NIES-Collection

LIST OF STRAINS

Fifth Edition

1997

Microalgae

and

Protozoa

Edited by

Makoto M. Watanabe and Mikiya Hiroki

Supervised by

Committee for Evaluating Microbial Culture Strains

National Institute for Environmental Studies

Environment Agency

JAPAN

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Cover design : Mayumi Erata

第五版の序

国立環境研究所微生物系統保存施設が、1994年に保存株リスト第四版を発行してから、3年を迎えることとなった。初版、二版、三版並びに四版に関して、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。

この第五版は、初版、二版、三版並びに四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619株、原生動物3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、不備な点は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、我が国の藻類学者によって分離培養されたものであり、他の微生物保存施設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、本施設の業務は、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株情報の電算機管理システムの開発等多岐に亘っているが、これらの業務を益々充実させ成果をあげていく所存である。今後とも一層のご批判とご支援を賜わることができれば幸いである。

平成9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部長

岩 熊 敏 夫

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

I. はじめに

国立環境研究所微生物系統保存施設は、昭和58年に環境微生物の系統保存を行なうことを目的として設立された。この施設は、当研究所で遂行されている微生物学的研究で使用されている微生物の培養を、所内研究者の要望に応じて保存し、分譲することを目的としていたが、環境科学に携る微生物学者からの強い要望を配慮して、所内に止らず、広く他機関からも微生物株とそれらの株データの収集および分譲を積極的に行なうこととし、将来的には国際的な環境微生物のカルチャーコレクションセンターとして国内外の環境関連研究機関および研究者と密接なネットワーク体制を構築し、環境微生物研究の推進を支える役割を担っていくことを計画している。

本施設で保存される微生物の培養株は、表１に記されているように微細藻類、原生動物および特殊な浄化能を有する細菌類が対象となっているが、現状ではこれらすべてを同時に保存できる体制の整備が不十分であることおよび環境科学の分野では水域の汚染と浄化に微細藻類が密接に関連していることから、微細藻類株が積極的に収集・保存されている。収集されたすべての株について、その種名、培養条件、保存法、形態学的特徴、生理生態学的特徴、環境科学との関連性に関する株特性の検査や情報収集が行なわれ、更にそれらの株データ管理のパーソナルコンピューターによるシステム化が行なわれている。

表１　本施設に保存される対象となる微生物株

環境問題との関連性での類型	対象となる微生物株
環境汚染の原因となる微生物	赤潮形成藻類，水の華形成藻類，有毒藻類，水道水の異味異臭をもたらす藻類または放線菌類，硫酸還元細菌等
環境汚染の指標となる微生物	AGP供試藻類，重金属耐性微生物，水質の富栄養化の指標となる細菌類，微細藻類，原生動物等
自浄作用，廃水および廃棄物処理に関係する微生物	光合成細菌，脱窒菌，硝化細菌，汚染原因微生物を捕食または溶解する微生物，活性汚泥および生物膜処理の原生動物および細菌類，嫌気性処理にかかわる嫌気性細菌，生物学的処理の障害となる微生物等
有機合成化合物の分解に関係する微生物	PCB，フェノール，各種除草剤および農薬等の分解に関与する細菌類
金属の酸化・還元作用に関連する微生物	塩化水銀($HgCl_2$)やシアン化水銀の還元に関与する細菌類，亜硫酸の酸化に関与する細菌類，重金属のバクテリアリーチング'に関与する細菌類等

本施設に保存された環境微生物培養株の最初のリストには、施設、組織、基本業務の概要説明とともに、微細藻類262株が掲載された(文献314, 315)。それ以降、施設、組織、基本業務の大きな変化はないが、寄託された株、安定した増殖が得られた株および株データの変更を行なった株があり、それらは追補株リストおよび第2版、第3版、第4版として掲載された(文献316, 317, 319, 328, 327)。現在、微細藻類619、原生動物3株が保存されるに至っている。第5版は、これらの保存株すべてを再整理し、新たなデータを加えて、掲載したものである。

II. 培養株の寄託

1. 寄託条件

微生物の培養株の本施設への保存寄託は、以下の条件を満たしている培養株で、微生物系統保存株評価委員会の審査を経たものとする。

(1) 寄託の対象となる微生物は原則として以下のいずれかにあてはまることとする。
(i)環境汚染の原因となる微生物、(ii)環境汚染の指標となる微生物、(iii)自浄作用、廃水及び廃棄物処理に関係する微生物、(iv)有機合成化合物の分解に関係する微生物、(v)金属の酸化・還元作用に関係する微生物。

(2) 種名及び履歴が明らかである培養株であることを原則とするが、既に多くの調査研究において属名をもって使用されている微生物株については例外として受け入れる。

(3) 寄託対象保存株は、保存条件が確立している培養株、すなわち保存中の状態が安定しており、次のいずれかにあてはまる培養株であることとする。
(i)微細藻類ではクローン培養株か単藻培養株であり、無菌培養株であることが望ましい、(ii)原生動物では無菌培養株か餌料としての他の微生物のみが混入している単一種培養株であること、(iii)細菌類はすべて純粋培養株であること。

(4) 寄託された培養株は原則としてすべて分譲対象として扱う。

(5) その他、特に微生物系統保存株評価委員会が必要と認めたもの。

2. 寄託の手続き

(1) 寄託者は様式-1の書類に所定事項を記入の上、下記の寄託先へ申し込むこととする。

〒305 茨城県つくば市小野川16-2 国立環境研究所 微生物系統保存施設
電話 0298(50)2556 ＦＡＸ 0298(50)2587

(2) 受託可否は寄託依頼があった日から１ヶ月以内に行う。

(3) 寄託者は受託の解答があった日から１ヶ月以内に、微生物株を本施設に寄託するものとする。

(4) 寄託書類の記載事項と寄託された微生物の状態が一致せず、前述した寄託条件より逸脱した場合には、寄託のあった日より１ヶ月以内に受託の取り消しを寄託者へ知らせることとする。

様式－１（１）

微生物株寄託依頼書

国立環境研究所
微生物系統保存施設　殿

国環研記入
受付日＿＿＿＿＿＿
受付担当者＿＿＿＿＿
受付番号＿＿＿＿＿＿
受託　　□可　□否

年　　月　　日

依頼者（日本語名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

所属機関（日本語名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

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

① 学名及び命名者

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

② 株番号又はシンボル

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

③ 履歴

1. 採 集 場 所：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
2. 生 息 環 境（２５ページより番号で記入してください。）：＿＿
3. 採集年月日：　　年　　月　　日
4. 採 集 者（日本語名）：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

5. 分離年月日：　　年　　月　　日
6. 分 離 者（日本語名）：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

7. 分離試料源：　□土，　□水，　□動物（　　），
   □植物（　　），　□雪または氷，　□その他（　　）
8. 分離する時の生物の状態：　□運動性栄養細胞，　□非運動性栄養細胞，　□休眠細胞，　□胞子，　□その他（　　）
9. 分離方法：□ピペット洗浄法，□希釈法，□寒天平板法，□走性，□その他（　　）
10. 分離した時の処理：　□無処理，　□抗生物質，　□紫外線照射，□化学物質，　□熱処理，□超音波処理，　□その他（　　）
11. 同　定　者（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
12. 無 菌 化 者（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
13. クローン化者（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

様式－１（２）

④　株の状態
1. 微細藻類　□無菌，□単藻，□クローン，□二種混合
2. 細 菌 類　□純粋，□非クローン
3. 原生動物　□無菌，□単一種混菌，□二種混菌，□混合
4. そ の 他（　　）

⑤　培地
1. 培地名及び出典：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
2. 培地組成[注)] 及び作成上の注意

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

⑥　培養条件
1. 温　　度：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
2. 照　　度：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
3. 光　　源：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
4. 明暗周期：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

⑦　保存条件

□継代培養条件
1. 温　　度：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
2. 照　　度：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
3. 光　　源：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
4. 明暗周期：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
5. 保存期間：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

注）通常よく使用されている培地の場合、原典を記すだけでよい。

□凍結保存
1. 凍害防御物質：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
2. 凍 結 速 度：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
3. 融 解 速 度：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
4. 保 存 温 度：□液体窒素，　□ディープフリーザー（－８０℃）
　　□その他（　　）

□凍結乾燥保存
□ 可　　□ 否

□乾燥保存
□ 可　　□ 否

⑧　株特性
1. 環境上問題となる特性（２５ﾍﾟｰｼﾞより番号で記入してください。）

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
2. 生理生態的特性（２５ﾍﾟｰｼﾞより番号で記入してください。）

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
3. その他の特性（２５ﾍﾟｰｼﾞより番号で記入してください。）

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

⑨　その他の情報

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

⑩　この株に関する文献がある場合は、別刷り又はコピーを２部ずつ添付してください。

III. 保存株の分譲

1. 所内研究者への分譲

(1) 分譲条件

i) 分譲された株を使った研究成果を論文として発表する場合は、NIES株番号（例："NIES-125"）と本施設から分譲を受けたことを明記し、別刷りまたはコピーを2部ずつ本施設に送ることとする。

ii) 分譲された株を第三者に分譲することを禁止する。

iii) 株データの分譲については、保存株の分譲に準じて行われる。

(2) 分譲依頼の手続き

i) 分譲希望者は様式-2の書類に所定事項を記入の上、本施設へ申し込むこととする。

ii) 分譲を受けた者は受領後直ちに培養株の状態について、様式-3の書類に所定事項を記入の上、本施設へ提出するものとする。

2. 所外への分譲

本施設に保存されている微生物株の所外への分譲は、(財)地球・人間環境フォーラムで行われている。分譲依頼等はフォーラム発行のカタログを参照されたい。

3. "Untransportable"株の分譲について

保存株リストの「株の性質」の項において、"Untransportable" と記載されている株（40頁を参照のこと）についての分譲依頼は季節や株の生育状態等により受け付けられないことがあるので、これらの株の分譲依頼にあたっては必ず事前に本施設へ問い合わせるものとする。

また当該株の海外への分譲は、持ち帰りの場合を除き、原則として行わないものとする。

様式－2

微生物株分譲依頼書

国立環境研究所
微生物系統保存施設　殿

国環研記入
受付日＿＿＿＿＿＿
受付者＿＿＿＿＿＿
受付番号＿＿＿＿＿＿

年　　月　　日

依頼者（日本語名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

所属機関（日本語名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

所属機関住所
〒□□□－□□

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

電話　　（　　）　　（内線　　）
ＦＡＸ　　（　　）
Ｅメールアドレス

下記微生物についての分譲を依頼します。

微生物学名及び株番号

研究目的（具体的に）

株データ
□ 要　　（株番号　　）
□ 不要

国環研担当者記入

様式－3

微生物株の受領と受領時の状態についての報告

国立環境研究所
微生物系統保存施設　殿

国環研記入
受付日＿＿＿＿＿＿
受付者＿＿＿＿＿＿
受付番号＿＿＿＿＿＿

年　　月　　日

依頼者（日本語名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

所属機関（日本語名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（ローマ字名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

所属機関住所
〒□□□－□□

＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

電話　　（　　）　　（内線　　）
ＦＡＸ　　（　　）
Ｅメールアドレス

年　　月　　日に分譲されました微生物株の受領と分譲時の株の状態について下記のように報告いたします。

分譲株（微生物学名及び株番号）

株の受領時の状態

□　良好株

□　不良株

□　その他

当施設についての意見と要望

国環研担当者記入

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照度下（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。

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照度下（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）。

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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_3BO_3
KCl	$MnCl_2 \cdot 4H_2O$
$CaCl_2 \cdot 2H_2O$	$MnSO_4 \cdot 7H_2O$
$MgCl_2 \cdot 6H_2O$	$FeCl_3 \cdot 6H_2O$
Na_2SO_4	$FeSO_4 \cdot 7H_2O$
K_2SO_4	$CoCl_2 \cdot 6H_2O$
$MgSO_4 \cdot 7H_2O$	$ZnSO_4 \cdot 7H_2O$
$NaNO_3$	$CuSO_4 \cdot 5H_2O$
KNO_3	$Na_2MoO_4 \cdot 2H_2O$
$Ca(NO_3)_2 \cdot 4H_2O$	ビタミン類
NH_4NO_3	Vitamin B_{12}
$NaH_2PO_4 \cdot 2H_2O$	Biotin
β-Na_2 glycerophosphate	Thiamine HCl
KH_2PO_4	Nicotinic acid
K_2HPO_4	Calcium panthothenate
Na_2CO_3	ρ-Aminobenzoic acid
$NaHCO_3$	Inositol
$Na_2SiO_3 \cdot 9H_2O$	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)　十分に撹拌しながら必要量のNa_2EDTAを溶解する。

iv)　十分に撹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B_{12}、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B_{12}、ビオチン、チアミン

i)　ビタミンB_{12}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を溶解し、蒸留水で1/100に希釈してビタミンB_{12}、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、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-56参照)。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) 十分に撹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。一部を溶解し、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) 十分に撹拌しながら、Tris、glycylglycine、HEPES、TAPS、Bicine、MES等の緩衝剤(必要とされる場合)を必要量天秤で測定し、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) 十分に撹拌しながら、緩衝剤(Tris, NTA等)および多量栄養塩類(NaCl, $MgSO_4 \cdot 7H_2O$, KCl, $CaCl_2 \cdot 2H_2O$)を必要量天秤で測定し、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%の蒸留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測定し、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測定し、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 FIFTH EDITION

Three years have passed since we published the fourth edition of the list of strains of microalgae and protozoa. During this period about 90 new strains have been added to the NIES-Collection. We appreciate the many comments and words of encouragement about the publication 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 applied fields such as agriculture, fisheries, food science and medical science.

The fifth edition lists 619 strains of microalgae and 3 strains of protozoa. This issue has 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 taken 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, development of preservation technology, and the development of a data processing system for culture strain information. We hope to make steady progress in these various activities. We would much appreciate your advice, criticism and cooperation concerning the performance of the NIES-Collection.

March 1, 1997

Toshio Iwakuma, D. Sci.
Chairman of 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

T. Yanagita

Tomomichi Yanagita, D. Sci.
Professor Emeritus of the University of Tokyo

CONTENTS

I. INTRODUCTION

Microbial Culture Collection at the National Institute for Environmental Studies (NIES-Collection) was founded in 1983 as the first collection center of environmental microorganisms.

Although microalgae, bacteria and protozoa related to environmental problems will be preserved in this collection in the future (Table 1), microalgae associated with water pollution and cleaning have been collected and preserved the most actively as the first step. The scientific names, sources, conditions of cultivation and preservation, purity, morphological and physiological characteristics, and environmental characteristics, of all the strains collected have been re-examined, and the revised data processed using a personal computer.

The first list of environmental microorganisms preserved in the NIES-Collection (Ref. 314, 315) offered 262 strains of microalgae, together with the examples of NIES-Collection facilities, organization and fundamental pattern of research. Since then, as the result of our studies on many strains isolated by us and deposited by many other microbiologists, a considerable number of new algal strains have been added and the supplementary, the second and the third lists published (Ref. 316, 317, 319, 327, 328). The total numbers of strains of algae and protozoa in the NIES-Collection are now 619 and 3, respectively.

The fifth edition lists all the strains of algae and protozoa preserved in the collection together with new or revised data.

Table 1. Microbial culture strains preserved in the NIES-Collection

Environmental Microorganisms	Examples
Causative microorganisms of environmental pollution.	Causative algae of red tide or water bloom, toxic algae, microorganisms causing the offensive odor or taste of tap water, and sulfate-reducing bacteria.
Microbial indicators of environmental pollution.	Algae used in bioassay studies of water pollution, metal resistant microorganisms, and microbial indicators of eutrophication.
Microorganisms associated with environmental self-cleaning and waste water treatment	Photosynthetic bacteria, denitrifying bacteria, microorganisms which prey upon or lyse causative organisms of environmental pollution, and bacteria and protozoa associated with activated sludge, microbial film processing or anaerobic processing.
Microorganisms associated with biodegradation of synthetic organic compounds	Bacteria associated with biodegradation of PCB, phenol and agricultural chemicals.
Microorganisms associated with oxidation and reduction of metals.	Bacteria associated with reduction of mercury chloride (II) or mercury cyanide (II), oxidation of arsenious acid, or bacterial leaching of heavy metals.

II. DEPOSITION OF STRAINS

1. Condition for deposit

The decision to accept the deposit of a strain is made by the Committee for Evaluating Microbial Culture Strains. A strain for deposit in the NIES-Collection should fit the following criteria.

(1) It must be at least one of the following microorganism types:
   i) Causative microorganism of environmental pollution.
   ii) Microbial indicator of environmental pollution.
   iii) Microorganism related to waste water treatment of self-cleaning by the environment.
   iv) Microorganism related to the biodegradation of synthetic organic compounds.
   v) Microorganism capable of oxidation of reduction of metals.

(2) The source of the strain and the specific name should be established, though strains which have been used in number of studies may be accepted even if only the generic name is known.

(3) It should be a stable culture under defined conditions and fit one of the following states:
   i) Microalgae: clonal or unialgal strain.
   ii) Protozoa: axenic or xenic strain with supplementary microorganisms added as food.
   iii) Bacteria: pure strain.

(4) As a rule, deposited strains are available to the general public.

(5) At the discretion of the Committee for Evaluating Microbial Culture Strains, some micro-organisms may be accepted for deposit, even if they do not meet the above criteria.

2. Procedure for deposit

(1) The depositor should complete the Strain Deposit Request Form (p. 20) and send it to the following address:

   Microbial Culture Collection,
   National Institute for Environmental Studies,
   16-2 Onogawa, Tsukuba, Ibaraki 305, Japan
   Tel : 81-298-50-2556
   Fax : 81-298-50-2587

(2) The decision for the deposit of the strain is given within one month from the date of receipt of the Strain Deposit Request 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 the acceptance.

(4) If the state of the strain sent does not coincide with the description of the Stain Deposit Request Form, or do not meet any of the rules described above, the acceptance for deposit is canceled. (The NIES reserves the right to refuse any deposit at its discretion.)

Strain Deposit Request Form

Director,
Microbial Culture Collection,
National Institute for Environmental Studies

NIES use only
Date
Name
Number
Acceptance☐YES ☐NO

Date:

Depositor's full name (underline the family name.):

Depositor's affiliation and address:

TEL: FAX:

E-mail:

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

Reason for deposit:

1. *Scientific name with citation of authority*

2. Strain designation or symbol and other collection number

3. History

a. Locality:

b. Habitat (select from Nos. in page 25): _____

c. Collection date:

d. Collector's full name (underline the family name):

e. Isolation date:

f. Isolator's full name (underline the family name):

g. Source of isolation: ☐ soil, ☐ water, ☐ animal( ), ☐ plant( ), ☐ snow or ice, ☐ others( )

h. Isolation objective: ☐ motile vegetative cell, ☐nonmotile vegetative cell, ☐ domant cell, ☐ spore, ☐ others( )

i. Physical separation: ☐ pipette washing, ☐ dilution, ☐ agar plating, ☐ taxis, ☐ others( )

j. Isolation treatment: ☐ none, ☐ antibiotics, ☐ ultra-violet irradiation, ☐ chemicals( ), ☐ ultra-sonic, ☐ heat, ☐ others( )

k. Identified by (write full name with underlined family name):

l. Axenified by (write full name with underlined family name):

m. Clonized by (write full name with underlined family name):

4. Status

a. Microalgae: ☐ axenic, ☐ unialgal, ☐ clonal, ☐ mixed

b. Bacteria: ☐ pure, ☐ non-clonal

c. Protozoa: ☐ axenic, ☐ monoxenic, ☐ dixenic, ☐ mixed

5. Medium

a. Designation and references:

b. Composition and notes for preparation of medium:

6. Experimental culture conditions

a. Temperature:

b. Light intensity:

c. Light quality:

d. L/D cycle:

7. Stock-culture conditions

a. Maintenance by sub-culturing

i. Temperature:

ii. Light intensity:

iii. Light quality:

iv. L/D cycle:

v. Duration:

b. Presservation in freezing

i. Cryoprotectant:

ii. Freezing rate:

iii. Thawing rate:

iv. Temperature: ☐ liquid nitrogen, ☐ − 80℃ ☐ others( )

c. Preservation in freeze-drying

☐ yes ☐ no

d. Preservation in drying

☐ yes ☐ no

8. Strain characteristics

a. Environmental characteristics (select from Nos. in page 25): _____

b. Physiological and ecological characteristics (select from Nos. in page 25): _____

c. Miscllaneous characteristics (select from Nos. in page 25): _____

9. Other information

10. References

Two copies of relevant reprint(s) should be accompanied with this form.

III. ORDERING AND DISTRIBUTION OF STRAINS

1. Distribution to researchers of this institute

(1) Rules on distribution

i) Anyone who uses a NIES-Collection strain in a paper which is subsequently published, is requested to give the full number of the strain, e.g. NIES-125, and to send two copies of the *reprint(s) or Xerox copies* to the NIES-Collection.

ii) In order to prevent trouble, confusion, or difficulty in the collection, accumulation and processing of strain information and data, the distribution of any NIES-Collection strain to a third party is strictly prohibited.

(2) Procedure for ordering strains

i) All orders for strains must be requested to the NIES-Collection by completing the Strain Ordering Form (p. 23).

ii) Upon receipt of a strain, the Strain Receipt Form (p. 24) should be completed and returned to the NIES-Collection as soon as possible.

2. Distribution to people of other organizations, both academic and commercial

The distribution of the strains is made through the Global Environmental Form (GEF), and the ordering procedure is shown in the GEF Catalogue (April, 1997).

3. Special warning for distribution of "Untransportable" strains

Orders for the strains that are indicated by "Untransportable" in the description of each strain data (see page 42) may not be accepted, depending on the season or condition of the cultures.
In principle, "Untransportable" strains can be distributed overseas only by the orderers themselves (for example, as hand luggage).

Strain Ordering Form

NIES use only
Date
Name
Number

Director,

Microbial Culture Collection,

National Institute for Environmental Studies

Date:

Orderer's full name (underline the family name):

Orderer's affiliation and address:

TEL: FAX:

E-mail:

The following microbial culture strains are requested.

Scientific names and strain numbers:

Object of use (in detail):

Strain data

☐ Needed (strain number)

☐ Not needed

Strain Receipt Form

NIES use only
Date
Name
Number

Director,
Microbial Culture Collection,
National Institute for Environmental Studies

Date:

Orderer's full name (underline the family name):

Orderer's affiliation and address:

TEL: FAX:

Date of strain receipt :

I received the following culture strains.

Scientific names and strain numbers:

States of strains received:

☐ Good (strain number)

☐ Poor (strain number)

☐ Others (strain nimber)

Comments:

--- **Habitat**（生息環境）---

1) Freshwater （淡水）
1-a) Oligotrophic（貧栄養） 1-b) Mesotrophic（中栄養） 1-c) Eutrophic（富栄養） 1-d) Saprotrophic（腐食栄養）
2) Marine （海水） 3) Brackish （汽水） 4) Tide pool （潮だまり）
5) Salt water （塩水） 6) Soil （土） 7) Hot spring （温泉）
8) Snow or ice （雪または氷） 9) Lotic （流水） 10) Lentic （止水）
11) Others （その他） {write details（お書きください）}

--- **Environmental Characteristics**（環境上問題となる特性）---

1) Red tide （赤潮） 2) Water bloom （水の華）
3) AGP 4) Oxidation pond （酸化池）
5) Biodegradation （生分解） 6) Activated sludge （活性汚泥）
7) Microbial film process （生物膜処理） 8) Indicator （指標）
9) Predator （捕食） 10) Offensive taste and odor （異味異臭）
11) Toxic （毒性） 12) Inhibition of purification （浄水障害）
13) Corrosion （腐食性） 14) Others（その他） {write details（お書きください）}

--- **Physiological and Ecological Characteristics**（生理生態的特性）---

1) Autotrophic （独立栄養） 2) Mixotrophic （混合栄養）
3) Phagotrophic （摂食栄養） 4) Heterotrophic （従属栄養）
5) Planktonic （浮遊性） 6) Benthic （底生）
7) Symbiotic （共生） 8) Parasitic （寄生）
9) Saprophytic （腐生） 10) Endophytic （内生）
11) Eurythermal （広温性） 12) Psychrophilic （好冷性）
13) Euryhaline （広塩分性） 14) Stenohaline （狭塩分性）
15) Acidophilic （好酸性） 16) Nitrogen fixation （窒素固定）
17) Fermentation （発酵） 18) Bioluminescence （生物発光）
19) Phototaxis （走光性） 20) Hydrogen evolution （水素発生）
21) Aerobic （好気性） 22) Anaerobic （嫌気性）
23) Gram positive （グラム ＋） 24) Gram negative （グラム －）
25) Others（その他） {write details（お書きください）}

--- **Miscellaneous Characteristics**（その他の特性）---

1) Mutant （突然変異株） 2) Type strain （タイプ株）
3) Heterothallic （雌雄異株） 4) Homothallic （雌雄同株）
5) Dioecious （雌雄異体） 6) Monoecious （雌雄同体）
7) Isogamy （同型配偶） 8) Anisogamy （異型配偶）
9) Oogamy （卵生殖） 10) Polyploidy （倍数性株）
11) Chromatic adaptation （色順応） 12) Rod （桿菌）
13) Coccus （球菌） 14) Spiral （ラセン菌）
15) Motile （運動性） 16) Immotile（非運動性）
17) Resting spore forming（休眠胞子形成） 18) Resting spore not forming（休眠胞子非形成）
19) Mating type ＋ （交配型 ＋） 20) Mating type － （交配型 －）
21) Mating type female （交配型 雌） 22) Mating type male （交配型 雄）
23) Others（その他） {write details（お書きください）}

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_3BO_3
KCl	$MnCl_2 \cdot 4H_2O$
$CaCl_2 \cdot 2H_2O$	$MnSO_4 \cdot 7H_2O$
$MgCl_2 \cdot 6H_2O$	$FeCl_3 \cdot 6H_2O$
Na_2SO_4	$FeSO_4 \cdot 7H_2O$
K_2SO_4	$CoCl_2 \cdot 6H_2O$
$MgSO_4 \cdot 7H_2O$	$ZnSO_4 \cdot 7H_2O$
$NaNO_3$	$CuSO_4 \cdot 5H_2O$
KNO_3	$Na_2MoO_4 \cdot 2H_2O$
$Ca(NO_3)_2 \cdot 4H_2O$	**Vitamins**
NH_4NO_3	Vitamin B_{12}
$NaH_2PO_4 \cdot 2H_2O$	Biotin
β-Na_2glycerophosphate	Thiamine HCl
KH_2PO_4	Nicotinic acid
K_2HPO_4	Calcium panthothenate
Na_2CO_3	ρ-Aminobenzoic acid
$NaHCO_3$	Inositol
$Na_2SiO_3 \cdot 9H_2O$	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 Na_2EDTA, 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 B_{12}, 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 B_{12}, biotin and thiamine HCl

i) Prepare separate primary stock solution with a concentration of 0.1 mg/ml of vitamin B_{12} 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 B_{12} 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-56). 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, $MgSO_4 \cdot 7H_2O$, KCl and $CaCl_2 \cdot 2H_2O$, 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 cmϕ) and cool to form an agar slant.

VI. MEDIA

1) Stock media for algae

1)-1. For freshwater algae

1. AF-6 (90)[1)]

$NaNO_3$	14	mg
NH_4NO_3	2.2	mg
$MgSO_4 \cdot 7H_2O$	3	mg
KH_2PO_4	1	mg
K_2HPO_4	0.5	mg
$CaCl_2 \cdot 2H_2O$	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, $CaCO_3$ 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)

$(NH_4)SO_4$	132	mg
KH_2PO_4	27.2	mg
$MgSO_4 \cdot 7H_2O$	24.6	mg
$CaCl_2 \cdot 2H_2O$	7.4	mg
Allen Metals[1)]	0.01	ml
Distilled water	99.9	ml
pH 2.5[2)]		

1) See 48
2) pH is adjusted to 2.5 with 1 N H_2SO_4.

4. C (56)

$Ca(NO_3)_2 \cdot 4H_2O$	15	mg
KNO_3	10	mg
β-Na_2glycerophosphate	5	mg
$MgSO_4 \cdot 7H_2O$	4	mg
Vitamin B_{12}	0.01	μg
Biotin	0.01	μg
Thiamine HCl	1	μg
PIV metals[1)]	0.3	ml
Tris (hydroxymethyl) aminomathane	50	mg
Distilled water	99.7	ml
pH 7.5		

1) See 54

5. CA (66)

$Ca(NO_3)_2 \cdot 4H_2O$	2	mg
KNO_3	10	mg
NH_4NO_3	5	mg
β-Na_2glycerophosphate	3	mg
$MgSO_4 \cdot 7H_2O$	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 54
2) See 50

6. CAM

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

7. Carefoot (9)

$NaNO_3$	24.7	mg
$CaCl_2 \cdot 2H_2O$	1.1	mg
$MgSO_4 \cdot 7H_2O$	4.7	mg
K_2HPO_4	0. 9	mg
KH_2PO_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 B_{12}, 0.02 μg Biotin and 2 μg Thiamine HCl are added to this medium.

1) See 54

8. CB

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

9. CC (61)

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

10. CSi

C medium with pH adjusted to 7.0 by buffering with 50 mg HEPES instead of Tris (hydroxymethyl) aminomethane. Thereafter, 10 mg $Na_2SiO_3 \cdot 9H_2O$ is added.

11. CSi+Cu

0.250mg $CuSO_4 \cdot 5H_2O$ is added to CSi medium.

12. CT (310)

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

13. CYT

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

14. HUT (55)

KH_2PO_4	2	mg
$MgSO_4 \cdot 7H_2O$	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.

15. M-11 (36), (339)

$NaNO_3$	10	mg
K_2HPO_4	1	mg
$MgSO_4 \cdot 7H_2O$	7.5	mg
$CaCl_2 \cdot 2H_2O$	4	mg
Na_2CO_3	3	mg
$FeSO_4 \cdot 7H_2O$	0.1	mg
$Na_2EDTA \cdot 2H_2O$	0.1	mg
Distilled water	100	ml

pH 8.0

16. MA (58)

$Ca(NO_3)_2 \cdot 4H_2O$	5	mg
KNO_3	10	mg
$NaNO_3$	5	mg
Na_2SO_4	4	mg
$MgCl_2 \cdot 6H_2O$	5	mg
β-Na_2glycerophosphate	10	mg
Na_2EDTA	0.5	mg
$FeCl_3 \cdot 6H_2O$	0.05	mg
$MnCl_2 \cdot 4H_2O$	0.5	mg
$ZnCl_2$	0.05	mg
$CoCl_2 \cdot 6H_2O$	0.5	mg
$Na_2MoO_4 \cdot 2H_2O$	0.08	mg
H_3BO_3	2	mg
Bicine	50	mg
Distilled water	100	ml

pH 8.6

17. MAF-6

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

18. M Chu No. 10 (11)

$Ca(NO_3)_2 \cdot 4H_2O$	2.0	mg
KH_2PO_4	0.62	mg
$MgSO_4 \cdot 7H_2O$	2.5	mg
Na_2CO_3	2	mg
$Na_2SiO_3 \cdot 9H_2O$	2.5	mg
HCl (1N)[1]	0.025	ml
$Na_2EDTA \cdot 2H_2O$	0.2	mg
$FeCl_3 \cdot 6H_2O$	0.1	mg
H_3BO_3	0.248	mg
$MnCl_2 \cdot 4H_2O$	0.139	mg
$(NH_4)_6Mo_7O_{24} \cdot 4H_2O$	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.

19. MDM (287)

KNO_3	100	mg
$MgSO_4 \cdot 7H_2O$	25	mg
K_2HPO_4	25	mg
NaCl	10	mg
$CaCl_2 \cdot 2H_2O$	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 51
2) See 47

20. MG (57)

$Ca(NO_3)_2 \cdot 4H_2O$	2	mg
KNO_3	10	mg
β-Na_2glycerophosphate	3	mg
$MgSO_4 \cdot 7H_2O$	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 54
2) See 50

21. MGM

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

22. P 35 (58)

NH_4NO_3	10	mg
$MgSO_4 \cdot 7H_2O$	4	mg
KCl	5	mg
$CaCl_2 \cdot 2H_2O$	7.4	mg
β-Na_2glycerophosphate	5	mg
Sodium acetate	100	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 8.0		

1) See 54

23. MW (224)

Urea	0.85	mg
$NaNO_3$	0.17	mg
NH_4Cl	0.042	mg
$Ca(NO_3)_2 \cdot 4H_2O$	10	mg
$CaCO_3$	1	mg
$CaCl_2 \cdot 2H_2O$	1.4	mg
KNO_3	1	mg
$KHCO_3$	0.9	mg
β-Na_2glycerophosphate	2	mg
$MgSO_4 \cdot 7H_2O$	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 54

24. MW / 5

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

25. URO (95), (138)

NH_4NO_3	0.5	mg
β-Na_2glycerophosphate	0.4	mg
$MgSO_4 \cdot 7H_2O$	1	mg
$CaCl_2 \cdot 2H_2O$	1	mg
KCl	0.1	mg
Thiamine HCl	1	μg
Vitamin B_{12}	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 54
2) pH is adjusted to 7. 5 with 0.1 N HCl.

26. VT (222)

$Ca(NO_3)_2 \cdot 4H_2O$	11.78	mg
β-Na_2glycerophosphate	5	mg
$MgSO_4 \cdot 7H_2O$	4	mg
KCl	5	mg
Vitamin B_{12}	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 54

27. VTAC (192)

20 mg sodium acetate is added to VT medium.

28. VTYT (61)

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

29. W (308)

$Ca(NO_3)_2 \cdot 4H_2O$	10	mg
KNO_3	1	mg
$MgSO_4 \cdot 7H_2O$	1.5	mg
β-Na_2glycerophosphate	2	mg
Urea	1.7	mg
Thiamine HCl	0.2	μg
Vitamin B_{12}	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 54

30. SW (218)

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

31. SOT (194)

$NaHCO_3$	1.68	g
K_2HPO_4	50	mg
$NaNO_3$	250	mg
K_2SO_4	100	mg
NaCl	100	mg
$MgSO_4 \cdot 7H_2O$	20	mg
$CaCl_2 \cdot 2H_2O$	4	mg
$FeSO_4 \cdot 7H_2O$	1	mg
Na_2EDTA	8	mg
A_5 solution[1)]	0.1	ml
Distilled water	99.9	ml

1) See 47

1)-2. For marine algae

32. ESM (200)

$NaNO_3$	12	mg
K_2HPO_4	0.5	mg
Vitamin B_{12}	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	95	ml
pH 8.0		

1) See 57

33. f / 2 (35)

$NaNO_3$	7.5	mg
$NaH_2PO_4 \cdot 2H_2O$	0.6	mg
Vitamin B_{12}	0.05	μg
Biotin	0.05	μg
Thiamine HCl	10	μg
$Na_2SiO_3 \cdot 9H_2O$	1	mg
f / 2 metals[1)]	0.1	ml
Sea water	99.9	ml

1) See 52

34. M-ASP7 (328)

NaCl	2.5	g
$MgSO_4 \cdot 7H_2O$	900	mg
KCl	70	mg
$CaCl_2 \cdot 2H_2O$	30	mg
$NaNO_3$	5	mg
$NaH_2PO_4 \cdot 2H_2O$	2	mg
Vitamin B_{12}	0.1	μg
Vitamin mix S_3[1)]	1	ml
$Na_2SiO_3 \cdot 9H_2O$	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 56
2) See 55

35. MF

f / 2 medium with $Na_2SiO_3 \cdot 9H_2O$ replaced by 1.0ml soil extract[1)] and adjusted to pH 8.0 by buffering with 100mg Tris (hydroxymethyl) aminomethane.

1) See 57

36. MKM (287)

KNO_3	75	mg
KH_2PO_4	2.5	mg
$MgSO_4 \cdot 7H_2O$	2	mg
Fe-citrate	250	μg
Agar	1.5	g
Sea water	50	ml
Distilled water	50	ml

37. 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 fresh water algae

38. YT (61)

Stock medium	100	ml
Yeast extract	100	mg
Tryptone	200	mg

39. B - I (67)

Stock medium	100	ml
Proteose peptone	100	mg

40. B - II (67)

Stock medium	100	ml
Yeast extract	500	mg

41. B - III (67)

Stock medium	100	ml
Peptone	500	mg
Beef extract	300	mg

42. B - IV (67)

Stock medium	100	ml
Glucose	100	mg
Peptone	100	mg

43. B - V (67)

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

2)-2. For marine algae

44. STP (221)

$NaNO_3$	20	mg
K_2HPO_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 S_3.
2) In the NIES-Collection, yeast autolysate is replaced by yeast extract.
3) See 57

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

NaCl	1.8	g
$MgSO_4 \cdot 7H_2O$	500	mg
KCl	60	mg
$NaNO_3$	100	mg
$CaCl_2 \cdot 2H_2O$	36.7	mg
K_2HPO_4	6	mg
Sucrose	400	mg
PII metals [1]	2	ml
$FeCl_3 \cdot 6H_2O$	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 53
2) See 49

46. Bf / 2 (355)

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

47. A_5 solution (53)

H_3BO_3	286	mg
$MnSO_4 \cdot 7H_2O$	250	mg
$ZnSO_4 \cdot 7H_2O$	22.2	mg
$CuSO_4 \cdot 5H_2O$	7.9	mg
$Na_2MoO_4 \cdot 2H_2O$	2.1	mg
Distilled water	100	ml

48. Allen metals (1)

Fe-EDTA	30.16	mg
$MnCl_2 \cdot 4H_2O$	1.79	mg
H_3BO_3	2.86	mg
$ZnSO_4 \cdot 7H_2O$	0.22	mg
$CuSO_4 \cdot 5H_2O$	0.079	mg
$(NH_4)_6MoO_{24} \cdot 4H_2O$	0.13	mg
NH_4VO_3	0.023	mg
Distilled water	100	ml

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

Glycine	100	mg
D, L - Alanine	100	mg
L - Aspargine	100	mg
Sodium acetate $\cdot 3H_2O$	200	mg
Glucose	200	mg
L - Glutamic acid	200	mg
Distilled water	100	ml

50. Fe (as EDTA; 1:1 molar) (220)

$Fe(NH_4)_2(SO_4)_2 \cdot 6H_2O$	70.2	mg
$Na_2EDTA \cdot 2H_2O$	66	mg
Distilled water	100	ml

* 1 ml of this solution contains 0.1 mg Fe.

51. Fe solution (61)

$FeSO_4 \cdot 7H_2O$	200	mg
Distilled water	100	ml
Conc $\cdot H_2SO_4$	0.026	ml[1)]

1) 2drops / 500ml (Ref. 61).

52. f / 2 metals (35)

$Na_2EDTA \cdot 2H_2O$	440	mg
$FeCl_3 \cdot 6H_2O$	316	mg
$CoSO_4 \cdot 7H_2O$	1.2	mg
$ZnSO_4 \cdot 7H_2O$	2.1	mg
$MnCl_2 \cdot 4H_2O$	18	mg
$CuSO_4 \cdot 5H_2O$	0.7	mg
$Na_2MoO_4 \cdot 2H_2O$	0.7	mg
Distilled water	100	ml

53. PII metals (219)

H_3BO_3	114	mg
$FeCl_3 \cdot 6H_2O$	4.9	mg
$MnSO_4 \cdot 4H_2O$	16.4	mg
$ZnSO_4 \cdot 7H_2O$	2.2	mg
$CoSO_4 \cdot 7H_2O$	480	μg
$Na_2EDTA \cdot 2H_2O$	100	mg
Distilled water	100	ml

54. PIV metals (222)

$FeCl_3 \cdot 6H_2O$	19.6	mg
$MnCl_2 \cdot 4H_2O$	3.6	mg
$ZnSO_4 \cdot 7H_2O$ [1)]	2.2	mg
$CoCl_2 \cdot 6H_2O$	0.4	mg
$Na_2MoO_4 \cdot 2H_2O$	0.25	mg
$Na_2EDTA \cdot 2H_2O$	100	mg
Distilled water	100	ml

1) In the NIES-Collection, $ZnCl_2$ is replaced by $ZnSO_4 \cdot 7H_2O$.

55 P_N metals (328)

$Na_2EDTA \cdot 2H_2O$	100	mg
H_3BO_3	113	mg
$FeCl_3 \cdot 6H_2O$	6.3	mg
$CoSO_4 \cdot 7H_2O$	0.093	mg
$ZnSO_4 \cdot 7H_2O$	4.66	mg
$MnCl_2 \cdot 4H_2O$	3.2	mg
Distilled water	100	ml

56. Vitamine mix S_3 (219)

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

57. Soil extract (221)

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

58. 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. 保存株リストの利用法

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－をつ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) Geitler[1)]

Syn. ***Arthrospira platensis*** Gomont[2)]

45[3)]

Lake Kasumigaura / Ibaraki[4)] (1975-11)[5)]

IAM M-184[6)], Axenic, Clonal[7)], M.M.Watanabe[8)] (1975-11)[9)]

Identified by: M.M.Watanabe[10)]

Culture conditions: MA, 25° C, 1500 lx, 1M[11)]

Characteristics: Water bloom, Freshwater,

Forming water bloom in Inbanuma[12)]

KAS-6-50[13)]

References: 61, 260, 307, 310, 318, 335[14)]

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 は東京大学分子細胞生物学研究所、TAC は国立科学博物館筑波実験植物園、UTEX はテキサス大学の藻類株保存施設である。
7) 株の状態。
   Axenic の表示があるものは無菌株である。
8) 分離者。
9) 分離年月。
10) 同定者。
11) 培地名、保存温度、保存照度、保存期間。明暗周期は12時間12時間に設定されてい

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、照度は前培養が必要な場合、その条件である。

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; 長期間の（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。

VII. EXPLANATORY NOTES ABOUT THE LIST

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) Geitler[1)]
Syn. ***Arthrospira platensis*** Gomont[2)]
45[3)]
Lake Kasumigaura / Ibaraki[4)] (1975-11)[5)]
IAM M-184[6)], Axenic, Clonal[7)], M.M.Watanabe[8)] (1975-11)[9)]
Identified by: M.M.Watanabe[10)]
Culture conditions: MA, 25° C, 1500 lx, 1M[11)]
Characteristics: Water bloom, Freshwater,
Forming water bloom in Inbanuma[12)]
KAS-6-50[13)]
References: 61, 260, 307, 310, 318, 335[14)]

1) Scientific name with authority.
2) Synonym.
3) Strain number.
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.
   UTEX: Culture Collection of Algae at the University of Texas at Austin.
7) Status of the strain.
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.

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

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.120~139.

VIII. LIST OF STRAINS

ALGAE

Achnanthes longipes Agardh

330
Kawazu / Shizuoka (1985-05)
Unialgal, Clonal, T.Sawaguchi (1985-05)
Identified by: T.Sawaguchi
Culture conditions: f/2, 10° C, 2000 lx, 2M
Characteristics: Marine
IMHB-5
Reference: 79

Achnanthes minutissima Kützing

71
Kosaka River / Akita (1983-04)
Axenic, Clonal, A.Yuri (1983-09)
Identified by: M.Mizuno
Culture conditions: CSi, 20° C, 4000 lx, 1M
Characteristics: Indicator, Freshwater
A15-6
References: 213, 262, 263, 330, 331

407
Miyata River / Ibaraki (1987-05)
Unialgal, Non-clonal, F.Kasai (1987-06)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
4st-0-8
Reference: 263

408
Ashio / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-09)
Identified by: M.Idei
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
AT5-23
Reference: 263

409
Ashio / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-08)
Identified by: M.Idei
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
Ast-3-3
Reference: 263

410
Ashio / Gunma (1987-08)
Unialgal, Non-clonal F.Kasai (1987-09)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
AT4-18
Reference: 263

411
Miyata River / Ibaraki (1987-02)
Unialgal, Non-clonal, F.Kasai (1987-03)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
1st-3-17
References: 262, 263

412
Miyata River / Ibaraki (1987-02)
Unialgal, Non-clonal, F.Kasai (1987-03)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
1St-1-1
References: 262, 263

413
Miyata River / Ibaraki (1987-02)
Unialgal, Non-clonal, F.Kasai (1987-03)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
1st-2-8
References: 262, 263

414
Ooe River(Ozegahara) / Fukushima (1987-10)
Unialgal, Non-clonal, F.Kasai (1987-11)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
0-25
Reference: 263

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, 4000 lx, 1M
Characteristics: Indicator, Freshwater, Reidentified by M.Idei
KAAC-6

Actinastrum hantzschii Lagerheim
415
Lake Kasumigaura / Ibaraki (1983-07)
Axenic, Clonal, F.Kasai (1983-07)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, *COXI* gene (D63660)
F7-4
References: 48, 318

Alexandrium affine (Inouye et Fukuyo) Balech
673
Harima-Nada / Seto Inland Sea (1980-09)
Unialgal, Clonal, S.Yoshimatsu (1980-09)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

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, 4000 lx, 2M
Characteristics: Red tide, Marine, Unstable, Untransportable
KGW-31-1

519
Owase Bay / Mie
Axenic, Clonal, T.Okaichi
Culture conditions: ESM, 20° C, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Unstable, Untransportable
88HH-2

674
Harima-Nada / Seto Inland Sea (1980-06)
Axenic, Clonal, S.Yoshimatsu (1980-06)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Mating type -, Untransportable
Ac 5

676
Uranouchi Bay / Kochi (1988-05)
Unialgal, Clonal, S.Yoshimatsu (1988-05)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
PCko-2

677
Yamakawa Bay / Kagoshima (1988-03)
Axenic, Clonal, S.Yoshimatsu (1988-04)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 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, 4000 lx, 2M
Characteristics: Toxic, Marine, Untransportable
References: 98, 99, 131

Alexandrium insuetum Balech
678
Uchiumi Bay / Kagawa (1985-06)
Axenic, Clonal, S.Yoshimatsu (1985-06)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

Amphidinium britanicum (Herdman) Lebour
405
Hasaki / Ibaraki (1987-05)
Unialgal, Clonal, T.Sawaguchi (1987-05)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 4000 lx, 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, 4000 lx, 1M
Characteristics: Marine, Unstable, Untransportable
IIDA

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, 4000 lx, 1M
Characteristics: Marine, Untransportable
AK-1

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, 1500 lx, 1M
Characteristics: Water bloom, Freshwater, Unstable
References: 61, 158, 318, 349

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, 1500 lx, 1M
Characteristics: Water bloom, Freshwater, Unstable
References: 61, 157, 158, 318

Anabaena cylindrica Lemmermann
19
IAM M-1, Axenic, Non-clonal
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Nitrogen fixation, Reidentified by M.M.Watanabe
References: 2, 3, 8, 20, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 47, 61, 118, 135, 195, 196, 197, 198, 215, 216, 217, 259, 274, 287, 294, 318, 344, 345, 346, 347, 348, 349

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, 1500 lx, 1M
Characteristics: Water bloom, Indicator ,Freshwater, Unstable
K-TAN-32
References: 158, 251, 318

74
Lake Kasumigaura / Ibaraki (1978-08)
TAC 33, Axenic, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: CT, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-TAN-33
References: 132, 133, 134, 318

75
Lake Kasumigaura / Ibaraki (1978-12)
TAC 43, Unialgal, Clonal, M.Watanabe (1978-12)
Identified by: M.Watanabe
Culture conditions: CB, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-TAN-43
Reference: 318

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, 1500 lx, 20D
Characteristics: Water bloom, Freshwater, Unstable
K-TAN-42
References: 158, 318

Anabaena spiroides Klebahn
76
Lake Kasumigaura / Ibaraki (1983-06)
Unialgal, Clonal, S.Suda (1983-06)
Identified by: S.Suda
Culture conditions: CA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-A-12
References: 158, 199, 318

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, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-TAN-30
References: 157, 158

Anabaena spiroides Klebahn f. ***spiroides***
77
Lake Kasumigaura / Ibaraki (1978-08)
TAC 31, Axenic, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: CT, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-TAN-31
Reference: 318

79
Lake Kasumigaura / Ibaraki (1978-07)
TAC 28, Axenic, Clonal, M.Watanabe (1978-07)
Identified by: M.Watanabe
Culture conditions: CB, MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-TAN-28

263
Lake Kasumigaura / Ibaraki (1978-07)
TAC 27, Axenic, Clonal, M.Watanabe (1978-07)
Identified by: M.Watanabe
Culture conditions: CT, MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Freshwater, Unstable
K-TAN-27
Reference: 318

Anabaena variabilis Kützing ex Bornet et Flahault
23
IAM M-2, Axenic, Clonal
Culture conditions: MDM(S), 20° C, 500 lx,4M, (25° C, 3000 lx)
Characteristics: Freshwater, Non-heterocystous variant
References: 3, 15, 16, 17, 30, 31, 32, 61, 259, 275, 287

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Re.,identified by M.M.Watanabe
References: 3, 61, 135, 287, 293, 318

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, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, Unstable
K-TAN-1
References: 158, 251, 318

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, 500 lx, 4M, (20° C, 1500 lx)
Characteristics: Freshwater

NK-24
Reference: 263

* ***Arthrospira platensis*** Gomont
See ***Spirulina platensis*** (Gomont) Geitler

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, 2000 lx, 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, 2000 lx, 1M
Characteristics: Marine

Astrephomene gubernaculifera Pocock
418
Kaisei / Kanagawa (1981-4)
Axenic, Clonal, H.Nozaki (1981-05)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-419, *rbcL* gene (D63428)
1520-4 (–)
References: 165, 185

419
Kaisei / Kanagawa (1981-4)
Axenic, Clonal, H.Nozaki (1981-05)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-418
1520-1 (+)
Reference: 165

627
Hayama / Kanagawa (1980-12)
Unialgal , Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, Crosses with N-628
1726-1(+)

628
Hayama / Kanagawa (1980-12)
Unialgal, Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Hetherothallic, Isogamy, Mating type –, Crosses with N-627
1727-1(-)

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, 2000 lx, 1M
Characteristics: Freshwater, Type strain, Heterothallic, Isogamy, Mating type +, Crosses with NIES-565, *rbcL* gene (D63429)
1620-3-2
References: 165, 185

565
Hayama / Kanagawa (1980-12)
UTEX 2475, Unialgal, Clonal, H.Nozaki (1981-06)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Type strain, Heterothallic, Isogamy, Mating type –, Crosses with NIES-564
1620-4-1
References: 165, 184

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Nitrogen fixation, M-128 as Aulosira fertissima in IAM, Reidentified by M.M.Watanabe
References: 61, 318

Auxenochlorella protothecoides (Kruger) Kalina
629
Watarase River / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-08)
Identified by: F.Kasai

Culture conditions: C, 15° C, 500 lx, 6M, (15° C, 1500 lx)
Characteristics: Freshwater
AT1-7
Reference: 263

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, 2000 lx, 1M
Characteristics: Freshwater, Akinete forming, *rbcL* gene (D63430)
3907-1
References: 168, 185, 186

Botrydiopsis arhiza Borzi
621
Shelford / England
CCAP 222/1B, Unialgal, George (1947)
Culture conditions: AF-6, 20° C, 4000 lx, 2M
Characteristics: Freshwater

Botrydium granulatum (L.) Greville
622
CCAP 805/3A, Axenic, Vischer (1939)
Culture conditions: AF-6, 20° C, 4000 lx, 2M
Characteristics: Freshwater

Brachiomonas submarina Bohlin
375
Hachinohe Harbor / Aomori (1986-08)
Axenic, Clonal, T.Sawaguchi (1986-08)
Identified by: T.Sawaguchi
Culture conditions: ESM, 15° C, 2000 lx, 1M
Characteristics: Marine, Brackish
86-SuHH-2

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, 4000 lx, 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, 4000 lx, 1M
Characteristics: Marine, Untransportable
KSTH-29

Calothrix brevissima 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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Nitrogen fixation Chromatic adaptation
References: 61, 214, 287

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, 500 lx, 6M, (20° C, 1500 lx)
Characteristics: Marine
References: 61, 307, 321

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, 500 lx, 6M, (20° C, 1500 lx)
Characteristics: Indicator, Marine, Endophyte in *Nemalion* (Rhodophyceae)
Reference: 61

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, 500 lx, 6M, (20° C, 1500 lx)
Characteristics: Indicator, Marine, Endophyte

in *Codium* (Chlorophyceae)
Reference: 61

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, 500 lx, 6M, (20° C, 1500 lx)
Characteristics: Indicator, Marine
References: 61, 307, 321

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, 2000 lx, 2M
Characteristics: Freshwater, Formarly identified as *Carteria inversa* (Korshikov) Bourrelly
Kas-10
Reference: 181

425
Tsukuba / Ibaraki (1985-11)
Axenic, Clonal, S.Suda (1985-11)
Reidentified by: H.Nozaki et al.
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater, Formarly identified as *Carteria inversa* (Korshikov) Bourrelly, Type strain of *Carteria cerasiformis* Nozaki et al.
w-8-15
Reference: 181

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, 2000 lx, 2M
Characteristics: Freshwater, *rbcL* gene (D63431)
SIST3-1
Reference: 185

630
New Haven / USA
UTEX 432, Unialgal, Clonal, R.A.Lewin
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater
Reference: 181

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, 2000 lx, 1M
Characteristics: Freshwater, Homothallic, Isogamy
91-409-1
Reference: 180

632
Saiwai-ku / Kawasaki (1990-10)
Unialgal, Clonal, H.Nozaki (1991-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Homothallic, Isogamy
91-421-4
References: 180, 181

633
Shirako / Chiba (1991-03)
Unialgal, Clonal, H.Nozaki (1991-05)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Homothallic, Isogamy
91-504-1
References: 180, 181

634
UTEX 2161, Unialgal, Clonal, B.Vandover (1972)
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Homothallic, Isogamy
Reference: 181

635
Allahabad / India
UTEX 233, Unialgal, Clonal, Pringsheim.O.
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Type strain of *Carteria eugametos* Mitra
Reference: 181

636
California / USA
UTEX 1032, Unialgal, Clonal, A.Waters
Reidentified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M

Characteristics: Freshwater, Formerly identified as *Carteria olivieri* G. S. West (Starr and Zeikus 1993)
Reference: 181

Carteria inversa (Korshikov) Bourrelly
422
Tsukuba / Ibaraki (1982-11)
Axenic, Clonal, F.Kasai (1982-11)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 3M
Characteristics: Freshwater
134-4
Reference: 181

423
Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Erata (1983-08)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 3M
Characteristics: Freshwater
106
Reference: 181

* ***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, 2000 lx, 2M
Characteristics: Freshwater
SIST7-4

Carteria multifilis (Fresenius) Dill
427
Kashiwa / Chiba (1986)
Axenic, Clonal, M.M.Watanabe (1986)
Identified by: S.Suda
Culture conditions: VT, 20° C, 2000 lx, 2M
Characteristics: Freshwater
Ca1-2

Carteria obtusa Dill
428
Kashiwa / Chiba (1986-09)
Axenic, Clonal, M.M.Watanabe (1986-09)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater
Ca-2-1

429
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, M.Kasama (1986-03)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater
SIS5-20

430
Kashiwa / Chiba (1986-09)
Axenic, Clonal, M.M.Watanabe (1986-09)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater
Ca2-3

431
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater
SIST6-3

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, 2000 lx, 2M
Characteristics: Freshwater
w-5-2

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, 4000 lx, 1M
Characteristics: Brackish, Freshwater, Untransportable
860627-10

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, 1000 lx, 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, 2000 lx, 20D
Characteristics: Marine
STHB-4

553
Tokyo Bay / Tokyo (1991-10)
Unialgal, Clonal, S.Ono (1991-10)
Identified by: S.Ono
Culture conditions: f/2, 5° C, 2000 lx, 1M
Characteristics: Red tide, Marine
T-1

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, 500 lx, 2M,
(10° C, 1500 lx)
Characteristics: Freshwater
M-29
References: 263, 264

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, 500 lx,
3M, (20° C, 1500 lx)
Characteristics: Freshwater
2st-2-1
References: 262, 263, 264

Characiochloris acuminata Lee et Bold
637
El 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, 2000 lx, 2M
Characteristics: Freshwater, Type strain
Reference: 177

Characiochloris sasae Nozaki
567
Kawasaki / Kanagawa (1990-10)
Unialgal, Clonal, H.Nozaki (1991-01)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater, Type strain,
Aplanospore forming
91-0106-1
Reference: 177

638
Saiwai-ku / Kawasaki (1990-10)
Unialgal, Clonal, H.Nozaki (1991-01)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Spore not forming,
Endemic in Japan
Reference: 177

Characium angustum A.Braun
639
Kinu River / Tochigi (1987-08)
Unialgal, F.Kasai, (1987-09-17)
Identified by: F.Kasai
Culture conditions: C, 15° C, 500 lx, 4M,
(15° C, 1500 lx)
Characteristics: Freshwater
AK-5-2
Reference: 263

Characium maximum S.Watanabe
154
Sasebo / Nagasaki (1975-08)
Unialgal, Non-clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M,
(25° C, 3000 lx)
Characteristics: Soil, Habitat: Garden Shrine
where *Cryptomeria japonica* was planted
6-EBO-2
Reference: 334

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
N-76-0
Reference: 61

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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
Ho-1
References: 50, 109, 111, 136, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 159, 324, 350, 353

2
Osaka Bay / Osaka (1982-09)
Axenic, Clonal, S.Yamochi
Identified by: S.Yamochi
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
OCH-a
Reference: 50

83
Off Hiketa / Seto Inland Sea (1977-08)
Axenic, Clonal, C.Ono
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-2
References: 50, 279

84
Off Hiketa / Seto Inland Sea (1972)
Axenic, Clonal, T.Okaichi
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-6-1
Reference: 50

85
Shodo Isl. / Kagawa (1978-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-8-5
References: 50, 51

86
Uranouchi Bay / Kochi (1980-11)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-42-4
References: 50, 51, 279

113
Naoshima Isl. / Kagawa (1982-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-59-2
Reference: 50

114
Harima-Nada / Seto Inland Sea (1983-08)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-74-8
References: 50, 343

161
Hiroshima Bay / Hiroshima
Axenic, Clonal
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
Hiroshima-70
References: 39, 40

557
Hiroshima Bay / Hiroshima (1970-09)
Axenic, Clonal, H.Takayama (1970-09)
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

558
Mikawa Bay / Aichi
Axenic, Clonal, S.Toriumi
Identified by: S.Toriumi
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

Chattonella marina (Subrahmanyan) Hara et Chihara

3
Osaka Bay / Osaka (1982-08)
Axenic, Clonal, S.Yamochi (1982-08)
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
OCH-m
Reference: 279

14
Harima-Nada / Seto Inland Sea (1983-02)
Axenic, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
H-53-11
References: 50, 343

115
Kinko Bay / Kagoshima (1978-06)
Axenic, Clonal, Aramaki/Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-9-1
Reference: 50

116
Harima-Nada / Seto Inland Sea (1981-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-46-7
Reference: 50

117
Naoshima Isl. / Kagawa (1982-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-58-3
Reference: 50

118
Harima-Nada / Seto Inland Sea (1983-07)
Axenic, Clonal, S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-75-2
References: 40, 50, 51, 223, 279

121
Kagoshima Bay / Kagoshima (1982)
Axenic, Clonal, T.Aramaki (1982)
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGO-57-1
References: 50, 51, 279

559
Maizuru Bay / Kyoto (1975-10)
Axenic, Clonal, H. Takayama (1975-10)
Identified by: S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

Chattonella ovata Y.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, 4000 lx, 1M
Characteristics: Marine, Untransportable
References: 38, 40

671
Harima-Nada / Seto Inland Sea (1982-07)
Unialgal, Clonal, S.Yoshimatsu (1982-07)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

Chattonella verrculosa 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, 3000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
Reference: 40

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, 500 lx, 3M,
(25° C, 3000 lx)
Characteristics: Soil
ASE-242

References: 334, 335

Chlamydomonas fasciata Ettl
437
Tsukuba / Ibaraki (1984-05)
Axenic, Clonal, S.Suda (1984-05)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater
H-3-4-2

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, 2000 lx, 2M
Characteristics: Freshwater
Kas-7

Chlamydomonas monticola S.Watanabe
157
Mt. Shiroumadake / Nagano (1980-08)
Axenic, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Soil
KUC80-4
References: 213, 334

Chlamydomonas neglecta Korshikov ex Pascher
439
Tsukuba / Ibaraki (1984-05)
Axenic, Clonal, S.Suda (1984-05)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater
T-4-19

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, 2000 lx, 2M
Characteristics: Marine
I-29
References: 229, 233

441
Hachinohe Harbor / Aomori (1985-01)
Axenic, Clonal, S.Suda (1985-02)
Identified by: S.Suda
Culture conditions: f/2, 20° C, 2000 lx, 2M
Characteristics: Marine
HH-5
Reference: 229

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, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater
MKF-50
References: 61, 318, 335

Chlamydomonas tetragama (Bohlin) Ettl
446
Tsuchiura / Ibaraki (1985-04)
Axenic, Clonal, S.Suda (1985-04)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater, Neotype strain of *Chlamydomonas tetragama* (Bohlin) Ettl, Formerly identified as *Chlorogonium metamorphum* Skuja
413D4-4
Reference: 182

Chlorarachnion reptans Geitler
624
Puerto Penasco / Mexico
CCAP 815/1, Unialgal, Norris (1966)
Culture conditions: ESM, 20° C, 4000 lx, 2M
Characteristics: Marine

Chlorella fusca Shihira et Krauss var. ***fusca***
685
IAM C-101, Unialgal, Clonal, R.A.Lewin
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Type strain

* ***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, 500 lx, 6M, (10° C, 1500 lx)
Characteristics: Freshwater
Tst-8-2
Reference: 263

Chlorella vulgaris Beijerinck
227
IAM C-30, Axenic, Clonal, A.Watanabe
Identified by: H.Fukushima
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, *COXI* gene (D63763)
References: 48, 61, 91, 120, 129, 187, 206, 278, 287, 335, 358

641
Miyata River / Ibaraki (1987-02)
Unialgal, Clonal, F.Kasai (1987-03)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 6M
Characteristics: Freshwater
1st-3-26
References: 262, 263

642
Miyata River / Ibaraki (1987-02)
Unialgal, Clonal, F.Kasai (1987-03)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 6M
Characteristics: Freshwater
1st-2-17
References: 262, 263

Chlorella vulgaris Beijerinck var. *vulgaris*
686
Delft / Holland
IAM C-207, Unialgal, Clonal, M.W.Beijerinck (1892)
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Type strain

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, 2000 lx, 1M
Characteristics: Freshwater, Type strain, Monoecious, Isogamy, Pedogamy
92-912-1

Chlorogonium fusiforme Matwienko
123
Niseko / Hokkaido (1964-07)
IAM C-349, Axenic, Clonal, T.Ichimura (1964-07)
Identified by: T.Ichimura
Culture conditions: AF-6, 20° C, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater, Homothallic, Formerly identified as *Chlorogonium metamorphum* Skuja
MKF-14
References: 61, 182

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

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

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, 2000 lx, 2M
Characteristics: Freshwater
Kas-8

Chlorosarcinopsis caeca S.Watanabe
160
Tottori (1972-05)
Unialgal, Non-clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Soil
TOT-24
Reference: 334

Chlorosarcinopsis delicata S.Watanabe
153

Kyoto / Kyoto (1975-04)
Unialgal, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Soil
KUC3-6
Reference: 334

Chrysochromulina parva Lackey
562
NIES / Tsukuba (1992-02)
Unialgal, Clonal, N.Hatakeyama (1992-03)
Identified by: M.Kawachi
Culture conditions: AF-6, 15° C, 3000 lx, 1M
Characteristics: Freshwater

Closterium acerosum Ehrenberg ex Ralfs
124
Daramshara / Nepal (1965-10)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
N-20-1
Reference: 57

125
Rukumkot / Nepal (1965-10)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
N-25-22
Reference: 57

127
Sapporo / Hokkaido
IAM C-435, Axenic, Clonal, Y.Nishihama
Identified by: Y.Nishihama
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
H-2-2
References: 57, 61

448
IAM C-314, UTEX 1075, Axenic, Clonal
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
Reference: 61

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, 4000 lx, 2M
Characteristics: Water bloom, Freshwater, Heterothallic, Mating type +, Crosses with NIES-259 and NIES-260
Bca-25
Reference: 12

259
Lake Biwa / Shiga (1983-12)
Axenic, Clonal, M.M.Watanabe (1983-12)
Identified by: M.M.Watanabe
Culture conditions: CA, 20° C, 4000 lx, 2M
Characteristics: Water bloom, Freshwater, Heterothallic, Mating type –, Crosses with NIES-258
Bca-26

Closterium calosporum Wittrock var. ***calosporum***
271
Vermont / U.S.A.
IAM C-318, Axenic, Clonal, P.W.Cook
Culture conditions: AF-6, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater
References: 61, 66, 296, 297

Closterium calosporum Wittrock
var. ***galiciense*** Gutwinski
128
Ibaraki
Axenic, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-162
IB-21-20

162
Ibaraki
Unialgal, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (25° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-128, NIES-163 and NIES-168
IB-21-21

163
Ginama / Okinawa (1973-06)
IAM C-455, Axenic, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-162, NIES-164 and NIES-165
R-5-3
References: 66, 296, 297

164
Ginama / Okinawa (1973-06)
IAM C-454, Unialgal, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic Mating type +, Crosses with NIES-163 and NIES-166
R-5-2
References: 66, 296, 297

165
Iriomote Isl. / Okinawa (1973-03)
IAM C-457, Axenic, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (25° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-163, NIES-166 and NIES-168
R-11-6
References: 66, 296, 297

166
Kagawa-cho / Kagawa (1974-09)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-164, NIES-165 and NIES-167
J5-56-11

167
Kagawa-cho / Kagawa (1974-09)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-166
J5-56-12

168
Iriomote Isl. / Okinawa (1973-03)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-165
R-11-5
References: 66, 296, 297

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, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-134-5
References: 296, 297

170
Suke / Nepal (1972-06)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-143-19

171
Suke / Nepal (1972-06)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-147-3
References: 86, 296

336
Suke / Nepal (1972-06)
Axenic, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 25° C, 1500 lx, 2M
Characteristics: Freshwater, Homothallic
N-147-12
Reference: 296

Closterium ehrenbergii Meneghini ex Ralfs
228
Ebina / Kanagawa (1975-12)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (25° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Mating group B
Crosses with NIES-229
KK-33-1
References: 49, 59, 60, 62, 63, 65, 86

229
Ebina / Kanagawa (1975-12)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Mating group B
Crosses with NIES-228
KK-33-6
References: 49, 59, 60, 62, 63, 65, 86

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, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-180
N-90-58
References: 57, 61

180
Kathmandu / Nepal (1968-05)
IAM C-445, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-179
N-90-59
References: 57, 61

Closterium incurvum Brébisson
181
Dhorpatan / Nepal (1965-11)
IAM C-438, Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-34-2
References: 57, 61

337
Nawakot / Nepal (1965-10)
Unialgal, Non-clonal, T. Ichimura
Identified by: T. Ichimura
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-12-92
Reference: 57

Closterium moniliferum Ehrenberg ex Ralfs var. ***moniliferum***
172
Nepal
Unialgal, Non-clonal
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-100-1

173
Kitaadachi-gun / Saitama (1969-01)

IAM C-432, Axenic, Clonal, T.Ichimura (1969-03)
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
S-1-22
Reference: 61

174
Ghorepani / Nepal (1965-12)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
N-76-30
Reference: 57

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, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-183
S-1-13
References: 57, 61

183
Kitaadachi-gun / Saitama (1969-01)
IAM C-434, Unialgal, Clonal, T.Ichimura (1969-03)
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-182
S-1-24
References: 57, 61

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, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-49-7
References: 57, 61

176
Ghorepani / Nepal (1965-12)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-75-10
Reference: 57

177
Billethadi / Nepal (1965-12)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-79-26
Reference: 57

178
Shewaden / Nepal (1972-06)
Unialgal, Clonal, M.M.Watanabe (1974)
Culture conditions: CA, 20° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater
N-134-15

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, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic, Mating type +, Group II A
IB-4-2
References: 307, 311, 312, 313

52
Katsuta / Ibaraki (1974-08)
Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic,

Mating type –, Group II A
IB-4-9
References: 307, 311, 312, 313

53
Katsuta / Ibaraki (1974-08)
Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II A
IB-6-8
References: 307, 311, 312, 313

54
Katsuta / Ibaraki (1974-08)
Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II A
IB-6-9
References: 307, 311, 312

55
Katsuta / Ibaraki (1975-05)
Axenic, Clonal, M.M.Watanabe (1975-05)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II C
IB-8-15
References: 307, 311, 312

56
Katsuta / Ibaraki (1975-05)
Axenic, Clonal, M.M.Watanabe (1975-05)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II A
IB-8-24
References: 213, 307, 311, 312

57
Katsuta / Ibaraki (1975-05)
Axenic, Clonal, M.M.Watanabe (1975-05)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II A
IB-8-25
References: 213, 307, 311, 312

58
Mito / Ibaraki (1975-06)
Unialgal, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II A
IB-10-1
References: 307, 311, 312

59
Mito / Ibaraki (1975-06)
Axenic, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II A
IB-10-2
References: 307, 311, 312

60
Mito / Ibaraki (1975-06)
Axenic, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II B
IB-12-1
References: 307, 311, 312

61
Mito / Ibaraki (1975-06)
Axenic, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15°C, 1000 lx, 3M, (20°C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II B

IB-12-2
References: 307, 311, 312

62
Katsuta / Ibaraki (1975-06)
Axenic, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II A
IB-13-1
References: 307, 311, 312

63
Katsuta / Ibaraki (1975-06)
Unialgal, Clonal, M.M.Watanabe (1975-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II A
IB-13-2
References: 307, 311, 312

64
Lake Kasumigaura / Ibaraki (1974-11)
Unialgal, Clonal, M.M.Watanabe (1974-11)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type –, Group II B
KAS-4-29
References: 87, 88, 89, 154, 236, 243, 307, 311, 312, 313

65
Lake Kasumigaura / Ibaraki (1974-11)
Axenic, Clonal, M.M.Watanabe (1974-11)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II B
KAS-4-30
References: 87, 88, 89, 154, 236, 243, 307, 311, 312, 313

66
Piuthan / Nepal (1965-10)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic, Mating type +, Group I A
N-13-1
References: 56, 57, 307

67
Damchan / Nepal (1965-11)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic, Mating type +, Group I B
N-31-19
References: 57, 161, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 307

68
Damchan / Nepal (1965-11)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic, Mating type –, Group I B
N-31-24
References: 57, 161, 234, 235, 236, 237, 238, 239, 242, 243, 307

69
Lake Teganuma / Chiba (1974-06)
Unialgal, Clonal, M.M.Watanabe (1974-06)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M, (20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Mating type +, Group II B
TG-2-21
References: 307, 311, 312

70
Lake Teganuma / Chiba (1974-06)
Axenic, Clonal, M.M.Watanabe (1974-06)
Identified by: M.M.Watanabe

Culture conditions: C, 15° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type –, Group II B
TG-2-22
References: 307, 311, 312

261
Katsuta / Ibaraki (1974-08)
Unialgal, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: C, 15° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type +, Group II C
IB-8-14
References: 307, 311, 312

262
Piuthan / Nepal (1965-10)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 15° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type –
N-13-4
References: 56, 57, 307

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, 1000 lx, 3M,
(25° C, 1500 lx)
Characteristics: Freshwater
R-11-20

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, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-12-3
References: 57, 61

451
Billethadi / Nepal (1965-12)
Unialgal, Clonal, , T.Ichimura
Identified by: T.Ichimura
Culture conditions: MG, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-78-8
Reference: 57

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, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Heterothallic
N-79-19
References: 57, 61

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, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
N-90-55
References: 57, 61

Closterium selenastrum M.Watanabe
339
Mt. Yonahadake / Okinawa (1972-10)
Unialgal, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(25° C, 1500 lx)
Characteristics: Indicator, Freshwater, Homothallic
R-9-40
References: 66, 296, 297

340
Mt. Yonahadake / Okinawa (1972-10)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,

(25° C, 1500 lx)
Characteristics: Indicator, Freshwater, Homothallic
R-9-42
References: 66, 297

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, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic,
Type strain
AK-46
References: 66, 296, 297

187
Mt. Yonahadake / Okinawa (1973-06)
IAM C-461, Unialgal, Clonal, T.Ichimura (1973-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
R-9-13
References: 66, 296, 297

341
Mt. Yonahadake / Okinawa (1972-10)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic
R-9-12
References: 66, 296, 297

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, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic,
Mating type +
M-10-1
References: 296, 297

189
Penang / Malaysia (1974-01)
Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic,
Mating type –
M-10-4
References: 296, 297

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, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic
R-12-3
References: 296, 297

192
Iriomote Isl. / Okinawa (1973-06)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(25° C, 1500 lx)
Characteristics: Indicator, Freshwater, Homothallic
R-12-6
References: 296, 297

193
Iriomote Isl. / Okinawa (1973-06)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic,
Giant cell
R-12-2G3
Reference: 296

Closterium spinosporum Hodgetts var. ***spinosporum***
194
Tsukude-mura / Aichi (1972-10)
Axenic, Clonal, T.Ichimura
Identified by: M.Watanabe
Culture conditions: CAM, 20° C, 1000 lx, 3M,

(25° C, 1500 lx)
Characteristics: Indicator, Freshwater, Homothallic
A-2-22
References: 66, 296, 297

195
Tsukude-mura / Aichi (1972-10)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CAM, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic
A-7-3
Reference: 297

196
Tsukude-mura / Aichi (1972-10)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CAM, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic
A-7-6
Reference: 296

197
Tsukude-mura / Aichi (1972-10)
Unialgal, Clonal, M.M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Homothallic
A-13-4
References: 296, 297

* ***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, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-79-11
References: 57, 61

Closterium venus Kützing ex Ralfs
199
Kathmandu / Nepal (1968)
Unialgal, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 1000 lx, 3M,
(20° C, 3000 lx)
Characteristics: Freshwater
N-90-48

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, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
S-1-0
Reference: 61

201
Lake Kasumigaura / Ibaraki (1983-09)
Axenic, Clonal, F.Kasai (1983-09)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Indicator, Freshwater, Homothallic
F60-21

202
Ghasa / Nepal (1965-11)
Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
N-63-0
Reference: 57

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, 1000 lx, 2M,
(25° C, 3000 lx)
Characteristics: Freshwater
TAN-56-7

130
Lake Shoji / Yamanashi (1981-08)
TAC 51-9A, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 1000 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater
TAN-51-9A

244
Lake Kasumigaura / Ibaraki (1983-08)
Unialgal, Clonal, F.Kasai (1983-08)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater

342
Lake Kawaguchi / Yamanashi (1981-10)
TAC 54, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 1000 lx, 2M
Characteristics: Freshwater
TAN-54-1

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
F78-4-2

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
N-63-20
References: 61, 318

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, 1000 lx, 2M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
TAN-53-5A

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
F63-3

Coolia monotis Meunier
343
Hachijo Isl. / Tokyo (1984-04)
Axenic, Clonal, S.Suda (1984-04)
Identified by: S.Suda
Culture conditions: ESM, 20° C, 1500 lx, 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, 4000 lx, 1M
Characteristics: Toxic, Marine, Untransportable
CM-01

Cosmarium contractum Kirchner
133
Lake Yamanaka / Yamanashi (1981-10)
TAC 53, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 1000 lx, 2M, (20° C, 1500 lx)
Characteristics: Indicator, Freshwater
TAN-53-2

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, 1000 lx, 2M
Characteristics: Indicator, Freshwater
YAMA-Cos-4

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, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
F75-2

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, 4000 lx, 1M
Characteristics: Red tide, Marine
OCri
Reference: 205

Cryptomonas ovata Ehrenberg
274
Tsuchiura / Ibaraki (1982-10)
Axenic, Clonal, M.Ishimitsu (1982-10)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00046
Reference: 73

275
Tsuchiura / Ibaraki (1982-09)
Axenic, Clonal, M.Ishimitsu (1982-09)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00042
Reference: 73

Cryptomonas platyuris Skuja
276
Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Ishimitsu (1983-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 1M
Characteristics: Freshwater
#00096
Reference: 73

344
Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Ishimitsu (1983-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00103
Reference: 73

Cryptomonas rostratiformis Skuja
277
Hongo / Hiroshima (1983-10)
Axenic, Clonal, M.Ishimitsu (1983-10)
Identified by: M.Ishimitsu
Culture conditions: VT, 15° C, 2000 lx, 1M
Characteristics: Freshwater
#00148
Reference: 73

278
Hongo / Hiroshima (1983-10)
Axenic, Clonal, M.Ishimitsu (1983-10)
Identified by: M.Ishimitsu
Culture conditions: VT, 15° C, 2000 lx, 1M
Characteristics: Freshwater
#00154
Reference: 73

345
Sugadaira / Nagano (1982-07)
Axenic, Clonal, M.Ishimitsu (1982-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00006
Reference: 73

Cryptomonas tetrapyrenoidosa Skuja
279
Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Ishimitsu (1983-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00099
Reference: 73

280
Sugadaira / Nagano (1982-07)
Axenic, Clonal, M.Ishimitsu (1982-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00014
Reference: 73

281
Minamiizu / Shizuoka (1983-05)
Axenic, Clonal, M.Ishimitsu (1983-05)
Identified by: M.Ishimitsu
Culture conditions: VT, 5° C, 2000 lx, 2M
Characteristics: Freshwater
#00073
Reference: 73

282
Tsuchiura / Ibaraki (1982-09)
Axenic, Clonal, M.Ishimitsu (1982-09)
Identified by: M.Ishimitsu
Culture conditions: VT, 15° C, 2000 lx, 1M
Characteristics: Freshwater
#00056
References: 5, 6, 7, 73

346
Sugadaira / Nagano (1982-07)
Axenic, Clonal, M.Ishimitsu (1982-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 5° C, 2000 lx, 2M
Characteristics: Freshwater
#00009
Reference: 73

347
Minamiizu / Shizuoka (1983-05)
Axenic, Clonal, M.Ishimitsu (1983-05)
Identified by: M.Ishimitsu
Culture conditions: VT, 5° C, 2000 lx, 2M
Characteristics: Freshwater
#00072
Reference: 73

348
Higashihiroshima / Hiroshima (1983-08)
Axenic, Clonal, M.Ishimitsu (1983-08)
Identified by: M.Ishimitsu
Culture conditions: VT, 10° C, 2000 lx, 2M
Characteristics: Freshwater
#00109
Reference: 73

Cyanidioschyzon merdae De Luca et al.
549
Unialgal, Non-clonal
Identified by: A.Merola et al.
Culture conditions: Allen, 20° C, 500 lx, 6M,
(20° C, 1500 lx)
Characteristics: Acidophilic
3
Reference: 122

Cyanidium caldarium (Tilden) Geitler
250
See ***Galdieria sulphuraria*** (Galdieri) Merola

551
Unialgal, Non-clonal
Identified by: A.Merola et al.
Culture conditions: Allen, 20° C, 500 lx, 6M,
(20° C, 1500 lx)
Characteristics: Acidophilic
086
Reference: 122

Cyanophora paradoxa Korshikov
547
England
UTEX 555, Axenic, Clonal, E.G.Pringsheim (1943)
Identified by: E.G.Pringsheim
Culture conditions: C, 20° C, 1000 lx, 2M,
(25° C, 3000 lx)
Characteristics: Alkaline water

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, 1000 lx, 4M,
(25° C, 3000 lx)
Characteristics: Freshwater, Homothallic
6801-68

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Aerial on the surface of the bark of *Picea jezoensis*
CCHU-2227
Reference: 153

Dictyosphaerium pulchellum Wood
453
Lake Kasumigaura / Ibaraki (1988-12)
Unialgal, Clonal, T.Yanai (1988-12)
Identified by: Y.Niiyama
Culture conditions: MG, 15° C, 1500 lx, 2M
Characteristics: Freshwater

Dimorphococcus lunatus A.Brown
134
Ozegahara / Gunma (1983-08)
Unialgal, Clonal, F.Kasai (1983-09)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater
34-5

135
Tsuchiura / Ibaraki (1983-10)
Axenic, Clonal, F.Kasai (1983-10)
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater
F-61-4
Reference: 318

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, 2000 lx, 4M
Characteristics: Freshwater
F-75-26

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, 2000 lx, 1M
Characteristics: Marine
KBB-10

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, 1000 lx, 3M
Characteristics: Freshwater
41-11

Draparnaldia plumosa (Vaucher) Agardh
454
Shirai River / Sapporo (1987-10)
Unialgal, Non-clonal, F.Kasai (1987-10)
Identified by: F.Kasai
Culture conditions: C, 10° C, 500 lx, 3M, (10° C, 1500 lx)
Characteristics: Freshwater
2Tst-2-1
Reference: 263

Echinosphaeridium nordstedtii Lemmermann
137
Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, F.Kasai (1983-08)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
F-56-3
Reference: 318

Eremosphaera gigas (Archer) Fott et Kalina
379
Shinobugaoka / Osaka (1968-11)
IAM C-338, Unialgal, Clonal, T.Ichimura (1969-01)
Identified by: T.Nakano
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
O-2
References: 61, 318

Eremosphaera viridis De Bary
380
Oze / Fukushima (1983-08)
Unialgal, Clonal, F.Kasai (1983-09)

Identified by: T.Nakano
Culture conditions: CAM, 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
43-23

643
Miyatoko Mire / Fukushima (1992-04)
Unialgal, Clonal, H.Nozaki (1992-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater
92-604-E-5

644
Miyatoko Mire / Fukushima (1992-04)
Unialgal, Clonal, H.Nozaki (1992-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater
92-604-E-3

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
N-76-1
Reference: 61

Eudorina elegans Ehrenberg
351
Lake Biwa / Shiga (1983-12)
Unialgal, Clonal, S.Suda (1983-12)
Identified by: S.Suda
Culture conditions: CA, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Homothallic
B-Eud-6
Reference: 251

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, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Male, Crosses with NIES-457, *rbcL* gene (D63432)
A-5 (m)
References: 164, 184, 185

457
Chiyoda-ku / Tokyo (1977-09)
Axenic, Clonal, H.Nozaki (1977-09)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Female, Crosses with NIES-456
I-14 (f)
Reference: 164

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, 1500 lx, 1M
Characteristics: Freshwater, Homothallic, Monoecious
04427-1
Reference: 171

568
Kathmandu / Nepal (1986-09)
Axenic, Clonal, H.Nozaki (1987-09)
Identified by: H.Nozaki
Culture conditions: CA, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Homothallic, Monoecious
7914-E-6
Reference: 172

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, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Female, Crosses with NIES-460
5607-E-14 (F)
References: 169, 190

460
Saiwai-ku / Kawasaki / Kanagawa (1984-01)
Axenic, Clonal, H.Nozaki (1985-06)

Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Male, Crosses with NIES-459, *rbcL* gene (D63433)
5630-E-3 (m)
References: 169, 184, 185

Euglena clara Skuja
253
Higashiyata River / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 1500 lx, 1M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
USI-21

Euglena gracilis Klebs
47
IAM E-3, Axenic, Clonal
Culture conditions: HUT(SS), 20° C, 500 lx, 1M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, Material for Vitamin B_{12} bioassay
References: 61, 78, 287

48
IAM E-6(Z strain), Axenic, Clonal
Culture conditions: HUT(SS), 20° C, 500 lx, 1M, (25° C, 3000 lx)
Characteristics: Freshwater, Material for Vitamin B_{12} bioassay
References: 14, 61, 68, 78, 127, 135, 209, 210, 211, 212, 272, 273, 360

Euglena gracilis Klebs var. ***bacillaris*** Pringsheim
49
IAM E-2, Axenic, Clonal
Culture conditions: HUT, 20° C, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater
References: 61, 78, 287

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, 1500 lx, 1M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater

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, 1500 lx, 4M
Characteristics: Freshwater
(1)-16
Reference: 263

Eutreptiella gymnastica Throndsen
381
Yashima Bay / Kagawa (1982-10)
Axenic, Clonal, S.Yoshimatsu
Identified by: S.Yoshimatsu
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine
KGW-63-1

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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-20-2
Reference: 282

462
Hasaki / Ibaraki (1987-05)
Axenic, Clonal, T.Sawaguchi (1987-05)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 4000 lx, 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, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

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, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Benthic
Yu-50

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, 2000 lx, 1M
Characteristics: Freshwater
KEB-24

Galdieria sulphuraria (Galdieri) Merola
250
IAM M-8, Unialgal, Non-clonal
Culture conditions: Allen, 20° C, 500 lx, 4M, (20° C, 1500 lx)
Characteristics: Hot spring, Formerly identified as *Cyanidium caldarium* (Tilden) Geitler
References: 61, 93, 135

550
Unialgal, Non-clonal, Pinto
Identified by: A.Merola et al.
Culture conditions: Allen, 20° C, 500 lx, 6M, (25° C, 1500 lx)
Characteristics: Acidophilic, Type strain
002
Reference: 122

Gephyrocapsa oceanica Kamptner
353
Tsushima / Nagasaki (1986-03)
Axenic, Clonal, T.Sawaguchi (1986-05)
Identified by: I.Inouye
Culture conditions: ESM, 20° C, 1500 lx, 20D
Characteristics: Marine
TMCO-2
Reference: 113

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, 4000 lx, 2M
Characteristics: Freshwater, Unstable, Untransportable
TM3D-6

Gloeomonas lateperforata (Skuja) Ettl
464
Tsukuba / Ibaraki (1982-11)
Axenic, Clonal, F.Kasai (1982-11)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater

Gomphonema angustatum var. ***obtusatum*** (Kützing) Grunow
620
Mt.Tsukuba / Ibaraki (1987-04-17)
Unialgal, Clonal, F.Kasai (1987-05)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
1-36
Reference: 263

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, 1500 lx, 2M
Characteristics: Freshwater
Ast-1-1
Reference: 263

Gomphonema parvulum Kützing var. ***parvulum***
466
Shirai River / Sapporo (1987-07)
Unialgal, Non-clonal, F.Kasai (1987-07)
Identified by: N.Takamura
Culture conditions: CSi, 10° C, 1500 lx, 2M
Characteristics: Freshwater
Tst-1-18
Reference: 263

467
Shirai River / Sapporo (1987-07)

Unialgal, Clonal, F.Kasai (1987-07)
Identified by: N.Takamura
Culture conditions: CSi, 10° C, 1500 lx, 2M
Characteristics: Freshwater
Tst-4-3
Reference: 263

Gonatozygon brebissonii De Bary

138
Lake Kasumigaura / Ibaraki (1974-11)
Axenic, Clonal
Culture conditions: C, 20° C, 1000 lx, 4M, (20° C, 1500 lx)
Characteristics: Freshwater
KAS-4-43

139
Lake Shoji / Yamanashi (1981-10)
TAC 56-1, Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: C, 20° C, 1000 lx, 4M, (20° C, 1500 lx)
Characteristics: Freshwater
TAN-56-1

Gonatozygon monotaenium De Bary

247
Tsukiyono / Gunma (1984-06)
Axenic, Clonal, F.Kasai (1984-06)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
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, 1000 lx, 2M, (20° C, 1500 lx)
Characteristics: Freshwater
TAN-53-3

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, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-469
9406-10
References: 166, 175, 191

469
Kohoku-ku / Yokohama / Kanagawa (1979-04)
Axenic, Clonal, H.Nozaki (1979-04)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-468
9406-12
Reference: 166

569
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, Crosses with NIES-570, *rbcL* gene (D63437)
88-1113-G-1
Reference: 185

570
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –, Crosses with NIES-569
88-1113-G-2

645
Near Goshokake Hot Spring / Akita (1985-07)
Unialgal, Clonal, H.Nozaki (1985-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +
5912-6(+)

646
Near Goshokake Hot Spring / Akita (1985-07)
Unialgal, Clonal, H.Nozaki (1985-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –

5912-6(-)

Gonium quadratum Pringsheim ex Nozaki
647
Unialgal, Clonal, H.Nozaki (1990-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type -, F1 clone of N-652 × N-653, Sister clone to N-648, N-649, N-650 from one zygote
90-809-F1-2-1

648
Unialgal, Clonal, H.Nozaki (1990-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, F1 clone of N-652 × N-653, Sister clone to N-647, N-649, N-650 from one zygote
90-809-F1-2-2

649
Unialgal, Clonal, H.Nozaki (1990-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, F1 clone of N-652 × N-653, Sister clone to N-647, N-648, N-650 from one zygote
90-809-F1-2-3

650
Unialgal, Clonal, H.Nozaki (1990-08)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –, F1 clone of N-652 × N-653, Sister clone to N-647, N-648, N-649 from one zygote
90-809-F1-2-4

651
Klausen / Italy
UTEX 956, Unialgal, Clonal, E.G.Pringsheim (1957)
Identified by: E.G.Pringsheim
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Type strain
References: 175, 178

652
Itahari / Nepal (1989-10)
Unialgal, Clonal, H.Nozaki (1990-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Crosses with N-653
90-423-3
Reference: 178

653
Itahari / Nepal (1989-10)
Unialgal, Clonal, H.Nozaki (1990-04)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Crosses with N-652, *rbcL* gene (D63438)
90-423-2
References: 178, 185, 191

* ***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, 1500 lx, 1M
Characteristics: Indicator, Freshwater, Heterothallic, Mating type –, Crosses with NIES-289 and 290
G4
References: 174, 295

289
Okinawa / Okinawa (1973-06)
Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1500 lx, 1M
Characteristics: Indicator, Freshwater, Type strain, Heterothallic, Mating type +, Crosses with NIES-288
G3
References: 174, 295

290
Okinawa / Okinawa (1973-06)
Axenic, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: CA, 20° C, 1500 lx, 1M

Characteristics: Indicator, Freshwater, Type strain, Heterothallic, Mating type +, Crosses with NIES-288
G1
References: 174, 295

654
Midori-ku / Yokohama (1980-01)
UTEX 2519, Unialgal, Clonal, H.Nozaki (1985-11)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +
KY-4 (+)
References: 174, 184

655
Midori-ku / Yokohama (1980-01)
UTEX 2520, Unialgal, Clonal, H.Nozaki (1985-11)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –
KY-7 (-)
Reference: 174

Graesiella emersonii (Shihira et Kraus) 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
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Formerly identified as *Chlorella pyrenoidosa* Chick
References: 61, 123, 156, 187, 265, 287, 335, 356, 357, 358, 359

687
USA
IAM C-104, CCAP 211/8B, Unialgal, Clonal, R.Emerson (1923)
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Type strain of *Chlorella fusca* Shihira et Krauss var. *vacuolata* Shihira et Krauss
Reference: 187

688
CCAP 211/8G, Unialgal, Clonal, R.Emerson
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
Reference: 187

689
CCAP 211/8H, Unialgal, Clonal, R.Emerson
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
Reference: 187

690
CCAP 211/11N, Unialgal, Clonal, R.Emerson (1939)
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Type strain of *Chlorella emersonii* Shihira et Krauss
Reference: 187

Gymnodinium breve Davis
679
Harima-Nada / Seto Inland Sea (1979-06)
Unialgal, Clonal, S.Yoshimatsu (1979-06)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

Gymnodinium fuscum Stein
470
Tsuchiura / Ibaraki (1986-02)
Unialgal, Clonal, T.Sawaguchi (1986-05)
Identified by: T.Sawaguchi
Culture conditions: AF-6/2, 20° C, 4000 lx, 1M
Characteristics: Freshwater, Unstable, Untransportable
SPSDG

Gymnodinium mikimotoi Miyake et Kominami ex Oda
Syn. ***Gymnodinium nagasakiense*** Takayama et Adachi
249
Harima-Nada / Seto Inland Sea (1980-08)
Axenic, Clonal, K.Yuki
Identified by: K.Yuki
Culture conditions: ESM, 20° C, 4000 lx, 1M

Characteristics: Red tide, Marine, Unstable, Untransportable
KGW-34-4
Reference: 207

680
Uchiumi Bay / Kagawa (1992-10)
Unialgal, Clonal, S.Yoshimatsu (1992-10)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

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

Gymnodinium sanguineum Hirasaka
11
Harima-Nada / Seto Inland Sea (1979-01)
Axenic, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Unstable, Untransportable
B-O-2
References: 136, 282, 353

Gyrodinium instriatum Freudenthal et Lee
143
Shodo Isl. / Kagawa (1978-06)
Unialgal, Clonal, K.Yuki
Identified by: K.Yuki
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine Unstable, Untransportable
KGW-17-1

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Homothallic, Isogamy
MKF-8
References: 61, 80, 81, 101, 102, 103, 104, 105, 267, 268, 269, 318

* ***Haematococcus pluvialis*** Flotow
See ***Haematococcus lacustris***
(Girod-Chantrans) Rostafinski

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, 1500 lx, 1M, (20° C, 3000 lx)
Characteristics: Freshwater
OUT-5
References: 253, 318

656
Tsukuba / Ibaraki (1986-04-30)
Unialgal, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 1M
Characteristics: Freshwater
430M3-3

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, 3000 lx, 1M
Characteristics: Freshwater
Wn-24

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, 4000 lx, 1M
Characteristics: Freshwater, Untransportable
87SPD-1

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, 4000 lx, 1M
Characteristics: Marine, Untransportable
KSTH-23

473
Izuhara / Nagasaki (1986-03)
Unialgal, Clonal, T.Sawaguchi (1986-03)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Marine, Untransportable
TMUD-2

Heterocapsa triquetra Stein
7
Osaka Bay / Osaka (1981-04)
Axenic, Clonal, S.Yamochi
Identified by: S.Yamochi
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
OHet
Reference: 113

235
Harima-Nada / Seto Inland Sea (1982-03)
Axenic, Clonal, S.Yoshimatsu
Identified by: S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-57
Reference: 282

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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
FHE
References: 76, 233

5
Gokasho Bay / Mie (1966)
Axenic, Clonal, H.Iwasaki et al.
Identified by: Y.Hara
Culture conditions: f/2, M-ASP7, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
GHE
References: 77, 223

6
Osaka Bay / Osaka (1979-08)
Axenic, Clonal, M.M.Watanabe
Identified by: M.M.Watanabe
Culture conditions: f/2, M-ASP7, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
OHE-1
References: 42, 43, 106, 107, 108, 110, 113, 114, 125, 126, 128, 136, 231, 249, 250, 257, 283, 284, 285, 298, 299, 300, 301, 302, 303, 304, 305, 320, 322, 323, 324, 325, 326, 332, 351, 353

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, 4000 lx, 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, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-11-5
Reference: 282

146
Shido Bay / Kagawa (1978-06)
Axenic, Clonal, K.Yuki
Identified by: K.Yuki
Culture conditions: f/2, M-ASP7, 20° C, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
8280G21-1

561
Mikawa Bay / Aichi
Axenic, Clonal, S.Toriumi
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine

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, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-148
S-9-18

148
Nagatoro / Saitama (1969-11)
IAM C-511, Axenic, Clonal, T.Ichimura (1972-06)
Identified by: T.Ichimura
Culture conditions: C, 20° C, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-147
S-9-22

149
Lake Kasumigaura / Ibaraki (1975-12)
IAM C-512, Axenic, Clonal, T.Ichimura (1975-12)
Identified by: T.Ichimura
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-150
KAS-7-3

150
Lake Kasumigaura / Ibaraki (1975-12)
IAM C-513, Axenic, Clonal, T.Ichimura (1975-12)
Identified by: T.Ichimura
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic,
Crosses with NIES-149
KAS-7-8

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, 1000 lx, 3M,
(20° C, 1500 lx)
Characteristics: Freshwater, Homothallic
H-1

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, 500 lx, 4M,
(25° C, 3000 lx)
Characteristics: Benthic
Yu-52

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, 500 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater, Homothallic
O-2
Reference: 61

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, 500 lx, 1M
(10° C, 1500 lx)
Characteristics: Marine, Unstable, Untransportable
HHD-1

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, 500 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater

F37-1

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, 1000 lx, 1M
Characteristics: Red tide, Marine
St-12

Lobomonas monstruosa Korshikov
474
Iwaki / Fukushima (1984-08)
Axenic, Clonal, S.Suda (1984-08)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 2M
Characteristics: Freshwater
FL

Melosira ambigua (Grunow) O.Müller
20
Tsuchiura / Ibaraki (1983-10)
Axenic, Clonal, F.Kasai (1983-10)
Identified by: M.Mizuno
Culture conditions: CSi, M Chu No.10, 20° C, 4000 lx, 1M
Characteristics: Indicator, Freshwater, Unstable
F61-1
Reference: 213

Melosira granulata (Ehrenberg) Ralfs
var. *angustissima* O. Müller f. *spiralis*
333
Lake Kasumigaura / Ibaraki (1983-05)
Axenic, Clonal, T.Hiwatari (1983-05)
Identified by: M.Mizuno
Culture conditions: CSi, 15° C, 1000 lx, 1M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater, Unstable
K-Melo
Reference: 251

Merismopedia tenuissima Lemmermann
230
Tsukuba / Ibaraki (1984-05)
Unialgal, Clonal, F.Kasai (1984-05)
Identified by: M.M.Watanabe
Culture conditions: C, 20° C, 1500 lx, 1M
Characteristics: Freshwater
F98-2

Mesostigma viride Lauterborn
296
Mitsukaido / Ibaraki (1985-07)
Axenic, Clonal, S.Suda (1985-07)
Identified by: I.Inouye
Culture conditions: C, 20° C, 4000 lx, 1M
Characteristics: Freshwater
KY-14

475
Mitsukaido / Ibaraki (1986-01)
Axenic, Clonal, S.Suda (1987-12)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 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, 2000 lx, 20D
Characteristics: Freshwater, Heterothallic, Mating type –
KY-Mes-1

477
Mitsukaido / Ibaraki (1986-01)
Axenic, Clonal, S.Suda (1986-12)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 20D
Characteristics: Freshwater, Heterothallic, Mating type –
KY-Mes-3

Mesotaenium kramstae Lemmermann
657
IAM C-330, Unialgal, Clonal
Culture conditions: C, 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Crosses with N-658

658
IAM C-331, Unialgal, Clonal
Culture conditions: C, 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic, Crosses with N-657

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
F-19-4
Reference: 318

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, 1000 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater, Homothallic
N-90-27
Reference: 61

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, 1000 lx, 3M, (25° C, 1500 lx)
Characteristics: Freshwater
83-24-24

Microcystis aeruginosa (Kützing) Lemmermann f. *aeruginosa*
44
Lake Kasumigaura / Ibaraki (1974-08)
IAM M-176, Axenic, Clonal, M.M.Watanabe (1974-08)
Identified by: M.M.Watanabe
Culture conditions: CB, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
References: 4, 37, 61, 67, 84, 85, 158, 251, 266, 318, 349

87
Lake Kasumigaura / Ibaraki (1982-09)
Axenic, Clonal, M.H.Watanabe (1982-09)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
K-MA-11
References: 158, 206, 271, 318

88
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H.Watanabe (1981-06)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
KW-MA1-3
References: 71, 251, 318

89
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H.Watanabe (1981-06)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
KW-MA2-5
References: 157, 158, 318, 329

90
Lake Kawaguchi / Yamanashi (1981-06)
Axenic, Clonal, M.H.Watanabe (1981-06)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
KW-MB-2
References: 72, 318

91
Lake Kasumigaura / Ibaraki (1982-09)
Unialgal, Clonal, M.H.Watanabe (1982-09)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
K-MB-13
Reference: 318

99
Lake Suwa / Nagano (1982-08)
Unialgal, Clonal, M.H.Watanabe (1982-08)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
S-MA-S5
References: 318, 349

100
Lake Suwa / Nagano (1982-08)
Unialgal, Clonal, M.H.Watanabe (1982-08)

Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
S-MB-S7
References: 202, 204, 306, 318, 343

101
Lake Suwa / Nagano (1982-10)
TAC 48, Unialgal, Clonal, M.Watanabe (1982-10)
Identified by: M.Watanabe
Culture conditions: CB, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
S-TAN-48
References: 140, 306, 318

298
Lake Kasumigaura / Ibaraki (1982-09)
TAC 47, Axenic, Clonal, M.Watanabe (1982-09)
Culture conditions: CB, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Toxic, Freshwater
K-TAN-47
References: 37, 158, 203, 306, 329

299
Lake Kasumigaura / Ibaraki (1979-08)
Unialgal, Clonal, N.Takamura (1979-08)
Identified by: N.Takamura
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Freshwater
KN1133
Reference: 37

Microcystis aeruginosa (Kützing) Lemmermann
f. ***flos-aquae*** (Wittrock) Elenkin
98
Lake Kasumigaura / Ibaraki (1982-09)
Axenic, Clonal, M.H.Watanabe (1982-09)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Indicator, Freshwater
K-MF-K-3
References: 130, 158, 306, 318

478
Lake Kasumigaura / Ibaraki (1977-09)
Unialgal, Non-clonal, O.Yagi (1978-04)
Identified by: O.Yagi
Culture conditions: MA, 20° C, 500 lx, 3M,
(25° C, 1500 lx)
Characteristics: Freshwater
K-5
References: 336, 337, 338

Microcystis elabens Kützing var. ***minor*** Nygaard
42
Lake Kasumigaura / Ibaraki (1974-08)
IAM M-177, Axenic, Clonal, M.M.Watanabe
(1974-08)
Identified by: M.M.Watanabe
Culture conditions: CT, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Freshwater
References: 61, 157, 158, 343, 349

Microcystis holsatica Lemmermann
43
Lake Kasumigaura / Ibaraki (1974-08)
IAM M-179, Axenic, Clonal, M.M.Watanabe
(1974-08)
Identified by: M.M.Watanabe
Culture conditions: CT, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Freshwater
References: 61, 158, 343

Microcystis viridis (A.Brown) Lemmermann
102
Lake Kasumigaura / Ibaraki (1982-09)
Axenic, Clonal, M.H.Watanabe (1982-09)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Toxic,
Freshwater
K-MV-20
References: 69, 74, 92, 117, 157, 158, 208, 258,
309, 329, 343, 349

103
Lake Kasumigaura / Ibaraki (1978-12)
TAC 44, Unialgal, Clonal, M.Watanabe (1978-12)
Identified by: M.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Toxic,
Freshwater
K-TAN-44
Reference: 306

Microcystis wesenbergii Komárek
104
Chiyoda-ku / Tokyo (1982-11)
Axenic, Clonal, M.H.Watanabe (1982-11)
Identified by: M.H.Watanabe
Culture conditions: CB, MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater

MW-H1
References: 251, 343

105
Lake Kasumigaura / Ibaraki (1982-09)
Unialgal, Clonal, M.H.Watanabe (1982-09)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
K-MW-K4

106
Lake Kasumigaura / Ibaraki (1982-09)
Unialgal, Clonal, M.H.Watanabe (1982-09)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater, (A) large size
K-MW-19

107
Lake Kawaguchi / Yamanashi (1981-06)
Unialgal, Clonal, M.H.Watanabe (1981-06)
Identified by: M.H.Watanabe
Culture conditions: CB, MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
KW-MW-7
References: 157, 158, 329

108
Lake Suwa / Nagano (1982-08)
Unialgal, Clonal, M.H.Watanabe (1982-08)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
S-MW-52

109
Lake Yogo / Shiga (1982-07)
Unialgal, Clonal, M.H.Watanabe (1982-07)
Identified by: M.H.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
Y-MW-24

110
Lake Kasumigaura / Ibaraki (1978-08)
TAC 36, Unialgal, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
K-TAN-36

111
Lake Kasumigaura / Ibaraki (1978-08)
TAC 37, Axenic, Clonal, M.Watanabe (1978-08)
Identified by: M.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
K-TAN-37
References: 157, 158, 251, 329

112
Lake Suwa / Nagano (1982-10)
TAC 52, Axenic, Clonal, M.Watanabe (1982-10)
Identified by: M.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
S-TAN-52
References: 158, 306, 349

604
Lake Kasumigaura / Ibaraki (1977-09)
Axenic, Clonal, O.Yagi (1978-04)
Identified by: O.Yagi
Culture conditions: MA, 20° C, 500 lx, 3M, (25° C, 1500 lx)
Characteristics: Water bloom, Freshwater, Formerly identified as *Microcystis aeruginosa* K-3A
K-3A
References: 36, 116, 137, 244, 336

Microthamnion kützingianum Nägeli
479
Toyohira River / Sapporo (1987-07)
Unialgal,Clonal, F.Kasai (1987-07)
Identified by: F.Kasai
Culture conditions: C, 10° C, 500 lx, 6M, (10° C, 1500 lx)
Characteristics: Freshwater
Tst11-6
References: 263, 264

Monomastix minuta Skuja
255
Tsuchiura / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 4000 lx, 1M
Characteristics: Freshwater

SIS-Mono

256
Oze / Gunma (1983-08)
Axenic, Clonal, S.Suda (1983-11)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 4000 lx, 1M
Characteristics: Freshwater
Oz-35-m

* ***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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
SIS-1-M

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
Ep-i

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
AWA

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, 500 lx, 5M, (20° C, 1500 lx)
Characteristics: Freshwater
(1)-45
Reference: 263

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, 4000 lx, 1M
Characteristics: Red tide, Marine
810-13

Nephroselmis olivacea Stein
483
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 20D
Characteristics: Freshwater, Heterothallic, Mating type +
S-N-2-1
References: 121, 254

484
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 20D
Characteristics: Freshwater, Heterothallic, Mating type –
S-N-5-8

485
Tsuchiura / Ibaraki (1986-02)
Axenic, Clonal, S.Suda (1986-05)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 20D
Characteristics: Freshwater, Heterothallic, Mating type –
S-N-3-4
References: 121, 254

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, 1500 lx, 1M
Characteristics: Red tide, Marine, Type strain
H-70-2

Nitzschia palea (Kützing) W.Smith
487
Miyata River / Ibaraki (1987-04)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
3st-0-57
Reference: 263

488
Miyata River / Ibaraki (1987-02)
Unialgal, Non-clonal, F.Kasai (1987-03)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 2M
Characteristics: Freshwater
1st-3-39
Reference: 263

489
Ashio / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-08)
Identified by: N.Takamura
Culture conditions: CSi, 15° C, 1500 lx, 1M
Characteristics: Freshwater
Ast-2-2
References: 263, 264

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by M.M.Watanabe
References: 61, 158, 261, 287, 318

38
Marble Point
IAM M-115, Unialgal, Non-clonal, O.Holm-Hansen
Identified by: M.M.Watanabe
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater,From dry lichens and algae in sand
M-48-a
Reference: 61

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater
Reference: 287

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/Maruyama
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by M.M.Watanabe
References: 61, 287

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Chromatic adaptation
References: 287, 318

29
Ishigaki Isl. / Okinawa
IAM M-31, Unialgal, Non-clonal, M.Ishikawa
Identified by: M.M.Watanabe
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater
References: 287, 318

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, 1000 lx, 1M
Characteristics: Red tide, Marine
St-22

Odontella longicruris (Greville) Hoban
590
Hitachi / Ibaraki (1990-09)
Unialgal, Non-clonal, S.Ono (1990-10)
Identified by: S.Ono
Culture conditions: f/2, 15° C, 1000 lx, 1M
Characteristics: Red tide, Marine
St-11

Oedogonium obesum Witrock ex Hirn
203
IAM C-348, Axenic, Clonal, E.Saito
Identified by: E.Saito
Culture conditions: C, 20° C, 500 lx, 3M,
(25° C, 3000 lx)
Characteristics: Indicator, Freshwater
807
Reference: 61

Olisthodiscus luteus Carter
15
Tamano / Okayama / Seto Inland Sea
Axenic, Clonal, I.Inouye
Identified by: I.Inouye
Culture conditions: f/2, 20° C, 1500 lx, 1M
Characteristics: Red tide, Marine, Untransportable
Olisth
References: 41, 136, 282, 353

Oltamannsiellopsis 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, 4000 lx, 1M
Characteristics: Marine, Mutant

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, 1500 lx, 2M
Characteristics: Red tide, Marine, Type strain
810YB-6
Reference: 10

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, 4000 lx, 2M
Characteristics: Marine, 18SrDNA gene (D86495)
8280G41-2
References: 10, 155

Oocystis borgei Snow
659
Watarase River / Gunma (1987-08)
Unialgal, F.Kasai (1987-09)
Identified by: F.Kasai
Culture conditions: C, 15° C, 500 lx, 6M,
(15° C, 1500 lx)
Characteristics: Freshwater
AT2-26
Reference: 263

Oocystis lacustris Chodat
660
Watarase River / Gunma (1987-08)
Unialgal, Clonal, F.Kasai (1987-08)
Identified by: F.Kasai
Culture conditions: C, 15° C, 500 lx, 6M,
(15° C, 1500 lx)
Characteristics: Freshwater
Ast-3-1
Reference: 263

661
Miyata River / Ibaraki (1987-05)
Unialgal, Clonal, F.Kasai (1987-06)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 6M
Characteristics: Freshwater
4st-3-9
Reference: 263

662
Miyata River / Ibaraki (1987-02)
Unialgal, Clonal, F.Kasai (1987-03)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 6M
Characteristics: Freshwater
1st-2-9
References: 262, 263

Oscillatoria agardhii Gomont

204
Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, S.Suda (1983-08)
Identified by: S.Suda
Culture conditions: CB, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
K-O-A
References: 158, 245, 246, 247, 318, 335

205
Lake Kasumigaura / Ibaraki (1982-09)
TAC 53, Unialgal, Clonal, M.Watanabe (1982-09)
Identified by: M.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Indicator, Freshwater
K-TAN-53

594
North Ireland / U.K.
Axenic, Clonal
Culture conditions: CT, 20° C, 500 lx, 2M,
(20° C, 1500 lx)
Characteristics: Freshwater
k-8

595
North Ireland / U.K.
Axenic, Clonal
Culture conditions: CT, 20° C, 500 lx, 2M,
(20° C, 1500 lx)
Characteristics: Freshwater
3A②

596
Veluwemeer / Holland
Axenic, Clonal
Culture conditions: CT, 20° C, 500 lx, 2M,
(20° C, 1500 lx)
Characteristics: Freshwater
VLOA7

610
Lake Gjersjoen / Norway
CCAP 1459/22, Axenic, Romstad (1971)
Culture conditions: CB, MA, 20° C, 4000 lx, 1M
Characteristics: Freshwater
NIVA CYA 18
References: 225, 226, 227

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, 1500 lx, 1M
Characteristics: Marine, Benthic
Oa

Oscillatoria animalis Agardh ex Gomont

206
IAM M-75, Axenic, Clonal, F.Murano
Identified by: H.Fukushima
Culture conditions: MDM(S), 20° C, 500 lx, 4M,
(25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by
M.M.Watanabe
Reference: 61

Oscillatoria laetevirens Gomont

31
Kawaji / Tochigi
IAM M-42, Unialgal, Clonal, M.Ishikawa
Identified by: H.Fukushima
Culture conditions: MDM(S), 20° C, 500 lx, 4M,
(25° C, 3000 lx)
Characteristics: Freshwater, Hot spring, Reidentified
by M.M.Watanabe
References: 61, 318

Oscillatoria limnetica Lemmermann

36
Nakano / Tokyo
IAM M-92, Unialgal, Clonal, F.Murano
Identified by: H.Fukushima
Culture conditions: MDM(S), 20° C, 500 lx, 4M,
(25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by
M.M.Watanabe
References: 3, 61, 199

Oscillatoria raciborskii Woloszynska

207
Lake Kasumigaura / Ibaraki (1983-06)
Axenic, Clonal, S.Suda (1983-06)
Identified by: S.Suda
Culture conditions: CB, CT, 25° C, 1500 lx, 20D
Characteristics: Water bloom, Offensive taste and
odor, Freshwater, Unstable
K-O-R

References: 158, 318

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, 4000 lx, 1M
Characteristics: Indicator, Marine
NGS-1
Reference: 233

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, Reidentified by M.M.Watanabe
Reference: 61

Ostreopsis siamensis
616
Motobu / Okinawa (1993-06)
Unialgal, Clonal, H.Kobayashi (1993-06)
Identified by: Y.Fukuyo
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Marine, Untransportable
OS-01

Oxyrrhis marina Dujardin
494
Hachinohe / Aomori (1988-08)
Mixed, Clonal, T.Sawaguchi (1989-01)
Identified by: T.Sawaguchi
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Predator, Marine, Feeds on NIES-254, Untransportable
370OX

Pandorina colemaniae Nozaki
572
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki (1988-10)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Type strain, Isogamy, Mating type +, Crosses with NIES-573, *rbcL* gene (D63441)
88-1025-1
References: 185, 189

573
Kourakuen / Okayama (1988-10)
Unialgal, Clonal, H.Nozaki (1989-01)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Type strain, Isogamy, Mating type –, Crosses with NIES-572
89-0131-P-3
Reference: 189

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, 1500 lx, 1M
Characteristics: Indicator, Freshwater, Heterothallic, Mating type +, Crosses with NIES-243 and 362
Oz-Pa-2

243
Lake Ozenuma / Fukushima (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: S.Suda
Culture conditions: CA, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-242
Oz-Pa-3

362
Lake Ozenuma / Fukushima (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: S.Suda
Culture conditions: CA, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-242
Oz-Pa-1

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, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, Crosses with NIES-575, *rbcL* gene (D63442)
7916-P-7

References: 172, 185

575
Nepal (1986-09)
Unialgal, Clonal, H.Nozaki (1987-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –, Crosses with NIES-574
7916-P-8
Reference: 172

* ***Pandorina unicocca*** Rayburn et Starr
See ***Yamagishiella unicocca***
(Rayburn et Starr) Nozaki

Pavlova gyrans Butcher
623
Matoya Bay / Mie (1984-09)
Unialgal, Clonal, T.Sawaguchi (1984-09)
Identified by: S.Suda
Culture conditions: ESM, 20° C, 2000 lx, 2M
Characteristics: Marine
MB-D-24

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
83-24-1-7

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, 1000 lx, 2M
Characteristics: Indicator, Freshwater, *COXI* gene (D63659)
K-P-40
Reference: 48

301
Lake Shoji / Yamanashi (1981-10)
TAC 56-3A, Axenic, Clonal, M.Watanabe
Culture conditions: C, 20° C, 1000 lx, 2M
Characteristics: Freshwater
TAN-56-3A
Reference: 141

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, 1000 lx, 2M
Characteristics: Indicator, Freshwater
KW-P-1
Reference: 280

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, Reidentified by M.Watanabe
Pe-16

213
Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, T.Hiwatari (1983-06)
Identified by: T.Hiwatari
Culture conditions: C, 20° C, 1000 lx, 2M
Characteristics: Indicator, Freshwater, Reidentified by M.Watanabe
AQ-P-1
References: 52, 318

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
F50-1

214
Tsukuba / Ibaraki (1983-08)
Axenic, Clonal, T.Hiwatari (1983-08)

Identified by: T.Hiwatari
Culture conditions: C, 20° C, 1000 lx, 2M
Characteristics: Indicator, Freshwater, Reidentified by M.Watanabe
KR-P-2

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, 1000 lx, 2M
Characteristics: Indicator, Freshwater
B-P-18

302
Lake Kasumigaura / Ibaraki (1983-08)
Axenic, Clonal, F.Kasai (1983-08)
Culture conditions: C, 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
F-26-4

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, 1000 lx, 2M
Characteristics: Indicator, Freshwater
K-P-30

Pedinomonas minor Korshikov
363
Tsukuba / Ibaraki (1984-05)
Axenic, Clonal, S.Suda (1984-05)
Identified by: S.Suda
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
H31P4

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, 1000 lx, 2M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, Heterothallic
N-76-20
Reference: 61

303
Tsukiyono / Gunma (1984-06)
Axenic, Clonal, F.Kasai (1984-06)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
84-25-1

Peridinium bipes Stein
599
Fuya-Dam / Nara (1989-02)
Unialgal, Clonal, T.Sawaguchi (1989-02)
Identified by: T.Sawaguchi
Culture conditions: MW/5, 20° C, 4000 lx, 2M
Characteristics: Red tide, Planktonic, Untransportable
KZDP-2-3

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, 3000 lx, 2M
Characteristics: Freshwater, Untransportable
LOND-9

Peridinium bipes Stein
f. ***occultatum*** (Lindermann) Lefèvre
364
Lake Unagiike / Kagoshima (1985-02)
Axenic, Clonal, T.Sawaguchi (1985-02)
Identified by: T.Sawaguchi
Culture conditions: URO, 15° C, 3000 lx, 2M
Characteristics: Red tide, Freshwater, Untransportable
EPD-7

496
Isobe / Mie (1986-10)
Unialgal, Clonal, T.Sawaguchi (1986-11)
Identified by: T.Sawaguchi
Culture conditions: URO, 15° C, 3000 lx, 2M
Characteristics: Red tide, Freshwater, Untransportable
KDD-1

497
Lake Kizaki / Nagano (1988-04)
Unialgal, Clonal, T.Sawaguchi (1988-04)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 3000 lx, 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, 3000 lx, 3M
Characteristics: Red tide, 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, 3000 lx, 2M
Characteristics: Freshwater, Untransportable
TOM-1

Peridinium polonicum Woloszynska
500
Shiogama / Miyagi (1988-07)
Axenic, Clonal, T.Sawaguchi (1988-07)
Identified by: T.Sawaguchi
Culture conditions: AF-6/2, 20° C, 4000 lx, 2M
Characteristics: Freshwater, Untransportable
KAP-2

Peridinium volzii Lemmermann
365
Ajiro / Iwate (1984-09)
Axenic, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 3000 lx, 2M
Characteristics: Freshwater, Untransportable
HND-1

501
Tsuchiura / Ibaraki (1986-04)
Unialgal, Clonal, T.Sawaguchi (1986-05)
Culture conditions: Carefoot, 15° C, 3000 lx, 2M
Characteristics: Freshwater, Homothallic, Untransportable
SPSP-2

Peridinium wierzejskii Woloszynska
502
Tsuchiura / Ibaraki (1985-04)
Unialgal, Clonal, T.Sawaguchi (1985-04)
Identified by: T.Sawaguchi
Culture conditions: MW/5, 15° C, 3000 lx, 2M
Characteristics: Freshwater, Homothallic, Untransportable
SPD-7

Peridinium willei Huitfeldt-Kaas
304
Tsukiyono / Gunma (1984-06)
Axenic, Clonal, T.Sawaguchi (1984-06)
Identified by: T.Sawaguchi
Culture conditions: Carefoot, 15° C, 3000 lx, 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, 3000 lx, 2M
Characteristics: Freshwater, Homothallic, Untransportable
SPD-1

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, 4000 lx, 1M
Characteristics: Freshwater, Umetatechi-shinshutsusui lagoon
PhD-3

Phaeocystis pouchetii (Hariot) Lagerheim
388
Hachijo Isl. / Tokyo (1984-04)
Unialgal, Non-clonal, T.Sawaguchi (1984-04)
Identified by: T.Sawaguchi
Culture conditions: ESM, 15° C, 2000 lx, 20D,

(20° C, 4000 lx)
Characteristics: Red tide, Marine, Unstable, Untransportable
8-P

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, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by M.M.Watanabe
References: 61, 270, 278

34
Sendai / Miyagi
IAM M-59, Unialgal, Non-clonal, M.Ishikawa
Identified by: K.Maruyama
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by M.M.Watanabe
Reference: 61

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, 500 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
(1)-48
Reference: 263

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, 500 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
2st-2-4
References: 262, 263, 264

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, 500 lx, 2M, (20° C, 1500 lx)
Characteristics: Freshwater
AT4-17
References: 263, 264

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, 500 lx, 2M, (20° C, 1500 lx)
Characteristics: Freshwater
AT5-37
Reference: 263

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, 500 lx, 2M, (20° C, 1500 lx)
Characteristics: Freshwater
Ast-1-4
References: 263, 264

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, 500 lx, 2M, (20° C, 1500 lx)
Characteristics: Freshwater
AT2-17
References: 263, 264

Phormidium mucicola Huber-Pestalozzi et Naum
510
Mt.Tsukuba / Ibaraki (1987-04)
Unialgal, clonal, F.Kasai (1987-05)
Identified by: M.M.Watanabe
Culture conditions: CSi, CSi+Cu, 20° C, 500 lx, 4M, (20° C, 1500 lx)
Characteristics: Freshwater
(1)-23
Reference: 263

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, 500 lx, 4M, (20° C, 1500 lx)
Characteristics: Freshwater
841211St5-1
References: 262, 263

Phormidium tenue Gomont
30
Akita / Akita
IAM M-40, Unialgal, Non-clonal, M.Ishikawa
Identified by: H.Fukushima
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Reidentified by M.M.Watanabe
References: 61, 248

512
Nagoya / Aichi (1981-11)
Axenic, Non-clonal, N.Yamada (1985-05)
Identified by: N.Yamada
Culture conditions: CT, 20° C, 500 lx, 20D, (20° C, 1500 lx)
Characteristics: Offensive taste and odor, Freshwater, Nakaku Honmaru (a moat of the Nagoya Castle)
PM-81A
References: 199, 341, 342

611
Lake Biwa / Shiga (1987-06)
Unialgal, Clona, S.Ichise (1987-06)
Identified by: M.M.Watanabe
Culture conditions: CT, 25° C, 3000 lx, 1M
Characteristics: Freshwater
Bpt

Pinnularia gibba Ehrenberg
513
Shirai River / Sapporo (1987-07)
Axenic, Clonal, F.Kasai (1987-07)
Identified by: M.Idei
Culture conditions: CSi, 10° C, 1500 lx, 2M
Characteristics: Freshwater
Tst-1-20
Reference: 263

Planktonema lauterbornii Schmidle
514
Lake Kasumigaura / Ibaraki (1988-08)
Axenic, Clonal, Y.Niiyama (1988-08)
Identified by: Y.Niiyama
Culture conditions: C, 20° C, 1000 lx, 2M
Characteristics: Freshwater
K880818

Plectonema radiosum Gomont
515
Nikko / Tochigi (1987-04)
Axenic, Clonal, F.Kasai (1987-04)
Identified by: M.M.Watanabe
Culture conditions: CSi, 20° C, 500 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
NK-12
References: 263, 264

Pleodorina californica Shaw
576
Hachiman / Gifu (1990-08)
Axenic, Clonal, Y.Ogasawara (1990-08)
Identified by: Y.Ogasawara
Culture conditions: VT, 25° C, 3000 lx, 1M
Characteristics: Freshwater

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, 2000 lx, 1M
Characteristics: Freshwater, Type strain, Homothallic, Dioecious, Anisogamy, *rbcL* gene (D63440)
6715-7
References: 185, 192

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, 25° C, 1500 lx, 1M
Characteristics: Freshwater, Homothallic
F57-18-4

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: CA, 20° C, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-308
W-1-1

308
Naka-gun / Wakayama (1969-10)
IAM C-379, Axenic, Clonal, T.Ichimura (1969-11)
Identified by: T.Ichimura
Culture conditions: CA, 20° C, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-307
W-1-3

311
Iriomote Isl. / Okinawa (1973-06)
IAM C-430, Unialgal, Clonal, T.Ichimura (1973-11)
Culture conditions: MG, 20° C, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type +
R-13-19

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, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type +, Crosses with NIES-310
R-13-27
Reference: 61

310
Iriomote Isl. / Okinawa (1973-06)
IAM C-468, Unialgal, Clonal, T.Ichimura (1973-10)
Culture conditions: MG, 20° C, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater, Heterothallic,
Mating type –, Crosses with NIES-309
R-13-30
Reference: 61

Pleurotaenium nodosum (Brebisson ex Ralfs) Lundell
663
Miyatoko Mire / Fukushima (1993-09)
Unialgal, Clonal, H.Nozaki (1993-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater
93-913-Gon-1

664
Miyatoko Mire / Fukushima (1993-09)
Unialgal, Clonal, H.Nozaki (1993-09)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 2M
Characteristics: Freshwater
93-913-Gon-3

Pleurotaenium nodosum (Brébisson 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, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater
83-24-3

Pleurotaenium ovatum Nordstedt
313
Niimi / Okayama (1983-09)
Unialgal, Clonal, F.Kasai (1983-09)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater
F57-17-8

Polyedriopsis spinulosa (Schmidle) Schmidle
232
Tsukuba / Ibaraki (1984-05)
Unialgal, Clonal, F.Kasai (1984-05)
Identified by: F.Kasai
Culture conditions: C, 20° C, 500 lx, 3M,
(25° C, 3000 lx)
Characteristics: Freshwater
F128

Prorocentrum balticum (Lohmann) Loeblich III
681
Harima-Nada / Seto Inland Sea (1987-04)
Axenic, Clonal, S.Yoshimatsu (1987-04)
Identified by: S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

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, 4000 lx, 1M
Characteristics: Red tide, Marine, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
80

Prorocentrum lima (Ehrenberg) Dodge
517
Lake Obuchinuma / Aomori (1987-08)
Unialgal, Clonal, T.Sawaguchi (1987-08)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 4000 lx, 2M
Characteristics: Benthic, Marine, Untransportable
OBPD-5

617
Motobu / Okinawa (1993-06)
Unialgal, Clonal, H.Kobayashi (1993-06)
Identified by: Y.Fukuyo
Culture conditions: f/2, ESM, 20° C, 4000 lx, 1M
Characteristics: Toxic, Marine, Untransportable
PL-03

Prorocentrum mexicanum Osorio Tafall
317
Harima-Nada / Seto Inland Sea
Axenic, Clonal, S.Yoshimatsu (1984-08)
Identified by: S.Yoshimatsu
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-83

618
Motobu / Okinawa (1993-06)
Unialgal, Clonal, H.Kobayashi (1993-06)
Identified by: Y.Fukuyo
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Marine, Untransportable
PX-01

Prorocentrum micans Ehrenberg
12
Osaka Bay / Osaka (1981-07)
Axenic, Clonal, S.Yamochi
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
OPm
References: 136, 282, 353

218
Yashima Bay / Kagawa (1978-08)
Axenic, Clonal, K.Yuki
Culture conditions: f/2, 20° C, 4000 lx, 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, 20° C, 4000 lx, 2M
Characteristics: Red tide, Marine, Untransportable
MB-D-4

601
Mikawa bay / Aichi
Unialgal, Clonal, S.Toriumi
Culture conditions: f/2, 20° C, 4000 lx, 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, 4000 lx, 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, 4000 lx, 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, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable

Prorocentrum triestinum Schiller
13
Osaka Bay / Osaka (1982-08)
Axenic, Clonal, M.M.Watanabe (1982-08)
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
Otri

219
Nomi Bay / Kochi (1980-04)
Unialgal, Clonal, S.Yoshimatsu
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
KGW-28-1
Reference: 282

Protoceratium reticulatum
(Claparède et Lachmann) Bütschli
318
Matoya Bay / Mie (1984-09)
Axenic, Clonal, T.Sawaguchi (1984-09)
Identified by: T.Sawaguchi
Culture conditions: f/2, ESM, 20° C, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Unstable, Untransportable
KGW-62
Reference: 282

* ***Protogonyaulax catenella*** (Whedon et Kofoid) Taylor
See ***Alexandrium catenella*** (Whedon et Kofoid) Balech

Pseudocarteria mucosa (Korshikov) Ettl
522
Izumi / Miyagi (1985-08)
Axenic, Clonal, S.Suda (1985-08)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Homothallic
M-2
Reference: 255

523
Higashiyata River / Ibaraki (1983-07)
Unialgal, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Homothallic
USI-8
References: 252, 255

524
Izumi / Miyagi (1985-08)
Axenic, Clonal, S.Suda (1985-08)
Identified by: S.Suda
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Homothallic
M-4
Reference: 255

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Soil
KUC6-2
Reference: 334

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, 4000 lx, 1M
Characteristics: Red tide, Marine, Untransportable
H-88-1
References: 121, 282

626
Seto Inland Sea / Kagawa (1989-02)
Unialgal, Clonal, T.Sawaguchi (1989)
Identified by: I.Inouye
Culture conditions: ESM, 15° C, 2000 lx, 20D
Characteristics: Marine, Untransportable
89KGW-1

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, 4000 lx, 1M
Characteristics: Red tide, Marine
KGW-64-3
Reference: 282

320
Onagawa Bay / Miyagi (1984-08)
Axenic, Clonal, S.Suda (1984-09)
Identified by: S.Suda
Culture conditions: f/2, 20° C, 4000 lx, 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, 4000 lx, 1M
Characteristics: Indicator, Red tide, Marine, Tide pool, Collected from Senjo-jiki Yaene Hachijo
8-25-2
References: 112, 113, 230

Pyrocystis lunura (Schütt) Schütt
609
Unialgal, Non-Clonal
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Marine

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, 4000 lx, 2M
Characteristics: Red tide, Marine, Untransportable
MB-D-27

Scenedesmus acuminatus (Lageraeim) Chodot 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, 1000 lx, 2M
Characteristics: Indicator, Freshwater
K-S-1
Reference: 335

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
2-2-3-1
Reference: 335

95
Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, S.Suda (1983-05)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, Collected from an artificial pond beside Aquatron at the NIES
Aq-S-1
References: 52, 318

120
Tsukuba / Ibaraki (1983-05)
Axenic, Clonal, S.Suda (1983-05)
Identified by: M.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, Collected

from an artificial pond beside Aquatron at the NIES
Aq-S-2
Reference: 318

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
F-18-1
Reference: 318

119
Ozegahara / Gunma (1983-08)
Axenic, Clonal, S.Suda (1983-09)
Identified by: T.Hiwatari
Culture conditions: C, 20° C, 1000 lx, 2M
Characteristics: Indicator, Freshwater
OZ-29

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater, *COXI* gene (D63658)
TAN-51-3B
References: 48, 352

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Indicator, Freshwater
TAN-51-3C

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, 3000 lx, 20D
Characteristics: Indicator, Freshwater
F47-3

Scrippsiella precaria Montresor et Zingone
526
Hachinohe / Aomori (1988-08)
Unialgal, Clonal, T.Sawaguchi (1988-09)
Identified by: T.Sawaguchi
Culture conditions: ESM, 20° C, 4000 lx, 1M
Characteristics: Marine, Untransportable
HSS-10

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, 4000 lx, 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, 4000 lx, 1M
Characteristics: Red tide, Marine, Homothallic, Unstable, Untransportable
HHSS-1
References: 136, 353

Selenastrum capricornutum Printz
Syn. ***Monoraphidium capricornutum*** (Printz) Nygaad
35
Nitelva River / Norway
Axenic, Clonal, O.M.Skulberg (1959)
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: AGP, Freshwater
P-26
References: 54, 82, 83, 91, 115, 139, 140, 160, 256, 276, 337, 338, 340

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, 2000 lx, 1M
Characteristics: Red tide, Marine,
Collected from St. 53 Harima-Nada
H-53-3
Reference: 213, 233

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, 2000 lx, 1M
Characteristics: Red tide, Marine,
Collected from St. 90 Harima-Nada
H-90-2

223
Shodo Isl. / Kagawa (1979-07)
Unialgal, Clonal, K.Yuki
Culture conditions: f/2, 5° C, 2000 lx, 1M
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, 2000 lx, 1M
Characteristics: Red tide, Marine
Sk-85w
References: 75, 113

324
Off Kobe / Osaka Bay (1985-07)
Axenic, Clonal,S.Yamochi (1985-07)
Identified by: S.Yamochi
Culture conditions: f/2, 5° C, 2000 lx, 1M
Characteristics: Red tide, Marine
Sk-85su
Reference: 201

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, 1000 lx, 4M,
(25° C, 3000 lx)
Characteristics: Freshwater, Homothallic
83-24-19
Reference: 64

Spirulina platensis (Gomont) Geitler
Syn. ***Arthrospira platensis*** Gomont
39
Lake Chad / Chad
IAM M-135, Axenic, Clonal
Culture conditions: SOT, 20° C, 500 lx, 4M,
(25° C, 1500 lx)
Characteristics: Salt water, Hydrogen evolution,
Contain good quality of proteins
References: 3, 61, 118, 124, 260, 307, 310, 318

45
Lake Kasumigaura / Ibaraki (1975-11)
IAM M-184, Axenic, Clonal, M.M.Watanabe
(1975-11)
Identified by: M.M.Watanabe
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Water bloom, Freshwater,
Forming water bloom in Inbanuma
KAS-6-50
References: 61, 260, 307, 310, 318, 335

46
Lake Texcoco / Mexico
IAM M-185, Unialgal, Clonal
Culture conditions: SOT, 20° C, 500 lx, 4M
(25° C, 1500 lx)
Characteristics: Water bloom, Salt water,
Hydrogen evolution
References: 3, 61, 118, 260, 307, 310, 318

597
Lake Teganuma / Chiba (1990-07)
Unialgal, Non-clonal, T.Hagiwara (1990-07)
Identified by: T.Hagiwara
Culture conditions: MA, 20° C, 500 lx, 2M,
(25° C, 1500 lx)
Characteristics: Water bloom, Planktonic
T-43

Spirulina subsalsa Oersted ex Gomont
27
IAM M-183, Axenic, Clonal
Culture conditions: MA, 25° C, 1500 lx, 1M
Characteristics: Freshwater
References: 61, 335

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, 1500 lx, 1M
Characteristics: Indicator, Marine
Reference: 61

598
Chiyoda-ku / Tokyo (1989-10)
Unialgal, Non-clonal, T.Hagiwara (1989-10)
Identified by: T.Hagiwara
Culture conditions: CB, 20° C, 500 lx, 2M, (25° C, 1500 lx)
Characteristics: Planktonic
KO-39

Staurastrum dejectum Brébisson ex Ralfs
224
Lake Yamanaka / Yamanashi (1981-10)
TAC 53-1, Unialgal, Clonal, M.Watanabe
Identified by: M.Watanabe
Culture conditions: AF-6, 20° C, 1000 lx, 2M, (20° C, 3000 lx)
Characteristics: Freshwater
TAN-53-1

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, 3000 lx, 2M
Characteristics: Freshwater
NB

Staurastrum inconspicuum Nordstedt
390
Oze / Gunma (1983-08)
Axenic, Clonal, F.Kasai (1983-09)
Culture conditions: CAM, 20° C, 1000 lx, 3M, (20° C, 1500 lx)
Characteristics: Freshwater
34-10′

Staurastrum paradoxum Meyen
528
Lake Kasumigaura / Ibaraki (1982-12)
Axenic, Clonal, M.H.Watanabe (1982-12)
Culture conditions: C, 20° C, 1000 lx, 2M, (20° C, 3000 lx)
Characteristics: Indicator, Freshwater
Kas-K-3

Stephanopyxis palmeriana (Greville) Grunow
327
Hachijo Isl. / Tokyo (1984-04)
Unialgal, Clonal, T.Sawaguchi (1984-04)
Identified by: T.Sawaguchi
Culture conditions: f/2, 10° C, 2000 lx, 1M
Characteristics: Marine
8-B-2

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, 1500 lx, 3M
Characteristics: Freshwater
AT2-16
Reference: 263

530
Watarase River / Gunma (1987-08)
Unialgal, Non-clonal, F.Kasai (1987-09)
Identified by: F.Kasai
Culture conditions: C, 15° C, 1500 lx, 3M
Characteristics: Freshwater
AT5-17
References: 263, 264

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, 1000 lx, 3M
Characteristics: Freshwater
2st-3-12
References: 262, 263

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, 500 lx, 3M, (10° C, 1500 lx)
Characteristics: Freshwater
M-2
Reference: 263

Synura petersenii Korshikov
233
Higashiyata River / Ibaraki (1983-07)
Axenic, Clonal, S.Suda (1983-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 1500 lx, 2M
Characteristics: Indicator, Freshwater
USI-10
Reference: 251

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, 1500 lx, 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, 1500 lx, 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, 1500 lx, 2M
Characteristics: Indicator, Freshwater
SIS-1
Reference: 251

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, 2000 lx, 2M
Characteristics: Indicator, Freshwater
OZ-43-4
Reference: 213

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, 2000 lx, 1M
Characteristics: Freshwater, Psychrophilic
KG-4-8th
References: 184, 193

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, 1500 lx, 1M
Characteristics: Freshwater, Homothallic, Isogamy, *rbcL* gene (D63443)
21028-4
References: 170, 184, 185, 193

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Soil
3-EBO-1
Reference: 334

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, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Freshwater
F115
Reference: 251

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, 4000 lx, 1M
Characteristics: Water bloom, Freshwater
SM-6-9

Reference: 318

533
Mitsukaido / Ibaraki (1985-07)
Axenic, Clonal, S.Suda (1985-07)
Identified by: S.Suda
Culture conditions: C, 20° C, 2000 lx, 20D
Characteristics: Freshwater
KY-20-1

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, 2000 lx, 1M
Characteristics: Marine
MBB-6
Reference: 213

Thalassiosira pacifica Gran et Angst
535
Hachinohe Harbor / Aomori (1987-03)
Unialgal, Clonal, T.Sawaguchi (1987-03)
Identified by: T.Sawaguchi
Culture conditions: f/2, 10° C, 2000 lx, 1M
Characteristics: Marine
87MHHB-1

Tolypothrix tenuis Kützing ex Bornet et Flahault
37
Borneo
IAM M-29, Axenic, Non-clonal, A.Watanabe
Identified by: K.Negoro
Culture conditions: MDM(S), 20° C, 500 lx, 4M, (25° C, 3000 lx)
Characteristics: Freshwater, Nitrogen fixation, Chromatic adaptation, Heterotrophic, Reidentified by M.M.Watanabe, Material for studying on phycobilin production
References: 13, 18, 19, 20, 21, 22, 23, 25, 44, 45, 46, 61, 100, 135, 232, 277, 281, 286, 287, 288, 289, 290, 291, 292, 294, 354

Treubaria triappendiculata Bernard
394
Lake Kasumigaura / Ibaraki (1983-10)
Axenic, Clonal, F.Kasai (1983-10)
Identified by: Y.Niiyama
Culture conditions: C, 20° C, 500 lx, 2M, (25° C, 3000 lx)
Characteristics: Freshwater
F67-5

Tribonema marinum J.Feldmann
548
Tuscan / Italy (1991)
Unialgal, Clonal, T.Hagiwara (1992)
Identified by: G.Sartoni
Culture conditions: f/2, 20° C, 500 lx, 3M, (20° C, 3000 lx)
Characteristics: Marine
Reference: 228

Triceratium dubium Brightwell
556
Okinawa (1990)
Unialgal, Clonal, S.Ono (1990)
Identified by: S.Ono
Culture conditions: f/2, 20° C, 4000 lx, 1M
Characteristics: Marine
No.20

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, 1500 lx, 3M
Characteristics: Freshwater
References: 262, 263

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, 500 lx, 3M, (10° C, 1500 lx)
Characteristics: Freshwater
4st-1'-24
Reference: 263

537
Shirai River / Sapporo (1987-10)
Unialgal, Non-clonal, F.Kasai (1987-10)
Identified by: F.Kasai
Culture conditions: C, 10° C, 1500 lx, 1M
Characteristics: Freshwater
2Tst-1-1

Reference: 263

Urnella terrestris Playfair
156
Pokhara / Nepal (1975-10)
Axenic, Clonal, S.Watanabe
Identified by: S.Watanabe
Culture conditions: C(S), 20° C, 500 lx, 3M, (25° C, 3000 lx)
Characteristics: Soil
NPL-111
Reference: 333

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, 2000 lx, 1M
Characteristics: Water bloom, Phagotrophic, Freshwater, Untransportable
Strain 78
References: 70, 96, 97

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, 1000 lx, 3M
Characteristics: Freshwater
4st-2-10
References: 262, 263

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, 1000 lx, 3M
Characteristics: Freshwater
4st-3-5
Reference: 263

540
Miyata River / Ibaraki (1987-05)
Unialgal, Non-clonal, F.Kasai (1987-05)
Identified by: F.Kasai
Culture conditions: C, 20° C, 1000 lx, 3M
Characteristics: Freshwater
4st-0-16
Reference: 263

Volvox aureus Ehrenberg
241
Nagatoro / Saitama (1969-11)
IAM C-419, Axenic, Clonal, T.Ichimura
Identified by: T.Ichimura
Culture conditions: VT, 25° C, 3000 lx, 20D
Characteristics: Freshwater, Fertility lost, Untransportable
S-9-8
Reference: 61

396
Koshokugun / Nagano (1983-08)
Axenic, Clonal, Y.Ogasawara (1983-08)
Identified by: Y.Ogasawara
Culture conditions: VT, 20° C, 1500 lx, 20D
Characteristics: Freshwater, Homothallic, Untransportable

693
Meguro / Tokyo (1977-06)
Axenic, Clonal, H.Nozaki (1977-06)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Water bloom, Homothallic, Dioecious, Oogamy, Untransportable
k-5

694
Sakyo / Kyoto (1983-10)
Axenic, Clonal, H.Nozaki (1983-10)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Water bloom, Homothallic, Dioecious, Oogamy, Untransportable
31202-2-9

Volvox aureus Ehrenberg var. *aureus*
541
Lake Yamanaka / Yamanashi (1981)
Axenic, Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, *rbcL* gene (D63445), Untransportable
1706-2
References: 167, 179, 184, 185

542
Lake Yamanaka / Yamanashi (1981)
Axenic, Clonal, H.Nozaki (1981-07)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Untransportable
1706-4
Reference: 167

Volvox carteri Stein
397
Ichinomiya / Aichi (1983-06)
Axenic, Clonal, Y.Ogasawara (1983-06)
Culture conditions: VT, 25° C, 3000 lx, 20D
Characteristics: Freshwater, Heterothallic, Female, Crosses with NIES-398, Untransportable
V-4

398
Ichinomiya / Aichi (1983-06)
Axenic, Clonal, Y.Ogasawara (1983-06)
Culture conditions: VT, 25° C, 3000 lx, 20D
Characteristics: Freshwater, Heterothallic, Male, Crosses with NIES-397, Untransportable
V-11

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, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Dioecious, Oogamy, Female, Crosses with NIES-581, Untransportable
6823-♀-2
Reference: 173

581
Kawasaki / Kanagawa (1990-10)
Unialgal, Clonal, H.Nozaki (1990-11)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Dioecious, Oogamy, Male, Crosses with NIES-580, Untransportable
90-1111-5
Reference: 173

Volvox prolificus Iyengar
543
Axenic, Clonal, Y.Ogasawara
Identified by: S.Suda
Culture conditions: VT, 25° C, 3000 lx, 1M
Characteristics: Freshwater, Untransportable
V-sp

Volvox tertius Meyer
544
Kisofukushima / Nagano (1986-08)
Axenic, Clonal, Y.Ogasawara (1986-08)
Identified by: Y.Ogasawara
Culture conditions: MG, 20° C, 1500 lx, 20D
Characteristics: Freshwater, Homothallic, Untransportable

Volvulina compacta Nozaki
582
Birtamod / Nepal (1988-10)
Axenic, Clonal, H.Nozaki (1989-08)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-583
89-804-4
Reference: 188

583
Birtamod / Nepal (1988-10)
Axenic, Clonal, H.Nozaki (1989-08)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-582
89-804-7
Reference: 188

Volvulina steinii Playfair
545
Hayama / Kanagawa (1980-12)
Axenic, Clonal, H.Nozaki (1981-01)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type –, Crosses with NIES-546
1107-5 (–)
References: 163, 183

546
Hayama / Kanagawa (1980-12)
Axenic, Clonal, H.Nozaki (1981-01)
Identified by: H.Nozaki

Culture conditions: VTAC, 20° C, 1500 lx, 1M
Characteristics: Freshwater, Heterothallic, Mating type +, Crosses with NIES-545
1107-8 (+)
Reference: 163

584
Bahrabise / Nepal (1988-09)
Unialgal, Clonal, H.Nozaki (1989-03)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, Crosses with NIES-585
89-306-1
Reference: 176

585
Bahrabise / Nepal (1988-09)
Unialgal, Clonal, H.Nozaki (1989-04)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –, Crosses with NIES-584
89-423-1
Reference: 176

Woloszynskia leopoliense (Woloszynska)Thompson
619
Mitsukaidou / Ibaraki (1985-04)
Unialgal, Clonal, T.Sawaguchi (1985-04)
Identified by: T.Sawaguchi
Culture conditions: MW1/5, 20° C, 4000 lx, 1M
Characteristics: Freshwater, Homothallic, Untransportable
KRYZ-3

Yamagishiella unicocca (Raybarn 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, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, Crosses with NIES-579
01209-1

579
Kamogawa / Chiba (1980-10)
Unialgal, Clonal, H.Nozaki (1980-12)
Identified by: H.Nozaki
Culture conditions: VTAC, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –, Crosses with NIES-578
01209-7

666
Nobi / Kanagawa (1979-05)
UTEX 2428, Unialgal, Clonal, S.Kato (1979-05)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type +, Crosses with N-667
X-441
References: 94, 162, 190

667
Nobi / Kanagawa (1979-05)
UTEX 2429, Unialgal, Clonal, S.Kato (1979-05)
Identified by: H.Nozaki
Culture conditions: VT, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Heterothallic, Isogamy, Mating type –, Crosses with N-666
X-443
Reference: 162

PROTOZOA

Paramecium bursaria Forke

668
Miyatoko Mire / Fukushima (1993-05)
Xenic, Clonal, H.Nozaki (1993-05)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Symbiotic
93-527-Pa-1

669
Miyatoko Mire / Fukushima (1993-05)
Xenic, Clonal, H.Nozaki (1993-05)
Identified by: H.Nozaki
Culture conditions: AF-6, 20° C, 2000 lx, 1M
Characteristics: Freshwater, Symbiotic
93-527-Pa-2

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
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514 *Planktonema lauterbornii*
515 *Plectonema radiosum*
517 *Prorocentrum lima*
519 *Alexandrium catenella*
520 *Alexandrium catenella*
522 *Pseudocarteria mucosa*
523 *Pseudocarteria mucosa*
524 *Pseudocarteria mucosa*

526 *Scrippsiella precaria*
527 *Spirulina subsalsa*
528 *Staurastrum paradoxum*
529 *Stichococcus bacillaris*
530 *Stichococcus bacillaris*
531 *Stigeoclonium aestivale*
532 *Stigeoclonium fasciculare* var. *fasciculare*
533 *Tetraselmis cordiformis*
534 *Thalassionema nitzschioides*
535 *Thalassiosira pacifica*
536 *Ulothrix zonata*
537 *Ulothrix zonata*
538 *Uronema confervicolum*
539 *Uronema gigas*
540 *Uronema gigas*
541 *Volvox aureus* var. *aureus*
542 *Volvox aureus* var. *aureus*
543 *Volvox prolificus*
544 *Volvox tertius*
545 *Volvulina steinii*
546 *Volvulina steinii*
547 *Cyanophora paradoxa*
548 *Tribonema marinum*
549 *Cyanidioschyzon merdae*
550 *Galdieria sulphuraria*
551 *Cyanidium caldarium*
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 *Oscillatoria agardhii*
595 *Oscillatoria agardhii*
596 *Oscillatoria agardhii*
597 *Spirulina platensis*
598 *Spirulina subsalsa*
599 *Peridinium bipes*
600 *Peridinium bipes* var. *tabulatum*
601 *Prorocentrum micans*
603 *Chattonella ovata*
604 *Mycrocystis wesenbergii*
605 *Fibrocapsa japonica*
608 *Prorocentrum micans*
609 *Pyrocystis lunura*
610 *Oscillatoria agardhii*
611 *Phormidium tenue*
612 *Alexandrium hiranoi*
613 *Amphidinium klebsii*
614 *Cachonina niei*
615 *Coolia monotis*
616 *Ostreopsis siamensis*
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*
627 *Astrephomene gubernaculifera*
628 *Astrephomene gubernaculifera*
629 *Auxenochlorella 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*
642 *Chlorella vulgaris*
643 *Eremosphaera viridis*
644 *Eremosphaera viridis*
645 *Gonium pectorale*
646 *Gonium 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 *Oocystis lacustris*
663 *Pleurotaenium nodosum*
664 *Pleurotaenium nodosum*
665 *Staurastrum dorcidentiferum*
666 *Yamagishiella unicocca*
667 *Yamagishiella unicocca*
668 *Paramecium bursaria*
669 *Paramecium bursaria*
670 *Chattonella verrculosa*
671 *Chattonella ovata*
672 *Oltmannsiellopsis geminata*
673 *Alexandrium affine*
674 *Alexandrium catenella*
675 *Alexandrium catenella*
676 *Alexandrium catenella*
677 *Alexandrium catenella*
678 *Alexandrium insuetum*
679 *Gymnodinium breve*
680 *Gymnodinium mikimotoi*
681 *Prorocentrum balticum*
682 *Prorocentrum dentatum*
683 *Prorocentrum sigmoides*
684 *Scrippsiella sweeneyae*
685 *Chlorella fusca* var. *fusca*
686 *Chlorella vulgaris var. vulgaris*
687 *Graesiella emersonii*
688 *Graesiella emersonii*
689 *Graesiella emersonii*
690 *Graesiella emersonii*
691 *Tetrabaena socialis*
692 *Chlorogonium capillatum*
693 *Volvox aureus*
694 *Volvox aureus*
695 *Synura sphagnicola*
696 *Synura sphagnicola*

2. Systematic index

ALGAE

Cyanophyceae

Glaucophyceae

Rhodophyceae

Cryptophyceae

Dinophyceae

Chrysophyceae

Bacillariophyceae

Xanthophyceae

Haptophyceae

Raphidophyceae

PROTOZOA

Oligohymenophorea *

* See Ref. 119.

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