae*
969 *Synechococcus* sp.
970 *Synechococcus* sp.
971 *Synechococcus* sp.
972 *Synechococcus* sp.
973 *Synechococcus* sp.
974 *Synechococcus* sp.
975 *Synechococcus* sp.
976 *Synechococcus* sp.
977 *Synechococcus* sp.
978 *Synechococcus* sp.
979 *Synechococcus* sp.
980 *Synechococcus* sp.
981 *Synechococcus* sp.
982 *Synechococcus* sp.
983 *Synechococcus* sp.
984 *Synechococcus* sp.
985 *Synechococcus* sp.
986 *Synechococcus* sp.
987 *Synechococcus* sp.
988 *Synechococcus* sp.
989 *Planktothrix agardhii*
990 *Planktothrix agardhii*
991 *Cylindrospermopsis raciborskii*
992 *Cylindrospermopsis raciborskii*
993 *Cylindrospermopsis raciborskii*
994 *Cylindrospermopsis raciborskii*
995 *Mesostigma viride*
996 *Stichococcus ampulliformis*
997 *Calyptrosphaera sphaeroidea*
998 *Chrysochromulina quadrikonta*
999 *Emiliana huxleyi*
1000 *Gephyrocapsa oceanica*
1001 *Imantonia rotunda*
1002 *Glossomastix chrysoplata*
1003 *Pelagomonas calceolata*
1004 *Chroomonas coerulea*
1005 *Rhodomonas chrysoidea*
1006 *Rhodomonas salina*
1007 *Synura petersenii*
1008 *Pedinella squamata*
1009 *Gonyostomum semen*
1010 *Ophiocytium capitatum*
1011 *Cafeteria roenbergensis*
1012 *Placidia cafeteriopsis*
1013 *Placidia cafeteriopsis*
1014 *Wobblia lunata*
1015 *Hymenomonas coronata*
1016 *Prymnesium parvum*
1017 *Prymnesium parvum*
1018 *Prymnesium parvum*
1019 *Tetraselmis striata*
1020 *Apiocystis brauniana*
1021 *Chlamydomonas coccoides*
1022 *Chlamydomonas parkeae*
1023 *Spirogyra* sp.
1025 *Microcystis aeruginosa*
1026 *Microcystis aeruginosa*
1027 *Microcystis aeruginosa*
1028 *Microcystis aeruginosa*
1029 *Microcystis aeruginosa*
1031 *Chroogloeocystis siderophila*
1032 *Porphyridium* sp.
1033 *Porphyridium* sp.
1034 *Porphyridium* sp.
1035 *Porphyridium* sp.
1036 *Rhodella* sp.
1037 *Rhodella* sp.
1038 *Gonium multicocum*
1039 *Gonium multicocum*
1040 *Cylindrospermopsis raciborskii*
1041 *Cylindrospermopsis raciborskii*
1042 *Cylindrospermopsis raciborskii*
1043 *Microcystis aeruginosa*
1044 *Schizocladia ischiensis*
1045 *Cylindrotheca closterium*
1046 *Cylindrotheca fusiformis*
1047 *Cylindrotheca* sp.
1048 *Chlamydomonas noctigama*
1049 *Eucampia zodiacus*
1050 *Microcystis aeruginosa*
1051 *Microcystis aeruginosa*
1052 *Microcystis aeruginosa*
1053 *Microcystis aeruginosa*
1054 *Microcystis aeruginosa*
1055 *Microcystis aeruginosa*
1056 *Microcystis aeruginosa*
1057 *Microcystis aeruginosa*
1058 *Microcystis aeruginosa*
1059 *Microcystis aeruginosa*
1060 *Microcystis aeruginosa*
1061 *Microcystis aeruginosa*
1062 *Microcystis aeruginosa*
1063 *Microcystis aeruginosa*
1064 *Microcystis aeruginosa*
1065 *Microcystis aeruginosa*
1066 *Microcystis aeruginosa*
1067 *Microcystis aeruginosa*
1068 *Microcystis aeruginosa*
1069 *Microcystis aeruginosa*
1070 *Microcystis aeruginosa*

- 1171 *Microcystis aeruginosa*
1172 *Microcystis aeruginosa*
1173 *Microcystis aeruginosa*
1174 *Microcystis aeruginosa*
1175 *Microcystis aeruginosa*
1176 *Microcystis aeruginosa*
1177 *Microcystis aeruginosa*
1178 *Microcystis aeruginosa*
1179 *Microcystis aeruginosa*
1180 *Microcystis aeruginosa*
1181 *Microcystis aeruginosa*
1182 *Microcystis aeruginosa*
1183 *Microcystis aeruginosa*
1184 *Microcystis aeruginosa*
1185 *Microcystis aeruginosa*
1186 *Microcystis aeruginosa*
1187 *Microcystis aeruginosa*
1188 *Microcystis aeruginosa*
1189 *Microcystis aeruginosa*
1190 *Microcystis aeruginosa*
1191 *Microcystis aeruginosa*
1192 *Microcystis aeruginosa*
1193 *Microcystis aeruginosa*
1194 *Microcystis aeruginosa*
1195 *Microcystis aeruginosa*
1196 *Microcystis aeruginosa*
1197 *Microcystis aeruginosa*
1198 *Microcystis aeruginosa*
1199 *Microcystis aeruginosa*
1200 *Microcystis aeruginosa*
1201 *Microcystis aeruginosa*
1202 *Microcystis aeruginosa*
1203 *Microcystis aeruginosa*
1204 *Microcystis aeruginosa*
1205 *Microcystis aeruginosa*
1206 *Microcystis aeruginosa*
1207 *Microcystis aeruginosa*
1208 *Microcystis aeruginosa*
1209 *Microcystis aeruginosa*
1210 *Microcystis aeruginosa*
1211 *Microcystis aeruginosa*
1212 *Microcystis aeruginosa*
1213 *Microcystis aeruginosa*
1214 *Microcystis aeruginosa*
1215 *Microcystis aeruginosa*
1216 *Microcystis aeruginosa*
1217 *Microcystis aeruginosa*
1218 *Microcystis aeruginosa*
1219 *Microcystis aeruginosa*
1220 *Microcystis aeruginosa*
1221 *Microcystis aeruginosa*
1222 *Microcystis aeruginosa*
1223 *Microcystis aeruginosa*
1224 *Microcystis aeruginosa*
1225 *Microcystis aeruginosa*
1226 *Microcystis aeruginosa*
1227 *Microcystis aeruginosa*
1228 *Microcystis aeruginosa*
1229 *Microcystis aeruginosa*
1230 *Microcystis aeruginosa*
1231 *Microcystis aeruginosa*
1232 *Microcystis aeruginosa*
1233 *Microcystis aeruginosa*
1234 *Microcystis aeruginosa*
1235 *Microcystis aeruginosa*
1236 *Microcystis aeruginosa*
1237 *Microcystis aeruginosa*
1238 *Microcystis aeruginosa*
1239 *Microcystis aeruginosa*
1240 *Microcystis aeruginosa*
1241 *Microcystis aeruginosa*
1242 *Microcystis aeruginosa*
1243 *Microcystis aeruginosa*
1244 *Microcystis aeruginosa*
1245 *Microcystis aeruginosa*
1246 *Microcystis aeruginosa*
1247 *Microcystis aeruginosa*
1248 *Microcystis aeruginosa*
1249 *Microcystis aeruginosa*
1250 *Microcystis aeruginosa*
1251 *Microcystis aeruginosa*
1252 *Microcystis aeruginosa*
1253 *Microcystis aeruginosa*
1254 *Microcystis aeruginosa*
1255 *Microcystis aeruginosa*
1256 *Microcystis aeruginosa*
1257 *Microcystis aeruginosa*
1258 *Aphanizomenon flos-aquae*
1259 *Cylindrospermopsis raciborskii*
1260 *Cylindrospermopsis raciborskii*
1261 *Cylindrospermopsis raciborskii*
1262 *Cylindrospermopsis raciborskii*
1263 *Planktothrix agardhii*
1264 *Planktothrix agardhii*
1265 *Planktothrix agardhii*
1266 *Planktothrix rubescens*
1267 *Planktothrix rubescens*
1268 *Amphidinium tetsudo*
1269 *Chlorella* sp.
1270 *Nanochlorum* sp.

- 1271 *Trebouxia anticipata*
 1272 *Trebouxia anticipata*
 1273 *Trebouxia anticipata*
 1274 *Trebouxia arboricola*
 1275 *Trebouxia arboricola*
 1276 *Trebouxia arboricola*
 1277 *Trebouxia arboricola*
 1278 *Trebouxia corticola*
 1279 *Trebouxia corticola*
 1280 *Trebouxia corticola*
 1281 *Trebouxia corticola*
 1282 *Trebouxia corticola*
 1283 *Trebouxia corticola*
 1284 *Trebouxia corticola*
 1285 *Trebouxia corticola*
 1286 *Trebouxia corticola*
 1287 *Trebouxia corticola*
 1288 *Trebouxia corticola*
 1289 *Trebouxia higginsiae*
 1290 *Trebouxia higginsiae*
 1291 *Trebouxia higginsiae*
 1292 *Trebouxia higginsiae*
 1293 *Trebouxia higginsiae*
 1294 *Trebouxia higginsiae*
 1295 *Trebouxia higginsiae*
 1296 *Trebouxia higginsiae*
 1297 *Trebouxia showmanii*
 1298 *Asterochloris* cf. *glomerata*
 1299 *Asterochloris* cf. *glomerata*
 1300 *Asterochloris* cf. *glomerata*
 1301 *Asterochloris* cf. *glomerata*
 1302 *Glossomastix chrysoplata*
 1303 *Fibrocapsa japonica*
 1304 *Calcidiscus leptoporus*
 1305 *Calcidiscus leptoporus*
 1306 *Calcidiscus leptoporus*
 1307 *Calcidiscus leptoporus*
 1308 *Calyptrosphaera sphaeroidea*
 1309 *Calyptrosphaera sphaeroidea*
 1310 *Emiliana huxleyi*
 1311 *Emiliana huxleyi*
 1312 *Emiliana huxleyi*
 1313 *Emiliana huxleyi*
 1314 *Emiliana huxleyi*
 1315 *Gephyrocapsa oceanica*
 1316 *Gephyrocapsa oceanica*
 1317 *Gephyrocapsa oceanica*
 1318 *Gephyrocapsa oceanica*
 1319 *Gephyrocapsa oceanica*
 1320 *Oolithotus fragilis*
 1321 *Oolithotus fragilis*
 1322 *Oolithotus fragilis*
 1323 *Umbilicosphaera sibogae* var. *foliosa*
 1324 *Umbilicosphaera sibogae* var. *sibogae*
 1325 *Thoracosphaera heimii*
 1326 *Thoracosphaera heimii*
 1327 *Cryptomonas rostratiformis*
 1328 *Gephyrocapsa oceanica*
 1329 *Gephyrocapsa oceanica*
 1330 *Prymnesium calathiferum*

2. Systematic index

ALGAE

CYANOPHYTA (CYANOBACTERIA)

Cyanophyceae

<i>Anabaena affinis</i>	40	<i>Anabaena ucrainica</i>	825
<i>Anabaena circinalis</i>	41	<i>Anabaena ucrainica</i>	826
<i>Anabaena compacta</i>	806	<i>Anabaena ucrainica</i>	832
<i>Anabaena compacta</i>	835	<i>Anabaena variabilis</i>	23
<i>Anabaena cylindrica</i>	19	<i>Anabaena viguieri</i>	827
<i>Anabaena ellipsoides</i>	828	<i>Anabaenopsis circularis</i>	21
<i>Anabaena flos-aquae</i> f. <i>flos-aquae</i>	73	<i>Aphanizomenon flos-aquae</i>	1258
<i>Anabaena flos-aquae</i> f. <i>flos-aquae</i>	74	<i>Aphanizomenon flos-aquae</i> f. <i>gracile</i>	81
<i>Anabaena flos-aquae</i> f. <i>flos-aquae</i>	75	<i>Aphanocapsa montana</i>	416
<i>Anabaena kisseleviana</i>	807	<i>Aulosira laxa</i>	50
<i>Anabaena lemmermannii</i>	833	<i>Calothrix brevissima</i>	22
<i>Anabaena mendotae</i>	808	<i>Calothrix crustacea</i>	266
<i>Anabaena mucosa</i>	809	<i>Calothrix parasitica</i>	267
<i>Anabaena oumiana</i>	829	<i>Calothrix parasitica</i>	334
<i>Anabaena planktonica</i>	810	<i>Calothrix scopulorum</i>	268
<i>Anabaena planktonica</i>	811	<i>Chamaesiphon polymorphus</i>	433
<i>Anabaena planktonica</i>	812	<i>Chamaesiphon subglobosus</i>	434
<i>Anabaena planktonica</i>	813	<i>Chroogloeocystis siderophila</i>	1031
<i>Anabaena planktonica</i>	814	<i>Cylindrospermopsis raciborskii</i>	930
<i>Anabaena planktonica</i>	815	<i>Cylindrospermopsis raciborskii</i>	991
<i>Anabaena planktonica</i>	816	<i>Cylindrospermopsis raciborskii</i>	992
<i>Anabaena planktonica</i>	817	<i>Cylindrospermopsis raciborskii</i>	993
<i>Anabaena planktonica</i>	834	<i>Cylindrospermopsis raciborskii</i>	994
<i>Anabaena smithii</i>	818	<i>Cylindrospermopsis raciborskii</i>	1040
<i>Anabaena smithii</i>	819	<i>Cylindrospermopsis raciborskii</i>	1041
<i>Anabaena smithii</i>	820	<i>Cylindrospermopsis raciborskii</i>	1042
<i>Anabaena smithii</i>	821	<i>Cylindrospermopsis raciborskii</i>	1259
<i>Anabaena smithii</i>	822	<i>Cylindrospermopsis raciborskii</i>	1260
<i>Anabaena smithii</i>	823	<i>Cylindrospermopsis raciborskii</i>	1261
<i>Anabaena smithii</i>	824	<i>Cylindrospermopsis raciborskii</i>	1262
<i>Anabaena smithii</i>	830	<i>Fischerella major</i>	592
<i>Anabaena smithii</i>	831	<i>Gloeocapsa decorticans</i>	931
<i>Anabaena solitaria</i> f. <i>solitaria</i>	80	<i>Hydrococcus rivularis</i>	593
<i>Anabaena spiroides</i>	76	<i>Limnothrix redekei</i>	847
<i>Anabaena spiroides</i> f. <i>crassa</i>	78	<i>Lyngbya hieronymusii</i> var. <i>hieronymusii</i>	929
<i>Anabaena spiroides</i> f. <i>spiroides</i>	77	<i>Merismopedia tenuissima</i>	230
<i>Anabaena spiroides</i> f. <i>spiroides</i>	79	<i>Microcystis aeruginosa</i>	44
<i>Anabaena spiroides</i> f. <i>spiroides</i>	263	<i>Microcystis aeruginosa</i>	87
		<i>Microcystis aeruginosa</i>	88
		<i>Microcystis aeruginosa</i>	89
		<i>Microcystis aeruginosa</i>	90
		<i>Microcystis aeruginosa</i>	91
		<i>Microcystis aeruginosa</i>	98
		<i>Microcystis aeruginosa</i>	99

<i>Microcystis aeruginosa</i>	100	<i>Microcystis aeruginosa</i>	1071
<i>Microcystis aeruginosa</i>	101	<i>Microcystis aeruginosa</i>	1072
<i>Microcystis aeruginosa</i>	102	<i>Microcystis aeruginosa</i>	1073
<i>Microcystis aeruginosa</i>	103	<i>Microcystis aeruginosa</i>	1074
<i>Microcystis aeruginosa</i>	104	<i>Microcystis aeruginosa</i>	1075
<i>Microcystis aeruginosa</i>	105	<i>Microcystis aeruginosa</i>	1076
<i>Microcystis aeruginosa</i>	106	<i>Microcystis aeruginosa</i>	1077
<i>Microcystis aeruginosa</i>	107	<i>Microcystis aeruginosa</i>	1078
<i>Microcystis aeruginosa</i>	108	<i>Microcystis aeruginosa</i>	1079
<i>Microcystis aeruginosa</i>	109	<i>Microcystis aeruginosa</i>	1080
<i>Microcystis aeruginosa</i>	110	<i>Microcystis aeruginosa</i>	1081
<i>Microcystis aeruginosa</i>	111	<i>Microcystis aeruginosa</i>	1082
<i>Microcystis aeruginosa</i>	112	<i>Microcystis aeruginosa</i>	1083
<i>Microcystis aeruginosa</i>	298	<i>Microcystis aeruginosa</i>	1084
<i>Microcystis aeruginosa</i>	299	<i>Microcystis aeruginosa</i>	1085
<i>Microcystis aeruginosa</i>	478	<i>Microcystis aeruginosa</i>	1086
<i>Microcystis aeruginosa</i>	604	<i>Microcystis aeruginosa</i>	1087
<i>Microcystis aeruginosa</i>	843	<i>Microcystis aeruginosa</i>	1088
<i>Microcystis aeruginosa</i>	901	<i>Microcystis aeruginosa</i>	1089
<i>Microcystis aeruginosa</i>	902	<i>Microcystis aeruginosa</i>	1090
<i>Microcystis aeruginosa</i>	903	<i>Microcystis aeruginosa</i>	1091
<i>Microcystis aeruginosa</i>	904	<i>Microcystis aeruginosa</i>	1092
<i>Microcystis aeruginosa</i>	933	<i>Microcystis aeruginosa</i>	1093
<i>Microcystis aeruginosa</i>	1025	<i>Microcystis aeruginosa</i>	1094
<i>Microcystis aeruginosa</i>	1026	<i>Microcystis aeruginosa</i>	1095
<i>Microcystis aeruginosa</i>	1027	<i>Microcystis aeruginosa</i>	1096
<i>Microcystis aeruginosa</i>	1028	<i>Microcystis aeruginosa</i>	1097
<i>Microcystis aeruginosa</i>	1029	<i>Microcystis aeruginosa</i>	1098
<i>Microcystis aeruginosa</i>	1043	<i>Microcystis aeruginosa</i>	1099
<i>Microcystis aeruginosa</i>	1050	<i>Microcystis aeruginosa</i>	1100
<i>Microcystis aeruginosa</i>	1051	<i>Microcystis aeruginosa</i>	1101
<i>Microcystis aeruginosa</i>	1052	<i>Microcystis aeruginosa</i>	1102
<i>Microcystis aeruginosa</i>	1053	<i>Microcystis aeruginosa</i>	1103
<i>Microcystis aeruginosa</i>	1054	<i>Microcystis aeruginosa</i>	1104
<i>Microcystis aeruginosa</i>	1055	<i>Microcystis aeruginosa</i>	1105
<i>Microcystis aeruginosa</i>	1056	<i>Microcystis aeruginosa</i>	1106
<i>Microcystis aeruginosa</i>	1057	<i>Microcystis aeruginosa</i>	1107
<i>Microcystis aeruginosa</i>	1058	<i>Microcystis aeruginosa</i>	1108
<i>Microcystis aeruginosa</i>	1059	<i>Microcystis aeruginosa</i>	1109
<i>Microcystis aeruginosa</i>	1060	<i>Microcystis aeruginosa</i>	1110
<i>Microcystis aeruginosa</i>	1061	<i>Microcystis aeruginosa</i>	1111
<i>Microcystis aeruginosa</i>	1062	<i>Microcystis aeruginosa</i>	1112
<i>Microcystis aeruginosa</i>	1063	<i>Microcystis aeruginosa</i>	1113
<i>Microcystis aeruginosa</i>	1064	<i>Microcystis aeruginosa</i>	1114
<i>Microcystis aeruginosa</i>	1065	<i>Microcystis aeruginosa</i>	1115
<i>Microcystis aeruginosa</i>	1066	<i>Microcystis aeruginosa</i>	1116
<i>Microcystis aeruginosa</i>	1067	<i>Microcystis aeruginosa</i>	1117
<i>Microcystis aeruginosa</i>	1068	<i>Microcystis aeruginosa</i>	1118
<i>Microcystis aeruginosa</i>	1069	<i>Microcystis aeruginosa</i>	1119
<i>Microcystis aeruginosa</i>	1070	<i>Microcystis aeruginosa</i>	1120

<i>Microcystis aeruginosa</i>	1221	<i>Phormidium foveolarum</i>	32
<i>Microcystis aeruginosa</i>	1222	<i>Phormidium foveolarum</i>	34
<i>Microcystis aeruginosa</i>	1223	<i>Phormidium foveolarum</i>	503
<i>Microcystis aeruginosa</i>	1224	<i>Phormidium foveolarum</i>	504
<i>Microcystis aeruginosa</i>	1225	<i>Phormidium foveolarum</i>	505
<i>Microcystis aeruginosa</i>	1226	<i>Phormidium jenkelianum</i>	506
<i>Microcystis aeruginosa</i>	1227	<i>Phormidium jenkelianum</i>	507
<i>Microcystis aeruginosa</i>	1228	<i>Phormidium molle</i>	509
<i>Microcystis aeruginosa</i>	1229	<i>Phormidium mucicola</i>	510
<i>Microcystis aeruginosa</i>	1230	<i>Phormidium ramosum</i>	305
<i>Microcystis aeruginosa</i>	1231	<i>Phormidium tenue</i>	30
<i>Microcystis aeruginosa</i>	1232	<i>Phormidium tenue</i>	512
<i>Microcystis aeruginosa</i>	1233	<i>Phormidium tenue</i>	611
<i>Microcystis aeruginosa</i>	1234	<i>Planktothricoides raciborskii</i>	207
<i>Microcystis aeruginosa</i>	1235	<i>Planktothricoides raciborskii</i>	917
<i>Microcystis aeruginosa</i>	1236	<i>Planktothricoides raciborskii</i>	918
<i>Microcystis aeruginosa</i>	1237	<i>Planktothricoides raciborskii</i>	919
<i>Microcystis aeruginosa</i>	1238	<i>Planktothricoides raciborskii</i>	920
<i>Microcystis aeruginosa</i>	1239	<i>Planktothricoides raciborskii</i>	921
<i>Microcystis aeruginosa</i>	1240	<i>Planktothricoides raciborskii</i>	922
<i>Microcystis aeruginosa</i>	1241	<i>Planktothricoides raciborskii</i>	923
<i>Microcystis aeruginosa</i>	1242	<i>Planktothricoides raciborskii</i>	924
<i>Microcystis aeruginosa</i>	1243	<i>Planktothricoides raciborskii</i>	925
<i>Microcystis aeruginosa</i>	1244	<i>Planktothricoides raciborskii</i>	926
<i>Microcystis aeruginosa</i>	1245	<i>Planktothricoides raciborskii</i>	927
<i>Microcystis aeruginosa</i>	1246	<i>Planktothrix agardhii</i>	204
<i>Microcystis aeruginosa</i>	1247	<i>Planktothrix agardhii</i>	205
<i>Microcystis aeruginosa</i>	1248	<i>Planktothrix agardhii</i>	594
<i>Microcystis aeruginosa</i>	1249	<i>Planktothrix agardhii</i>	595
<i>Microcystis aeruginosa</i>	1250	<i>Planktothrix agardhii</i>	596
<i>Microcystis aeruginosa</i>	1251	<i>Planktothrix agardhii</i>	905
<i>Microcystis aeruginosa</i>	1252	<i>Planktothrix agardhii</i>	906
<i>Microcystis aeruginosa</i>	1253	<i>Planktothrix agardhii</i>	907
<i>Microcystis aeruginosa</i>	1254	<i>Planktothrix agardhii</i>	908
<i>Microcystis aeruginosa</i>	1255	<i>Planktothrix agardhii</i>	909
<i>Microcystis aeruginosa</i>	1256	<i>Planktothrix agardhii</i>	910
<i>Microcystis aeruginosa</i>	1257	<i>Planktothrix agardhii</i>	989
<i>Myxosarcina burmensis</i>	481	<i>Planktothrix agardhii</i>	990
<i>Nostoc commune</i>	24	<i>Planktothrix agardhii</i>	1263
<i>Nostoc commune</i>	38	<i>Planktothrix agardhii</i>	1264
<i>Nostoc linckia</i>	25	<i>Planktothrix agardhii</i>	1265
<i>Nostoc linckia</i> var. <i>arvense</i>	28	<i>Planktothrix mougeotii</i>	844
<i>Nostoc minutum</i>	26	<i>Planktothrix mougeotii</i>	911
<i>Nostoc minutum</i>	29	<i>Planktothrix mougeotii</i>	912
<i>Oscillatoria amphibia</i>	361	<i>Planktothrix mougeotii</i>	913
<i>Oscillatoria animalis</i>	206	<i>Planktothrix pseudagardhii</i>	845
<i>Oscillatoria laetevirens</i>	31	<i>Planktothrix pseudagardhii</i>	914
<i>Oscillatoria limnetica</i>	36	<i>Planktothrix pseudagardhii</i>	915
<i>Oscillatoria rosea</i>	208	<i>Planktothrix pseudagardhii</i>	916
<i>Oscillatoria tenuis</i>	33	<i>Planktothrix rubescens</i>	610

<i>Chroomonas dispersa</i>	704	<i>Chattonella antiqua</i>	2
<i>Chroomonas nordstedtii</i>	706	<i>Chattonella antiqua</i>	83
<i>Chroomonas nordstedtii</i>	707	<i>Chattonella antiqua</i>	84
<i>Chroomonas nordstedtii</i>	708	<i>Chattonella antiqua</i>	85
<i>Chroomonas nordstedtii</i>	709	<i>Chattonella antiqua</i>	86
<i>Chroomonas nordstedtii</i>	710	<i>Chattonella antiqua</i>	113
<i>Chroomonas nordstedtii</i>	711	<i>Chattonella antiqua</i>	114
<i>Chroomonas placoidea</i>	705	<i>Chattonella antiqua</i>	161
<i>Cryptomonas acuta</i>	697	<i>Chattonella antiqua</i>	557
<i>Cryptomonas irregularis</i>	698	<i>Chattonella antiqua</i>	558
<i>Cryptomonas ovata</i>	274	<i>Chattonella marina</i>	3
<i>Cryptomonas ovata</i>	275	<i>Chattonella marina</i>	14
<i>Cryptomonas platyuris</i>	276	<i>Chattonella marina</i>	115
<i>Cryptomonas platyuris</i>	344	<i>Chattonella marina</i>	116
<i>Cryptomonas rostratiformis</i>	277	<i>Chattonella marina</i>	117
<i>Cryptomonas rostratiformis</i>	278	<i>Chattonella marina</i>	118
<i>Cryptomonas rostratiformis</i>	345	<i>Chattonella marina</i>	121
<i>Cryptomonas rostratiformis</i>	1327	<i>Chattonella marina</i>	559
<i>Cryptomonas tetrapyrenoidosa</i>	279	<i>Chattonella minima</i>	848
<i>Cryptomonas tetrapyrenoidosa</i>	280	<i>Chattonella ovata</i>	603
<i>Cryptomonas tetrapyrenoidosa</i>	281	<i>Chattonella ovata</i>	671
<i>Cryptomonas tetrapyrenoidosa</i>	282	<i>Chattonella ovata</i>	849
<i>Cryptomonas tetrapyrenoidosa</i>	346	<i>Chattonella verruculosa</i>	670
<i>Cryptomonas tetrapyrenoidosa</i>	347	<i>Chattonella verruculosa</i>	850
<i>Cryptomonas tetrapyrenoidosa</i>	348	<i>Fibrocapsa japonica</i>	136
<i>Rhodomonas atrorosea</i>	699	<i>Fibrocapsa japonica</i>	462
<i>Rhodomonas baltica</i>	700	<i>Fibrocapsa japonica</i>	560
<i>Rhodomonas chrysoidea</i>	701	<i>Fibrocapsa japonica</i>	605
<i>Rhodomonas chrysoidea</i>	1005	<i>Fibrocapsa japonica</i>	1303
<i>Rhodomonas duplex</i>	765	<i>Gonyostomum semen</i>	1009
<i>Rhodomonas fulcata</i>	702	<i>Haramonas dimorpha</i>	716
<i>Rhodomonas salina</i>	1006	<i>Heterosigma akashiwo</i>	4
		<i>Heterosigma akashiwo</i>	5
		<i>Heterosigma akashiwo</i>	6
		<i>Heterosigma akashiwo</i>	9
		<i>Heterosigma akashiwo</i>	10
		<i>Heterosigma akashiwo</i>	145
		<i>Heterosigma akashiwo</i>	146
		<i>Heterosigma akashiwo</i>	293
		<i>Heterosigma akashiwo</i>	561
		<i>Olisthodiscus luteus</i>	15
HETEROKONTOPHYTA			
Chrysophyceae			
<i>Dinobryon divergens</i>	284		
<i>Synura petersenii</i>	233		
<i>Synura petersenii</i>	1007		
<i>Synura sphagnicola</i>	695		
<i>Synura sphagnicola</i>	696		
<i>Synura spinosa</i>	234		
<i>Uroglena americana</i>	395		
Dictyochophyceae			
		<i>Pedinella squamata</i>	1008
Raphidophyceae			
<i>Chattonella antiqua</i>	1		

Bacillariophyceae

<i>Achnanthes minutissima</i>	71
<i>Achnanthes minutissima</i>	407
<i>Achnanthes minutissima</i>	408
<i>Achnanthes minutissima</i>	409
<i>Achnanthes minutissima</i>	410
<i>Achnanthes minutissima</i>	411
<i>Achnanthes minutissima</i>	412
<i>Achnanthes minutissima</i>	413
<i>Achnanthes minutissima</i>	414
<i>Achnanthes minutissima</i> var. <i>saprophila</i>	372
<i>Achnanthes subconstricta</i>	330
<i>Asterionella glacialis</i>	265
<i>Asterionella glacialis</i>	417
<i>Chaetoceros didymus</i>	586
<i>Chaetoceros sociale</i>	377
<i>Chaetoceros sociale</i>	553
<i>Cyclotella meneghiniana</i>	803
<i>Cyclotella meneghiniana</i>	804
<i>Cyclotella meneghiniana</i>	805
<i>Cylindrotheca closterium</i>	1045
<i>Cylindrotheca fusiformis</i>	1046
<i>Cylindrotheca</i> sp.	1047
<i>Ditylum brightwellii</i>	350
<i>Eucampia zodiacus</i>	1049
<i>Eunotia pectinalis</i> var. <i>minor</i>	461
<i>Fragilaria capucina</i>	391
<i>Gomphonema angustatum</i> var. <i>obtusatum</i>	620
<i>Gomphonema gracile</i> var. <i>gracile</i>	465
<i>Gomphonema parvulum</i> var. <i>parvulum</i>	466
<i>Gomphonema parvulum</i> var. <i>parvulum</i>	467
<i>Hantzschia amphioxys</i> var. <i>compacta</i>	587
<i>Lithodesmium variabile</i>	588
<i>Melosira granulata</i>	333
var. <i>angustissima</i> f. <i>spiralis</i>	
<i>Nitzschia palea</i>	487
<i>Nitzschia palea</i>	488
<i>Nitzschia palea</i>	489
<i>Odontella aurita</i>	589
<i>Odontella longicruris</i>	590
<i>Skeletonema costatum</i>	16
<i>Skeletonema costatum</i>	17
<i>Skeletonema costatum</i>	223
<i>Skeletonema costatum</i>	323
<i>Skeletonema costatum</i>	324
<i>Tabellaria flocculosa</i>	225
<i>Thalassionema nitzschioides</i>	534
<i>Triceratium dubium</i>	556

Phaeophyceae

<i>Acinetospora crinita</i>	548
-----------------------------	-----

Xanthophyceae

<i>Botrydiopsis arrhiza</i>	621
<i>Botrydium granulatum</i>	622
<i>Ophiocytium capitatum</i>	1011

Pelagophyceae

<i>Pelagomonas calceolata</i>	1003
-------------------------------	------

Pinguiophyceae

<i>Glossomastix chrysoplata</i>	1002
<i>Glossomastix chrysoplata</i>	1302

Schizocladiphyceae

<i>Schizocladia ischiensis</i>	1044
--------------------------------	------

HAPTOPHYTA

Prymnesiophyceae

<i>Calcidiscus leptoporus</i>	1304
<i>Calcidiscus leptoporus</i>	1305
<i>Calcidiscus leptoporus</i>	1306
<i>Calcidiscus leptoporus</i>	1307
<i>Calyptrosphaera sphaeroidea</i>	997
<i>Calyptrosphaera sphaeroidea</i>	1308
<i>Calyptrosphaera sphaeroidea</i>	1309
<i>Chrysochromulina hirta</i>	741
<i>Chrysochromulina parva</i>	562
<i>Chrysochromulina quadrikonta</i>	998
<i>Cricosphaera roscoffensis</i>	8
<i>Emiliania huxleyi</i>	837
<i>Emiliania huxleyi</i>	999
<i>Emiliania huxleyi</i>	1310
<i>Emiliania huxleyi</i>	1311
<i>Emiliania huxleyi</i>	1312
<i>Emiliania huxleyi</i>	1313

<i>Emiliana huxleyi</i>	1314	<i>Coolia monotis</i>	615
<i>Gephyrocapsa oceanica</i>	353	<i>Glenodiniopsis uliginosa</i>	463
<i>Gephyrocapsa oceanica</i>	838	<i>Gymnodinium mikimotoi</i>	680
<i>Gephyrocapsa oceanica</i>	1000	<i>Hemidinium nasutum</i>	471
<i>Gephyrocapsa oceanica</i>	1315	<i>Heterocapsa pygmaea</i>	472
<i>Gephyrocapsa oceanica</i>	1316	<i>Heterocapsa pygmaea</i>	473
<i>Gephyrocapsa oceanica</i>	1317	<i>Heterocapsa triquetra</i>	7
<i>Gephyrocapsa oceanica</i>	1318	<i>Heterocapsa triquetra</i>	235
<i>Gephyrocapsa oceanica</i>	1319	<i>Katodinium rotundatum</i>	356
<i>Gephyrocapsa oceanica</i>	1328	<i>Oxyrrhis marina</i>	494
<i>Gephyrocapsa oceanica</i>	1329	<i>Peridinium bipes</i> f. <i>globosum</i>	495
<i>Hymenomonas coronata</i>	1016	<i>Peridinium bipes</i> f. <i>occultatum</i>	497
<i>Imantonia rotunda</i>	1001	<i>Peridinium bipes</i> var. <i>tabulatum</i>	600
<i>Oolithotus fragilis</i>	1320	<i>Peridinium inconspicuum</i> subsp. <i>remotum</i>	499
<i>Oolithotus fragilis</i>	1321	<i>Peridinium volzii</i>	365
<i>Oolithotus fragilis</i>	1322	<i>Peridinium volzii</i>	501
<i>Phaeocystis globosa</i>	388	<i>Peridinium willei</i>	304
<i>Prymnesium calathiferum</i>	1330	<i>Peridinium willei</i>	366
<i>Prymnesium parvum</i>	1017	<i>Prorocentrum dentatum</i>	682
<i>Prymnesium parvum</i>	1018	<i>Prorocentrum dentatum</i>	900
<i>Umbilicosphaera sibogae</i> var. <i>foliosa</i>	1323	<i>Prorocentrum gracile</i>	315
<i>Umbilicosphaera sibogae</i> var. <i>sibogae</i>	1324	<i>Prorocentrum lima</i>	617
		<i>Prorocentrum mexicanum</i>	618
		<i>Prorocentrum micans</i>	12
Pavlovophyceae		<i>Prorocentrum micans</i>	218
		<i>Prorocentrum micans</i>	316
<i>Pavlova gyrans</i>	623	<i>Prorocentrum micans</i>	601
		<i>Prorocentrum micans</i>	608
		<i>Prorocentrum minimum</i>	237
		<i>Prorocentrum minimum</i>	238
DINOPHYTA		<i>Prorocentrum sigmoides</i>	683
		<i>Prorocentrum triestinum</i>	219
Dinophyceae		<i>Protoceratium reticulatum</i>	318
		<i>Protoceratium reticulatum</i>	319
<i>Alexandrium catenella</i>	220	<i>Pyrocystis lunura</i>	609
<i>Alexandrium catenella</i>	519	<i>Pyrophacus steinii</i>	321
<i>Alexandrium catenella</i>	520	<i>Scrippsiella sweeneyae</i>	684
<i>Alexandrium catenella</i>	674	<i>Scrippsiella trochoidea</i>	369
<i>Alexandrium catenella</i>	675	<i>Thoracosphaera heimii</i>	1325
<i>Alexandrium catenella</i>	677	<i>Thoracosphaera heimii</i>	1326
<i>Alexandrium hiranoi</i>	612	<i>Woloszynskia leopoliense</i>	619
<i>Alexandrium insuetum</i>	678		
<i>Amphidinium britannicum</i>	405		
<i>Amphidinium carterae</i>	331	EUGLENOPHYTA	
<i>Amphidinium klebsii</i>	613		
<i>Amphidinium tetsudo</i>	1268	Euglenophyceae	
<i>Cachonina niei</i>	420		
<i>Cachonina niei</i>	614	<i>Euglena clara</i>	253
<i>Ceratium fusus</i>	899	<i>Euglena gracilis</i>	47
<i>Ceratium hirundinella</i>	376	<i>Euglena gracilis</i>	48
<i>Coolia monotis</i>	343		

<i>Euglena gracilis</i> var. <i>bacillaris</i>	49
<i>Euglena mutabilis</i>	286
<i>Eutreptiella gymnastica</i>	381
<i>Phacus agilis</i>	387

CHLORARACHNIOPHYTA

Chlorarachniophyceae

<i>Chlorarachnion reptans</i>	624
-------------------------------	-----

CHLOROPHYTA

Prasinophyceae

<i>Mesostigma viride</i>	296
<i>Mesostigma viride</i>	475
<i>Mesostigma viride</i>	476
<i>Mesostigma viride</i>	477
<i>Mesostigma viride</i>	995
<i>Monomastix minuta</i>	255
<i>Monomastix minuta</i>	256
<i>Nephroselmis astigmatica</i>	252
<i>Nephroselmis olivacea</i>	483
<i>Nephroselmis olivacea</i>	484
<i>Nephroselmis olivacea</i>	485
<i>Nephroselmis spinosa</i>	934
<i>Nephroselmis spinosa</i>	935
<i>Nephroselmis viridis</i>	486
<i>Pterosperma cristatum</i>	221
<i>Pterosperma cristatum</i>	626
<i>Pterosperma cristatum</i>	936
<i>Pyramimonas</i> aff. <i>amyliifera</i>	251
<i>Pyramimonas</i> aff. <i>amyliifera</i>	320
<i>Pyramimonas parkeae</i>	254
<i>Tetraselmis cordiformis</i>	18
<i>Tetraselmis cordiformis</i>	533
<i>Tetraselmis striata</i>	1019

Pedinophyceae

<i>Pedinomonas minor</i>	363
--------------------------	-----

Ulvophyceae

<i>Oltmannsiellopsis geminata</i>	672
<i>Oltmannsiellopsis unicellularis</i>	359
<i>Oltmannsiellopsis viridis</i>	360
<i>Ulothrix variabilis</i>	329
<i>Ulothrix zonata</i>	536
<i>Ulothrix zonata</i>	537

Trebouxiophyceae

<i>Actinastrum hantzschii</i>	415
<i>Asterochloris</i> cf. <i>glomerata</i>	1298
<i>Asterochloris</i> cf. <i>glomerata</i>	1299
<i>Asterochloris</i> cf. <i>glomerata</i>	1300
<i>Asterochloris</i> cf. <i>glomerata</i>	1301
<i>Chlorella protothecoides</i>	629
<i>Chlorella saccharophila</i>	640
<i>Chlorella vulgaris</i> var. <i>vulgaris</i>	227
<i>Chlorella vulgaris</i> var. <i>vulgaris</i>	641
<i>Chlorella vulgaris</i> var. <i>vulgaris</i>	642
<i>Chlorella vulgaris</i> var. <i>vulgaris</i>	686
<i>Chlorella</i> sp.	1269
<i>Dictyochloropsis irregularis</i>	378
<i>Dictyosphaerium pulchellum</i>	453
<i>Eremosphaera gigas</i>	379
<i>Eremosphaera viridis</i>	380
<i>Eremosphaera viridis</i>	643
<i>Eremosphaera viridis</i>	644
<i>Errerella bornhemiensis</i>	455
<i>Lagerheimia ciliata</i>	382
<i>Micractinium pusillum</i>	151
<i>Microthamnion kützingianum</i>	479
<i>Nanochlorum</i> sp.	1270
<i>Oocystis borgei</i>	659
<i>Oocystis lacustris</i>	660
<i>Oocystis lacustris</i>	661
<i>Oocystis lacustris</i>	662
<i>Stichococcus ampulliformis</i>	996
<i>Stichococcus bacillaris</i>	529
<i>Stichococcus bacillaris</i>	530
<i>Trebouxia anticipata</i>	1271
<i>Trebouxia anticipata</i>	1272
<i>Trebouxia anticipata</i>	1273
<i>Trebouxia arboricola</i>	1274
<i>Trebouxia arboricola</i>	1275
<i>Trebouxia arboricola</i>	1276
<i>Trebouxia arboricola</i>	1277
<i>Trebouxia corticola</i>	1278

<i>Trebouxia corticola</i>	1279
<i>Trebouxia corticola</i>	1280
<i>Trebouxia corticola</i>	1281
<i>Trebouxia corticola</i>	1282
<i>Trebouxia corticola</i>	1283
<i>Trebouxia corticola</i>	1284
<i>Trebouxia corticola</i>	1285
<i>Trebouxia corticola</i>	1286
<i>Trebouxia corticola</i>	1287
<i>Trebouxia corticola</i>	1288
<i>Trebouxia higginsiae</i>	1289
<i>Trebouxia higginsiae</i>	1290
<i>Trebouxia higginsiae</i>	1291
<i>Trebouxia higginsiae</i>	1292
<i>Trebouxia higginsiae</i>	1293
<i>Trebouxia higginsiae</i>	1294
<i>Trebouxia higginsiae</i>	1295
<i>Trebouxia higginsiae</i>	1296
<i>Trebouxia showmanii</i>	1297

Chlorophyceae

<i>Apiocystis brauniana</i>	1020
<i>Astrephomene gubernaculifera</i>	418
<i>Astrephomene gubernaculifera</i>	419
<i>Astrephomene gubernaculifera</i>	628
<i>Astrephomene gubernaculifera</i>	853
<i>Astrephomene gubernaculifera</i>	854
<i>Astrephomene gubernaculifera</i>	855
<i>Astrephomene perforata</i>	564
<i>Astrephomene perforata</i>	565
<i>Basichlamys sacculifera</i>	566
<i>Botryococcus braunii</i>	836
<i>Brachiomonas submarina</i>	375
<i>Carteria cerasiformis</i>	424
<i>Carteria cerasiformis</i>	425
<i>Carteria crucifera</i>	421
<i>Carteria crucifera</i>	630
<i>Carteria eugametos</i>	631
<i>Carteria eugametos</i>	632
<i>Carteria eugametos</i>	633
<i>Carteria eugametos</i>	634
<i>Carteria eugametos</i>	635
<i>Carteria eugametos</i>	636
<i>Carteria inversa</i>	422
<i>Carteria inversa</i>	423
<i>Carteria klebsii</i>	426
<i>Carteria multifilis</i>	427
<i>Carteria obtusa</i>	428

<i>Carteria obtusa</i>	429
<i>Carteria obtusa</i>	430
<i>Carteria obtusa</i>	431
<i>Carteria radiosa</i>	432
<i>Characiochloris acuminata</i>	637
<i>Characiochloris sasae</i>	567
<i>Characiochloris sasae</i>	638
<i>Characium angustum</i>	639
<i>Characium maximum</i>	154
<i>Characium polymorphum</i>	436
<i>Chlamydomonas augustae</i> var. <i>ellipsoidea</i>	158
<i>Chlamydomonas coccoides</i>	1021
<i>Chlamydomonas debaryana</i> var. <i>cristata</i>	884
<i>Chlamydomonas fasciata</i>	437
<i>Chlamydomonas kuwadae</i>	968
<i>Chlamydomonas monadina</i> var. <i>monadina</i>	438
<i>Chlamydomonas monticola</i>	157
<i>Chlamydomonas noctigama</i>	1048
<i>Chlamydomonas parkeae</i>	440
<i>Chlamydomonas parkeae</i>	1022
<i>Chlamydomonas pulsatilla</i>	122
<i>Chlamydomonas tetragama</i>	446
<i>Chlorogonium capillatum</i>	692
<i>Chlorogonium capillatum</i>	742
<i>Chlorogonium capillatum</i>	743
<i>Chlorogonium capillatum</i>	744
<i>Chlorogonium capillatum</i>	745
<i>Chlorogonium capillatum</i>	746
<i>Chlorogonium capillatum</i>	747
<i>Chlorogonium capillatum</i>	748
<i>Chlorogonium capillatum</i>	749
<i>Chlorogonium capillatum</i>	750
<i>Chlorogonium elongatum</i>	751
<i>Chlorogonium elongatum</i>	752
<i>Chlorogonium elongatum</i>	753
<i>Chlorogonium euchlorum</i>	754
<i>Chlorogonium euchlorum</i>	755
<i>Chlorogonium euchlorum</i>	756
<i>Chlorogonium euchlorum</i>	757
<i>Chlorogonium euchlorum</i>	758
<i>Chlorogonium euchlorum</i>	759
<i>Chlorogonium euchlorum</i>	760
<i>Chlorogonium fusiforme</i>	123
<i>Chlorogonium kasakii</i>	761
<i>Chlorogonium neglectum</i>	439
<i>Chloromonas insignis</i>	447
<i>Chlorosarcinopsis caeca</i>	160
<i>Chlorosarcinopsis delicata</i>	153
<i>Coelastrum astroideum</i>	129
<i>Coelastrum astroideum</i>	130

<i>Coelastrum astroideum</i>	244	<i>Gonium viridistellatum</i>	290
<i>Coelastrum astroideum</i>	342	<i>Gonium viridistellatum</i>	654
<i>Coelastrum morus</i>	231	<i>Gonium viridistellatum</i>	655
<i>Coelastrum proboscideum</i>	131	<i>Gonium viridistellatum</i>	857
<i>Coelastrum reticulatum</i>	132	<i>Graesiella emersonii</i>	226
<i>Coelastrum reticulatum</i> var. <i>reticulatum</i>	245	<i>Graesiella emersonii</i>	687
<i>Dimorphococcus lunatus</i>	134	<i>Graesiella emersonii</i>	688
<i>Dimorphococcus lunatus</i>	135	<i>Graesiella emersonii</i>	689
<i>Draparnaldia plumosa</i>	454	<i>Graesiella emersonii</i>	690
<i>Echinospaeridium nordstedtii</i>	137	<i>Haematococcus lacustris</i>	144
<i>Eudorina cylindrica</i>	722	<i>Hafniomonas montana</i>	257
<i>Eudorina elegans</i>	351	<i>Hafniomonas montana</i>	656
<i>Eudorina elegans</i> var. <i>carteri</i>	721	<i>Hydrodictyon reticulatum</i>	295
<i>Eudorina elegans</i> var. <i>elegans</i>	456	<i>Lobomonas monstruosa</i>	474
<i>Eudorina elegans</i> var. <i>elegans</i>	457	<i>Monoraphidium circinale</i>	480
<i>Eudorina elegans</i> var. <i>elegans</i>	717	<i>Monoraphidium contortum</i>	384
<i>Eudorina elegans</i> var. <i>elegans</i>	718	<i>Monoraphidium griffithii</i>	385
<i>Eudorina elegans</i> var. <i>elegans</i>	719	<i>Oedogonium obesum</i>	203
<i>Eudorina elegans</i> var. <i>elegans</i>	720	<i>Pandorina colemaniae</i>	572
<i>Eudorina elegans</i> var. <i>synoica</i>	458	<i>Pandorina colemaniae</i>	573
<i>Eudorina elegans</i> var. <i>synoica</i>	568	<i>Pandorina morum</i>	242
<i>Eudorina illinoisensis</i>	459	<i>Pandorina morum</i>	243
<i>Eudorina illinoisensis</i>	460	<i>Pandorina morum</i>	362
<i>Eudorina illinoisensis</i>	723	<i>Pandorina morum</i>	886
<i>Eudorina minodii</i>	856	<i>Pandorina morum</i>	887
<i>Eudorina unicocca</i> var. <i>peripheralis</i>	726	<i>Pandorina morum</i>	888
<i>Eudorina unicocca</i> var. <i>unicocca</i>	724	<i>Pandorina morum</i>	889
<i>Eudorina unicocca</i> var. <i>unicocca</i>	725	<i>Pandorina morum</i>	890
<i>Gloeomonas lateperforata</i>	464	<i>Pandorina morum</i> var. <i>morum</i>	574
<i>Gonium multicoccum</i>	737	<i>Pandorina morum</i> var. <i>morum</i>	575
<i>Gonium multicoccum</i>	885	<i>Paulschulzia pseudovolvox</i>	727
<i>Gonium multicoccum</i>	1038	<i>Pediastrum angulosum</i> var. <i>angulosum</i>	300
<i>Gonium multicoccum</i>	1039	<i>Pediastrum boryanum</i>	209
<i>Gonium octonarium</i>	851	<i>Pediastrum boryanum</i>	301
<i>Gonium octonarium</i>	852	<i>Pediastrum duplex</i>	212
<i>Gonium pectorale</i> var. <i>pectorale</i>	468	<i>Pediastrum duplex</i> var. <i>duplex</i>	210
<i>Gonium pectorale</i> var. <i>pectorale</i>	469	<i>Pediastrum duplex</i> var. <i>duplex</i>	213
<i>Gonium pectorale</i> var. <i>pectorale</i>	569	<i>Pediastrum duplex</i> var. <i>gracillimum</i>	211
<i>Gonium pectorale</i> var. <i>pectorale</i>	570	<i>Pediastrum duplex</i> var. <i>gracillimum</i>	214
<i>Gonium pectorale</i> var. <i>pectorale</i>	645	<i>Pediastrum simplex</i>	215
<i>Gonium pectorale</i> var. <i>pectorale</i>	646	<i>Pediastrum simplex</i>	302
<i>Gonium quadratum</i>	647	<i>Pediastrum tetras</i>	216
<i>Gonium quadratum</i>	648	<i>Phacotus lenticularis</i>	858
<i>Gonium quadratum</i>	649	<i>Phacotus lenticularis</i>	859
<i>Gonium quadratum</i>	650	<i>Planctonema lauterbornii</i>	514
<i>Gonium quadratum</i>	651	<i>Platydorina caudata</i>	728
<i>Gonium quadratum</i>	652	<i>Platydorina caudata</i>	729
<i>Gonium quadratum</i>	653	<i>Pleodorina californica</i>	576
<i>Gonium viridistellatum</i>	288	<i>Pleodorina californica</i>	735
<i>Gonium viridistellatum</i>	289	<i>Pleodorina indica</i>	736

<i>Pleodorina japonica</i>	577	<i>Vitreochlamys nekrassovii</i>	881
<i>Polyedriopsis spinulosa</i>	232	<i>Vitreochlamys ordinata</i>	882
<i>Pseudocarteria mucosa</i>	522	<i>Vitreochlamys pinguis</i>	883
<i>Pseudocarteria mucosa</i>	523	<i>Volvox africanus</i>	863
<i>Pseudocarteria mucosa</i>	524	<i>Volvox aureus</i>	241
<i>Pseudokirchneriella subcapitata</i>	35	<i>Volvox aureus</i>	396
<i>Pseudopleurococcus printzii</i>	159	<i>Volvox aureus</i>	693
var. <i>longissimus</i>		<i>Volvox aureus</i>	694
<i>Pteromonas aculeata</i>	738	<i>Volvox aureus</i>	864
<i>Pteromonas aculeata</i>	860	<i>Volvox aureus</i>	891
<i>Pteromonas angulosa</i>	739	<i>Volvox aureus</i>	892
<i>Pteromonas angulosa</i>	861	<i>Volvox aureus</i> var. <i>aureus</i>	541
<i>Pteromonas angulosa</i>	862	<i>Volvox aureus</i> var. <i>aureus</i>	542
<i>Pteromonas multipyrenoidea</i>	740	<i>Volvox barberi</i>	730
<i>Scenedesmus abundans</i>	685	<i>Volvox carteri</i>	397
<i>Scenedesmus acuminatus</i>	92	<i>Volvox carteri</i>	398
var. <i>tetradesmoides</i>		<i>Volvox carteri</i> f. <i>kawasakiensis</i>	580
<i>Scenedesmus acutus</i>	94	<i>Volvox carteri</i> f. <i>kawasakiensis</i>	581
<i>Scenedesmus acutus</i>	95	<i>Volvox carteri</i> f. <i>kawasakiensis</i>	732
<i>Scenedesmus acutus</i>	120	<i>Volvox carteri</i> f. <i>kawasakiensis</i>	733
<i>Scenedesmus dimorphus</i>	93	<i>Volvox carteri</i> f. <i>nagariensis</i>	865
<i>Scenedesmus dimorphus</i>	119	<i>Volvox carteri</i> f. <i>weismannia</i>	866
<i>Scenedesmus gutwinskii</i> var. <i>heterospina</i>	797	<i>Volvox dissipatrix</i>	731
<i>Scenedesmus gutwinskii</i> var. <i>heterospina</i>	798	<i>Volvox gigas</i>	867
<i>Scenedesmus gutwinskii</i> var. <i>heterospina</i>	799	<i>Volvox obversus</i>	868
<i>Scenedesmus gutwinskii</i> var. <i>heterospina</i>	800	<i>Volvox prolificus</i>	543
<i>Scenedesmus gutwinskii</i> var. <i>heterospina</i>	801	<i>Volvox rousseletii</i>	734
<i>Scenedesmus gutwinskii</i> var. <i>heterospina</i>	802	<i>Volvox tertius</i>	544
<i>Scenedesmus quadricauda</i>	96	<i>Volvox tertius</i>	869
<i>Scenedesmus serratus</i>	97	<i>Volvulina boldii</i>	893
<i>Schroederia setigera</i>	246	<i>Volvulina boldii</i>	894
<i>Stigeoclonium aestivale</i>	531	<i>Volvulina compacta</i>	582
<i>Stigeoclonium fasciculare</i>	532	<i>Volvulina compacta</i>	583
var. <i>fasciculare</i>		<i>Volvulina pringsheimii</i>	895
<i>Tetrabaena socialis</i>	691	<i>Volvulina steinii</i>	545
<i>Tetrabaena socialis</i> var. <i>socialis</i>	571	<i>Volvulina steinii</i>	546
<i>Tetracystis chlorococcoides</i>	155	<i>Volvulina steinii</i>	584
<i>Tetraëdron incus</i>	392	<i>Volvulina steinii</i>	585
<i>Trentepohlia</i> sp.	967	<i>Volvulina steinii</i>	896
<i>Treubaria triappendiculata</i>	394	<i>Volvulina steinii</i>	897
<i>Urnella terrestris</i>	156	<i>Volvulina steinii</i>	898
<i>Uronema confervicolum</i>	538	<i>Yamagishiella unicocca</i>	578
<i>Uronema gigas</i>	539	<i>Yamagishiella unicocca</i>	579
<i>Uronema gigas</i>	540	<i>Yamagishiella unicocca</i>	666
<i>Vitreochlamys aulata</i>	875	<i>Yamagishiella unicocca</i>	667
<i>Vitreochlamys aulata</i>	876	<i>Yamagishiella unicocca</i>	762
<i>Vitreochlamys aulata</i>	877	<i>Yamagishiella unicocca</i>	870
<i>Vitreochlamys aulata</i>	878	<i>Yamagishiella unicocca</i>	871
<i>Vitreochlamys fluviatilis</i>	879	<i>Yamagishiella unicocca</i>	872
<i>Vitreochlamys gloeocystiformis</i>	880	<i>Yamagishiella unicocca</i>	873

<i>Yamagishiella unicocca</i>	874	<i>Closterium peracerosum- strigosum-littorale</i> complex	55
Charophyceae		<i>Closterium peracerosum- strigosum-littorale</i> complex	56
<i>Closterium acerosum</i>	124	<i>Closterium peracerosum- strigosum-littorale</i> complex	57
<i>Closterium acerosum</i>	125	<i>Closterium peracerosum- strigosum-littorale</i> complex	58
<i>Closterium acerosum</i>	127	<i>Closterium peracerosum- strigosum-littorale</i> complex	59
<i>Closterium acerosum</i>	448	<i>Closterium peracerosum- strigosum-littorale</i> complex	60
<i>Closterium aciculare</i> var. <i>subpronum</i>	258	<i>Closterium peracerosum- strigosum-littorale</i> complex	61
<i>Closterium aciculare</i> var. <i>subpronum</i>	259	<i>Closterium peracerosum- strigosum-littorale</i> complex	62
<i>Closterium calosporum</i> var. <i>calosporum</i>	271	<i>Closterium peracerosum- strigosum-littorale</i> complex	63
<i>Closterium calosporum</i> var. <i>galiciense</i>	128	<i>Closterium peracerosum- strigosum-littorale</i> complex	64
<i>Closterium calosporum</i> var. <i>galiciense</i>	162	<i>Closterium peracerosum- strigosum-littorale</i> complex	65
<i>Closterium calosporum</i> var. <i>galiciense</i>	163	<i>Closterium peracerosum- strigosum-littorale</i> complex	66
<i>Closterium calosporum</i> var. <i>galiciense</i>	164	<i>Closterium peracerosum- strigosum-littorale</i> complex	67
<i>Closterium calosporum</i> var. <i>galiciense</i>	165	<i>Closterium peracerosum- strigosum-littorale</i> complex	68
<i>Closterium calosporum</i> var. <i>galiciense</i>	166	<i>Closterium peracerosum- strigosum-littorale</i> complex	69
<i>Closterium calosporum</i> var. <i>galiciense</i>	167	<i>Closterium peracerosum- strigosum-littorale</i> complex	70
<i>Closterium calosporum</i> var. <i>galiciense</i>	168	<i>Closterium peracerosum- strigosum-littorale</i> complex	261
<i>Closterium calosporum</i> var. <i>himalayense</i>	169	<i>Closterium peracerosum- strigosum-littorale</i> complex	262
<i>Closterium calosporum</i> var. <i>himalayense</i>	170	<i>Closterium pleurodermatum</i>	449
<i>Closterium calosporum</i> var. <i>himalayense</i>	171	<i>Closterium praelongum</i> var. <i>brevius</i>	450
<i>Closterium calosporum</i> var. <i>himalayense</i>	336	<i>Closterium praelongum</i> var. <i>brevius</i>	451
<i>Closterium ehrenbergii</i>	228	<i>Closterium pusillum</i> var. <i>maius</i>	185
<i>Closterium ehrenbergii</i>	229	<i>Closterium rostratum</i> var. <i>subrostratum</i>	338
<i>Closterium gracile</i>	179	<i>Closterium selenastrum</i>	339
<i>Closterium gracile</i>	180	<i>Closterium selenastrum</i>	340
<i>Closterium incurvum</i>	181	<i>Closterium spinosporum</i> var. <i>crassum</i>	186
<i>Closterium incurvum</i>	337	<i>Closterium spinosporum</i> var. <i>crassum</i>	187
<i>Closterium moniliferum</i> var. <i>moniliferum</i>	172	<i>Closterium spinosporum</i> var. <i>crassum</i>	341
<i>Closterium moniliferum</i> var. <i>moniliferum</i>	173	<i>Closterium spinosporum</i> var. <i>malaysiense</i>	188
<i>Closterium moniliferum</i> var. <i>moniliferum</i>	174	<i>Closterium spinosporum</i> var. <i>malaysiense</i>	189
<i>Closterium moniliferum</i>	182	<i>Closterium spinosporum</i> var. <i>ryukyuense</i>	191
var. <i>submoniliferum</i>		<i>Closterium spinosporum</i> var. <i>ryukyuense</i>	192
<i>Closterium moniliferum</i>	183		
var. <i>submoniliferum</i>			
<i>Closterium navicula</i>	175		
<i>Closterium navicula</i>	176		
<i>Closterium navicula</i>	177		
<i>Closterium navicula</i>	178		
<i>Closterium peracerosum- strigosum-littorale</i> complex	51		
<i>Closterium peracerosum- strigosum-littorale</i> complex	52		
<i>Closterium peracerosum- strigosum-littorale</i> complex	53		
<i>Closterium peracerosum- strigosum-littorale</i> complex	54		

<i>Closterium spinosporum</i> var. <i>ryukyuense</i>	193	<i>Pleurotaenium cylindricum</i>	306
<i>Closterium spinosporum</i> var. <i>spinosporum</i>	194	var. <i>stuhlmannii</i>	
<i>Closterium spinosporum</i> var. <i>spinosporum</i>	195	<i>Pleurotaenium ehrenbergii</i> var. <i>curtum</i>	307
<i>Closterium spinosporum</i> var. <i>spinosporum</i>	196	<i>Pleurotaenium ehrenbergii</i> var. <i>curtum</i>	308
<i>Closterium spinosporum</i> var. <i>spinosporum</i>	197	<i>Pleurotaenium ehrenbergii</i> var. <i>curtum</i>	311
<i>Closterium tumidum</i>	198	<i>Pleurotaenium ehrenbergii</i>	309
<i>Closterium venus</i>	199	var. <i>ehrenbergii</i>	
<i>Closterium wallichii</i>	200	<i>Pleurotaenium ehrenbergii</i>	310
<i>Closterium wallichii</i>	201	var. <i>ehrenbergii</i>	
<i>Closterium wallichii</i>	202	<i>Pleurotaenium nodosum</i> var. <i>borgei</i>	663
<i>Cosmarium askenasyi</i>	768	<i>Pleurotaenium nodosum</i> var. <i>borgei</i>	664
<i>Cosmarium askenasyi</i>	769	<i>Pleurotaenium nodosum</i> var. <i>gutwinskii</i>	787
<i>Cosmarium askenasyi</i>	770	<i>Pleurotaenium nodosum</i> var. <i>gutwinskii</i>	788
<i>Cosmarium askenasyi</i>	771	<i>Pleurotaenium nodosum</i> var. <i>nodosum</i>	312
<i>Cosmarium contractum</i>	133	<i>Pleurotaenium nodosum</i> var. <i>nodosum</i>	785
<i>Cosmarium dilatatum</i>	839	<i>Pleurotaenium nodosum</i> var. <i>nodosum</i>	786
<i>Cosmarium hians</i>	452	<i>Pleurotaenium ovatum</i>	313
<i>Cosmocladium constrictum</i>	248	<i>Spinoclosterium cuspidatum</i>	325
<i>Cylindrocystis brebissonii</i> var. <i>brebissonii</i>	349	<i>Spirogyra</i> sp.	1023
<i>Docidium undulatum</i> var. <i>undulatum</i>	285	<i>Staurastrum dejectum</i>	224
<i>Euastrum biverrucosum</i>	840	<i>Staurastrum dorcidentiferum</i>	665
<i>Euastrum turgidum</i>	772	<i>Staurastrum inconspicuum</i>	390
<i>Euastrum turgidum</i>	773	<i>Staurastrum levanderi</i>	841
<i>Gonatozygon brebissonii</i>	138	<i>Staurastrum paradoxum</i>	528
<i>Gonatozygon brebissonii</i>	139	<i>Staurastrum tsukubicum</i>	842
<i>Gonatozygon monotaenium</i>	247	<i>Triploceras gracile</i>	789
<i>Gonatozygon monotaenium</i>	287	<i>Triploceras gracile</i>	790
<i>Hyalotheca dissiliens</i>	147	<i>Triploceras gracile</i>	791
<i>Hyalotheca dissiliens</i>	148	<i>Triploceras gracile</i>	792
<i>Hyalotheca dissiliens</i>	149	<i>Triploceras gracile</i>	793
<i>Hyalotheca dissiliens</i>	150	<i>Triploceras gracile</i>	794
<i>Hyalotheca dissiliens</i>	294	<i>Triploceras gracile</i>	795
var. <i>dissiliens</i> f. <i>tridentula</i>		<i>Triploceras gracile</i>	796
<i>Mesotaenium kramstae</i>	657		
<i>Mesotaenium kramstae</i>	658		
<i>Micrasterias anomala</i>	774		
<i>Micrasterias anomala</i>	776		
<i>Micrasterias crux-melitensis</i>	152		
<i>Micrasterias foliacea</i>	777		
<i>Micrasterias foliacea</i>	778		
<i>Micrasterias foliacea</i> var. <i>foliacea</i>	297		
<i>Micrasterias mahabuleshwarensis</i>	779		
<i>Micrasterias mahabuleshwarensis</i>	780		
<i>Micrasterias thomasiana</i> var. <i>notata</i>	781		
<i>Micrasterias thomasiana</i> var. <i>notata</i>	782		
<i>Micrasterias truncata</i> var. <i>pusilla</i>	783		
<i>Micrasterias truncata</i> var. <i>pusilla</i>	784		
<i>Penium margaritaceum</i>	217		
<i>Penium margaritaceum</i>	303		

* The order of algal phyla and classes, and assignment of strains to each taxon in this index is according to the system in Chihara (Ed.), "Diversity and Evolution of Algae" (Shokabo, Tokyo, 1999), and Nakayama, T. (unpubl.).

PROTOZOA

Oligohymenophorea *

<i>Paramecium bursaria</i>	668
<i>Tetrahymena pyriformis</i>	403

* See Ref.226.

Bicoecea

<i>Cafeteria roenbergensis</i>	1012
--------------------------------	------

Placididea

<i>Placidia cafeteriopsis</i>	1013
<i>Placidia cafeteriopsis</i>	1014
<i>Wobblia lunata</i>	1015

X. REFERENCES

- 1 Allen, M. B. 1959 Studies with *Cyanidium caldarium*, an anomalously pigmented chlorophyte. *Arch. Mikrobiol.*, **32**, 270-277.
- 2 Aoyama, K., Uemura, I., Miyake, J. & Asada, Y. 1997 Fermentative metabolism to produce hydrogen gas and organic compounds in a cyanobacterium, *Spirulina platensis*. *J. Ferment. Bioeng.*, **83**, 17-20.
- 3 Aruga, Y. 1965 Ecological studies of photosynthesis and matter production of phytoplankton II. Photosynthesis of algae in relation to light intensity and temperature. *Bot. Mag. Tokyo*, **78**, 360-365.
- 4 Asada, Y. & Kawamura, S. 1986 Screening for cyanobacteria that evolve molecular hydrogen under dark and anaerobic conditions. *J. Ferment. Technol.*, **64**, 553-556.
- 5 Asada, Y., Kawamura, S. & Ho, K.-K. 1987 Hydrogenase from the unicellular cyanobacterium, *Microcystis aeruginosa*. *Phytochemistry*, **26**, 637-640.
- 6 Asai, R., Matsukawa, R., Ikebukuro, K. & Karube, I. 1998 Chemiluminescence flow-injection system for rapid detection of red tide phytoplankton, *Chattonella antiqua*. *Anal. Lett.*, **31**, 2279-2288.
- 7 Baldia, S. F., Fukami, K., Nishijima, T. & Hata, T. 1995 Growth responses of *Spirulina platensis* to some physico-chemical factors and the kinetics of phosphorus utilization. *Fish. Sci.*, **61**, 331-335.
- 8 Baldia, S. F., Nishijima, T., Fukami, K. & Hata, Y. 1994 Studies on the chemical composition of a cyanophyte, *Spirulina platensis*. In *The Third Asian Fisheries Forum*, Eds. by Chou, L. M., et al., Asian Fisheries Society, Manila, Philippines, 1994, p.940-943.
- 9 Ban, S. 1992 Effects of photoperiod, temperature, and population density on induction of diapause egg production in *Eurytemora affinis* (Copepoda: Calanoida) in Lake Ohnuma, Hokkaido, Japan. *J. Crustacean Biol.*, **12**, 361-367.
- 10 Ban, S. 1994 Effect of temperature and food concentration on post-embryonic development, egg production and adult body size of calanoid copepod *Eurytemora affinis*. *J. Plankton Res.*, **16**, 721-735.
- 11 Ban, S. & Minoda, T. 1994 Induction of diapause egg production in *Eurytemora affinis* by their own metabolites. *Hydrobiologia*, **292/293**, 185-189.
- 12 Bischoff, H. W. & Bold, H. C. 1963 Some soil algae from enchanted rock and related algal species. *Phycological Studies IV.*, Univ. Texas Publ. No. 6318, Texas, p. 95.
- 13 Brooks, A. E. 1966 The sexual cycle and intercrossing in the genus *Astrephomene*. *J. Protozool.*, **13**, 367-375.
- 14 Canini, A., Civitareale, P., Marini, S., Grilli Caiola, M. & Rotilio, G. 1992 Purification of iron superoxide dismutase from the cyanobacterium *Anabaena cylindrica* Lemm. and localization of the enzyme in heterocysts by immunogold labeling. *Planta*, **187**, 438-444.
- 15 Carefoot, J. R. 1966 Sexual reproduction and intercrossing in *Volvulina steinii*. *J. Phycol.*, **2**, 150-156.
- 16 Carefoot, J. R. 1968 Culture and heterotrophy of the freshwater dinoflagellate, *Peridinium cinctum* fa. *ovoplanum* Lindeman. *J. Phycol.*, **4**, 129-131.
- 17 Castenholz, R. W. 1969 Thermophilic blue-green algae and the thermal environment. *Bacteriol. Rev.*, **33**, 476-504.
- 18 Chihara, M., Inouye, I. & Takahata, N. 1986 *Oltmannsiellopsis*, a new genus of marine flagellate (Dunaliellaceae, Chlorophyceae). *Arch. Protistenk.*, **132**, 313-324.
- 19 Choi, K., Imai, A., Kim, B. & Matsushige, K. 2001 Properties of dissolved organic carbon (DOC) released by three species of blue-green algae. *Korean J. Limnol.*, **34**, 20-29.
- 20 Chu, S. P. 1942 The influence of the mineral composition of the medium on the growth of

- planktonic algae. Part I. Methods and culture media. *J. Ecol.*, **30**, 284-325.
- 21 Coesel, P. F. M. 1991 Ammonium dependency in *Closterium aciculare* T. West, a planktonic desmid from alkaline, eutrophic waters. *J. Plank. Res.*, **13**, 913-922.
- 22 Coleman, A. W. 1959 Sexual isolation in *Pandorina morum*. *J. Protozool.*, **6**, 249-264.
- 23 Connell, L. & Cattolico, R. A. 1996 Fragile algae: axenic culture of field-collected samples of *Heterosigma carterae*. *Mar. Biol.*, **125**, 421-426.
- 24 De Halperin, D. R., Mendoza, M. L. & De Caire, G. Z. 1973 Axenic cultures of blue-green algae (Cyanophyta). *Physis secc. B. Buenos Aires.*, **32**, 67-84 (in Spanish with English summary).
- 25 Denboh, T., Hendrayanti, D. & Ichimura, T. 2001 Monophyly of the genus *Closterium* and the order Desmidiaceae (Charophyceae, Chlorophyta) inferred from nuclear small subunit rDNA data. *J. Phycol.*, **37**, 1063-1072.
- 26 Ehara, M., Kitayama, T., Watanabe, K. I., Inagaki, Y., Hayashi-Ishimaru, Y. & Ohama, T. 1999 Comprehensive molecular phylogenetic analysis of a heterokont alga (NIES 548) using genes from all three cellular compartments. *Phycol. Res.*, **47**, 225-231.
- 27 Ehara, M., Watanabe, K. I., Kawai, H., Inagaki, Y., Hayashi-Ishimaru, Y. & Ohama, T. 1998 Distribution of the mitochondrial deviant genetic code AUA for methionine in heterokont algae. *J. Phycol.*, **34**, 1005-1008.
- 28 Ehara, T., Shihira-Ishikawa, I., Osafune, T., Hase, E. & Ohkuro, I. 1975 Some structural characteristics of chloroplast degeneration in cells of *Euglena gracilis* Z during their heterotrophic growth in darkness. *J. Electron Microscopy*, **24**, 253-261.
- 29 Erata, M. & Chihara, M. 1987 Cryptomonads from the Sugadaira-Moor, Central Japan. *Bull. Sugadaira Mont. Res. Center, Univ. Tsukuba*, **8**, 57-69 (in Japanese with English summary).
- 30 Erata, M. & Chihara, M. 1989 Re-examination of *Pyrenomonas* and *Rhodomonas* (Class Cryptophyceae) through ultrastructural survey of red pigmented cryptomonads. *Bot. Mag. Tokyo*, **102**, 429-443.
- 31 Erata, M. & Chihara, M. 1991 Cryptomonads of Japan (2) three species of *Chroomonas*. *J. Jpn. Bot.*, **66**, 7-11.
- 32 Erata, M., Kubota, M., Takahashi, T., Inouye, I. & Watanabe, M. 1995 Ultrastructure and phototactic action spectra of two genera of cryptophyte flagellate algae, *Cryptomonas* and *Chroomonas*. *Protoplasma*, **188**, 258-266.
- 33 Foy, R. H. & Gibson, C. E. 1982 Photosynthetic characteristics of planktonic blue-green algae: the response of twenty strains grown under high and low light. *Br. phycol. J.*, **17**, 169-182.
- 34 Fujii, K., Yahashi, Y., Nakano, T., Imanishi, S., Baldia, S. F. & Harada, K. 2002 Simultaneous detection and determination of the absolute configuration of thiazole-containing amino acids in a peptide. *Tetrahedron*, **58**, 6873-6879.
- 35 Fujita, Y. 1974 The light-induced oxidation-reduction reaction of cytochrome *b-559* in membrane fragments of the blue-green alga *Anabaena variabilis*. *Plant & Cell Physiol.*, **15**, 861-874.
- 36 Fujita, Y. 1975 Further investigation of the light-induced cytochrome *b-559* reaction in membrane fragments of the blue-green alga *Anabaena variabilis*. *Plant & Cell Physiol.*, **16**, 1037-1048.
- 37 Fujita, Y. 1976 The C550 photoresponse at room temperature observed in membrane fragments of the blue-green alga *Anabaena variabilis*. *Plant & Cell Physiol.*, **17**, 187-191.
- 38 Fujita, Y. & Hattori, A. 1960 Formation of phycoerythrin in pre-illuminated cells of *Tolypothrix tenuis* with special reference to nitrogen metabolism. *Plant & Cell Physiol.*, **1**, 281-292.
- 39 Fujita, Y. & Hattori, A. 1960 Effect of chromatic lights on phycobilin formation in a blue-green alga, *Tolypothrix tenuis*. *Plant & Cell Physiol.*, **1**, 293-303.
- 40 Fujita, Y. & Hattori, A. 1962 Preliminary note on a new phycobilin pigment isolated from blue-green algae. *J. Biochem.*, **51**, 89-91.

- 41 Fujita, Y. & Hattori, A. 1962 Changes in composition of cellular material during formation of phycobilin chromoproteids in a blue-green alga, *Tolypothrix tenuis*. *J. Biochem.*, **52**, 38-42.
- 42 Fujita, Y. & Hattori, A. 1962 Photochemical interconversion between precursors of phycobilin chromoproteids in *Tolypothrix tenuis*. *Plant & Cell Physiol.*, **3**, 209-220.
- 43 Fujita, Y. & Hattori, A. 1963 Occurrence of a purple bile pigment in phycoerythrin-rich cells of the blue-green alga, *Tolypothrix tenuis*. *J. Gen. Appl. Microbiol.*, **9**, 253-256.
- 44 Fujita, Y. & Hattori, A. 1963 Action spectrum of light-induced nitrite reduction in *Anabaena cylindrica*. *J. Gen. Appl. Microbiol.*, **9**, 257-265.
- 45 Fujita, Y. & Hattori, A. 1963 Effects of second chromatic illumination on phycobilin chromoprotein formation in chromatically preilluminated cells of *Tolypothrix tenuis*. *Plant & Cell Physiol., Spec. Iss. (Studies on Microalgae and Photosynthetic Bacteria)*, 431-440.
- 46 Fujita, Y. & Murano, F. 1968 Occurrence of back flow of electrons against the action of photochemical system I in sonicated lamellar fragments. In *Comparative Biochemistry and Biophysics of Photosynthesis*, Eds. by Shibata, K., et al., University of Tokyo Press, Tokyo, p. 161-169.
- 47 Fujita, Y. & Myers, J. 1966 Some properties of the cytochrome C reducing substance, a factor for light-induced redox reaction of cytochrome C in photosynthetic lamellae. *Plant & Cell Physiol.*, **7**, 599-606.
- 48 Fujita, Y., Ohama, H. & Hattori, A. 1964 Hydrogenase activity of cell-free preparation obtained from the blue-green alga, *Anabaena cylindrica*. *Plant & Cell Physiol.*, **5**, 305-314.
- 49 Fujita, Y., Pjon, C.-J. & Suzuki, R. 1974 Studies on the Hill reaction of membrane fragments of blue-green algae V. A correlation between the solubilization of a photochemically active chromoprotein (ACP) and the inactivation of photosystem II activity in membrane fragments of *Anabaena cylindrica*. *Plant & Cell Physiol.*, **15**, 779-787.
- 50 Fujita, Y. & Suzuki, R. 1971 Studies on the Hill reaction of membrane fragments of blue-green algae I. Stabilizing effect of various media on the 2,6-dichlorophenol indophenol-Hill activity of membrane fragments obtained from *Anabaena cylindrica* and *Anabaena variabilis*. *Plant & Cell Physiol.*, **12**, 641-651.
- 51 Fujita, Y. & Suzuki, R. 1973 Studies on the Hill reaction of membrane fragments of blue-green algae III. Fluorescence characteristics of membrane fragments of *Anabaena variabilis* and *Anabaena cylindrica*. *Plant & Cell Physiol.*, **14**, 249-260.
- 52 Fujita, Y. & Suzuki, R. 1973 Studies on the Hill reaction of membrane fragments of blue-green algae IV. Carotenoid photobleaching induced by photosystem II action. *Plant & Cell Physiol.*, **14**, 261-273.
- 53 Fujita, Y. & Tsuji, T. 1968 Photochemically active chromoprotein isolated from the blue-green alga *Anabaena cylindrica*. *Nature*, **219**, 1270-1271.
- 54 Fukumoto, R., Dohmae, N., Takio, K., Satoh, S., Fujii, T. & Sekimoto, H. 2002 Purification and characterization of a pheromone that induces sexual cell division in the unicellular green alga *Closterium ehrenbergii*. *Plant Physiol. Biochem.*, **40**, 183-188.
- 55 Fukumoto, R., Fujii, T. & Sekimoto, H. 1997 Detection and evaluation of a novel sexual pheromone that induces sexual cell division of *Closterium ehrenbergii* (Chlorophyta). *J. Phycol.*, **33**, 441-445.
- 56 Fukumoto, R., Fujii, T. & Sekimoto, H. 1998 A newly identified chemotactic sexual pheromone from *Closterium ehrenbergii*. *Sex. Plant. Reprod.*, **11**, 81-85.
- 57 Gontcharov, A. A. & Watanabe, M. M. 1999 Rare and new desmids (Desmidiaceae, Chlorophyta) from Japan. *Phycol. Res.*, **47**, 233-240.
- 58 Grilli Caiola, M., Canini, A., Galiazzo, F. & Rotilio, G. 1991 Superoxide dismutase in vegetative cells, heterocysts and akinetes of *Anabaena cylindrica* Lemm. *FEMS Microbiol. Letters*, **80**, 161-166.
- 59 Guillard, R. R. L. & Ryther, J. H. 1962 Studies of marine planktonic diatoms. I. *Cyclotella nana* Hustedt, and *Detonula confervacea* (Cleve)

- Gran. *Can. J. Microbiol.*, **8**, 229-239.
- 60 Hagiwara, T., Yagi, O., Takamura, Y. & Sudo, R. 1984 Isolation of bacteria-free *Microcystis aeruginosa* from Lake Kasumigaura. *Jpn. J. Water Poll. Res.*, **7**, 437-442 (in Japanese with English summary).
- 61 Hanazato, T. 1991 Interrelations between *Microcystis* and Cladocera in the highly eutrophic Lake Kasumigaura, Japan. *Int. Revue ges. Hydrobiol.*, **76**, 21-36.
- 62 Handa, S., Nakahara, M., Tsubota, H., Deguchi, H. & Nakano, T. 2003 A new aerial alga, *Stichococcus ampulliformis* sp. nov. (Trebouxiophyceae, Chlorophyta) from Japan. *Phycol. Res.*, **51**, 203-210.
- 63 Hara, Y. 1990 *Chattonella ovata* Y. Hara et Chihara mss. In *Red Tide Organisms in Japan - An Illustrated Taxonomic Guide*, Eds. by Fukuyo, Y., Takano, H., Chihara, M. & Matsuoka, K., Uchida Rokakuho, Tokyo, p. 340-341 (in Japanese with English summary).
- 64 Hara, Y. & Chihara, M. 1982 Ultrastructure and taxonomy of *Chattonella* (Class Raphidophyceae) in Japan. *Jpn. J. Phycol.*, **30**, 47-56 (in Japanese with English summary).
- 65 Hara, Y., Doi, K. & Chihara, M. 1994 Four new species of *Chattonella* (Raphidophyceae, Chromophyta) from Japan. *Jpn. J. Phycol. (Sôru)*, **42**, 407-420.
- 66 Hara, Y., Inouye, I. & Chihara, M. 1985 Morphology and ultrastructure of *Olisthodiscus luteus* (Raphidophyceae) with special reference to the taxonomy. *Bot. Mag. Tokyo*, **98**, 251-262.
- 67 Harashima, A., Watanabe, M. & Fujishiro, I. 1988 Evolution of bioconvection patterns in a culture of motile flagellates. *Phys. Fluids*, **31**, 764-775.
- 68 Hashimoto, H. 1997 Electron-opaque annular structure girdling the constricting isthmus of the dividing chloroplasts of *Heterosigma akashiwo* (Raphidophyceae, Chromophyta). *Protoplasma*, **197**, 210-216.
- 69 Hatakeyama, S., Fukushima, S., Kasai, F. & Shiraishi, H. 1994 Assessment of herbicide effects on algal production in the Kokai River (Japan) using a model stream and *Selenastrum* bioassay. *Ecotoxicology*, **3**, 143-156.
- 70 Hatano, S., Hara, Y. & Takahashi, M. 1983 Preliminary study on the effects of photoperiod and nutrients on the vertical migratory behavior of a red tide flagellate, *Heterosigma akashiwo*. *Jpn. J. Phycol.*, **31**, 263-269 (in Japanese with English summary).
- 71 Hattori, A. & Fujita, Y. 1959 Crystalline phycobilin chromoproteids obtained from a blue-green alga, *Tolypothrix tenuis*. *J. Biochem.*, **46**, 633-644.
- 72 Hattori, A. & Fujita, Y. 1959 Spectroscopic studies on the phycobilin pigments obtained from blue-green and red algae. *J. Biochem.*, **46**, 903-909.
- 73 Hattori, A. & Fujita, Y. 1959 Effect of pre-illumination on the formation of phycobilin pigments in a blue-green alga, *Tolypothrix tenuis*. *J. Biochem.*, **46**, 1259-1261.
- 74 Hattori, A. & Uesugi, I. 1968 Ferredoxin-dependent photoreduction of nitrate and nitrite by subcellular preparations of *Anabaena cylindrica*. In *Comparative Biochemistry and Biophysics of Photosynthesis*, Eds. by Shibata, K., et al., University of Tokyo Press, Tokyo, p. 201-205.
- 75 Hayashi-Ishimaru, Y., Ehara, M., Inagaki, Y. & Ohama, T. 1997 A deviant mitochondrial genetic code in prymnesiophytes (yellow-algae): UGA codon for tryptophan. *Curr Genet*, **32**, 296-299.
- 76 Hayashi-Ishimaru, Y., Ohama, T., Kawatsu, Y., Nakamura, K. & Osawa, S. 1996 UAG is a sense codon in several chlorophycean mitochondria. *Curr Genet*, **30**, 29-33.
- 77 Hepperle, D., Nozaki, H., Hohenberger, S., Huss, V. A. R., Morita, E. & Krienitz, L. 1998 Phylogenetic position of the Phacotaceae within the Chlamydomonadales as revealed by analysis of 18S rDNA and *rbcL* sequences. *J. Mol. Evol.*, **47**, 420-430.
- 78 Hino, S. 1991 An examination of algal bioassay method for agricultural chemicals and heavy metals in a water environment. *Hokkaido Kankyô Kagaku Kenkyû Sentâ Syohô*, **18**, 41-49 (in Japanese with English summary).

- 79 Hirabayashi, R. & Imamura, N. 2003 Action mechanism of a selective anti-cyanobacterial compound, argimicin A. *J. Antibiotics*, **56**, 154-159.
- 80 Hiroishi, S., Nakai, R., Seto, H., Yoshida, T. & Imai, I. 2002 Identification of *Heterocapsa circularisquama* by means of antibody. *Fish. Sci.*, **68**, *Suppl.*, 627-628.
- 81 Hiroishi, S., & Uchida, A., Nagasaki, K. & Ishida, Y. 1988 A new method for identification of inter- and intra-species of the red tide algae *Chattonella antiqua* and *Chattonella marina* (Raphidophyceae) by means of monoclonal antibodies. *J. Phycol.*, **24**, 442-444.
- 82 Hiroishi, S., Uchida, A., Nagasaki, K. & Ishida, Y. 1989 A new method for inter- and intra-species identification of red tide algae *Chattonella antiqua* and *Chattonella marina* by means of monoclonal antibodies. In *Red Tides: Biology, Environmental Science, and Toxicology*, Eds. by Okaichi, T., Anderson, D. M. & Nemoto, T., Elsevier Science Pub., New York, p. 299-300.
- 83 Hiroki, M., Shimizu, A., Li, R., Watanabe, M. & Watanabe, M. M. 1998 Development of a database system useful for identification of *Anabaena* spp. (Cyanobacteria). *Phycol. Res.*, **46**, *Suppl.*, 85-93.
- 84 Hiwatari, T., Kasai, F., Watanabe, M. M. & Nei, T. 1984 Cryopreservation of *Scenedesmus acutus* and *Pediastrum duplex* in liquid nitrogen - Survival and growth after freezing. *Jpn. J. Freez. Dry.*, **30**, 27-31 (in Japanese with English title).
- 85 Holm-Hansen, O., Gerloff, G. C. & Skoog, F. 1954 Cobalt as an essential element for blue-green algae. *Physiol. Planta.*, **7**, 665-675.
- 86 Houdai, T., Matsuoka, S., Murata, M., Satake, M., Ota, S., Oshima, Y. & Rhodes, L. L. 2001 Acetate labeling patterns of dinoflagellate polyketides, amphidinols 2, 3 and 4. *Tetrahedron*, **57**, 5551-5555.
- 87 Horiguchi, T. 1996 *Haramonas dimorpha* gen. et sp. nov. (Raphidophyceae), a new marine raphidophyte from Australian mangrove. *Phycol. Res.*, **44**, 143-150.
- 88 Hosomi, M. & Sudo, R. 1979 Studies on the effects of sediments on algal growth - Algal growth potential of sediments. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 6, 115-121 (in Japanese with English summary).
- 89 Hutner, S. H., Zahalsky, A. C., Aaronson, S., Baker, H. & Frank, O. 1966 Culture media for *Euglena gracilis*. In *Methods in Cell Physiology*. Vol. 2, Ed. by Prescott, D. M., Academic Press, New York, p. 217-228.
- 90 Ichimura, T. 1971 Sexual cell division and conjugation-papilla formation in sexual reproduction of *Closterium strigosum*. In *Proceedings of the Seventh International Seaweed Symposium*, University of Tokyo Press, Tokyo, p. 208-214.
- 91 Ichimura, T. 1973 The life cycle and its control in some species of *Closterium*, with special reference to the biological species problems. *Thesis D. Sci.*, University of Tokyo, 69 pp., 11 tables, 40 figs.
- 92 Ichimura, T. 1979 2. Isolation and culture methods of algae. 2.5.B. Freshwater algae [2. Sôrui no bunri to baiyôhô. 2.5.B. Tansui sôrui]. In *Methods in Phycological Studies [Sôrui Kenkyûhō]*, Eds. by Nishizawa, K. & Chihara, M., Kyoritsu Shuppan, Tokyo, p. 294-305 (in Japanese without English title).
- 93 Ichimura, T. 1981 Mating types and reproductive isolation in *Closterium ehrenbergii* Meneghini. *Bot. Mag. Tokyo*, **94**, 325-334.
- 94 Ichimura, T. 1983 Hybrid inviability and predominant survival of mating type minus progeny in laboratory crosses between two closely related mating groups of *Closterium ehrenbergii*. *Evolution*, **37**, 252-260.
- 95 Ichimura, T. 1997 *Chlamydomonas pulsatilla* Wollenweber from a supra-littoral rockpool on a small island offshore the city of Muroan, Hokkaido, Japan. *Algol. Stud.*, **85**, 23-29.
- 96 Ichimura, T. & Itoh, T. 1977 17. Preservation methods of microalgae (I) [17. Bisaisôrui no hozonhō (I)]. In *Preservation methods of microorganisms [Biseibutsu Hozonhō]*, Ed. by Nei, T., University of Tokyo Press, Tokyo, p. 355-373 (in Japanese without English title).
- 97 Ichimura, T. & Kasai, F. 1984 Post-zygotic isolation between allopatric mating groups of *Closterium ehrenbergii* Meneghini (Conjugato-

- phyceae). *Phycologia*, **23**, 77-85.
- 98 Ichimura, T. & Kasai, F. 1984 Time lapse analyses of sexual reproduction in *Closterium ehrenbergii* (Conjugatophyceae). *J. Phycol.*, **20**, 258-265.
- 99 Ichimura, T. & Kasai, F. 1985 Studies on the life cycle of *Spinoclosterium cuspidatum* (Bailey) Hirano (Conjugatophyceae). *Phycologia*, **24**, 205-216.
- 100 Ichimura, T. & Kasai, F. 1987 Time-lapse analyses of sexual isolation between two closely related mating groups of the *Closterium ehrenbergii* species complex (Chlorophyta). *J. Phycol.*, **23**, 523-534.
- 101 Ichimura, T. & Kasai, F. 1989 Life cycles of homothallic and heterothallic clones of *Triploceras gracile* Bailey (Desmidiaceae, Chlorophyta). *Phycologia*, **28**, 212-221.
- 102 Ichimura, T. & Watanabe, M. 1974 The *Closterium calosporum* complex from the Ryukyu Islands - Variation and taxonomical problems. *Mem. Natn. Sci. Mus. Tokyo*, **7**, 89-102, pls. 13-14.
- 103 Ichimura, T. & Watanabe, M. M. 1977 An axenic clone of *Microcystis aeruginosa* Kütz. emend. Elenkin from Lake Kasumigaura. *Bull. Jpn. Soc. Phycol.*, **25**, 177-181.
- 104 Iino, M. & Hashimoto, H. 2003 Intermediate features of cyanelle division of *Cyanophora paradoxa* (Glaucocystophyta) between cyanobacterial and plastid division. *J. Phycol.*, **39**, 561-569.
- 105 Ikegami, S., Imai, I., Kato, J. & Ohtake, H. 1995 Chemotaxis toward inorganic phosphate in the red tide alga *Chattonella antiqua*. *J. Plankton Res.*, **17**, 1587-1591.
- 106 Ikushima, T. 1975 Action of furylfuramide (AF-2) on chloroplasts of *Euglena gracilis*. *Annu. Rep. Res. Reactor Inst. Kyoto Univ.*, **8**, 83-85.
- 107 Imai, A., Fukushima, T. & Matsushige, K. 1999 Effects of aquatic humic substances on the growth of the cyanobacterium *Microcystis aeruginosa*. *J. Jpn. Soc. Wat. Environ. [Mizukankyô Gakkai Shi]*, **22**, 555-560 (in Japanese with English summary).
- 108 Imai, A., Fukushima, T. & Matsushige, K. 1999 Effects of iron limitation and aquatic humic substances on the growth of *Microcystis aeruginosa*. *Can. J. Fish. Aquat. Sci.*, **56**, 1929-1937.
- 109 Imai, I., Ishida, Y. & Hata, Y. 1993 Killing of marine phytoplankton by a gliding bacterium *Cytophaga* sp., isolated from the coastal sea of Japan. *Mar. Biol.*, **116**, 527-532.
- 110 Imai, I., Ishida, Y., Sakaguchi, K. & Hata, Y. 1995 Algicidal marine bacteria isolated from northern Hiroshima Bay, Japan. *Fish. Sci.*, **61**, 628-636.
- 111 Imai, I., Ishida, Y., Sawayama, S. & Hata, Y. 1991 Isolation of a marine gliding bacterium that kills *Chattonella antiqua* (Raphidophyceae). *Nippon Suisan Gakkaishi*, **57**, 1409.
- 112 Imai, I., Kim, M. C., Nagasaki, K., Itakura, S. & Ishida, Y. 1998 Detection and enumeration of microorganisms that are lethal to harmful phytoplankton in coastal waters. *Plankton Biol. Ecol.*, **45**, 19-29.
- 113 Imai, I., Kim, M. C., Nagasaki, K., Itakura, S. & Ishida, Y. 1998 Relationships between dynamics of red tide-causing raphidophycean flagellates and algicidal micro-organisms in the coastal sea of Japan. *Phycol. Res.*, **46**, 139-146.
- 114 Imai, I., Nakagiri, S., Nagai, K., Nagasaki, K., Itakura, S. & Yamaguchi, M. 1998 Fluctuations of algicidal microorganisms against the harmful dinoflagellate *Heterocapsa circularisquama* in Ago Bay, Mie Prefecture, Japan. *Bull. Nansei Natl. Fish. Res. Inst.*, **31**, 53-61 (in Japanese with English summary).
- 115 Imamura, N., Motoike, I., Noda, M., Adachi, K., Konno, A. & Fukami, H. 2000 Argimicin A, a novel anti-cyanobacterial compound produced by an algae-lysing bacterium. *J. Antibiotics*, **53**, 1317-1319.
- 116 Imamura, N., Motoike, I., Shimada, N., Nishikori, M., Morisaki, H. & Fukami, H. 2001 An efficient screening approach for anti-*Microcystis* compounds based on knowledge of aquatic microbial ecosystem. *J. Antibiotics*, **54**, 582-587.
- 117 Inagaki, Y., Ehara, M., Watanabe, K. I., Hayashi-Ishimaru, Y. & Ohama, T. 1998 Directionally

- evolving genetic code: the UGA codon from stop to tryptophan in mitochondria. *J. Mol. Evol.*, **47**, 378-384.
- 118 Inagaki, Y., Hayashi-Ishimaru, Y., Ehara, M., Igarashi, I. & Ohama, T. 1997 Algae or protozoa: phylogenetic position of euglenophytes and dinoflagellates as inferred from mitochondrial sequences. *J. Mol. Evol.*, **45**, 295-300.
- 119 Inamori, Y., Ohno, Y., Kaya, K., Watanabe, M. M. & Sudo, R. 1990 Studies on the removal and decomposition of *Microcystis viridis* toxic substance in the bio-film reactor. *Jpn. J. Water Poll. Res.*, **13**, 525-530 (in Japanese with English summary).
- 120 Iseki, M., Matsunaga, S., Murakami, A., Ohno, K., Shiga, K., Yoshida, K., Sugai, M., Takahashi, T., Hori, T. & Watanabe, M. 2002 A blue-light-activated adenylyl cyclase mediates photoavoidance in *Euglena gracilis*. *Nature*, **415**, 1047-1051.
- 121 Ishibashi, Y., Ichianagi, J., Gotoh, M. & Konno, H. 1993 Culture conditions and characteristics of offensive odor-producing substance in the genus *Uroglena* [*Uroglena* zoku no baiyôjôken to syûkibusshitsu tokusei]. In *Proceedings of 27th Annual Meeting of Japan Society on Water Environment* [Dai 27kai Nippon Mizukankyô-Gakkai Nenkaikôensyû], p. 282-283 (in Japanese with English title).
- 122 Ishida, K., Matsuda, H. & Murakami, M. 1998 Micropeptins 88-A to 88-F, chymotrypsin inhibitors from the cyanobacterium *Microcystis aeruginosa* (NIES-88). *Tetrahedron*, **54**, 5545-5556.
- 123 Ishida, K., Matsuda, H. & Murakami, M. 1998 Four new microginins, linear peptides from the cyanobacterium *Microcystis aeruginosa*. *Tetrahedron*, **54**, 13475-13484.
- 124 Ishida, K., Matsuda, H., Murakami, M. & Yamaguchi, K. 1996 Kawaguchipeptin A, a novel cyclic undecapeptide from cyanobacterium *Microcystis aeruginosa* (NIES-88). *Tetrahedron*, **52**, 9025-9030.
- 125 Ishida, K., Matsuda, H., Murakami, M. & Yamaguchi, K. 1996 The absolute stereochemistry of micropeptin 90. *Tetrahedron Letters*, **37**, 9225-9226.
- 126 Ishida, K., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Kawaguchipeptin B, an antibacterial cyclic undecapeptide from the cyanobacterium *Microcystis aeruginosa*. *J. Nat. Prod.*, **60**, 724-726.
- 127 Ishida, K., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Microginins 299-A and -B, leucine aminopeptidase inhibitors from the cyanobacterium *Microcystis aeruginosa* (NIES-299). *Tetrahedron*, **53**, 10281-10288.
- 128 Ishida, K., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Micropeptins 478-A and -B, plasmin inhibitors from the cyanobacterium *Microcystis aeruginosa*. *J. Nat. Prod.*, **60**, 184-187.
- 129 Ishida, K. & Murakami, M. 2000 Kasumigamide, an anti-algal peptide from the cyanobacterium *Microcystis aeruginosa*. *J. Org. Chem.*, **65**, 5898-5900.
- 130 Ishida, K., Murakami, M., Matsuda, H. & Yamaguchi, K. 1995 Micropeptin 90, a plasmin and trypsin inhibitor from the blue-green alga *Microcystis aeruginosa* (NIES-90). *Tetrahedron Letters*, **36**, 3535-3538.
- 131 Ishida, K., Nakagawa, H. & Murakami, M. 2000 Microcyclamide, a cytotoxic cyclic hexapeptide from the cyanobacterium *Microcystis aeruginosa*. *J. Nat. Prod.*, **63**, 1315-1317.
- 132 Ishida, K., Okita, Y., Matsuda, H., Okino, T. & Murakami, M. 1999 Aeruginosins, protease inhibitors from the cyanobacterium *Microcystis aeruginosa*. *Tetrahedron*, **55**, 10971-10988.
- 133 Ishimitsu, M. & Chihara, M. 1984 Four species of *Cryptomonas* (Class Cryptophyceae) in Japan. *J. Jpn. Bot.*, **59**, 161-169.
- 134 Ishitsuka, M. O., Kusumi, T., Kakisawa, H., Kaya, K. & Watanabe, M. M. 1990 Microviridin: a novel tricyclic depsipeptide from the toxic cyanobacterium *Microcystis viridis*. *J. Am. Chem. Soc.*, **112**, 8180-8182.
- 135 Itoh, Y., Murakami, H. & Ikeda, R. 1993 Studies on the growth limiting nutrients of red tide plankton in the tidal area. [Kanchô-iki ni okeru akashio gen'in sôru no zôshoku yokusei inshi no suitei.] *Proc. Coast. Engineering, JSCE* [Kaigan Kôgaku Ronbun-shû], **40**, 1001-1005 (in Japanese without English title).

- 136 Itou, Y., Ishida, K., Shin, H. J. & Murakami, M. 1999 Oscillapeptins A to F, serine protease inhibitors from the three strains of *Oscillatoria agardhii*. *Tetrahedron*, **55**, 6871-6882.
- 137 Itou, Y., Okada, S. & Murakami, M. 2001 Two structural isomeric siderophores from the freshwater cyanobacterium *Anabaena cylindrica* (NIES-19). *Tetrahedron*, **57**, 9093-9099.
- 138 Itou, Y., Suzuki, S., Ishida, K. & Murakami, M. 1999 Anabaenopeptins G and H, potent carboxypeptidase A inhibitors from the cyanobacterium *Oscillatoria agardhii* (NIES-595). *Bioorg. Med. Chem. Lett.*, **9**, 1243-1246.
- 139 Iwahori, K., Miyata, N., Umeda, Y., Aoyama, K., Shimoi, K. & Kinai, N. 1999 Applicability of environmental microorganisms to alkaline single cell gel electrophoresis (comet) assay. *Jpn. J. Water Treat. Biol.*, **35**, 261-270 (in Japanese with English summary).
- 140 Iwami, N., Inamori, Y., Sugiura, N. & Matsumura, M. 1996 Degradation characteristics of toxic *Microcystis viridis* by Mastigophora, *Monas guttula* using aquatic large scale microcosm. *J. Jpn. Soc. Wat. Environ.* **19**, 140-146.
- 141 Iwamoto, K. & Ikawa, T. 2000 A novel glycolate oxidase requiring flavin mononucleotide as the cofactor in the prasinophycean alga *Mesostigma viride*. *Plant Cell Physiol.*, **41**, 988-991.
- 142 Iwasaki, H., Fujiyama, T. & Yamashita, E. 1968 Studies on the red tide dinoflagellates - I. On *Entomosigma* sp. appeared in coastal area of Fukuyama. *J. Fac. Fish. Anim. Husb. Hiroshima Univ.*, **7**, 259-267 (in Japanese with English summary).
- 143 Iwasaki, H. & Sasada, K. 1969 Studies on the red tide dinoflagellates - II. On *Heterosigma inlandica* appeared in Gokasho Bay, Shima Peninsula. *Bull. Jpn. Soc. Sci. Fish.*, **35**, 943-947 (in Japanese with English summary).
- 144 Iwata, H., et al. 1991 Methods for producing heat-unsoluble β -1,3-glucan [Kanetsu gyôkosei β -1,3-glucan no seizôhô]. In *Nippon-koku Tokkyo-chô (JP), Kôkai Tokkyo Kôhô (A), Hei3-163102*, 5 pp (in Japanese without English title).
- 145 Jang, M-H., Ha, K., Joo, G-J. & Takamura, N. 2003 Toxin production of cyanobacteria is increased by exposure to zooplankton. *Freshwater Biol.*, **48**, 1540-1550.
- 146 Johnson, L. M., Hoagland, K. D. & Gretz, M. R. 1995 Effects of bromide and iodine on stalk secretion in the biofouling diatom *Achnanthes longipes* (Bacillariophyceae). *J. Phycol.*, **31**, 401-412.
- 147 Kajiwara, S., Kakizono, T., Saito, T., Kondo, K., Ohtani, T., Nishio, N., Nagai, S. & Misawa, N. 1995 Isolation and functional identification of a novel cDNA for astaxanthin biosynthesis from *Haematococcus pluvialis*, and astaxanthin synthesis in *Escherichia coli*. *Plant Mol. Biol.*, **29**, 343-352.
- 148 Kakizono, T., Kobayashi, M. & Nagai, S. 1992 Effect of carbon/nitrogen ratio on encystment accompanied with astaxanthin formation in a green alga, *Haematococcus pluvialis*. *J. Ferment. Bioeng.*, **74**, 403-405.
- 149 Kaneko, H. & Yamaguchi, M. 1995 Toxicity evaluation of municipal solid waste incinerator fly ash by algal assay. *Reports Facul. Eng. Yamanashi Univ.*, **46**, 84-89 (in Japanese with English summary).
- 150 Kaneko, H., Yamaguchi, M. & Ikeda, F. 1996 Toxicity of municipal solid waste incinerator fly ash and the contribution of Cadmium. *J. Jpn. Soc. Wat. Environ.* [Mizukankyô Gakkai Shi], **19**, 563-568 (in Japanese with English summary).
- 151 Kang, B.-H., Tan, S., & Ho, K.-K. 1988 Isolation of water-soluble cytochromes from cyanobacteria by adsorption chromatography. *Archiv. Biochem. Biophysics*, **263**, 387-393.
- 152 Kang, C. B. H. & Ho, K.-K. 1991 Characterization of a soluble inorganic pyrophosphatase from *Microcystis aeruginosa*. *Archiv. Biochem. Biophysics*, **289**, 281-288.
- 153 Kasai, F. & Arts, M. T. 1998 The interactive effects of UV-B radiation and a herbicide on uptake and allocation of carbon in two strains of the green alga *Scenedesmus*. *Aqua. Ecol.*, **31**, 261-272.
- 154 Kasai, F. & Hanazato, T. 1995 Genetic changes in phytoplankton communities exposed to the herbicide simetryn in outdoor experimental

- ponds. *Arch. Environ. Contam. Toxicol.*, **28**, 154-160.
- 155 Kasai, F. & Hatakeyama, S. 1993 Herbicide susceptibility in two green algae, *Chlorella vulgaris* and *Selenastrum capricornutum*. *Chemosphere*, **27**, 899-904.
- 156 Kasai, F. & Hatakeyama, S. 1996 Changes in herbicide susceptibility of algae in a river running through an agricultural region. *Ecol. Chem. (St. Petersburg)*, **5**, 292-296.
- 157 Kasai, F. & Ichimura, T. 1986 Morphological variabilities of three closely related mating groups of *Closterium ehrenbergii* Meneghini (Chlorophyta). *J. Phycol.*, **22**, 158-168.
- 158 Kasai, F. & Ichimura, T. 1990 Temperature optima of three closely related mating groups of the *Closterium ehrenbergii* (Chlorophyta) species complex. *Phycologia*, **29**, 396-402.
- 159 Kasai, F., Takamura, N. & Hatakeyama, S. 1993 Effects of simetryne on growth of various freshwater algal taxa. *Environ. Poll.*, **79**, 77-83.
- 160 Kato, A., Obokata, J. & Sasaki, K. 1981 Mating type interaction in *Closterium peracerosum-strigosum-littorale*: mating induced protoplast release. *Plant & Cell Physiol.*, **22**, 1215-1222.
- 161 Kato, A., Ohmura, K., Kanazawa, H. & Sasaki, K. 1983 Natural and artificial production of protoplasts from heterothallic and homothallic *Closterium*. *J. Fac. Sci., Hokkaido Univ., Ser. V (Bot.)*, **13**, 7-15.
- 162 Kato, A. & Sasaki, K. 1983 Effects of tunica-mycin on sexual reproduction in heterothallic strains of *Closterium*. *J. Fac. Sci., Hokkaido Univ., Ser. V (Bot.)*, **13**, 1-6.
- 163 Kato, S. 1982 Laboratory culture and morphology of *Colacium vesiculosum* Ehrb. (Euglenophyceae). *Jpn. J. Phycol.*, **30**, 63-67 (in Japanese with English summary).
- 164 Kato, T., Watanabe, M. F. & Watanabe M. 1991 Allozyme divergence in *Microcystis* (Cyanophyceae) and its taxonomic inference. *Algological Studies*, **64**, 129-140.
- 165 Kato, T., Watanabe, M. F., Watanabe, M. & Hara, Y. 1991 Allozyme genotype and toxin composition of the *Microcystis* strains from Lake Okutama-ko (1). *Bull. Natn. Sci. Mus., Tokyo, Ser. B* **17**, 1-4.
- 166 Kato-Minoura, T., Okumura, M., Hirono, M. & Kamiya, R. 2003 A novel family of unconventional actins in Volvocalean algae. *J. Mol. Evol.*, **57**, 555-561.
- 167 Kawai, H., Maeba, S., Sasaki, H., Okuda, K. & Henry, E. C. 2003 *Schizocladia ischiensis*: a new filamentous marine chromophyte belonging to a new class, Schizocladiphyceae. *Protist*, **154**, 211-228.
- 168 Kawanobe, K. 1990 A report in the completion of the research work [Chōsa kenkyū syūryō no hōkoku]. Unpublished report in Kurashiki-shi Kankyō Hozen Kyōkai, 3 pp. (in Japanese without English title).
- 169 Kaya, K. & Sano, T. 1998 A photodetoxification mechanism of the cyanobacterial hepatotoxin microcystin-LR by ultraviolet irradiation. *Chem. Res. Toxicol.*, **11**, 159-163.
- 170 Kaya, K. & Watanabe, M. M. 1990 Microcystin composition of an axenic clonal strain of *Microcystis viridis* and *Microcystis viridis*-containing waterblooms in Japanese freshwaters. *J. Appl. Phycol.*, **2**, 173-178.
- 171 Kim, D., Nakamura, A., Okamoto, T., Komatsu, N., Oda, T., Ishimatsu, A. & Muramatsu, T. 1999 Toxic potential of the raphidophyte *Olisthodiscus luteus*: mediation by reactive oxygen species. *J. Plankton Res.*, **21**, 1017-1027.
- 172 Kim, D., Oda, T., Ishimatsu, A. & Muramatsu, T. 2000 Galacturonic-acid-induced increase of superoxide production in red tide phytoplankton *Chattonella marina* and *Heterosigma akashiwo*. *Biosci. Biotechnol. Biochem.*, **64**, 911-914.
- 173 Kim, D., Okamoto, T., Oda, T., Tachibana, K., Lee, K. S., Ishimatsu, A., Matsuyama, Y., Honjo, T. & Muramatsu, T. 2001 Possible involvement of the glycocalyx in the ichthyotoxicity of *Chattonella marina* (Raphidophyceae): immunological approach using antiserum against cell surface structures of the flagellate. *Mar. Biol.*, **139**, 625-632.
- 174 Kim, D., Sato, Y., Oda, T., Muramatsu, T., Matsuyama, Y. & Honjo, T. 2000 Specific toxic effect of dinoflagellate *Heterocapsa*

- circularisquama* on the rotifer *Brachionus plicatilis*. *Biosci. Biotechnol. Biochem.*, **64**, 2719-2722.
- 175 Kim, M.-C., Yoshinaga, I., Imai, I., Nagasaki, K., Itakura, S. & Ishida, Y. 1998 A close relationship between algicidal bacteria and termination of *Heterosigma akashiwo* (Raphidophyceae) blooms in Hiroshima Bay, Japan. *Mar. Ecol. Prog. Ser.*, **170**, 25-32.
- 176 Kim, Y.-S., Oyaizu, H., Matsumoto, S., Watanabe, M. M. & Nozaki, H. 1994 Chloroplast small-subunit ribosomal RNA gene sequence from *Chlamydomonas parkeae* (Chlorophyta) : molecular phylogeny of a green alga with a peculiar pigment composition. *Eur. J. Phycol.*, **29**, 213-217.
- 177 Kimura, B. & Ishida, Y. 1985 Photophagotrophy in *Uroglena americana*, Chrysophyceae. *Jpn. J. Limnol.*, **46**, 315-318.
- 178 Kimura, B. & Ishida, Y. 1986 Possible phagotrophic feeding of bacteria in a freshwater red tide Chrysophyceae *Uroglena americana*. *Bull. Jpn. Soc. Sci. Fish.*, **52**, 697-701.
- 179 Kimura, B., Ishida, Y. & Kadota, H. 1986 Effect of naturally collected bacteria on growth of *Uroglena americana*, a freshwater red tide Chrysophyceae. *Bull. Jpn. Soc. Sci. Fish.*, **52**, 691-696.
- 180 Kinugawa, K., Etoh, M., Kuba, T. & Kusuda, T. 1999 A possibility of control and prevention of excessive phytoplankton growth by photochromism. *J. Jpn. Soc. Wat. Environ.*, **22**, 932-937 (in Japanese with English summary).
- 181 Kita, T. & Fukuyo, Y. 1988 Description of the Gonyaulacoid dinoflagellate *Alexandrium hiranoi* sp. nov. inhabiting tidepools on Japanese Pacific coast. *Bull. Plank. Soc. Jpn.*, **35**, 1-7.
- 182 Kita, T., Fukuyo, Y., Tokuda, H. & Hirano, R. 1993 Sexual reproduction of *Alexandrium hiranoi* (Dinophyceae). *Bull. Plank. Soc. Jpn.*, **39**, 79-85.
- 183 Kiyohara, T., Fujita, Y., Hattori, A. & Watanabe, A. 1962 Effect of light on glucose assimilation in *Tolypothrix tenuis*. *J. Gen. Appl. Microbiol.*, **8**, 165-168.
- 184 Kobayashi, H., Ohta, S., Murao, N., Tachibana, H. & Yamagata, S. 2000 Radiative transfer model for satellite remote sensing of ocean colors in coastal zones. *J. Global Environ. Eng.*, **6**, 13-31.
- 185 Kobayashi, M., Hirai, N., Kurimura, Y., Ohigashi, H. & Tsuji, Y. 1997 Abscisic acid-dependent algal morphogenesis in the unicellular green alga *Haematococcus pluvialis*. *Plant Growth Regulation*, **22**, 79-85.
- 186 Kobayashi, M., Kakizono, T. & Nagai, S. 1991 Astaxanthin production by a green alga, *Haematococcus pluvialis* accompanied with morphological changes in acetate media. *J. Ferment. Bioeng.*, **71**, 335-339.
- 187 Kobayashi, M., Kakizono, T. & Nagai, S. 1993 Enhanced carotenoid biosynthesis by oxidative stress in acetate-induced cyst cells of a green unicellular alga, *Haematococcus pluvialis*. *Appl. Environ. Microbiol.*, **59**, 867-873.
- 188 Kobayashi, M., Kakizono, T. & Nagai, S. 1993 Photo-dependent astaxanthin biosynthesis in a green alga, *Haematococcus pluvialis*. *Seibutsu-Kôgaku*, **71**, 233-237 (in Japanese with English summary).
- 189 Kobayashi, M., Kakizono, T., Nishio, N. & Nagai, S. 1992 Effects of light intensity, light quality, and illumination cycle on astaxanthin formation in a green alga, *Haematococcus pluvialis*. *J. Ferment. Bioeng.*, **74**, 61-63.
- 190 Kobayashi, M., Kakizono, T., Nishio, N., Nagai, S., Kurimura, Y. & Tsuji, Y. 1997 Antioxidant role of astaxanthin in the green alga *Haematococcus pluvialis*. *Appl. Microbiol. Biotechnol.*, **48**, 351-356.
- 191 Kobayashi, M., Kakizono, T., Yamaguchi, K., Nishio, N. & Nagai, S. 1992 Growth and astaxanthin formation of *Haematococcus pluvialis* in heterotrophic and mixotrophic conditions. *J. Ferment. Bioeng.*, **74**, 17-20.
- 192 Kobayashi, M., Kurimura, Y., Kakizono, T., Nishio, N. & Tsuji, Y. 1997 Morphological changes in the life cycle of the green alga *Haematococcus pluvialis*. *J. Ferment. Bioeng.*, **84**, 94-97.

- 193 Kobayashi, M., Kurimura, Y., Sakamoto, Y. & Tsuji, Y. 1997 Selective extraction of astaxanthin and chlorophyll from the green alga *Haematococcus pluvialis*. *Biotech. Tech.*, **11**, 657-660.
- 194 Kobayashi, M., Kurimura, Y. & Tsuji, Y. 1997 Light-independent, astaxanthin production by the green microalga *Haematococcus pluvialis* under salt stress. *Biotech. Lett.*, **19**, 507-509.
- 195 Kobayashi, M., Todoroki, Y., Hirai, N., Kurimura, Y., Ohigashi, H. & Tsuji, Y. 1998 Biological activities of abscisic acid analogs in the morphological change of the green alga *Haematococcus pluvialis*. *J. Ferment. Bioeng.*, **85**, 529-531.
- 196 Kodani, S., Ishida, K. & Murakami, M. 1998 Dehydroradiosumin, a trypsin inhibitor from the cyanobacterium *Anabaena cylindrica*. *J. Nat. Prod.*, **61**, 854-856.
- 197 Kodani, S., Ishida, K. & Murakami, M. 1998 Aeruginosin 103-A, a thrombin inhibitor from the cyanobacterium *Microcystis viridis*. *J. Nat. Prod.*, **61**, 1046-1048.
- 198 Kodani, S., Ishida, K. & Murakami, M. 1999 Occurrence and identification of UDP-N-acetylmuramyl-pentapeptide from the cyanobacterium *Anabaena cylindrica*. *FEMS Microbiol. Lett.*, **176**, 321-325.
- 199 Kohata, K. & Watanabe, M. 1984 The use of a controlled experimental ecosystem (Microcosm) in studies of mechanism of red tide outbreaks (II) - Growth of *Heterosigma akashiwo*, red tide flagellate, in Microcosm. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **63**, 111-121 (in Japanese with English summary).
- 200 Kohata, K. & Watanabe, M. 1986 Synchronous division and the pattern of diel vertical migration of *Heterosigma akashiwo* (Hada) Hada (Raphidophyceae) in a laboratory culture tank. *J. Exp. Mar. Biol. Ecol.*, **100**, 209-224.
- 201 Kohata, K. & Watanabe, M. 1987 The use of a controlled experimental ecosystem (Microcosm) in studies of mechanism of red tide outbreaks (V) - Growth and cell volume change of *Heterosigma akashiwo*, a red tide flagellate. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **110**, 57-66 (in Japanese with English summary).
- 202 Kohata, K. & Watanabe, M. 1987 The use of a controlled experimental ecosystem (Microcosm) in studies of mechanism of red tide outbreaks (VI) - Diurnal changes of C/N ratio and distribution of chloroplast pigments in the culture of *Chattonella antiqua*, a red tide flagellate. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **110**, 67-77 (in Japanese with English summary).
- 203 Kohata, K. & Watanabe, M. 1987 The use of a controlled experimental ecosystem (Microcosm) in studies of mechanism of red tide outbreaks (VII) - Growth and its mathematical model of *Heterosigma akashiwo*, a red tide flagellate, in light-limited synchronous cultures. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **110**, 79-88 (in Japanese with English summary).
- 204 Kohata, K. & Watanabe, M. 1988 Diel changes in the composition of photosynthetic pigments and cellular carbon and nitrogen in *Chattonella antiqua* (Raphidophyceae). *J. Phycol.*, **24**, 58-66.
- 205 Kohata, K. & Watanabe, M. 1989 Diel changes in the composition of photosynthetic pigments and cellular carbon and nitrogen in *Pyramimonas parkeae* (Prasinophyceae). *J. Phycol.*, **25**, 377-385.
- 206 Kohata, K., Watanabe, M. & Yamanaka, K. 1991 Highly sensitive determination of photosynthetic pigments in marine *in situ* samples by high-performance liquid chromatography. *J. Chromatography*, **558**, 131-140.
- 207 Kohata, K., Watanabe, M. M., Nakamura, Y. & Watanabe, M. 1982 Growth and phosphate uptake kinetics in *Olisthodiscus luteus*: grown on synchronized batch cultures. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **30**, 95-111 (in Japanese with English summary).
- 208 Koike, H., Shibata, M., Yasutomi, K., Kashino, Y. & Satoh, K. 2000 Identification of photosystem I components from a glaucocystophyte, *Cyanophora paradoxa*: The PsaD protein has an N-terminal stretch homologous to higher plants. *Photosynth. Res.*, **65**, 207-217.
- 209 Kondo, F., Ikai, Y., Oka, H., Ishikawa, N., Watanabe, M. F., Watanabe, M., Harada, K. & Suzuki, M. 1992 Separation and identification of microcystins in cyanobacteria by frit-fast atom bombardment liquid chromatography / mass

- spectrometry. *Toxicon*, **30**, 227-237.
- 210 Kondo, R., Kagiya, G., Hiroishi, S. & Watanabe, M. 2000 Genetic typing of a bloom-forming cyanobacterial genus *Microcystis* in Japan using 16S rRNA gene sequence analysis. *Plankton Biol. Ecol.*, **47**, 1-6.
- 211 Kondo, R., Kagiya, G., Hiroishi, S., Watanabe, M. & Hata, Y. 1999 Rapid DNA extraction from a bloom-forming cyanobacterium. *Microb. Environ.*, **14**, 157-161.
- 212 Kondo, R., Kagiya, G., Komura, M., Yuki, Y., Hiroishi, S. & Watanabe, M. 2000 Molecular taxonomy of a bloom-forming cyanobacterial genus *Microcystis*. *Bull. Plankton Soc. Japan*, **47**, 25-33 (in Japanese with English summary).
- 213 Kondo, R., Kagiya, G., Yuki, Y., Hiroishi, S. & Watanabe, M. 1998 Taxonomy of a bloom-forming cyanobacterial genus *Microcystis*. *Nippon Suisan Gakkaishi*, **64**, 291-292 (in Japanese with English title).
- 214 Kondo, R., Komura, M., Hiroishi, S. & Hata, Y. 1998 Detection and 16S rDNA sequence analysis of a bloom-forming cyanobacterial genus *Microcystis*. *Fish. Sci.*, **64**, 840-841.
- 215 Kondo, R., Yoshida, T., Yuki, Y., & Hiroishi, S. 2000 DNA-DNA reassociation among a bloom-forming cyanobacterial genus, *Microcystis*. *Int. J. Syst. Evol. Microbiol.*, **50**, 767-770.
- 216 Konno, R. & Wakabayashi, A. 1987 Effects of chemical substance on the growth of algae [Sôru no zôsyoku ni oyobosu kagakubusshitsu no eikyô]. *Tokyo-to Kankyô Kagaku Kenkyûjo Nenpô*. 1987, 4 pp. (in Japanese without English title).
- 217 Kumagai, M., Takamura, Y., Yagi, O. & Sudo, R. 1986 Interactions between *Microcystis aeruginosa* and *Moraxella nonliquefaciens*. *Jpn. J. Limnol.*, **47**, 219-228 (in Japanese with English summary).
- 218 Kusumi, T., Ooi, T., Watanabe, M. M. Takahashi, H. & Kakisawa, H. 1987 Cyanoviridin RR, a toxin from the cyanobacterium (blue-green alga) *Microcystis viridis*. *Tetrahedron Letters*, **28**, 4695-4698.
- 219 Lee, H. & Ban, S. 1999 Effect of crowding on growth and reproduction of *Simocephalus vetulus* O.F.Müller. *Hydrobiologia*, **391**, 135-145.
- 220 Lee, H.-W., Ban, S., Ando, Y., Ota, T. & Ikeda, T. 1999 Deleterious effect of diatom diets on egg production and hatching success in the marine copepod *Pseudocalanus newmani*. *Plankton Biol. Ecol.*, **46**, 104-112.
- 221 Lee, H-W., Ban, S., Ikeda, T. & Matsuishi, T. 2003 Effect of temperature on development, growth and reproduction in the marine copepod *Pseudocalanus newmani* at satiating food condition. *J. Plankton Res.*, **25**, 261-271.
- 222 Lee, K.-Y., Park, J.-H. & Park, B.-S. 1996 CO₂ fixation and SCP production using blue green algae. *Theories and Applications of Chem. Eng. (Korea)*, **2**, 489-492 (in Korean with English title).
- 223 Lee, T., Tsuzuki, M., Takeuchi, T., Yokoyama, K. & Karube, I. 1994 *In vivo* fluorometric method for early detection of cyanobacterial waterblooms. *J. Appl. Phycol.*, **6**, 489-495.
- 224 Lee, T., Tsuzuki, M., Takeuchi, T., Yokoyama, K. & Karube, I. 1995 Quantitative determination of cyanobacteria in mixed phytoplankton assemblages by an *in vivo* fluorimetric method. *Anal. Chim. Acta*, **302**, 81-87.
- 225 Lemieux, C., Otis, C. & Turmel, M. 2000 Ancestral chloroplast in *Mesostigma viride* reveals an early branch of green plant evolution. *Nature*, **403**, 649-652.
- 226 Levine, N. D., Corliss, J. O., Cox, F. E. G., Deroux, G., Grain, J., Honigberg, B. M., Leedale, G. F., Loeblich, III, A. R., Lom, J., Lynn, D., Merinfeld, E. G., Page, F. C., Poljansky, G., Sprague, V., Vavra, J. & Wallace, F. G. 1980 A newly revised classification of the Protozoa. *J. Protozool.*, **27**, 37-58.
- 227 Li, R., Yokota, A., Sugiyama, J., Watanabe, M., Hiroki, M. & Watanabe, M. M. 1998 Chemotaxonomy of planktonic cyanobacteria based on non-polar and 3-hydroxy fatty acid composition. *Phycol. Res.*, **46**, 21-28.
- 228 Liu, C. B., Lin, L. P. & Su, Y. C. 1996 Utilization of *Chlorella vulgaris* for uptake of nitrogen, phosphorus and heavy metals. *J. Chin.*

- Agr. Chem. Soc.*, **34**, 331-343 (in Chinese with English summary).
- 229 Maki, T. & Imai, I. 2001 Effects of harmful dinoflagellate *Heterocapsa circularisquama* cells on the growth of intracellular bacteria. *Micr. Environ.*, **16**, 234-239.
- 230 Makino, W. & Ban, S. 2000 Response of life history traits to food conditions in a cyclopid copepod from an oligotrophic environment. *Limnol. Oceanogr.*, **45**, 396-407.
- 231 Marin, B. & Melkonian, M. 1994 Flagellar hairs in prasinophytes (Chlorophyta): ultrastructure and distribution on the flagellar surface. *J. Phycol.*, **30**, 659-678.
- 232 Matsuda, H., Okino, T., Murakami, M. & Yamaguchi, K. 1996 Aeruginosins 102-A and B, new thrombin inhibitors from the cyanobacterium *Microcystis viridis* (NIES-102). *Tetrahedron*, **52**, 14501-14506.
- 233 Matsuda, H., Okino, T., Murakami, M. & Yamaguchi, K. 1996 Radiosumin, a trypsin inhibitor from the blue-green alga *Plectonema radiosum*. *J. Org. Chem.*, **61**, 8648-8650.
- 234 Matsunaga, S., Hori, T., Takahashi, T., Kubota, M., Watanabe, M., Okamoto, K., Masuda, K. & Sugai, M. 1998 Discovery of signaling effect of UV-B/C light in the extended UV-A/blue-type action spectra for step-down and step-up photophobic responses in the unicellular flagellate alga *Euglena gracilis*. *Protoplasma*, **201**, 45-52.
- 235 Matsunaga, S., Takahashi, T., Watanabe, M., Sugai, M. & Hori, T. 1999 Control by ammonium ion of the change from step-up to step-down photophobically responding cells in the flagellate alga *Euglena gracilis*. *Plant Cell Physiol.*, **40**, 213-221.
- 236 Matsunaga, S., Watanabe, S., Sakaushi, S., Miyamura, S. & Hori, T. 2003 Screening effect diverts the swimming directions from diaphototactic to positive phototactic in a disk-shaped green flagellate *Mesostigma viride*. *Photochem. Photobiol.*, **77**, 324-332.
- 237 Mihara, S. & Hase, E. 1976 A short note on the effects of 6-methyl purine on the revolution of the cell cycle of *Chlorella pyrenoidosa* in synchronous culture. *Plant & Cell Physiol.*, **17**, 403-406.
- 238 Miya, A., Adachi, T., Tazawa, R., Suzuki, S., Kanki, R., Toyobe, M. & Oguchi, M. 1994 Gas revitalization by microalgae II. CO₂/O₂ gas exchange system. *CELSS J.*, **7**, 29-34 (in Japanese with English summary).
- 239 Miyagi, N., Satoh, E. & Fujii, T. 1989 Effects of *n*-alkylamines on the motility and viability of *Heterosigma akashiwo* cells. *Plant & Cell Physiol.*, **30**, 637-642.
- 240 Miyagi, N., Satoh, S. & Fujii, T. 1992 A nitrate-inducible plasma membrane protein of a marine alga, *Heterosigma akashiwo*. *Plant & Cell Physiol.*, **33**, 971-976.
- 241 Miyoshi, Y. & Tsubo, Y. 1969 Permanent bleaching of *Euglena* by chloramphenicol. *Plant & Cell Physiol.*, **10**, 221-225.
- 242 Mori, F., Erata, M. & Watanabe, M. M. 2002 Cryopreservation of cyanobacteria and green algae in the NIES-Collection. *Microbiol. Cult. Coll.*, **18**, 45-55.
- 243 Mori, S., Nakamura, Y., Watanabe, M. M., Yamochi, S. & Watanabe, M. 1982 The effect of various environmental factors on the growth yield of red tide algae II. *Olisthodiscus luteus*. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **30**, 71-86 (in Japanese with English summary).
- 244 Morimoto, T., Murakami, N., Nagatsu, A. & Sakakibara, J. 1993 Studies on glycolipids. VII. Isolation of two new sulfoquinovosyl diacylglycerols from the green alga *Chlorella vulgaris*. *Chem. Pharm. Bull.*, **41**, 1545-1548.
- 245 Morita, E., Abe, T., Tsuzuki, M., Fujiwara, S., Sato, N., Hirata, A., Sonoike, K. & Nozaki, H. 1999 Role of pyrenoids in the CO₂-concentrating mechanism: comparative morphology, physiology and molecular phylogenetic analysis of closely related strains of *Chlamydomonas* and *Chloromonas* (Volvocales). *Planta*, **208**, 365-372.
- 246 Moriya, M., Nakayama, T. & Inouye, I. 2000 Ultrastructure and 18S rDNA sequence analysis of *Wobbllia lunata* gen. et sp. nov., a new heterotrophic flagellate (Stramenopiles, *incertae sedis*). *Protist*, **151**, 41-55.
- 247 Moriya, M., Nakayama, T. & Inouye, I. 2002 A new class of the Stramenopiles, Placididea Classis nova: description of *Placidia*

- cafeteriopsis* gen. et sp. nov. *Protist*, **153**, 143-156.
- 248 Munekage, Y., Iwasaki, N., Le, T. X., Hasegawa, H., Natukawa, Y. & Kikuhara, S. 2002 Studies on the distribution of antibiotics in water, suspended solid, bottom mud in semi-enclosed sea and its accumulation in plankton. *Proceedings of the 12th International Offshore and Polar Engineering Conference, Kitakyushu, Japan 2002*, p. 425-431.
- 249 Murakami, M., Ishida, K., Okino, T., Okita, Y., Matsuda, H. & Yamaguchi, K. 1995 Aeruginosins 98-A and B, trypsin inhibitors from the blue-green alga *Microcystis aeruginosa* (NIES-98). *Tetrahedron Letters*, **36**, 2785-2788.
- 250 Murakami, M., Itou, Y., Ishida, K. & Shin, H. J. 1999 Prenylagaramides A and B, new cyclic peptides from two strains of *Oscillatoria agardhii*. *J. Nat. Prod.*, **62**, 752-755.
- 251 Murakami, M., Kodani, S., Ishida, K., Matsuda, H. & Yamaguchi, K. 1997 Micropeptin 103, a chymotrypsin inhibitor from the cyanobacterium *Microcystis viridis* (NIES-103). *Tetrahedron Letters*, **38**, 3035-3038.
- 252 Murakami, M., Makabe, K., Yamaguchi, K., Konosu, S. & Wälchli, M. R. 1988 Goniodomin A, a novel polyether macrolide from the dinoflagellate *Goniodoma pseudogoniaulax*. *Tetrahedron Letters*, **29**, 1149-1152.
- 253 Murakami, M., Okita, Y., Matsuda, H., Okino, T. & Yamaguchi, K. 1994 Aeruginosin 298-A, a thrombin and trypsin inhibitor from the blue-green alga *Microcystis aeruginosa* (NIES-298). *Tetrahedron Letters*, **35**, 3129-3132.
- 254 Murakami, M., Shin, H. J., Matsuda, H., Ishida, K. & Yamaguchi, K. 1997 A cyclic peptide, anabaenopeptin B, from the cyanobacterium *Oscillatoria agardhii*. *Phytochemistry*, **44**, 449-452.
- 255 Murakami, M., Sun, Q., Ishida, K., Matsuda, H., Okino, T. & Yamaguchi, K. 1997 Microviridins, elastase inhibitors from the cyanobacterium *Nostoc minutum* (NIES-26). *Phytochemistry*, **45**, 1197-1202.
- 256 Murakami, M., Suzuki, S., Itou, Y., Kodani, S. & Ishida, K. 2000 New anabaenopeptins, potent carboxypeptidase-A inhibitors from the cyanobacterium *Aphanizomenon flos-aquae*. *J. Nat. Prod.*, **63**, 1280-1282.
- 257 Murakami, N., Shirahashi, H., Nagatsu, A. & Sakakibara, J. 1992 Two unsaturated 9R-hydroxy fatty acids from the cyanobacterium *Anabaena flos-aquae* f. *flos-aquae*. *Lipids*, **27**, 776-778.
- 258 Murakami, N., Shirahashi, H., Nagatsu, A. & Sakakibara, J. 1993 Studies on glycolipids. VI. New acyl-distributed glyceroglycolipids from the nitrogen-fixing cyanobacterium *Anabaena flos-aquae* f. *flos-aquae*. *Chem. Pharm. Bull.*, **41**, 1177-1179.
- 259 Murakami, N., Shirahashi, H., Sakakibara, J. & Tsuchida, Y. 1992 A novel glyceroglycolipid from the nitrogen-fixing cyanobacterium *Anabaena flos-aquae* f. *flos-aquae*. *Chem. Pharm. Bull.*, **40**, 285-287.
- 260 Murano, F. & Fujita, Y. 1967 Comparative studies of photochemical oxidation-reduction reactions in lamellar fragments of various algae and spinach. *Plant & Cell Physiol.*, **8**, 673-682.
- 261 Nagai, H., Satake, M., Murata, M. & Yasumoto, T. 1990 Screening of marine phytoplankton for antifungal substances. In *Toxic Marine Phytoplankton*, Eds. by Graneli, E., Sundstrom, B., Edler, L. & Anderson, D. M., Elsevier Science Pub., New York, p. 385-390.
- 262 Nakagawa, M., Takamura, Y. & Yagi, O. 1987 Isolation and characterization of the slime from a cyanobacterium, *Microcystis aeruginosa* K-3A. *Agric. Biol. Chem.*, **51**, 329-337.
- 263 Nakahara, H. & Sako, Y. 1987 2. Life history of freshwater phytoplankton [2. Tansui syokubutsu purankuton no seikatsushi]. In *Freshwater red tide [Tansui Akashio]*, Ed. by Kadota, H., Kôseisy-Kôseikaku, Tokyo, p. 21-77 (in Japanese without English title).
- 264 Nakahara, M., Ito, H., Yano, H. & Harimaya, K. 1988 Eutrophication in three reservoirs as the sources of the waterworks in Kobe City. *Jpn. J. Water Treat. Biol.*, **24**, 19-24 (in Japanese with English title).
- 265 Nakai, S., Inoue, Y., Hosomi, M. & Murakami, A. 1999 Growth inhibition of blue-green algae by allelopathic effects of macrophytes. *Wat. Sci. Tech.*, **39**, 47-53.

- 266 Nakai, S., Inoue, Y., Hosomi, M. & Murakami, A. 2000 *Myriophyllum spicatum*-released allelopathic polyphenols inhibiting growth of blue-green algae *Microcystis aeruginosa*. *Wat. Res.*, **34**, 3026-3032.
- 267 Nakai, S., Yamane, S. & Hosomi, M. 2000 Algal growth inhibition effects of *Myriophyllum spicatum*-releasing four allelopathic polyphenols. *J. Jpn. Soc. Wat. Environ.*, **23**, 726-730 (in Japanese with English summary).
- 268 Nakamura, A., Okamoto, T., Komatsu, N., Ooka, S., Oda, T., Ishimatsu, A. & Muramatsu, T. 1998 Fish mucus stimulates the generation of superoxide anion by *Chattonella marina* and *Heterosigma akashiwo*. *Fish. Sci.*, **64**, 866-869.
- 269 Nakamura, H. 1993 Results of AGP experiments [AGP, T-P, PO₄-P no shiken oyobi bunsekikokka]. Unpublished report in Ebara Yujiraito Co. Ltd., 32pp. (in Japanese without English title).
- 270 Nakamura, M., Yamagishi, M., Yoshizaki, F. & Sugimura, Y. 1992 The syntheses of plastocyanin and cytochrome *c*-553 are regulated by copper at the pre-translational level in a green alga, *Pediastrum boryanum*. *J. Biochem.*, **111**, 219-224.
- 271 Nakamura, M., Yoshizaki, F. & Sugimura, Y. 2000 Accumulation of plastocyanin mRNA lacking 5' region in the green alga *Pediastrum boryanum* grown under copper-deficient conditions. *Plant Cell Physiol.*, **41**, 33-41.
- 272 Nakamura, Y. 1987 Effects of growth conditions on nitrate, ammonium and phosphate uptake by *Chattonella antiqua*. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 110**, 115-126 (in Japanese with English summary).
- 273 Nakamura, Y., Sawai, K., Mochida, M. & Watanabe, M. 1987 An approach to estimate the limiting nutrient of *Chattonella antiqua* in the Seto Inland Sea - Semicontinuous culture using natural seawater. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 110**, 197-212 (in Japanese with English summary).
- 274 Nakamura, Y., Sawai, K. & Watanabe, M. 1987 Growth inhibition of a red tide flagellate, *Chattonella antiqua* by cupric ion. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 110**, 127-138 (in Japanese with English summary).
- 275 Nakamura, Y. & Watanabe, M. M. 1983 Growth characteristics of *Chattonella antiqua* (Raphidophyceae). Part 1. Effects of temperature, salinity, light intensity and pH on growth. *J. Oceanogr. Soc. Japan*, **39**, 110-114.
- 276 Nakamura, Y. & Watanabe, M. M. 1983 Growth characteristics of *Chattonella antiqua* Part 2. Effects of nutrients on growth. *J. Oceanogr. Soc. Japan*, **39**, 151-155.
- 277 Nakamura, Y. & Watanabe, M. M. 1983 Nitrate and phosphate uptake kinetics of *Chattonella antiqua* grown in light/dark cycles. *J. Oceanogr. Soc. Japan*, **39**, 167-170.
- 278 Nakamura, Y. & Watanabe, M. M. 1984 Effects of temperature, salinity, light intensity and pH on the growth of *Chattonella antiqua*. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 63**, 79-85 (in Japanese with English summary).
- 279 Nakamura, Y. & Watanabe, M. M. 1984 Effects of nutrients on the growth of *Chattonella antiqua*. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 63**, 87-95 (in Japanese with English summary).
- 280 Nakamura, Y. & Watanabe, M. M. 1984 Diurnal vertical migration of a red tide flagellate, *Chattonella antiqua* with special reference to the ecological role. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 63**, 97-102 (in Japanese with English summary).
- 281 Nakamura, Y. & Watanabe, M. M. 1984 Nitrate and phosphate uptake kinetics of *Chattonella antiqua* grown in light/dark cycles. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 63**, 103-109 (in Japanese with English summary).
- 282 Nakamura, Y., Watanabe, M. M. & Watanabe, M. 1982 The effect of various environmental factors on the growth yield of red tide algae. I. *Chattonella antiqua*. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 30**, 53-70 (in Japanese with English summary).
- 283 Nakanishi, K., Karube, I., Hiroshi, S., Uchida, A. & Ishida, Y. 1996 Detection of the red tide-causing plankton *Chattonella marina* using a piezoelectric immunosensor. *Anal. Chim. Acta*, **325**, 73-80.
- 284 Nakano, T. & Isagi, Y. 1987 *Dictyochloropsis irregularis* sp. nov. (Chlorococcales, Chloro-

- phyceae) isolated from the surface of bark. *Phycologia*, **26**, 222-227.
- 285 Nakayama, T., Ishii, E. & Kanazawa, H. 1987 The study on the isolation and culture of the protoplast from heterothallic *Closterium*. *J. Fac. Sci., Hokkaido Univ., Ser. V (Bot.)*, **14**, 95-114.
- 286 Nakayama, T., Watanabe, S. & Inouye, I. 1996 Phylogeny of wall-less green flagellates inferred from 18SrDNA sequence data. *Phycol. Res.*, **44**, 151-161.
- 287 Nakazawa, A., Krienitz, L. & Nozaki, H. 2001 Taxonomy of the unicellular green algal genus *Vitreochlamys* (Volvocales), based on comparative morphology of cultured material. *Eur. J. Phycol.*, **36**, 113-128.
- 288 Nakazawa, A. & Nozaki, H. 2000 Morphology and asexual reproduction of *Vitreochlamys aulata* (Volvocales, Chlorophyceae). *J. Jpn. Bot.*, **75**, 42-46.
- 289 Naohara, T. & Ishikawa, H. 1975 Assay of the activity of herbicides using *Chlorella*. *Zassô-Kenkyû*, **20**, 82-86 (in Japanese with English summary).
- 290 Neilan, B. A., Hawkins, P. R., Cox, P. T. & Goodman, A. E. 1994 Towards a molecular taxonomy for the bloom-forming cyanobacteria. *Aust. J. Mar. Freshwater Res.*, **45**, 869-873.
- 291 Neilan, B. A., Jacobs, D. & Goodman, A. E. 1995 Genetic diversity and phylogeny of toxic cyanobacteria determined by DNA polymorphisms within the phycocyanin locus. *Appl. Environ. Microbiol.*, **61**, 3875-3883.
- 292 Nichols, P. D., Volkman, J. K., Hallegraeff, G. M. & Blackburn, S. I. 1987 Sterols and fatty acids of the red tide flagellates *Heterosigma akashiwo* and *Chattonella antiqua* (Raphidophyceae). *Phytochemistry*, **26**, 2537-2541.
- 293 Niki, T., Kunugi, M. & Otsuki, A. 2000 DMSP-lyase activity in five marine phytoplankton species: its potential importance in DMS production. *Mar. Biol.*, **136**, 759-764.
- 294 Nishibe, Y., Kawabata, Z. & Nakano, S. 2002 Grazing on *Microcystis aeruginosa* by the heterotrophic flagellate *Collodictyon triciliatum* in a hypertrophic pond. *Aquat. Microb. Ecol.*, **29**, 173-179.
- 295 Nishida, T., Tsutsumi, Y., Kemi, M., Haneda, T. & Okamura, H. 1999 Decolorization of anthraquinone dyes by white-rot fungi and its related enzymes. *J. Jpn. Soc. Wat. Environ.*, **22**, 465-471 (in Japanese with English summary).
- 296 Nishihara, H., Miwa, H., Watanabe, M., Nagashima, M., Yagi, O. & Takamura, Y. 1997 Random amplified polymorphic DNA (RAPD) analyses for discriminating genotypes of *Microcystis* cyanobacteria. *Biosci. Biotech. Biochem.*, **61**, 1067-1072.
- 297 Noël, M-H., Kawachi, M. & Inouye, I. 2004 Induced dimorphic life cycle of a coccolithophorid, *Calyptrosphaera sphaeroidea* (Prymnesiophyceae, Haptophyta). *J. Phycol.*, **40**, 112-129.
- 298 Noike, T. & Souma, Y. 1993 Survey on the influence factors of eutrophication of lakes and the necessity of advanced waste treatment. [Koshô no fu-eiyôka no kanôsei to kôdo shori no hitsuyôsei ni kansuru chôsa.] *J. Jpn. Soc. Sewage Works [Gesuidô-Kyôkai Shi]*, **30**, 38-44 (in Japanese without English title).
- 299 Nojiri, T., Fujii, T. & Sekimoto, H. 1995 Purification and characterization of a novel sex pheromone that induces the release of another sex pheromone during sexual reproduction of the heterothallic *Closterium peracerosum-strigosum-littorale* complex. *Plant Cell Physiol.*, **36**, 79-84.
- 300 Nozaki, H. 1981 The life history of Japanese *Pandorina unicocca* (Chlorophyta, Volvocales). *J. Jpn. Bot.*, **56**, 65-72, pls. 1-2.
- 301 Nozaki, H. 1982 Morphology and reproduction of Japanese *Volvulina steinii* (Chlorophyta, Volvocales). *J. Jpn. Bot.*, **57**, 105-113, pls. 3-4.
- 302 Nozaki, H. 1983 Morphology and taxonomy of two species of *Astrephomene* (Chlorophyta, Volvocales) in Japan. *J. Jpn. Bot.*, **58**, 345-352, pls. 11-13.
- 303 Nozaki, H. 1983 Sexual reproduction in *Eudorina elegans* (Chlorophyta, Volvocales). *Bot. Mag. Tokyo*, **96**, 103-110.
- 304 Nozaki, H. 1984 Newly found facets in the asexual and sexual reproduction of *Gonium pectorale* (Chlorophyta, Volvocales). *Jpn. J. Phycol.*, **32**, 130-133.

- 305 Nozaki, H. 1984 *Volvox aureus* Ehrenberg var. *aureus*. In *Photomicrog. Fresh-w. Alg.* [Tansui Sôruï Syashinsyû] Vol. 1, Eds. by Yamagishi, T. & Akiyama, M., Uchida Rokakuho, Tokyo, p. 97 (in Japanese & English).
- 306 Nozaki, H. 1986 Notes on microalgae in Japan (9). *Basichlamys sacculifera* (Chlorophyta, Volvocales). *Jpn. J. Phycol.*, **34**, 143 (in Japanese with English title).
- 307 Nozaki, H. 1986 Notes on microalgae in Japan (10). *Eudorina illinoisensis* (Chlorophyta, Volvocales). *Jpn. J. Phycol.*, **34**, 144 (in Japanese with English title).
- 308 Nozaki, H. 1986 Sexual reproduction in *Gonium sociale* (Chlorophyta, Volvocales). *Phycologia*, **25**, 29-35.
- 309 Nozaki, H. 1986 Zygote germination in *Eudorina elegans* var. *synoica* (Chlorophyta, Volvocales). *J. Jpn. Bot.*, **61**, 316-320, pl. 8.
- 310 Nozaki, H. 1988 Colonial Volvocales (Chlorophyta) from Kathmandu, Nepal. In *Cryptogams of the Himalayas. Vol. 1. The Kathmandu Valley*, Eds. by Watanabe, M. & Malla, S. B., Department of Botany, National Science Museum, Tsukuba, p. 39-46.
- 311 Nozaki, H. 1988 Morphology, sexual reproduction and taxonomy of *Volvox carteri* f. *kawasakiensis* f. nov. (Chlorophyta) from Japan. *Phycologia*, **27**, 209-220.
- 312 Nozaki, H. 1989 Morphological variation and reproduction in *Gonium viridistellatum* (Volvocales, Chlorophyta). *Phycologia*, **28**, 77-88.
- 313 Nozaki, H. 1990 Colonial Volvocales (Chlorophyta) from Central and East Nepal. In *Cryptogams of the Himalayas. Vol. 2. Central and Eastern Nepal*, Eds. by Watanabe, M. & Malla, S. B., Department of Botany, National Science Museum, Tsukuba, p. 41-47.
- 314 Nozaki, H. 1990 Ultrastructure of the extracellular matrix of *Gonium* (Volvocales, Chlorophyta). *Phycologia*, **29**, 1-8.
- 315 Nozaki, H. 1993 Asexual and sexual reproduction in *Gonium quadratum* (Chlorophyta) with a discussion of phylogenetic relationships within the Goniaceae. *J. Phycol.*, **29**, 369-376.
- 316 Nozaki, H. 1993 Morphology, reproduction and taxonomy of *Characiochloris sasae* sp. nov. (Chlorophyta) from Japan. *Phycologia*, **32**, 129-135.
- 317 Nozaki, H. 1994 Aplanogamous sexual reproduction in *Carteria eugametos* (Volvocales, Chlorophyta). *Eur. J. Phycol.*, **29**, 135-139.
- 318 Nozaki, H. 1994 Unequal flagellar formation in *Volvox* (Volvocaceae, Chlorophyta). *Phycologia*, **33**, 58-61.
- 319 Nozaki, H., Aizawa, K. & Watanabe, M. M. 1994 A taxonomic study of four species of *Carteria* (Volvocales, Chlorophyta) with cruciate anterior papillae, based on cultured material. *Phycologia*, **33**, 239-247.
- 320 Nozaki, H., Aizawa, K. & Watanabe, M. M. 1996 Re-examination of two NIES strains labeled *Chlorogonium metamorphum* (Volvocales, Chlorophyta) from Japan. *Nova Hedwigia Beiheft*, **112**, 483-490.
- 321 Nozaki, H., Hara, Y. & Kasaki, H. 1987 Light and electron microscopy of pyrenoids and species delimitation in *Volvolina* (Chlorophyta, Volvocaceae). *J. Phycol.*, **23**, 359-364.
- 322 Nozaki, H. & Ito, M. 1994 Phylogenetic relationships within the colonial Volvocales (Chlorophyta) inferred from cladistic analysis based on morphological data. *J. Phycol.*, **30**, 353-365.
- 323 Nozaki, H., Ito, M., Sano, R., Uchida, H., Watanabe, M. M. & Kuroiwa, T. 1995 Phylogenetic relationships within the colonial Volvocales (Chlorophyta) inferred from *rbcL* gene sequence data. *J. Phycol.*, **31**, 970-979.
- 324 Nozaki, H., Ito, M., Sano, R., Uchida, H., Watanabe, M. M., Takahashi, H. & Kuroiwa, T. 1997 Phylogenetic analysis of *Yamagishiella* and *Platydorina* (Volvocaceae, Chlorophyta) based on *rbcL* gene sequences. *J. Phycol.*, **33**, 272-278.
- 325 Nozaki, H., Ito, M., Uchida, H., Watanabe, M. M. & Kuroiwa, T. 1997 Phylogenetic analysis of *Eudorina* species (Volvocaceae, Chlorophyta) based on *rbcL* gene sequences. *J. Phycol.*, **33**, 859-863.

- 326 Nozaki, H., Ito, M., Watanabe, M. M. & Kuroiwa, T. 1996 Ultrastructure of the vegetative colonies and systematic position of *Basichlamys* (Volvocales, Chlorophyta). *Eur. J. Phycol.*, **31**, 67-72.
- 327 Nozaki, H., Ito, M., Watanabe, M. M., Takano, H. & Kuroiwa, T. 1997 Phylogenetic analysis of morphological species of *Carteria* (Volvocales, Chlorophyta) based on *rbcL* gene sequences. *J. Phycol.*, **33**, 864-867.
- 328 Nozaki, H. & Kasaki, H. 1979 The sexual process of Japanese *Pandorina morum* Bory (Chlorophyta). *J. Jpn. Bot.*, **54**, 363-370, pl. 9.
- 329 Nozaki, H., Katagiri, M., Nakagawa, M., Aizawa, K. & Watanabe, M. M. 1995 Taxonomic re-examination of the two strains labeled "*Chlorella*" in the Microbial Culture Collection at the National Institute for Environmental Studies (NIES-Collection). *Microbiol. Cult. Coll.*, **11**, 11-18.
- 330 Nozaki, H. & Krienitz, L. 2001 Morphology and phylogeny of *Eudorina minodii* (Chodat) Nozaki et Krienitz, comb. nov. (Volvocales, Chlorophyta) from Germany. *Eur. J. Phycol.*, **36**, 23-28.
- 331 Nozaki, H., Kuroiwa, H. & Kuroiwa, T. 1994 Light and electron microscopic characterization of two types of pyrenoids in *Gonium* (Goniaceae, Chlorophyta). *J. Phycol.*, **30**, 279-290.
- 332 Nozaki, H., Kuroiwa, H., Mita, T. & Kuroiwa, T. 1989 *Pleodorina japonica* sp. nov. (Volvocales, Chlorophyta) with bacteria-like endosymbionts. *Phycologia*, **28**, 252-267.
- 333 Nozaki, H. & Kuroiwa, T. 1990 *Volvolina compacta* sp. nov. (Volvocaceae, Chlorophyta) from Nepal. *Phycologia*, **29**, 410-417.
- 334 Nozaki, H. & Kuroiwa, T. 1991 Morphology and sexual reproduction of *Gonium multicocum* (Volvocales, Chlorophyta) from Nepal. *Phycologia*, **30**, 381-393.
- 335 Nozaki, H. & Kuroiwa, T. 1991 *Pandorina colemaniae* sp. nov. (Volvocaceae, Chlorophyta) from Japan. *Phycologia*, **30**, 449-457.
- 336 Nozaki, H. & Kuroiwa, T. 1992 Ultrastructure of the extracellular matrix and taxonomy of *Eudorina*, *Pleodorina* and *Yamagishiella* gen. nov. (Volvocaceae, Chlorophyta). *Phycologia*, **31**, 529-541.
- 337 Nozaki, H., Misawa, K., Kajita, T., Kato, M., Nohara, S. & Watanabe, M. M. 2000 Origin and evolution of the colonial Volvocales (Chlorophyceae) as inferred from multiple, chloroplast gene sequences. *Mol. Phylog. Evol.*, **17**, 256-268.
- 338 Nozaki, H., Misumi, O. & Kuroiwa, T. 2003 Phylogeny of the quadriflagellate Volvocales (Chlorophyceae) based on chloroplast multigene sequences. *Mol. Phylog. Evol.*, **29**, 58-66.
- 339 Nozaki, H., Ohta, N., Morita, E. & Watanabe, M. M. 1998 Toward a natural system of species in *Chlorogonium* (Volvocales, Chlorophyta): a combined analysis of morphological and *rbcL* gene sequence data. *J. Phycol.*, **34**, 1024-1037.
- 340 Nozaki, H., Ohta, N., Takano, H. & Watanabe, M. M. 1999 Reexamination of phylogenetic relationships within the colonial Volvocales (Chlorophyta): an analysis of *atpB* and *rbcL* gene sequences. *J. Phycol.*, **35**, 104-112.
- 341 Nozaki, H. & Ohtani, S. 1992 *Gonium sociale* (Volvocales, Chlorophyta) from Antarctica. *Jpn. J. Phycol.*, **40**, 267-271.
- 342 Nozaki, H., Onishi, K. & Morita, E. 2002 Differences in pyrenoid morphology are correlated with differences in the *rbcL* genes of members of the *Chloromonas* lineage (Volvocales, Chlorophyceae). *J. Mol. Evol.*, **55**, 414-430.
- 343 Nozaki, H., Song, L., Liu, Y., Hiroki, M. & Watanabe, M. M. 1998 Taxonomic re-examination of a Chinese strain labeled '*Eudorina* sp.' (Volvocaceae, Chlorophyta) based on morphological and DNA sequence data. *Phycol. Res.*, **46**, *Suppl.*, 63-70.
- 344 Nozaki, H., Takahara, M., Nakazawa, A., Kita, Y., Yamada, T., Takano, H., Kawano, S. & Kato, M. 2002 Evolution of *rbcL* group IA introns and intron open reading frames within the colonial Volvocales (Chlorophyceae). *Mol. Phylogen. Evol.*, **23**, 326-338.
- 345 Oda, T., Nakamura, A., Okamoto, T., Ishimatsu, A. & Muramatsu, T. 1998 Lectin-induced enhancement of superoxide anion production by red tide phytoplankton. *Mar. Biol.*, **131**, 383-

- 390.
- 346 Oda, T., Sato, Y., Kim, D., Muramatsu, T., Matsuyama, Y. & Honjo, T. 2001 Hemolytic activity of *Heterocapsa circularisquama* (Dinophyceae) and its possible involvement in shellfish toxicity. *J. Phycol.*, **37**, 509-516.
- 347 Ogawa, S. & Hirota, K. 2000 Disintegration of chloroplasts during zygote maturation in *Closterium ehrenbergii* (Zygnematales, Chlorophyta). *Int. J. Plant Sci.*, **161**, 609-614.
- 348 Ogawa, S., Iokawa, Y., Oba, T. & Watanabe, T. 1999 Application of low-vacuum scanning electron microscope (LV SEM) to the classes for plankton observation. *Bull. Joetsu Univ. Educ.*, **19**, 99-109 (in Japanese with English summary).
- 349 Ogawa, T. & Terui, G. 1970 Studies on the growth of *Spirulina platensis*. (I) On the pure culture of *Spirulina platensis*. *J. Ferment. Technol.*, **48**, 361-367.
- 350 Ohmori, M. & Hattori, A. 1971 Heterocyst and nitrogen fixation in *Anabaena cylindrica*. In *Proceedings of the Seventh International Seaweed Symposium*, University of Tokyo Press, Tokyo, p. 598-601.
- 351 Ohmori, M. & Hattori, A. 1971 Nitrogen fixation and heterocysts in the blue-green alga *Anabaena cylindrica*. *Plant & Cell Physiol.*, **12**, 961-967.
- 352 Ohmori, M. & Hattori, A. 1972 Effect of nitrate on nitrogen-fixation by the blue-green alga *Anabaena cylindrica*. *Plant & Cell Physiol.*, **13**, 589-599.
- 353 Ohmori, M. & Hattori, A. 1974 Effect of ammonia on nitrogen fixation by the blue-green alga *Anabaena cylindrica*. *Plant & Cell Physiol.*, **15**, 131-142.
- 354 Oikawa, E., Ishibashi, Y., Abe, T. & Umetsu, H. 2000 Phylogenetic classification of musty odor and/or toxic compounds producing cyanobacteria. *Environ. Eng. Res.*, **37**, 183-191 (in Japanese with English summary).
- 355 Oikawa, E., Ohnuma, T., Shimizu, A. & Ishibashi, Y. 1994 Phylogenetic studies on musty odor producing cyanobacteria using the 16S ribosomal RNA. [16S ribosômu RNA enki-hairetsu no hikaku ni yoru kabi-shû sansei ransô-ruï no bunrui.] *J. Jpn. Water Works Assoc. [Suidô-Kyôkai Zasshi]*, **63**(12), 56-63 (in Japanese without English title).
- 356 Okaichi, T., Nishio, S. & Imatomi, Y. 1982 Collection and mass culture [Shiryô no saisyu to baiyô]. In *Toxic phytoplankton - Occurrence, mode of action, and toxins [Yûdoku Purankuton - Hassei, Sayôkikô, Dokuseibun]*, Ed. by Jpn. Fish. Soc., Kôseisya-Kôseikaku, Tokyo, p. 22-34 (in Japanese without English title).
- 357 Okamoto, T., Kim, D., Oda, T., Matsuoka, K., Ishimatsu, A. & Muramatsu, T. 2000 Concanavalin A-induced discharge of glycocalyx of raphidophycean flagellates, *Chattonella marina* and *Heteroshigma akashiwo*. *Biosci. Biotechnol. Biochem.*, **64**, 1767-1770.
- 358 Okamura, H., Aoyama, I., Liu, D., Maguire, R. J., Pacepavicius, G. J. & Lau, Y. L. 2000 Fate and ecotoxicity of the new antifouling compound irgarol 1051 in the aquatic environment. *Water Res.*, **34**, 3523-3530.
- 359 Okamura, K. 1992 Growth characteristics of *Skeletonema costatum* for algal growth potential. *Kanagawa-ken Kankyô Kagaku Sentâ Kenkyû Hôkoku*, **15**, 12-15 (in Japanese with English title).
- 360 Okino, T., Matsuda, H., Murakami, M. & Yamaguchi, K. 1993 Microginin, an angiotensin-converting enzyme inhibitor from the blue-green alga *Microcystis aeruginosa*. *Tetrahedron Letters*, **34**, 501-504.
- 361 Okino, T., Matsuda, H., Murakami, M. & Yamaguchi, K. 1995 New microviridins, elastase inhibitors from the blue-green alga *Microcystis aeruginosa*. *Tetrahedron*, **51**, 10679-10686.
- 362 Okino, T., Murakami, M., Haraguchi, R., Munekata, H., Matsuda, H. & Yamaguchi, K. 1993 Micropeptins A and B, plasmin and trypsin inhibitors from the blue-green alga *Microcystis aeruginosa*. *Tetrahedron Letters*, **34**, 8131-8134.
- 363 Okino, T., Sun, Q., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Nostopeptins A and B, elastase inhibitors from the cyanobacterium *Nostoc minutum*. *J. Nat. Prod.*, **60**, 158-161.

- 364 Okuyama, H., Morita, N. & Kogame, K. 1992 Occurrence of octadecapentaenoic acid in lipids of a cold stenothermic alga, prymnesiophyte strain B. *J. Phycol.*, **28**, 465-472.
- 365 Omura, T., Umita, T., Aizawa, J., Komatsu, Y., Ishizaki, M. & Onuma, M. 1991 Accumulation of extracellular non-volatile organic acids in batch cultures of *Chlorella vulgaris* and *Microcystis aeruginosa*. *Jpn. J. Water Poll. Res.*, **14**, 615-623 (in Japanese with English summary).
- 366 Ono, Y., Okamura, H., Kawara, O., Aoyama, I. & Oda, Y. 1999 Genotoxicity and ecotoxicity of sediment in road runoff. *J. Jpn. Soc. Wat. Environ.*, **22**, 561-567 (in Japanese with English summary).
- 367 Onodera, H., Oshima, Y., Watanabe, M. F., Watanabe, M., Bolch, C. J., Blackburn, S. & Yasumoto, T. 1996 Screening of paralytic shellfish toxins in freshwater cyanobacteria and chemical confirmation of the toxins in cultured *Anabaena circinalis* from Australia. In *Intergovernmental Oceanographic Commissions of UNESCO*, Eds. by Yasumoto, T., Oshima, Y. & Fukuyo, Y., p. 563-566.
- 368 Ooi, T., Kusumi, T., Kakisawa, H. & Watanabe, M. M. 1989 Structure of cyanoviridin RR, a toxin from the blue-green alga, *Microcystis viridis*. *J. Appl. Phycol.*, **1**, 31-38.
- 369 Osafune, T. 1973 Three-dimensional structures of giant mitochondria, dictyosomes and "concentric lamellar bodies" formed during the cell cycle of *Euglena gracilis* (Z) in synchronous culture. *J. Electron Microscopy*, **22**, 51-61.
- 370 Osafune, T., Mihara, S., Hase, E. & Ohkuro, I. 1975 Formation and division of giant mitochondria during the cell cycle of *Euglena gracilis* Z in synchronous culture. I. Some characteristics of changes in the morphology of mitochondria and oxygen-uptake activity of cells. *Plant & Cell Physiol.*, **16**, 313-326.
- 371 Osafune, T., Mihara, S., Hase, E. & Ohkuro, I. 1975 Formation and division of giant mitochondria during the cell cycle of *Euglena gracilis* Z in synchronous culture. II. Modes of division of giant mitochondria. *J. Electron Microscopy*, **24**, 33-39.
- 372 Osafune, T., Mihara, S., Hase, E. & Ohkuro, I. 1975 Formation and division of giant mitochondria during the cell cycle of *Euglena gracilis* Z in synchronous culture. III. Three-dimensional structures of mitochondria after division of giant forms. *J. Electron Microscopy*, **24**, 283-286.
- 373 Otsuka, S., Suda, S., Li, R., Matsumoto, S. & Watanabe, M. M. 2000 Morphological variability of colonies of *Microcystis* morphospecies in culture. *J. Gen. Appl. Microbiol.*, **46**, 39-50.
- 374 Otsuka, S., Suda, S., Li, R., Watanabe, M., Oyaizu, H., Hiroki, M., Mahakhant, A., Liu, Y., Matsumoto, S. & Watanabe, M. M. 1998 Phycoerythrin-containing *Microcystis* isolated from P.R. China and Thailand. *Phycol. Res.*, **46**, *Suppl.*, 45-50.
- 375 Otsuka, S., Suda, S., Li, R., Watanabe, M., Oyaizu, H., Matsumoto, S. & Watanabe, M. M. 1998 16S rDNA sequences and phylogenetic analyses of *Microcystis* strains with and without phycoerythrin. *FEMS Microbiol. Lett.*, **164**, 119-124.
- 376 Otsuka, S., Suda, S., Li, R., Watanabe, M., Oyaizu, H., Matsumoto, S. & Watanabe, M. M. 1999 Phylogenetic relationships between toxic and non-toxic strains of the genus *Microcystis* based on 16S to 23S internal transcribed spacer sequence. *FEMS Microbiol. Lett.*, **172**, 15-21.
- 377 Otsuka, S., Suda, S., Shibata, S., Oyaizu, H., Matsumoto, S. & Watanabe, M. M. 2001 A proposal for the unification of five species of the cyanobacterial genus *Microcystis* Kützing ex Lemmermann 1907 under the rules of the Bacteriological Code. *Int. J. Syst. Evol. Microbiol.*, **51**, 873-879.
- 378 Otsuki, A., Watanabe, M. M. & Sugahara, K. 1987 Chlorophyll pigments in methanol extracts from ten axenic cultured diatoms and three green algae as determined by reverse phase HPLC with fluorometric detection. *J. Phycol.*, **23**, 406-414.
- 379 Park, H-D. & Hayashi, H. 1994 *Microcystis* and microcystins. [Microcystis zoku to mikuroshisuchin.] In *Waterbloom of Blue-green Algae and Their Toxins* [Aoko, sono shutsugen to dokuso], Eds. by Watanabe, M. F., Harada, K. & Fujii, H., University of Tokyo Press,

- p.75-99 (in Japanese without English title).
- 380 Park, H-D. & Watanabe, M. F. 1996 Toxic *Microcystis* in eutrophic lakes. In *Toxic Microcystis*, Eds. by Watanabe, M.F., Harada, K., Carmichael W.W. & Fujii, H., CRC Press, Boca Raton, p. 57-77.
- 381 Park, H-D., Watanabe, M. F., Harada, K., Nagai, H., Suzuki, M., Watanabe, M. & Hayashi, H. 1993 Hepatotoxin (microcystin) and neurotoxin (anatoxin-a) contained in natural blooms and strains of cyanobacteria from Japanese freshwaters. *Natural Toxins*, **1**, 353-360.
- 382 Pedersén, M. & DaSilva, E. J. 1973 Simple brominated phenols in the bluegreen alga *Calothrix brevissima* West. *Planta*, **115**, 83-86.
- 383 Pjon, C.-J. & Fujita, Y. 1973 Immunological identification of pigment component of a photochemically active chromoprotein (ACP) isolated from the blue-green alga *Anabaena cylindrica*. *Plant & Cell Physiol.*, **14**, 201-205.
- 384 Pjon, C.-J. & Fujita, Y. 1974 The separation and characterization of the photoreactive component of a photochemically active chromoprotein (ACP) obtained from the blue-green alga *Anabaena cylindrica*. *Plant & Cell Physiol.*, **15**, 789-797.
- 385 Pjon, C.-J., Suzuki, R. & Fujita, Y. 1972 Photochemical activity fluorescence and absorption spectrum of the photochemically active chromoprotein (ACP) isolated from the blue-green alga *Anabaena cylindrica*. *Plant & Cell Physiol.*, **13**, 437-447.
- 386 Pringsheim, E. G. 1946 The biphasic or soil-water culture method for growing algae and flagellata. *J. Ecol.*, **33**, 193-204.
- 387 Provasoli, L. 1963 Growing marine seaweeds. In *Proceedings of the Fourth International Seaweed Symposium*, University of Tokyo Press, Tokyo, p. 9-17.
- 388 Provasoli, L. 1966 Media and prospects for the cultivation of marine algae. In *Cultures and Collections of Algae*, Eds. by Watanabe, A. & Hattori, A., Proc. U.S.-Japan Conf., Hakone, Sept. 1966., Jpn. Soc. Plant Physiol., p. 63-75.
- 389 Provasoli, L., McLaughlin, J. J. A. & Droop, M. R. 1957 The development of artificial media for marine algae. *Arch. Mikrobiol.*, **25**, 392-428.
- 390 Provasoli, L. & Pintner, I. J. 1959 Artificial media for fresh-water algae: problems and suggestions. In *The Ecology of Algae. Spec. Pub. No. 2.*, Eds. by Tryon, C. A., Jr. & Hartmann, R. T., Pymatuning Laboratory of Field Biology, University of Pittsburgh, Pittsburgh, p. 84-96.
- 391 Robertson, B. R., Tezuka, N. & Watanabe, M. M. 2001 Phylogenetic analyses of *Synechococcus* strains (cyanobacteria) using sequences of 16S rDNA and part of the phycocyanin operon reveal multiple evolutionary lines and reflect phycobilin content. *Int. J. Syst. Evol. Microbiol.*, **51**, 861-871.
- 392 Sakamori, S., Uraya, K. & Annen, K. 2001 Eutrophication of the sea area (III). *Bull. Toyama Pref. Environ. Sci. Res. Center*, **29**, 34-42 (in Japanese with English summary).
- 393 Sakamori, S., Yoshikawa, H. & Annen, K. 2000 The research on the eutrophication of the sea area (II). *Bull. Toyama Pref. Environ. Sci. Res. Center*, **28**, 31-41 (in Japanese with English summary).
- 394 Sakamoto, S., Yamaguchi, M., Watanabe, M. F., Watanabe, M. & Kamiya, H. 1996 Distribution and characterization of lectins from natural and cultured *Microcystis* spp. In *Harmful and Toxic Algal Blooms*, Eds. by Yasumoto, T., Oshima, Y. & Fukuyo, Y., Intergovernmental Oceanographic Commission of UNESCO 1996, p.569-572.
- 395 Sakio, Y., Ishibashi, M. & Okuyama, E. 2000 Chemical constituents of a diatom *Triceratium dubium*. *Nat. Med.*, **54**, 104.
- 396 Sako, Y., Adachi, M. & Ishida, Y. 1995 Specific monoclonal antibodies and DNA probes for the identification of the toxic dinoflagellate genus *Alexandrium*. In *Harmful Marine Algal Blooms*, Eds. by Lassus, P., et al., Lavoisier, Intercept Ltd., p. 77-82.
- 397 Sako, Y., Ishida, Y., Kadota, H. & Hata, Y. 1984 Sexual reproduction and cyst formation in the freshwater dinoflagellate *Peridinium cunningtonii*. *Bull. Jpn. Soc. Sci. Fish.*, **50**, 743-750.
- 398 Sano, T. & Kaya, K. 1995 Oscillamide Y, a chymotrypsin inhibitor from toxic *Oscillatoria*

- agardhii*. *Tetrahedron Letters*, **36**, 5933-5936.
- 399 Sano, T. & Kaya, K. 1995 A 2-amino-2-butenic acid (Dhb)-containing microcystin isolated from *Oscillatoria agardhii*. *Tetrahedron Letters*, **36**, 8603-8606.
- 400 Sano, T. & Kaya, K. 1996 Oscillapeptin G, a tyrosinase inhibitor from toxic *Oscillatoria agardhii*. *J. Nat. Prod.*, **59**, 90-92.
- 401 Sano, T., Usui, T., Ueda, K., Osada, H. & Kaya, K. 2001 Isolation of new protein phosphatase inhibitors from two cyanobacteria species, *Planktothrix* spp. *J. Nat. Prod.*, **64**, 1052-1055.
- 402 Sartoni, G. & Sonni, C. 1991 *Tribonema marinum* J. Feldmann and *Acinetospora crinita* (Carmichael) Sauvageau in the benthic mucilaginous aggregates observed along Tuscan shores during the summer of 1991. *Informatore Botanico Italiano*, **23**, 23-30 (in Italian with English summary).
- 403 Sasa, T., Suda, S., Watanabe, M. M. & Takaichi, S. 1992 A yellow marine *Chlamydomonas*: morphology and pigment composition. *Plant Cell Physiol.*, **33**, 527-534.
- 404 Sasa, T., Takaichi, S., Hatakeyama, N. & Watanabe, M. M. 1992 A novel carotenoid ester, linoxanthin dodecenoate, from *Pyramimonas parkeae* (Prasinophyceae) and a chlorarachniophycean alga. *Plant Cell Physiol.*, **33**, 921-925.
- 405 Sato, R., Fujishima, H. & Itabashi, Y. 2003 Analysis of algal phosphatidylglycerols by chiral phase high-performance liquid chromatography. *Bull. Fish. Sci. Hokkaido Univ.*, **54**, 7-12 (in Japanese with English summary).
- 406 Sato, Y., Murakami, M., Miyazawa, K. & Hori, K. 2000 Purification and characterization of a novel lectin from a freshwater cyanobacterium, *Oscillatoria agardhii*. *Comp. Biochem. Physiol., Part B* **125**, 169-177.
- 407 Satoh, E., Satoh, S. & Fujii, T. 1992 Synchronization of phosphorylation of a chloroplast protein with the cell division cycle in *Heterosigma akashiwo*. *Plant Cell Physiol.*, **33**, 275-280.
- 408 Sawada, K., Handa, N., Shiraiwa, Y., Danbara, A. & Montani, S. 1996 Long-chain alkenones and alkyl alkenoates in the coastal and pelagic sediments of the northwest North Pacific, with special reference to reconstruction of *Emiliania huxleyi* and *Gephyrocapsa oceanica* ratios. *Org. Geochem.*, **24**, 751-764.
- 409 Scheibe, J. 1972 Photoreversible pigment: occurrence in a blue-green alga. *Science*, **176**, 1037-1039.
- 410 Sekiguchi, M., Ohtsuki, A., Shibata, Y. & Morita, M. 1995 Arsenic compounds accumulated in phytoplanktons of marine origin. *J. Environ. Chem. [Kankyô-Kagaku]*, **5**, 366-367 (in Japanese with English title).
- 411 Sekimoto, H. & Fujii, T. 1991 Sexual reproduction of microalgae: its physiological and biochemical study. *Cell Science*, **7**, 562-571 (in Japanese with English title).
- 412 Sekimoto, H. & Fujii, T. 1992 Analysis of gametic protoplast release in the *Closterium peracerosum-strigosum-littorale* complex (Chlorophyta). *J. Phycol.*, **28**, 615-619.
- 413 Sekimoto, H. & Fujii, T. 1993 Cell-cell interaction involved in the sexual reproduction of *Closterium* [Mikadukimo no yûsei seisyoku ni kakawaru saibôkan jôhō kôkan]. *Idea*, **47** (1), 43-48 (in Japanese without English title).
- 414 Sekimoto, H., Satoh, S. & Fujii, T. 1990 Biochemical and physiological properties of a protein inducing protoplast release during conjugation in the *Closterium peracerosum-strigosum-littorale* complex. *Planta*, **182**, 348-354.
- 415 Sekimoto, H., Satoh, S. & Fujii, T. 1992 Biochemical and physiological properties of a gametic protoplast-release-inducing protein in *Closterium*. *Korean J. Phycol.*, **7**, 121-129.
- 416 Sekimoto, H., Satoh, S. & Fujii, T. 1993 Analysis of binding of biotinylated protoplast-release-inducing protein that induces release of gametic protoplasts in the *Closterium peracerosum-strigosum-littorale* complex. *Planta*, **189**, 468-474.
- 417 Sekimoto, H., Sone, Y. & Fujii, T. 1994 cDNA cloning of a 42-kilodalton subunit of protoplast-release-inducing protein from *Closterium*. *Plant Physiol.*, **104**, 1095-1096.

- 418 Sekimoto, H., Sone, Y. & Fujii, T. 1994 A cDNA encoding a 19-kilodalton subunit of protoplast-release-inducing protein from *Closterium*. *Plant Physiol.*, **105**, 447.
- 419 Sekimoto, H., Sone, Y. & Fujii, T. 1994 Regulation of expression of the genes for a sex pheromone by an inducer of the sex pheromone in the *Closterium peracerosum-strigosum-littorale* complex. *Planta*, **193**, 137-144.
- 420 Sekimoto, H., Sone, Y. & Fujii, T. 1995 Biochemical, physiological, and molecular analysis of sexual isolation in the species complex *Closterium peracerosum-strigosum-littorale* (Chlorophyta). *J. Phycol.*, **31**, 611-615.
- 421 Sekino, K., Kobayashi, H. & Shiraiwa, Y. 1996 Role of coccoliths in the utilization of inorganic carbon by a marine unicellular coccolithophorid, *Emiliana huxleyi*: a survey using intact cells and protoplasts. *Plant Cell Physiol.*, **37**, 123-127.
- 422 Sekino, K. & Shiraiwa, Y. 1994 Accumulation and utilization of dissolved inorganic carbon by a marine unicellular coccolithophorid, *Emiliana huxleyi*. *Plant Cell Physiol.*, **35**, 353-361.
- 423 Sekino, K. & Shiraiwa, Y. 1995 CO₂ release from the culture of calcifying and noncalcifying marine unicellular algae. *J. Mar. Biotechnol.*, **3**, 101-104.
- 424 Sekino, K. & Shiraiwa, Y. 1996 Evidence for the involvement of mitochondrial respiration in calcification in a marine coccolithophorid, *Emiliana huxleyi*. *Plant Cell Physiol.*, **37**, 1030-1033.
- 425 Seo, P-S. & Yokota, A. 2003 The phylogenetic relationships of cyanobacteria inferred from 16S rRNA, *gyrB*, *rpoC1* and *rpoD1* gene sequences. *J. Gen. Appl. Microbiol.*, **49**, 191-203.
- 426 Shatari, Y. & Ogawa, S. 2001 Observation of cell division in *Closterium* (Zygnematales, Chlorophyta) and its application to the teaching materials in high school biology. *Jpn. J. Biol. Educ.*, **41**, 90-99 (in Japanese with English summary).
- 427 Shibata, M., Kashino, Y., Satoh, K. & Koike, H. 2001 Isolation and characterization of oxygen-evolving thylakoid membranes and photosystem II particles from a glaucocystophyte, *Cyanophora paradoxa*. *Plant Cell Physiol.*, **42**, 733-741.
- 428 Shibukawa, K., Takamura, Y., Takao, E., Irie, M. & Yagi, O. 1986 Studies on the growth factors of an axenic clone of the cyanobacterium *Microcystis aeruginosa* K-3A. *Jpn. J. Limnol.*, **47**, 247-255 (in Japanese with English summary).
- 429 Shin, H. J., Matsuda, H., Murakami, M. & Yamaguchi, K. 1996 Agardhipeptins A and B, two new cyclic hepta- and octapeptide, from the cyanobacterium *Oscillatoria agardhii* (NIES-204). *Tetrahedron*, **52**, 13129-13136.
- 430 Shin, H. J., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Aeruginosins 205A and -B, serine protease inhibitory glycopeptides from the cyanobacterium *Oscillatoria agardhii* (NIES-205). *J. Org. Chem.*, **62**, 1810-1813.
- 431 Shin, H. J., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Anabaenopeptins E and F, two new cyclic peptides from the cyanobacterium *Oscillatoria agardhii* (NIES-204). *J. Nat. Prod.*, **60**, 139-141.
- 432 Shin, H. J., Matsuda, H., Murakami, M. & Yamaguchi, K. 1997 Circinamide, a novel papain inhibitor from the cyanobacterium *Anabaena circinalis* (NIES-41). *Tetrahedron*, **53**, 5747-5754.
- 433 Shin, H. J., Murakami, M., Matsuda, H., Ishida, K. & Yamaguchi, K. 1995 Oscillapeptin, an elastase and chymotrypsin inhibitor from the cyanobacterium *Oscillatoria agardhii* (NIES-204). *Tetrahedron Letters*, **36**, 5235-5238.
- 434 Shin, H. J., Murakami, M., Matsuda, H. & Yamaguchi, K. 1996 Microviridins D-F, serine protease inhibitors from the cyanobacterium *Oscillatoria agardhii* (NIES-204). *Tetrahedron*, **52**, 8159-8168.
- 435 Shinobu, K., Abe, S., Asano, K. & Abe, T. 1992 On the laboratory experiment of algal culturing (AGP-test) [Sôru baiyô no shitsunai jikken (AGP shiken) ni tsuite]. *Heisei 4-nendo Tôhoku Chihô Kensetsu-kyoku Kan-nai Gijutsu Kenkyû Happyôkai Shiryô*, **Kyô-28**, 151-154 (in Japanese without English title).
- 436 Shono, M., Hara, Y., Wada, M. & Fujii, T. 1996 A sodium pump in the plasma membrane of the marine alga *Heterosigma akashiwo*. *Plant Cell Physiol.*, **37**, 385-388.

- 437 Shono, M., Wada, M. & Fujii, T. 1995 Partial purification of a Na⁺-ATPase from the plasma membrane of the marine alga *Heterosigma akashiwo*. *Plant Physiol.*, **108**, 1615-1621.
- 438 Soma, Y., Imaizumi, T., Yagi, K. & Kasuga, S. 1993 Estimation of algal succession in lake water using HPLC analysis of pigments. *Can. J. Fish. Aquat. Sci.*, **50**, 1142-1146.
- 439 Suda, S. 2003 Light microscopy and electron microscopy of *Nephroselmis spinosa* sp. nov. (Prasinophyceae, Chlorophyta). *J. Phycol.*, **39**, 590-599.
- 440 Suda, S. & Watanabe, M. M. 1995 Life cycle of *Pseudocarteria mucosa* (Korschikov) Ettl (Volvocales, Chlorophyta). *Phycologia*, **34**, 58-64.
- 441 Suda, S. & Watanabe, M. M. 1995 Notes on microalgae in Japan (2). *Hafniomonas montana* (Geitler) Ettl et Moestrup (Chlorophyceae, Dunaliellales). *Jpn. J. Phycol. (Sôru)*, **43**, 40-41 (in Japanese with English title).
- 442 Suda, S., Watanabe, M. M. & Inouye, I. 1989 Evidence for sexual reproduction in the primitive green alga *Nephroselmis olivacea* (Prasinophyceae). *J. Phycol.*, **25**, 596-600.
- 443 Suda, S., Watanabe, M. M. & Inouye, I. 1990 Morphological observations on the rare quadriflagellate *Pseudocarteria mucosa* (Chlorophyceae, Volvocales). *Phycologia*, **29**, 54-64.
- 444 Suda, S., Watanabe, M. M., Otsuka, S., Mahakahant, A., Yongmanitchai, W., Nopartnaraporn, N., Liu, Y. & Day, J. G. 2002 Taxonomic revision of water-bloom-forming species of oscillatoroid cyanobacteria. *Int. J. Syst. Evol. Microbiol.*, **52**, 1577-1595.
- 445 Sudo, R., Tai, S., Yagi, O., Okada, M., Hosomi, M. & Yamane, A. N. 1981 Comprehensive studies on the eutrophication of fresh-water areas. Determination of algal growth potential by algal assay procedure. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **26**, 1-53 (in Japanese with English title).
- 446 Sugahara, K., Kobayashi, Y., Watanabe, M. M. & Watanabe, M. 1982 Changes in cellular contents of ATP during growth of red tide algae. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **30**, 323-327 (in Japanese with English summary).
- 447 Sugaya, Y., Yasuno, M. & Yanai, T. 1990 Effects of toxic *Microcystis viridis* and isolated toxins on goldfish. *Jpn. J. Limnol.*, **51**, 149-153.
- 448 Sugiura, N., Iwami, N., Itayama, T. & Inamori, Y. 1997 Population dynamics of grazer *Monas guttula* and prey *Microcystis viridis* using aquatic large scale microcosm. *J. Jpn. Soc. Wat. Environ.*, **20**, 332-337.
- 449 Suzuki, R. & Fujita, Y. 1972 Studies on the Hill reaction of membrane fragments of blue-green algae II. The reaction steps inactivated at high water concentration. *Plant & Cell Physiol.*, **13**, 427-436.
- 450 Suzuki, S., Tazawa, R., Miya, A., Adachi, T., Kanki, R., Toyobe, M. & Oguchi, M. 1994 Gas revitalization by microalgae. I. Studies on species and culture condition. *CELLS J.*, **7**, 23-28 (in Japanese with English summary).
- 451 Tabata, K. 1996 Cyanobacteria as teaching materials for inquiring biology. [Tankyû katsudô no sozai to shite no shiano-bakuteria.] *The Heredity [Iden]*, **50**(9), 58-62 (in Japanese without English title).
- 452 Tada, N., Shibata, S., Otsuka, S., Namba, K. & Oyaizu, H. 1999 Comparison of gene arrangements of chloroplasts between two centric diatoms, *Skeletonema costatum* and *Odontella sinensis*. *DNA Sequence*, **10**, 343-347.
- 453 Takamura, N., Kasai, F. & Watanabe, M. M. 1988 Differences in the tolerant level of benthic algae to heavy metal - The effects of Cu, Cd, and Zn on the photosynthesis. *Res. Rep. Natl. Inst. Environ. Stud.*, No. **114**, 223-232 (in Japanese with English summary).
- 454 Takamura, N., Kasai, F. & Watanabe, M. M. 1989 Effects of Cu, Cd and Zn on photosynthesis of freshwater benthic algae. *J. Appl. Phycol.*, **1**, 39-52.
- 455 Takamura, N., Kasai, F. & Watanabe, M. M. 1990 Unique response of Cyanophyceae to copper. *J. Appl. Phycol.*, **2**, 293-296.
- 456 Takeda, H. 1988 Classification of *Chlorella* strains by cell wall sugar composition. *Phytochemistry*, **27**, 3823-3826.
- 457 Takishita, K., Koike, K., Maruyama, T. & Ogata, T. 2002 Molecular evidence for plastid robbery

- (kleptoplastidy) in *Dinophysis*, a dinoflagellate causing diarrhetic shellfish poisoning. *Protist*, **153**, 293-302.
- 458 Takishita, K. & Uchida, A. 1999 Molecular cloning and nucleotide sequence analysis of *psbA* from the dinoflagellates: origin of the dinoflagellate plastid. *Phycol. Res.*, **47**, 207-216.
- 459 Tan, S. & Ho, K.-K. 1989 Purification of an acidic plastocyanin from *Microcystis aeruginosa*. *Biochim. et Biophys. Acta*, **973**, 111-117.
- 460 Tanaka, S. & Nozaki, H. 1997 Notes on microalgae in Japan (3). *Pteromonas angulosa* (Carter) Lemmermann (Chlorophyceae, Volvocales). *Jpn. J. Phycol. (Sôru)*, **45**, 183-184 (in Japanese with English title).
- 461 Terasaki, M. & Itabashi, Y. 2002 Free fatty acid level and galactolipase activity in a red tide flagellate *Chattonella marina* (Raphidophyceae). *J. Oleo Sci.*, **51**, 213-218.
- 462 Terasaki, M., Itabashi, Y., Suzuki, T. & Nishimura, K. 2002 An improved method for determining the composition of FFA in red tide flagellates by RP-HPLC with fluorescence detection. *J. Am. Oil Chem. Soc.*, **79**, 1181-1186.
- 463 Tjahjono, A. E., Hayama, Y., Kakizono, T., Terada, Y., Nishio, N. & Nagai, S. 1994 Hyper-accumulation of astaxanthin in a green alga *Haematococcus pluvialis* at elevated temperatures. *Biotech. Letters*, **16**, 133-138.
- 464 Tjahjono, A. E., Kakizono, T., Hayama, Y. & Nagai, S. 1993 Formation and regeneration of protoplast from a unicellular green alga *Haematococcus pluvialis*. *J. Ferment. Bioeng.*, **75**, 196-200.
- 465 Tjahjono, A. E., Kakizono, T., Hayama, Y., Nishio, N. & Nagai, S. 1994 Isolation of resistant mutants against carotenoid biosynthesis inhibitors for a green alga *Haematococcus pluvialis*, and their hybrid formation by protoplast fusion for breeding of higher astaxanthin producers. *J. Ferment. Bioeng.*, **77**, 352-357.
- 466 Tohezou, Y., Iwata, T. & Nakayama, E. 1999 The research on the eutrophication of the sea area. - The situation of AGP in Toyama Bay - *Bull. Toyama Pref. Environ. Sci. Res. Center*, **27**, 39-44 (in Japanese with English summary).
- 467 Tominaga, H., Hayashida, Y., Hosoya, Y., Kurokawa, M., Sawa, Y. & Ochiai, H. 1993 Characterization of a small cryptic plasmid, pPF1, from *Phormidium foveolarum* and vector construction. *Biosci. Biotech. Biochem.*, **57**, 1795-1799.
- 468 Tominaga, H., Soejima, K., Kawagishi, S., Ashida, H., Sawa, Y. & Ochiai, H. 1993 Structural organization of a cryptic plasmid, pMA1, from *Microcystis aeruginosa* f. *aeruginosa* Kützing. *Biosci. Biotech. Biochem.*, **57**, 1503-1507.
- 469 Toume, K. & Ishibashi, M. 2002 5 α , 8 α -epidioxysterol sulfate from a diatom *Odontella aurita*. *Phytochemistry*, **61**, 359-360.
- 470 Toyomizu, M., Suzuki, K., Kawata, Y., Kojima, H. & Akiba, Y. 2001 Effective transformation of the cyanobacterium *Spirulina platensis* using electroporation. *J. Appl. Phycol.*, **13**, 209-214.
- 471 Tsubo, Y. 1975 Formation of colorless cells in algae. In *Advance of Phycology in Japan*, Eds. by Tokida, J. & Hirose, H., VEB Gustav Fischer Verlag, Jena, p. 180-193.
- 472 Tsubo, Y., Ueda, T. & Yokomura, E. 1971 Chloroplast autonomy revealed by nutritionally controlled *Euglena gracilis*. In *Proceedings of the Seventh International Seaweed Symposium*, University of Tokyo Press, Tokyo, p. 336-338.
- 473 Tsuchiya, Y., Watanabe, M. F. & Watanabe, M. 1992 Volatile organic sulfur compounds associated with blue-green algae from inland waters of Japan. *Wat. Sci. Tech.*, **25**, 123-130.
- 474 Tsuji, T. & Fujita, Y. 1971 Ascorbate photo-oxidation by a photochemically active chromo-protein isolated from the blue-green alga *Anabaena cylindrica*: the effect of monochromatic illumination. *Plant & Cell Physiol.*, **12**, 807-811.
- 475 Tsuji, T. & Fujita, Y. 1972 Electron donor-specificity observed in photosystem I reactions of membrane fragments of the blue-green alga *Anabaena variabilis* and the higher plant *Spinacea oleracea*. *Plant & Cell Physiol.*, **13**, 93-99.

- 476 Tsukui, T. & Yamazaki, M. 1992 Studies on eutrophication in rivers (II). Determination of AGP in the Kanda River System. *Tokyo-to Kankyô Kagaku Kenkyûjo Nenpô 1992*, 162-166 (in Japanese with English Summary).
- 477 Tsusue, Y. & Fujita, Y. 1964 Mono- and oligo-saccharides in the blue-green alga, *Tolypothrix tenuis*. *J. Gen. Appl. Microbiol.*, **10**, 283-294.
- 478 Turmel, M., Lemieux, C., Burger, G., Lang, B. F., Otis, C., Plante, I. & Gray, M. W. 1999 The complete mitochondrial DNA sequences of *Nephroselmis olivacea* and *Pedinomonas minor*: Two radically different evolutionary patterns within green algae. *The Plant Cell*, **11**, 1717-1729.
- 479 Turmel, M., Otis, C. & Lemieux, C. 1999 The complete chloroplast DNA sequence of the green alga *Nephroselmis olivacea*: Insights into the architecture of ancestral chloroplast genomes. *Proc. Natl. Acad. Sci. U.S.A.*, **96**, 10248-10253.
- 480 Turmel, M., Otis, C. & Lemieux, C. 2002 The complete mitochondrial DNA sequence of *Mesostigma viride* identifies this green alga as the earliest green plant divergence and predicts a highly compact mitochondrial genome in the ancestor of all green plants. *Mol. Biol. Evol.*, **19**, 24-38.
- 481 Ubekôsan Co. Ltd. 1988 Effects of UR-158 on the algal mortality [UR-158 no sassôkôka]. Unpublished report in Ubekôsan Co. Ltd., 3 pp. (in Japanese without English title).
- 482 Uchida, A., Nagasaki, K., Hiroishi, S. & Ishida, Y. 1989 The application of monoclonal antibodies to an identification of *Chattonella marina* and *Chattonella antiqua*. *Bull. Jpn. Soc. Sci. Fish.*, **55**, 721-725.
- 483 Uchida, H., Kitae, K., Tomizawa, K. & Yokota, A. 1998 Comparison of the nucleotide sequence and secondary structure of the 5.8S ribosomal RNA gene of *Chlamydomonas tetragama* with those of green algae. *DNA Sequence*, **8**, 403-408.
- 484 Ueda, K. & Nonaka, M. 1992 Division of chloroplasts in a green alga, *Pediastrum duplex*. *Ann. Bot.*, **69**, 113-118.
- 485 Ukai, Y., Fujita, Y., Morimura, Y. & Watanabe, A. 1958 Studies on growth of blue green alga *Tolypothrix tenuis*. *J. Gen. Appl. Microbiol.*, **4**, 163-169.
- 486 Uye, S. & Takamatsu, K. 1990 Feeding interactions between planktonic copepods and red-tide flagellates from Japanese coastal waters. *Mar. Ecol. Prog. Ser.*, **59**, 97-107.
- 487 Wada, M., Hara, Y., Kato, M., Yamada, M. & Fujii, T. 1987 Diurnal appearance, fine structure, and chemical composition of fatty particles in *Heterosigma akashiwo* (Raphidophyceae). *Protoplasma*, **137**, 134-139.
- 488 Wada, M., Satoh, S., Kasamo, K. & Fujii, T. 1989 Presence of a Na⁺-activated ATPase in the plasma membrane of the marine raphidophycean *Heterosigma akashiwo*. *Plant Cell Physiol.*, **30**, 923-928.
- 489 Wada, M., Urayama, O., Satoh, S., Hara, Y., Ikawa, Y. & Fujii, T. 1992 A marine algal Na⁺-activated ATPase possesses an immunologically identical epitope to Na⁺, K⁺-ATPase. *FEBS Letters*, **309**, 272-274.
- 490 Watanabe, A. 1959 On the mass-culturing of a nitrogen-fixing blue-green alga, *Tolypothrix tenuis*. *J. Gen. Appl. Microbiol.*, **5**, 85-91.
- 491 Watanabe, A. 1960 List of algal strains in collection at the Institute of Applied Microbiology, University of Tokyo. *J. Gen. Appl. Microbiol.*, **6**, 283-292.
- 492 Watanabe, A. 1962 Effect of nitrogen-fixing blue-green alga: *Tolypothrix tenuis* on the nitrogenous fertility of paddy soil and on the crop yield of rice plant. *J. Gen. Appl. Microbiol.*, **8**, 85-91.
- 493 Watanabe, A., Hattori, A., Fujita, Y. & Kiyohara, T. 1959 Large scale culture of a blue-green alga, *Tolypothrix tenuis*, utilizing hot spring and natural gas as heat and carbon dioxide sources. *J. Gen. Appl. Microbiol.*, **5**, 51-57.
- 494 Watanabe, A., Ito, R. & Sasa, T. 1955 Microalgae as a source of nutrients for daphnids. *J. Gen. Appl. Microbiol.*, **1**, 137-141.
- 495 Watanabe, A., Ito, R. & Sasa, T. 1955 Effect of various chemicals upon the growth of daphnids. *J. Gen. Appl. Microbiol.*, **1**, 190-193.

- 496 Watanabe, A., Shirota, M., Endo, H. & Yamamoto, Y. 1969 An observation of the practical applications of nitrogen fixing blue-green algae for rice cultivation. In *The Third International Conference on the Global Impacts of Applied Microbiology*, Bombay, p. 53-64.
- 497 Watanabe, A. & Yamamoto, Y. 1967 Heterotrophic nitrogen fixation by the blue-green alga *Anabaenopsis circularis*. *Nature*, **214**, 738.
- 498 Watanabe, A. & Yamamoto, Y. 1968 Effects of antibiotics on the growth of microalgae. *Phykos*, **7**, 248-258.
- 499 Watanabe, F., Miyamoto, E. & Nakano, Y. 2001 Inactive corrinoid-compound significantly decreases in *Spirulina platensis* grown in a cobalt-deficient medium. *J. Agric. Food Chem.*, **49**, 5685-5688.
- 500 Watanabe, K. I., Ehara, M., Inagaki, Y. & Ohama, T. 1998 Distinctive origins of group I introns found in the *COXI* genes of three green algae. *Gene*, **213**, 1-7.
- 501 Watanabe, M. 1977 A preliminary study of *Gonium viridistellatum* sp. nov. (Chlorophyta, Volvocaceae). *Bull. Jpn. Soc. Phycol.*, **25**, *Suppl. (Mem. Iss. Yamada)*, 379-384.
- 502 Watanabe, M. 1978 A taxonomic study of the *Closterium calosporum* complex (1). *Bull. Natn. Sci. Mus., Ser. B (Bot.)*, **4**, 133-154, pls. 1-8.
- 503 Watanabe, M. 1979 A taxonomic study of the *Closterium calosporum* complex (2). *Bull. Natn. Sci. Mus., Ser. B (Bot.)*, **5**, 1-23, pls. 9-11.
- 504 Watanabe, M. 1982 The diurnal variations in the cell densities of *Olisthodiscus luteus* and *Skeletonema costatum*. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 30**, 143-154 (in Japanese with English summary).
- 505 Watanabe, M. 1996 Isolation, cultivation and classification of bloom-forming *Microcystis* in Japan. In *Toxic Microcystis*, Eds. by Watanabe, M.F., Harada, K., Carmichael W.W. & Fujii, H., CRC Press, Boca Raton, p. 13-34.
- 506 Watanabe, M. & Harashima, A. 1982 Bio-convection in culture of *Olisthodiscus luteus* and Rayleigh-Taylor instability. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 30**, 155-173 (in Japanese with English summary).
- 507 Watanabe, M. & Harashima, A. 1982 The distribution pattern of *Olisthodiscus luteus* in convection cells. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 30**, 175-190 (in Japanese with English summary).
- 508 Watanabe, M., Kohata, K. & Kunugi, M. 1987 Diel vertical migration of *Heterosigma akashiwo* under salinity and phosphate stratifications and metabolism of intracellular phosphate pools. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 110**, 103-114 (in Japanese with English summary).
- 509 Watanabe, M., Kohata, K. & Kunugi, M. 1987 ³¹P nuclear magnetic resonance study of intracellular phosphate pools and polyphosphate metabolism in *Heterosigma akashiwo* (Hada) Hada (Raphidophyceae). *J. Phycol.*, **23**, 54-62.
- 510 Watanabe, M., Kohata, K. & Kunugi, M. 1988 Phosphate accumulation and metabolism by *Heterosigma akashiwo* (Raphidophyceae) during diel vertical migration in a stratified microcosm. *J. Phycol.*, **24**, 22-28.
- 511 Watanabe, M., Takamatsu, T., Kohata, K., Kunugi, M., Kawashima, M. & Koyama, M. 1989 Luxury phosphate uptake and variation of intracellular metal concentrations in *Heterosigma akashiwo* (Raphidophyceae). *J. Phycol.*, **25**, 428-436.
- 512 Watanabe, M., Watanabe, M. M., Kohata, K. & Harashima, A. 1982 The use of a controlled experimental ecosystem (Microcosm) in studies of the mechanism of red tide outbreaks. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 30**, 11-26 (in Japanese with English summary).
- 513 Watanabe, M. F. 1994 Cultivation of toxic blue-green algae. [Yûdoku-ransô no baiyô.] In *Waterbloom of Blue-green Algae and Their Toxins [Aoko, sono shutsugen to dokuso]*, Eds. by Watanabe, M. F., Harada, K. & Fujii, H., University of Tokyo Press, p.101-116 (in Japanese without English title).
- 514 Watanabe, M. F. 1996 Production of microcystins. In *Toxic Microcystis*, Eds. by Watanabe, M. F., Harada, K., Carmichael W. W. & Fujii, H., CRC Press, Boca Raton, p. 35-56.
- 515 Watanabe, M. F., Oishi, S., Watanabe, Y. & Watanabe, M. 1986 Strong probability of lethal toxicity in the blue-green alga *Microcystis viridis* Lemmermann. *J. Phycol.*, **22**, 552-556.

- 516 Watanabe, M. F. & Watanabe, M. 1994 Bloom-forming cyanophytes and their toxins. [Aoko wo tsukuru ransô to sono dokuso.] *Mizu*, **36**, 24-29 (in Japanese without English title).
- 517 Watanabe, M. F., Watanabe, M., Kato, T., Harada, K. & Suzuki, M. 1991 Composition of cyclic peptide toxins among strains of *Microcystis aeruginosa* (blue-green algae, Cyanobacteria). *Bot. Mag. Tokyo*, **104**, 49-57.
- 518 Watanabe, M. M. 1977 Biosystematics in *Closterium* of sexual unicellular green algae and *Calothrix* and *Spirulina* of asexual filamentous blue-green algae, with special reference to the analyses of natural populations. *Thesis D. Sci., Hokkaido University*, 114 pp., 28 tables, 54 figs.
- 519 Watanabe, M. M. 1983 Growth characteristics of freshwater red tide alga, *Peridinium* based on axenic culture. Establishment of synthetic culture medium [Junsuibaiyôhō niyoru tansuiakashio *Peridinium* no zôsyokutokusei no kaiseki-gôseibaichi no kakuritsu]. *Res. Data Natl. Inst. Environ. Stud.*, No. **24**, 111-121 (in Japanese without English title).
- 520 Watanabe, M. M. 1989 Toxicity of algae [Sôru no dokusei]. *Jpn. J. Water Poll. Res.*, **12**, 750-756 (in Japanese without English title).
- 521 Watanabe, M. M. & Hiroki, M. (Eds.) 1997 *NIES-Collection. List of Strains, Fifth Edition, 1997, Microalgae and Protozoa*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 140 pp.
- 522 Watanabe, M. M. & Ichimura, T. 1977 Fresh- and salt-water forms of *Spirulina platensis* in axenic cultures. *Bull. Jpn. Soc. Phycol.*, **25**, *Suppl. (Mem. Iss. Yamada)*, 371-377.
- 523 Watanabe, M. M. & Ichimura, T. 1978 Biosystematic studies of the *Closterium peracerosum-strigosum-littorale* complex. II. Reproductive isolation and morphological variation among several populations from the Northern Kanto area in Japan. *Bot. Mag. Tokyo*, **91**, 1-10.
- 524 Watanabe, M. M. & Ichimura, T. 1978 Biosystematic studies of the *Closterium peracerosum-strigosum-littorale* complex. III. Degrees of sexual isolation among the three population groups from the Northern Kanto area. *Bot. Mag. Tokyo*, **91**, 11-24.
- 525 Watanabe, M. M. & Ichimura, T. 1982 Biosystematic studies of the *Closterium peracerosum-strigosum-littorale* complex. IV. Hybrid breakdown between two closely related groups, Group II-A and Group II-B. *Bot. Mag. Tokyo*, **95**, 241-247.
- 526 Watanabe, M. M. & Kasai, F. (Eds.) 1985 *NIES-Collection. List of Strains, First Edition, 1985, Microalgae*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 116 pp.
- 527 Watanabe, M. M. & Kasai, F. (Eds.) 1985 *NIES-Collection. List of Strains, First Edition, 1985, Microalgae* [Hozonkabu-risuto dai 1 pan bisaisôru]. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 114 pp. (in Japanese without English title).
- 528 Watanabe, M. M. & Kasai, F. (Eds.) 1986 *Supplement to NIES-Collection. List of Strains, First Edition, 1985, Microalgae*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 25 pp.
- 529 Watanabe, M. M. & Kasai, F. (Eds.) 1987 *Second Supplement to NIES-Collection. List of Strains, First Edition, 1985, Microalgae*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 25 pp.
- 530 Watanabe, M. M., Kasai, F., Hiwatari, T., Suda, S. & Nei, T. 1984 Cryopreservation of microalgae in liquid nitrogen - Survival of algal cultures after freezing. *Jpn. J. Freez. Dry.*, **30**, 23-26 (in Japanese with English title).
- 531 Watanabe, M. M., Kasai, F. & Sudo, R. (Eds.) 1988 *NIES-Collection. List of Strains, Second Edition, 1988, Microalgae and Protozoa*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 148 pp.
- 532 Watanabe, M. M., Kawachi, M., Hiroki, M. & Kasai, F. (Eds.) 2000 *NIES-Collection. List of Strains, Sixth Edition, 2000, Microalgae and Protozoa*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 160 pp.
- 533 Watanabe, M. M., Kohata, K., Nakamura, Y. & Watanabe, M. 1982 Phosphate-limited continuous culture of a red tide flagellate, *Olisthodiscus luteus*: establishment of its method

- and the analysis of growth kinetics. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 30, 113-130 (in Japanese with English summary).
- 534 Watanabe, M. M. & Kurogi, M. 1975 Taxonomic reexamination of the two species of blue-green algae, *Calothrix scopulorum* and *C. crustacea*. *Bot. Mag. Tokyo*, 88, 111-125.
- 535 Watanabe, M. M. & Nakamura, Y. 1984 Growth characteristics of a red tide flagellate, *Heterosigma akashiwo* Hada. 1. The effects of temperature, salinity, light intensity and pH on growth. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 63, 51-58 (in Japanese with English summary).
- 536 Watanabe, M. M. & Nakamura, Y. 1984 Growth characteristics of a red tide flagellate, *Heterosigma akashiwo* Hada. 2. The utilization of nutrients. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 63, 59-68 (in Japanese with English summary).
- 537 Watanabe, M. M., Nakamura, Y. & Kohata, K. 1983 Diurnal vertical migration and dark uptake of nitrate and phosphate of the red tide flagellates, *Heterosigma akashiwo* Hada and *Chattonella antiqua* (Hada) Ono (Raphidophyceae). *Jpn. J. Phycol.*, 31, 161-166.
- 538 Watanabe, M. M., Nakamura, Y. & Kohata, K. 1984 Diurnal vertical migration of a red tide flagellate, *Heterosigma akashiwo* Hada, with special reference to the ecological role. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 63, 69-77 (in Japanese with English summary).
- 539 Watanabe, M. M., Nakamura, Y., Mori, S. & Yamochi, S. 1982 Effects of physico-chemical factors and nutrients on the growth of *Heterosigma akashiwo* Hada from Osaka Bay, Japan. *Jpn. J. Phycol.*, 30, 279-288.
- 540 Watanabe, M. M. & Nozaki, H. (Eds.) 1994 *NIES-Collection. List of Strains, Fourth Edition, 1994, Microalgae and Protozoa*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 127 pp.
- 541 Watanabe, M. M. & Satake, K. N. (Eds.) 1991 *NIES-Collection. List of Strains, Third Edition, 1991, Microalgae and Protozoa*. Microbial Culture Collection, National Institute for Environmental Studies, Tsukuba, 163 pp.
- 542 Watanabe, M. M. & Sawaguchi, T. 1995 Cryopreservation of a water-bloom forming cyanobacterium, *Microcystis aeruginosa* f. *aeruginosa*. *Phycol. Res.*, 43, 111-116.
- 543 Watanabe, M. M., Suda, S., Kasai, F. & Sawaguchi, T. 1985 Axenic cultures of the three species of *Microcystis* (Cyanophyta = Cyanobacteria). *Bull. JFCC*, 1, 57-63.
- 544 Watanabe, M. M., Takeuchi, Y. & Takamura, N. 1987 Cu tolerance of freshwater benthic diatom, *Achnanthes minutissima*. In *Biological Monitoring of Environmental Pollution*, Eds. by Yasuno, M. & Whitton, B. A., Tokai University Press, Tokyo, p. 171-177.
- 545 Watanabe, M. M., Takeuchi, Y. & Takamura, N. 1988 Copper tolerance of benthic diatom *Achnanthes minutissima*. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 114, 233-243 (in Japanese with English summary).
- 546 Watanabe, M. M., Yamochi, S., Kohata, K. & Watanabe, M. 1982 Vertical migration and diel periodicity of phosphate uptake in a red tide flagellate, *Olisthodiscus luteus*. *Res. Rep. Natl. Inst. Environ. Stud.*, No. 30, 131-141 (in Japanese with English summary).
- 547 Watanabe, S. 1981 Observations on *Urnella terrestris* Playfair (Chlorophyceae, Chlorococcales) in culture. *Phycologia*, 20, 12-15.
- 548 Watanabe, S. 1983 New and interesting green algae from soils of some Asian and Oceanian regions. *Arch. Protistenk.*, 127, 223-270.
- 549 Watanabe, Y., Ohmura, N. & Saiki, H. 1992 Microbial CO₂ fixation. 2. Isolation and determination of cultural characteristics of *Chlorella* strains which function under CO₂ enriched atmosphere. *CRIEPI Kenkyū-Hōkoku*, U92014, 1-21 (in Japanese with English summary).
- 550 Yagi, O., Hagiwara, T., Takamura, Y. & Sudo, R. 1984 Growth characteristics of axenic and unialgal *Microcystis* isolated from Lake Kasumigaura. *Jpn. J. Water Poll. Res.*, 7, 496-503 (in Japanese with English summary).
- 551 Yagi, O., Hagiwara, T., Takamura, Y. & Sudo, R. 1987 Limiting nutrients of algal growth in Lake Kasumigaura. *Jpn. J. Water Poll. Res.*, 10, 115-122 (in Japanese with English summary).

- 552 Yagi, O., Ohkubo, N., Tomioka, N. & Okada, M. 1989 Limiting nutrients of algal growth in Ushiku Marsh. *Jpn. J. Limnol.*, **50**, 139-148 (in Japanese with English summary).
- 553 Yagi, O., Okada, M. & Sudo, R. 1979 Cultivation of *Microcystis* and red-tide-organisms. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 6**, 223-229 (in Japanese with English summary).
- 554 Yagi, O., Sudo, R., Imaoka, T. & Teranishi, S. 1984 Algal growth potential on municipal wastewater using red tide organisms. *Res. Rep. Natl. Inst. Environ. Stud.*, **No. 63**, 231-242 (in Japanese with English summary).
- 555 Yamada, N., Aoyama, K., Yamada, M. & Hamamura, N. 1985 Studies on earthy-musty odor in natural water (1). Growth characteristics and 2-methylisoborneol production of *Phormidium tenue*. *Jpn. J. Water Poll. Res.*, **8**, 515-521 (in Japanese with English summary).
- 556 Yamada, N., Aoyama, K., Yamada, M. & Hamamura, N. 1986 Studies on earthy-musty odor in natural water (3). Isolation of bacteria-free *Phormidium tenue* and the effect of associated bacteria on the growth of axenic *P. tenue*. *Jpn. J. Water Poll. Res.*, **9**, 379-385 (in Japanese with English summary).
- 557 Yamaguchi, K., Murakami, M. & Okino, T. 1989 Screening of angiotensin-converting enzyme inhibitory activities in microalgae. *J. Appl. Phycol.*, **1**, 271-275.
- 558 Yamaguchi, M., Ogawa, T., Muramoto, K., Kamio, Y., Jimbo, M. & Kamiya, H. 1999 Isolation and characterization of a mannan-binding lectin from the freshwater cyanobacterium (blue-green algae) *Microcystis viridis*. *Biochem. Biophys. Res. Comm.*, **265**, 703-708.
- 559 Yamaguchi, T., Kobayashi, Y., Adachi, K. & Imamura, N. 2003 Argimicins B and C, new anti-cyanobacterial compounds produced by *Sphingomonas* sp. M-17. *J. Antibiotics*, **56**, 655-657.
- 560 Yamamoto, Y. 1972 The fatty acid composition of akinetes, heterocysts and vegetative cells in *Anabaena cylindrica*. *Plant & Cell Physiol.*, **13**, 913-915.
- 561 Yamamoto, Y. 1975 Effect of desiccation on the germination of akinetes of *Anabaena cylindrica*. *Plant & Cell Physiol.*, **16**, 749-752.
- 562 Yamamoto, Y. 1976 Effect of some physical and chemical factors on the germination of akinetes of *Anabaena cylindrica*. *J. Gen. Appl. Microbiol.*, **22**, 311-323.
- 563 Yamamoto, Y. 1978 Detection of algal lysing biological agents in lakes by the soft-agar overlay technique. *Jpn. J. Limnol.*, **39**, 9-14 (in Japanese with English summary).
- 564 Yamamoto, Y. 1981 Observation on the occurrence of microbial agents which cause lysis of blue-green algae in Lake Kasumigaura. *Jpn. J. Limnol.*, **42**, 20-27.
- 565 Yamamoto, Y. & Suzuki, K. 1990 Distribution and algal-lysing activity of fruiting myxobacteria in Lake Suwa. *J. Phycol.*, **26**, 457-462.
- 566 Yamatogi, T., Miyahara, J. & Tanaka, J. 1996 Preculture of noxious red tide flagellate *Chattonella antiqua* (Raphidophyceae) for AGP assay. *Bull. Nagasaki Pref. Inst. Fish.*, **22**, 7-13 (in Japanese with English summary).
- 567 Yamochi, S. 1983 Mechanisms for outbreak of *Heterosigma akashiwo* red tide in Osaka Bay, Japan. Part 1. Nutrient factors involved in controlling the growth of *Heterosigma akashiwo* Hada. *J. Oceanogr. Soc. Japan*, **39**, 310-316.
- 568 Yanagida, Y. 1992 An assay system for detecting the effects of weed killers, by using the green microalga *Scenedesmus quadricauda* [Bisyô ryokusô *Scenedesmus quadricauda* wo mochiita josôzai no eikyôhyôkahô nitsuite]. *Report of Freshwater Fisheries Experiment Station Ibaraki Prefecture*, **No. 28**, 124-127 (in Japanese without English title).
- 569 Yao, Y., Ujiie, Y., Watanabe, M., Yagi, O. & Takamura, Y. 1998 Protein phosphatase inhibition assay for detection of microcystins in lake water and *Microcystis* cultures. *Mircob. Environ.*, **13**, 149-157.
- 570 Yasumoto, T. 1992 Toxin of the marine microalgae [Kaiyô bisaisôru no Tokishin]. *BIO Medica*, **7**, 57-62 (in Japanese without English title).

- 571 Yoshida, T. & Ancajas, R. R. 1970 Application of the acetylene reduction method in nitrogen fixation studies. *Soil Sci. & Plant Nutr.*, **16**, 234-237.
- 572 Yoshida, T., Yuki, Y., Lei, S., Chinen, H., Yoshida, M., Kondo, R. & Hiroishi, S. 2003 Quantitative detection of toxic strains of the cyanobacterial genus *Microcystis* by competitive PCR. *Microb. Environ.*, **18**, 16-23.
- 573 Yoshida, Y. & Kawaguchi, K. 1983 Buoyancy and phototaxis of *Chattonella antiqua* (Hada) Ono. *Bull. Plankton Soc. Jpn.*, **30**, 11-19 (in Japanese with English summary).
- 574 Yoshizako, F., Nishimura, A. & Chubachi, M. 1992 Microbial reduction of cyclohexanone by *Chlorella pyrenoidosa* Chick. *J. Ferment. Bioeng.*, **74**, 395-397.
- 575 Yoshizako, F., Nishimura, A. & Chubachi, M. 1994 Identification of algal transformation products from alicyclic ketones. *J. Ferment. Bioeng.*, **77**, 144-147.
- 576 Yoshizako, F., Nishimura, A., Chubachi, M., Horii, T. & Ueno, T. 1991 Bioconversion of cyclohexaneacetic acid to monohydroxycyclohexaneacetic acids by *Chlorella pyrenoidosa* Chick. *J. Ferment. Bioeng.*, **72**, 343-346.
- 577 Yoshizako, F., Ogino, M., Nishimura, A., Chubachi, M. & Horii, T. 1995 Biotransformation of cyclic β -keto esters by *Chlorella pyrenoidosa* Chick. *J. Ferment. Bioeng.*, **79**, 141-145.
- 578 Yuki, Y., Yoshida, T. & Hiroishi, S. 2002 Molecular detection of the toxic cyanobacteria [Yûdoku aoko no bunshi-shikibetsu to yosatsu he-no ôyô]. In *Series of Fisheries Science Vol. 143, Prevention and Extermination Strategies of Harmful Algal Blooms [Suisan-gaku shirizu 134, Yûgai-yûdoku sôru burûmu no yobô to kujo]*, Eds. by Hiroishi, S., Imai, I. & Ishimaru, T., Koseisha-Koseikaku, Tokyo, p. 43-53 (in Japanese without English title).
- 579 Yuki-jirushi [Snow Brand] Milk Products Co.Ltd. & Showa Denko K.K. 1992 Separation and purification of useful substances from *Euglena*. [*Euglena* kara no yûyô-busshitsu no Bunri Seisei.] In *The Advanced Technology of the Separation and Purification of the Materials for Physiologically Functional Foods and Their Development [Kinôsei Shokuhin Sozai no Kôdo Bunri Seisei to Kaihatsu]*, Ed. and published by The Japanese Research and Development Association for the High Separation System in Food Industry [Shokuhin Sangyô Hai-separêshon Sisutemu Gijutu Kenkyû Kumiai], Tokyo, p.363-382 (in Japanese without English title).

Committee for Evaluating Microbial Culture Strains

Makoto M. Watanabe, D. Sci.	Environmental Biology Division	<Chairman>
Kunimitsu Kaya, D. A.	Laboratory of Intellectual Fundamentals for Environmental Studies	
Yuhei Inamori, D. Sci.	Research Center for Material Cycles and Waste Management	
Noriko Takamura, Ph. D	Regional and Community Environment Division	
Akio Imai, Ph. D	Water and Soil Environment Division	
Tomoharu Sano, D. Pharm.	Laboratory of Intellectual Fundamentals for Environmental Studies	
Junko Shimura, Ph. D	Laboratory of Intellectual Fundamentals for Environmental Studies	
Fumie Kasai, D. Sci.	Environmental Biology Division	<Secretary>
Masanobu Kawachi, D. Sci.	Environmental Biology Division	
Tomomichi Yanagita, D. Sci.	Professor Emeritus of University of Tokyo	<Adviser>
Mitsuo Chihara, D. Sci.	Professor Emeritus of the University of Tsukuba	<Adviser>
Kazuo Komagata, D. A.	Professor Emeritus of University of Tokyo	<Adviser>
Yoshinobu Shigenaka, D. Sci.	Professor Emeritus of Hiroshima University	<Adviser>
Yuzaburo Ishida, D. A.	Professor of Fukuyama University	<Adviser>
Isao Inouye, D. Sci.	Professor of the University of Tsukuba	<Adviser>

Contributors

Fumie Kasai, D. Sci.	Environmental Biology Division
Masanobu Kawachi, D. Sci.	Environmental Biology Division
Mayumi Erata, D. Sci.	Global Environmental Forum
Makoto M. Watanabe, D. Sci.	Environmental Biology Division
Akira Shimizu	Social and Environmental Systems Division
Fumi Mori	Global Environmental Forum
Kosei Yumoto	Global Environmental Forum
Mayumi Moriya, D. Sci.	Global Environmental Forum
Miwa Ishimoto	Global Environmental Forum

January 2004
Accepted by Editorial Board
National Institute for Environmental Studies

[Research Report from the National Institute for Environmental Studies R-182-2004]
ISSN 1341-3643

© National Institute for Environmental Studies 2004

NIES-Collection. List of Strains
Seventh Edition
Microalgae and Protozoa
2004

Correspondence
Fumie Kasai
Laboratory of Intellectual Fundamentals for Environmental Studies
National Institute for Environmental Studies

1 March, 2004

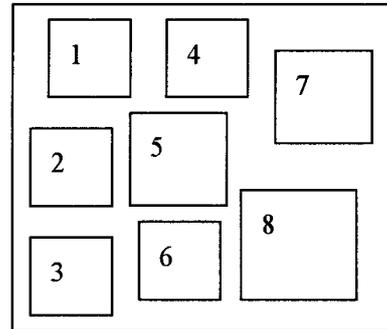
Published by National Institute for Environmental Studies
16-2 Onogawa, Tsukuba, Ibaraki 305-8506, Japan,
Tel: +81-29-850-2556 Fax: +81-29-850-2587
<http://www.nies.go.jp/biology/mcc/home.htm>
Email: mcc@nies.go.jp

Printed by Nissei Eblo Co., Ltd.
Address: 3-13-11, Azuma, Tsukuba, Ibaraki 305-0031 Japan

Cover Photos

Front Cover

- 1 *Gymnodinium mikimotoi* (NIES-680)
- 2 *Skeletonema costatum* (NIES-16)
- 3 *Spirulina subsalsa* (NIES-27)
- 4 *Paramecium bursaria* (NIES-668)
- 5 *Botryococcus braunii* (NIES-836)
- 6 *Chattonella marina* (NIES-3)
- 7 *Porphyridium* sp. (NIES-1035)
- 8 *Volvox aureus* v. *aureus* (NIES-541)



Back Cover

- 9 *Actinastrum hantzschii* (NIES-415)
- 10 *Achnanthes subconstricta* (NIES-330)
- 11 *Acinetospora crinita* (NIES-548)
- 12 *Aulosira laxa* (NIES-50)
- 13 *Pediastrum duplex* v. *gracillimum* (NIES-211)
- 14 *Pleurotaenium ehrenbergii* v. *curtum* (NIES-307)
- 15 *Scenedesmus quadricauda* (NIES-96)
- 16 *Ceratium hirundinella* (NIES-376)
- 17 *Coelastrum astroideum* (NIES-130)

