

藻類

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Catalogue of Kobe University Macroalgal Culture Collection (KU-MACC)

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THE JAPANESE SOCIETY OF PHYCOLOGY

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Catalogue of The Kobe University Macroalgal Culture Collection (KU-MACC)

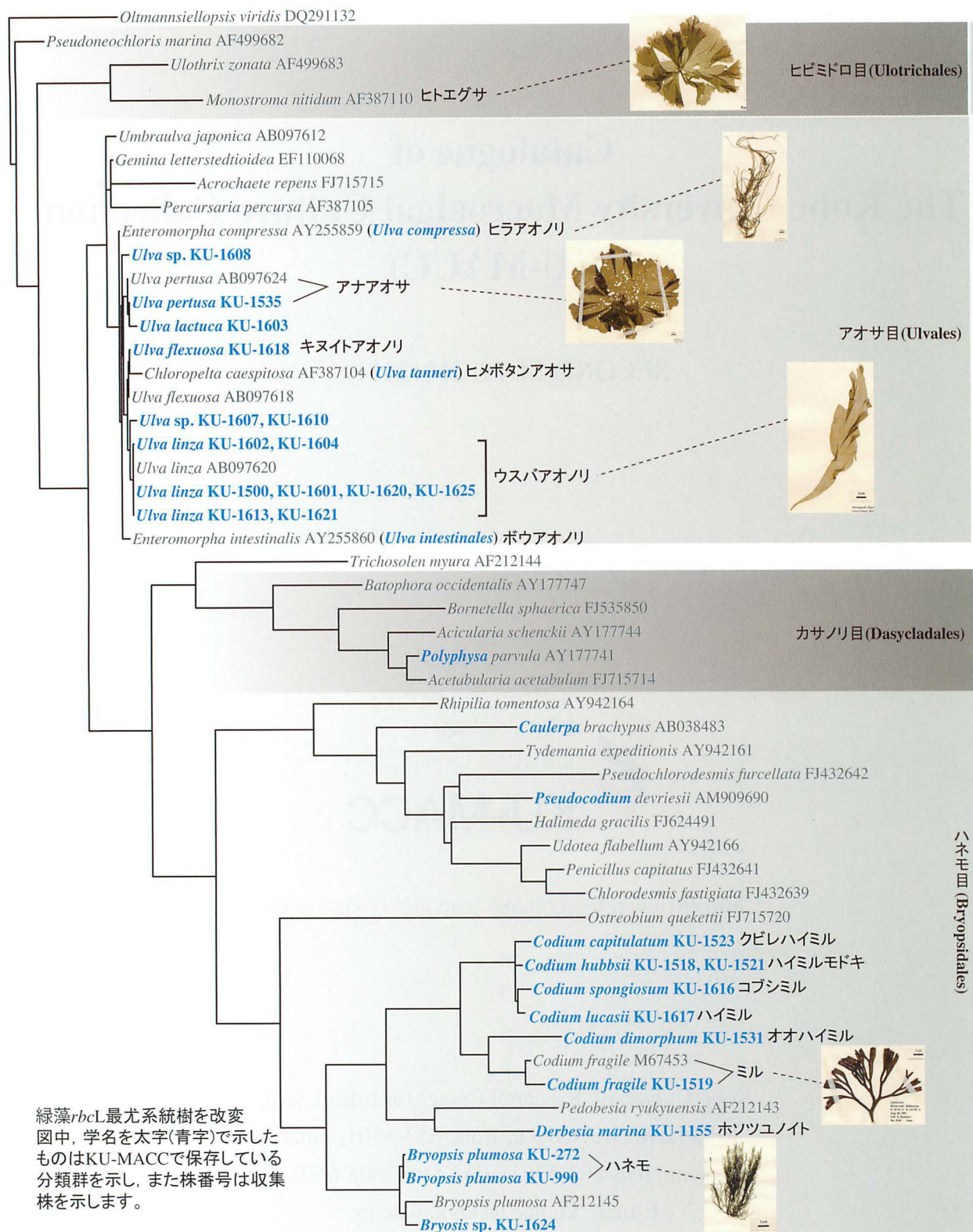
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<http://www.research.kobe-u.ac.jp/rcis-ku-macc/>

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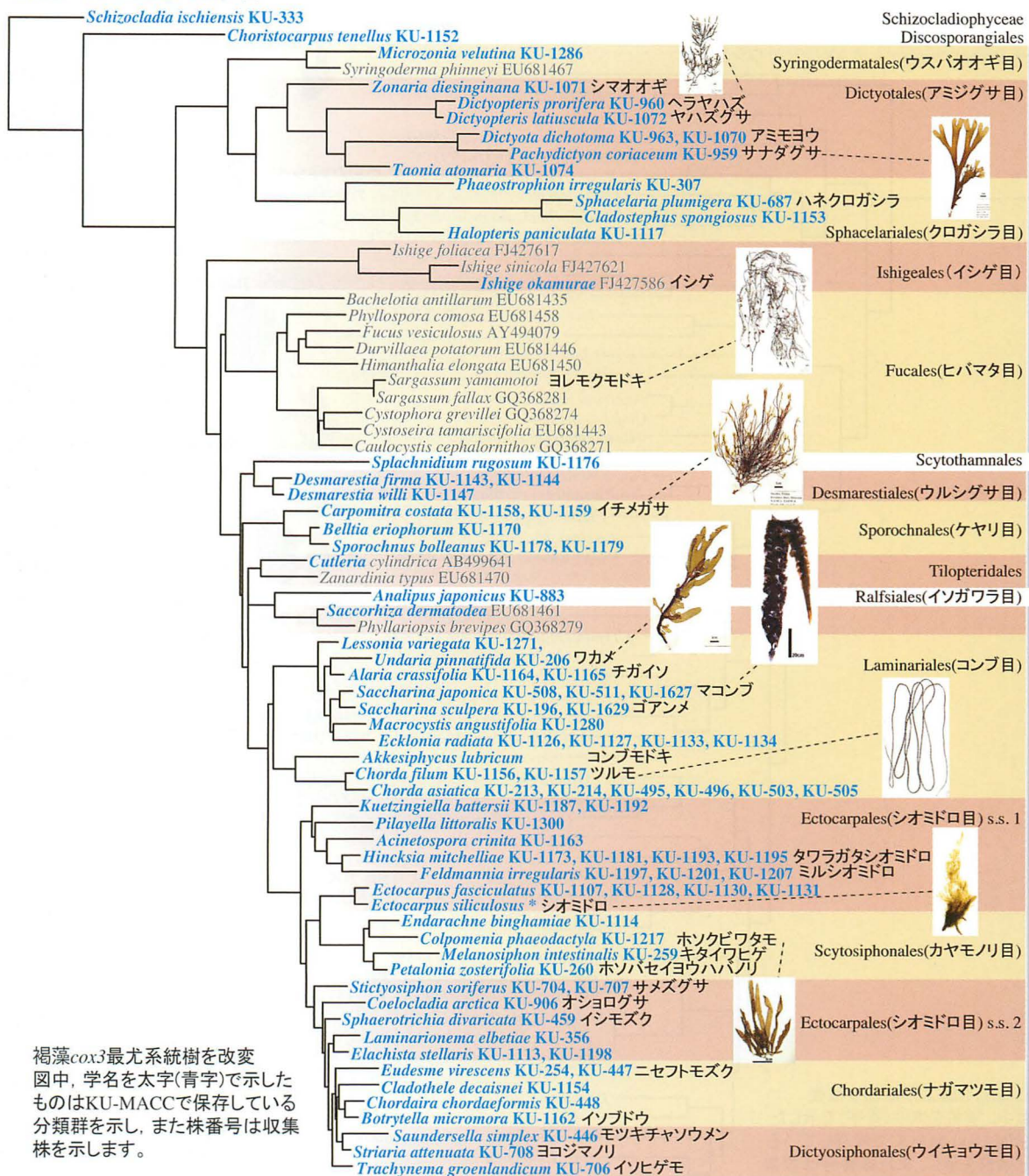
緑藻の系統と収集株



緑藻は、現時点では、アオサ目、ハネモ目の種が多く収集されています。核rDNA ITS領域、葉緑体*rbcL*遺伝子を用いた系統解析と系統株のタグ化を進めており、約20種40系統のタグ化を終了しています。

Majority of the green algal strains in the collection belong to Ulvales and Bryopsidales. ITS region of nuclear rDNA and chloroplast *rbcL* gene sequences are used for taxonomy and as genetic tags.

褐藻の系統と収集株



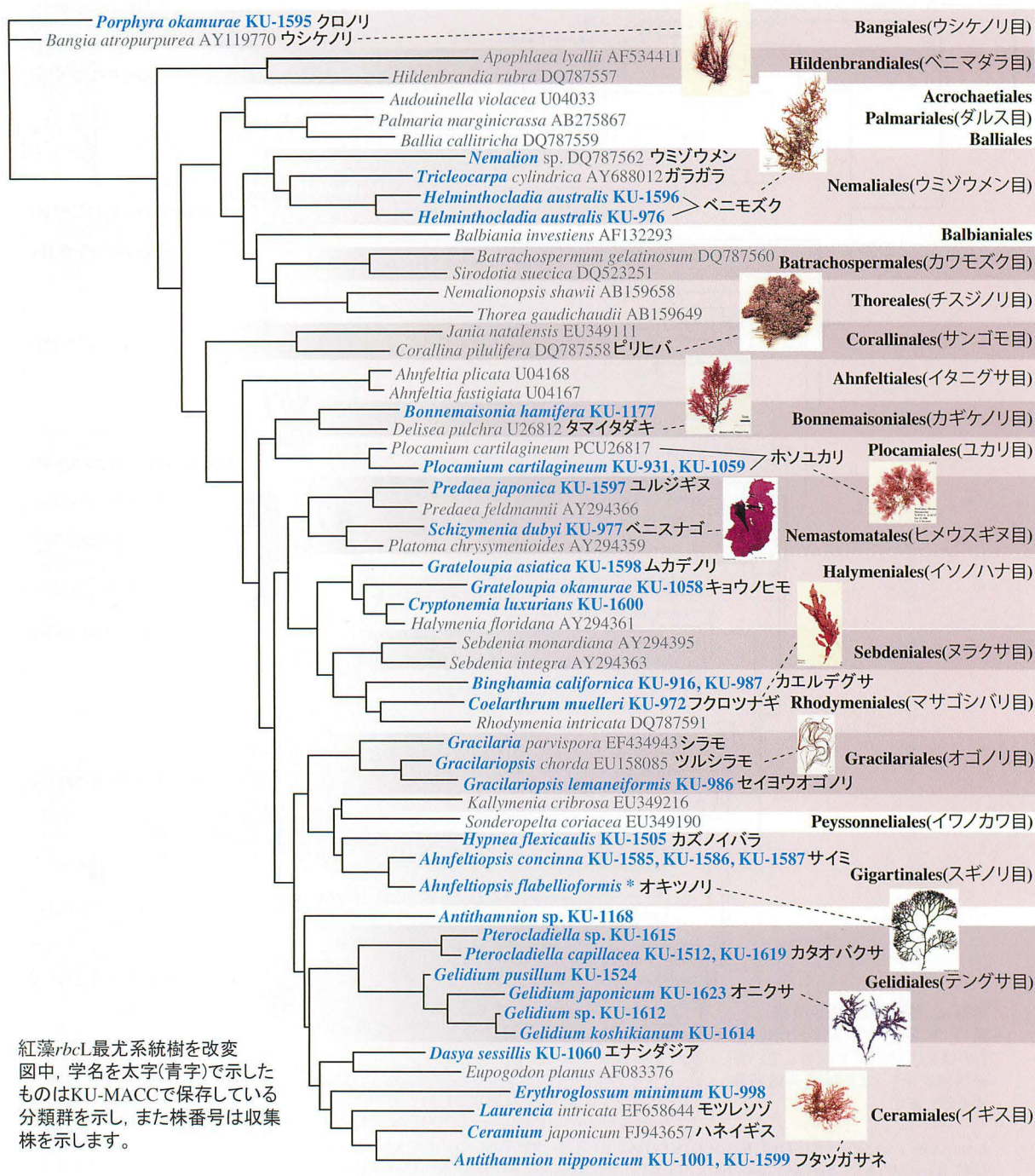
褐藻 *cox3* 最尤系統樹を改変
 図中、学名を太字(青字)で示した
 ものはKU-MACCで保存している
 分類群を示し、また株番号は収集
 株を示します。

*Ectocarpus siliculosus** KU-1102, KU-1103, KU-1104, KU-1105, KU-1106, KU-1109, KU-1111, KU-1112, KU-1330, KU-1332, KU-1336, KU-1342, KU-1343, KU-1344, KU-1345, KU-1348, KU-1352, KU-1355, KU-1363, KU-1364, KU-1371, KU-1372, KU-1424, KU-1433, KU-1434, KU-1435, KU-1436, KU-1442, KU-1443, KU-1444, KU-1717, KU-1752

褐藻類は、継代培養による維持が困難なヒバマタ目などを除くほとんどの目を網羅して収集しています。特にシオミドロ属については全ゲノム解析が終了したKU-1372 (Ec 32) 株を含む多くの系統株を保存しています。また重要な水産資源であるコンブ類やワカメなどの有用海藻も多数保存されています。ミトコンドリア *cox3* 遺伝子を用いた系統解析と系統株のタグ化を進めており、これまでに約90種150系統のタグ化を終了しています。またシオミドロ属を中心に約230株を凍結保存しています。

Collections of brown algal strains cover large part of brown algal orders excluding Fucales lacking alternation of life history and difficult to maintain in culture. In Ectocarpales, many strains of *Ectocarpus* spp. including Ec32 strain (KU-1372) used for genome sequencing are deposited. As economically and ecologically important taxa, various kelp species such as *Macrocystis*, *Saccharina*, *Laminaria* and *Undaria* are available. Mitochondrial *cox3* gene are sequenced for brown algal strains, and used for the taxonomy and as genetic tags. About 230 strains are cryopreserved to date.

紅藻の系統と収集株



紅藻*rbcL*最尤系統樹を改変
 図中、学名を太字(青字)で示した
 ものはKU-MACCで保存している
 分類群を示し、また株番号は収集
 株を示します。

*Ahnfeltiopsis flabelliformis** KU-1556, KU-1558, KU-1560, KU-1562, KU-1563, KU-1564, KU-1565, KU-1566, KU-1567, KU-1569, KU-1570, KU-1571, KU-1572, KU-1573, KU-1574, KU-1575, KU-1576, KU-1577, KU-1578, KU-1579, KU-1580, KU-1581, KU-1583, KU-1584

紅藻は、アマノリ類と多様な真正紅藻の系統を網羅しています。特に交雑株を含む多くのオキツノリ株とテングサ属の系統株が充実しています。またアマノリ類、テングサ類、オゴノリ類など水産資源として重要な有用海藻も多く収集されています。核rDNA ITS領域、葉緑体*rbcL*遺伝子による系統解析と系統株のタグ化を進めており、これまでに約50種120系統のタグ化を終了しています。またテングサ類の系統株を凍結保存しています。

Collections of red algae include some *Porphyra* species in Bangiophyceae, and diverse orders in Florideophyceae. Many strains of *Ahnfeltiopsis flabelliformis* and *Gelidium* spp. including laboratory hybrids are deposited. As economically important taxa, *Porphyra* spp., *Gelidium* spp. and *Gracilaria* spp. are available. ITS region of nuclear rDNA and chloroplast *rbcL* gene sequences are used for taxonomy and as genetic tags. Several *Gelidium* strains are cryopreserved to date.

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はじめに

神戸大学海藻類系統株コレクション (KU-MACC) は、平成 15 年、内海域環境教育研究センター内に海藻類系統株保存室として設置され、同センターの研究活動の一環としてさまざまな海藻類系統株の収集・保存を行なってきました。また、平成 17 年からは文部科学省ナショナルバイオリソースプロジェクト (NBRP) の支援を受け、国立環境研 NIES コレクションと連携して、収集株の分譲を行うとともに、分譲可能株のカタログ発行、収集株の遺伝子情報の解析、凍結保存と凍結保存株の国立環境研との相互バックアップ、NBRP 公式サイトでの収集株情報提供などの整備を進めております。

本コレクションは褐藻類（姉妹群のシゾクラディア藻を含む）、紅藻類、緑藻類などのいわゆる大型海藻類の単藻培養株を中心に収集し、継代培養および液体窒素による凍結保存で保存しています。これらの系統株は同センターに所属する研究者が独自に収集した株のほか、Dieter G. Müller 博士（ドイツ国）、Eric C. Henry 博士（米国）、北海道大学理学研究科の研究者ほかから寄託された株を基礎にしており、全体で 1,500 株以上を収集・保存していますが、現時点で約 230 種、約 500 株（系統）が分譲可能です。また、2010 年には多細胞海藻類の初めての全ゲノム解析例として、シオミドロ (*Ectocarpus siliculosus*) のゲノム塩基配列情報が公開されましたが、この解析に用いられた株（ゲノム株：Ec32=KU-1372）や近縁のシオミドロ株も多数収集しています。ここでは、平成 22 年度末での分譲可能株のリストと分譲申し込み方法、培養方法、これらの株を用いて実施された研究に基づく研究成果などについて紹介します。

川井浩史・山岸隆博・甲斐厚（神戸大学海藻類系統株コレクション）

I. 系統株の分譲

1. 分譲にあたっての同意事項

神戸大学海藻類系統株コレクション (Kobe University Macroalgal Culture Collection: KU-MACC) は、神戸大学自然科学系先端融合研究環内海域環境教育研究センターにおける成果有体物取扱内規に基づき、以下の事項に同意していただいた方に培養株を分譲します。

(1) KU-MACC から分譲された海藻類系統株、それを増殖させたもの及び由来物（以後培養株と記す）は教育、試験・研究および製品等の開発目的でのみ使用できます。人に直接使用することはできません。また、利用者は使用の際に、分譲された系統株に潜在的な危険性があることを認識し、その国、自治体、機関等の法令や規則を遵守しなければなりません。

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2. 系統株の注文方法

(1) [海藻類系統株分譲依頼書兼同意書]に必要事項を記入し、以下の宛先に郵送してください。依頼者が学生、非常勤職員などの場合は、指導教官、雇用者などから依頼するようお願いいたします。株は指導教官、雇用者宛に郵送されます。また、お急ぎの場合は、分譲依頼書をあらかじめファックス、または分譲依頼書をスキャンしたPDFファイルを電子メールでお送りください。なお株は署名捺印された依頼書兼同意書原本の到着確認後の発送となりますのでご注意ください。

(2) 系統株を受け取った方は、受領後1ヶ月以内に[受領報告書]に必要事項を記入し、以下の宛先にファックス、郵送、または電子メールで連絡してください。

宛先: 〒657-8501 神戸市灘区六甲台町1-1 神戸大学自然科学系先端融合研究環 内海域環境教育研究センター内
神戸大学海藻類系統株コレクション

Phone: 078-803-5781 / Fax 078-803-6698; Email: kumacc@kobe-u.ac.jp

3. 系統株分譲実費

(1) 大学、国公立研究機関等の非営利団体による教育・研究目的の利用の場合1株あたり3,000円、これ以外の場合6,000円とします。何れのカテゴリーに相当するか不明な場合は、事前にお問い合わせください。系統株を発送し、到着後お送りいただく受領報告書の確認後、請求書を発行しますので、記載されている期日までに所定の口座に金額を振り込んで下さい。納入期限までに収納されなかった場合は、年5パーセントの率により延滞金を徴収するものとします。

(2) 国内における分譲にともなう送料は原則として受取人払い(着払い)とします。

海藻類系統株分譲依頼書兼同意書

事務使用欄

平成 年 月 日

独立行政法人国立神戸大学契約担当役 殿

神戸大学自然科学系先端融合研究環内海域環境教育研究センター

教授 川井 浩史 印

下記の通り、神戸大学海藻類系統株コレクション (KU-MACC) に系統株分譲の依頼がありましたので申し出ます。

分譲依頼者はこの下の部分にご記入ください

分譲依頼年月日：西暦 年 月 日

依頼者名 (フリガナ): ()

所属機関名：

住所：

電話： FAX:

電子メールアドレス：

請求先:(上記機関、住所等と異なる場合にご記入ください)

下記海藻類系統株についての分譲を依頼します。

海藻類学名 (KU-MACC 株番号):

研究目的 (可能な範囲で具体的にご記入ください):

合計株数：

分譲依頼にあたって前記の同意事項に同意いたします。

西暦 年 月 日

氏名： 印 (又はサイン)

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

年 月 日

指導教官又は責任者名： 印 (又はサイン)

所属機関名：

住所

電話： FAX:

電子メールアドレス：

海藻類系統株受領報告書

受領報告年月日：西暦 年 月 日

依頼者名（フリガナ）： （ ）

所属機関名：

住所

電話：

FAX:

電子メールアドレス：

西暦 年 月 日に分譲された海藻類系統株の受領と受領時の株の状態について下記のように報告します。

受付番号：

海藻類学名 (KU 株番号) :

株が到着した日付： 年 月 日

株の受領時の状態

良 好：

不 良：

その他：

ご意見，要望など：

II. 系統株の寄託

1. 寄託の条件

神戸大学海藻類系統株コレクション (KU-MACC) は、寄託株が以下の KU-MACC における培養保存条件をみたまう場合、寄託を受け入れます。原則的にすべての寄託株は一定の期間をおいた後、公開・分譲されます。

- (1) 海藻の多様性や生態学および生化学的研究、または環境指標などとして科学的に重要な価値を有する。
- (2) 種の同定がなされており、株の由来が明らかである。寄託株が多くの研究で使用されている場合などは、属名のみであっても寄託株として受け入れる場合がある。
- (3) 寄託株は通常の条件で安定培養が可能であり、以下の条件をみたまう。
- ・単藻化され、かつクローン株である。

2. 寄託にあたっての同意事項

(1) 寄託者は、寄託株を KU-MACC に無償で寄託することとします。この寄託においては、知的所有権の移転はふくまれません。寄託を受けて、KU-MACC は、寄託された培養株の維持、保存、増殖を行い、また研究者に対し提供することができます。

(2) 寄託者は、寄託にあたって、寄託株の特性や品質に関する正確な情報 (特許等を含む) を添付することとします (寄託依頼書)。

(3) KU-MACC に寄託するにあたり、寄託株は法律上あるいは契約上いかなる制限も受けていないものとし、その由来は以下のいずれかに該当することとします。

- ・寄託株は、寄託者が分離・開発した培養株である。
- ・寄託株は、分離・開発者の許可を得て寄託される。

(4) KU-MACC は寄託者の定める以下の条件で利用を希望する者へ寄託株を提供することができます。

- ・論文発表まで寄託株を公開・分譲しない。
- ・その他

条件が付与されている場合でも、非公開は原則として寄託日から 1 年以内を目安とします。また、条件が付与されていない場合は、KU-MACC の承認後、ただちに公開株とします。

(5) KU-MACC は、保存株の維持・保存・増殖段階でのやむを得ない事情による変質・滅失あるいは自然災害その他の不可抗力による滅失・散逸などについて、神戸大学海藻類系統株コレクションに対し責任を問うことはできません。

(6) KU-MACC は、保存株評価委員会等の意見等を踏まえ、維持方針の変更が生じた場合は事前に寄託者に連絡のうえ、委託者の維持・保存・提供の中止その他の処分をすることができます。

3. 寄託方法

(1) [寄託依頼書兼同意書] に必要事項を記入し、以下の宛先に郵送してください。ファクスまたは PDF ファイルで送付いただく場合でも、署名捺印された [寄託依頼書兼同意書] の原本を後日かならず郵送してください。実際の系統株の取り引き時期などについては、スタッフにおたずねください。

宛先

〒 657-8501 神戸市灘区六甲台町 1-1 神戸大学自然科学系先端融合研究環 内海域環境教育研究センター内

神戸大学海藻類系統株コレクション

Phone: 078-803-5781 / Fax 078-803-6698 Email: kumacc@kobe-u.ac.jp

(2) [寄託依頼書兼同意書] の受け取り日から 1 ヶ月以内に寄託の可否が決定されます。

(3) 寄託株の状況が [寄託依頼書兼同意書] の内容と異なる場合や上述した寄託条件をみたまない場合は寄託をお断りする場合があります。

海藻類株寄託依頼書兼同意書

寄託依頼年月日：年 月 日

依頼者名（フリガナ付）：

所属機関名（日本語名）：

所属機関名（英語名）：

所属機関住所：〒

電話：（内線）

FAX：

電子メールアドレス：

下記大型海藻類株の寄託を依頼します。

〔基本情報〕

学名及び命名者名：

和名：

門名： 目名： 科名：

シノニム：

同定者名（フリガナ付）：

同定年： 西暦 年 月 日

株番号又は符号：

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

〔採集〕

採集年月日：西暦 年 月 日

採集者名（フリガナ付）：

採集地情報

国名：

産地住所（県名から）：

地名（河川，湖，池，湾，砂浜等の名称）：

緯度経度：

海域名と最も近い国名：

生息環境：□海域 □淡水域 □汽水域（塩濃度： ‰）

□潮間帯 □潮だまり（タイドプール） □潮下帯（水深：低調線以下 m）

□解放岩礁 □マングローブ □河口域 □港湾

□漂着海藻

□ドレッジ □その他（ ）

付着物体：□岩石 □小石または貝殻 □他の大型藻類 □その他

その他の生息環境コメント：

〔分離〕

分離年月日：西暦 年 月 日

分離者名（フリガナ付）：

分離試料源：□頂端組織 □栄養組織（非成長組織） □孢子 □接合子

□胚 □果孢子 □孢子囊 □その他（ ）

分離方法：□ピペット洗浄法 □切り出し □その他（ ）

分離時の培養条件（培地の種類，濃度，光，温度条件等）：

[状態]

☐単藻 ☐混合 ☐クローン ☐非クローン ☐無菌 ☐非無菌

[保存条件]

培地名：

培地の出典：

継代培養による保存条件

温度 (°C):

光強度 (Lux):

光強度 (μ E/m²sec):

光質: ☐白色蛍光灯 ☐赤色蛍光灯 ☐青色蛍光灯 ☐自然光 ☐その他 ()

明暗周期:

継代培養 (植え継ぎ) 周期: (☐日 ☐月間隔)

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

[特性]

環境上の特性

その他の特性

[遺伝子データ (随時コピーを行い, 登録されている全てのデータを記入してください)]

遺伝子名:

登録番号:

登録者名 (フリガナ付):

登録年月日: 西暦 年 月 日

[文献]

この株を扱った文献 (下記の例に従って記述してください)

(例) Sasaki, H., Flores-Moya, A., Henry E.C., Müller, D.G. and Kawai, H. (2001) Molecular phylogeny of Phyllariaceae, Halosiphonaceae and Tilopteridales (Phaeophyceae). *Phycologia* 40: 123-134.

この株に関する参考文献 (同定に用いた文献など, 上の例に従って記述してください)

[その他]

コメント:

寄託にあたって前記の同意事項に同意いたします。

西暦 年 月 日

氏名: 印 (又はサイン)

III. 培地

◎ 神戸大学海藻類系統コレクションの系統株は基本的に、プロバゾリの強化海水培地 (Provasoli's Enriched Sea water: PESI or PES) および人工海水培地 ASP₁₂ 中で保存培養されています。

1. 強化海水培地の作成

- (1) 清浄海水を採取し、フィルターにより濾過する。
- (2) 濾過海水をオートクレーブ滅菌 (121° C, 20 分) する。
- (3) 滅菌海水 1000 ml に 20 ml の PESI または PES stock solution(後述)を加え、攪拌する。

PESI stock solution の作成 (Tatewaki 1966; Kawai et al. 2005)

- i) 300 ml 程度の蒸留水に Tris, NaNO₃, Na₂-glycerophosphate, Fe stock solution, P-2 metal mix, KI stock solution を組成表 (APPENDIX) どおり加え、溶解させる。
- ii) pH を 7.8 に調整し、蒸留水を加え 1000 ml とする。
- iii) PESI stock solution をねじ口容器に 20 ml ずつ分注し、オートクレーブ滅菌 (121° C, 20 分) する。滅菌 PESI stock solution は 4° C で冷蔵保存する。

PES stock solution の作成 (Provasoli 1996; Kawai et al. 2005)

- i) 300 ml 程度の蒸留水に Tris, NaNO₃, Na₂-glycerophosphate, Fe stock solution, P-2 metal mix, Vitamine B₁₂ stock solution, Thiamine-HCl stock solution, Biotine stock solution を組成表 (APPENDIX) どおり加え、溶解させる。
- ii) pH を 7.8 に調整し、蒸留水を加え 1000 ml とする。
- iii) PESI stock solution をねじ口容器に 20 ml ずつ分注し、オートクレーブ滅菌 (121° C, 20 分) する。滅菌 PESI stock solution は 4° C で冷蔵保存する。

Fe stock solution の作成

- i) 450 ml の蒸留水に Na₂-EDTA·2H₂O, Fe(NH₄)₂(SO₄)₂·6H₂O を組成表 (APPENDIX) どおり、所定量順番に加えて溶解させる。(加える試薬の順番を誤ると沈殿をおこすので注意する。)
- ii) 蒸留水を加え 500 ml とする。Fe stock solution は 4° C で冷蔵保存する。

P-2 metal mix の作成

- i) 450 ml の蒸留水に Na₂-EDTA·2H₂O, H₃BO₃, FeCl₃·6H₂O, MnSO₄·4H₂O, CoSO₄·7H₂O, ZnSO₄·7H₂O を組成表 (APPENDIX) どおり、所定量順番に加えて溶解させる。(加える試薬の順番を誤ると沈殿をおこすので注意する。)
- ii) 蒸留水を加え 500 ml とする。P-2 metal mix は 4° C で冷蔵保存する。

参照：

Kawai, H., Motomura, T. and Okuda, K. Isolation and Purification Techniques for Macroalgae. In: Andersen, R.A. [Eds] Algal culturing techniques. 2005. Elsevier Academic Press, San Diego, California. Chapter 9, pp. 133-143.

Provasoli, L. 1966. Media and prospects for the cultivation of marine algae. In: Watanabe, A. and Hattori, A. [Eds] Cultures and Collections of algae. Proceedings of the US-Japan conference held at Hakone, 12-15 Sept. 1966. Jpn. Soc. Plant., Physiol., pp. 63-75.

Tatewaki, M. 1966. Formation of crustaceous sporophyte with unilocular sporangia in *Scytosiphon lomentaria*. Phycologia 6: 62-66.

2. ASP₁₂ 培地の作成

- (1) 900 ml 程度の蒸留水に組成表 (APPENDIX) どおり試薬を加え，十分溶解させる。
- (2) pH を 7.8 に調整し，蒸留水を加え 1000 ml とする。
- (3) オートクレーブ滅菌 (121° C, 20 分) する。培地は 4° C で冷蔵保存する。

参照：

千原光雄，西沢一俊（編）1979. 藻類研究法 pp. 287-288. 共立出版，東京

IV. 系統株のリスト

1. データ項目の解説

◎系統株のリストは網ごとに，それぞれ学名のアルファベット順に配置し，また同一種内では，株番号順に配置しています。リストのデータ項目の内容は以下を参照してください。

例)

Schizocladia ischiensis E.C. Henry, Okuda et Kawai¹⁾

Strain: KU-333²⁾. Origin: Ischia Isl., Naples, Italy (1987-10-21)³⁾. Leg./Isol. E. Henry⁴⁾. Culture: PES; 10°C⁵⁾.

Note: Type culture; 18S rDNA, *rbcL*⁶⁾. Reference: Kawai et al. (2003)⁷⁾

1) 学名と原著者名

2) 株番号：KU- の後に数字を付して使用する。

3) 採集地，() 内は採集年月日

4) 採集者 / 単離者

5) コレクションで用いられている培地・培養温度

6) 株情報 (世代，性および Type culture など)，DNA 塩基配列解析による同定，保存株のタグ化のために用いた分子マーカー，凍結保存状況（凍結保存株が存在する場合は “cryopreserved” と記入）。当該株が北海道大学から移転されたものである場合，北大の株番号 [HOK code] を先頭に付してあります。

7) 参考文献（当該系統株を利用して行われた研究成果論文のリストで，詳細は巻末に掲載）

PREFACE

Kobe University Macroalgal Culture Collection (KU-MACC) was established in 2003 as a section of the Kobe University Research Center for Inland Seas (KURCIS), and began to distribute cultures to the public in 2005. This collection is one of the research activities of KURCIS, but its development has been supported by the National BioResource Project (NBRP) of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in collaboration with the Microbial Culture Collection of the National Institute of Environmental Studies (NIES).

KU-MACC principally holds so-called macroalgae (Phaeophyceae, Rhodophyceae and Chlorophyceae), and preserves unialgal strains by maintaining vegetative thalli or by cryo-preservation in liquid nitrogen. The collection is based on the culture strains collected and isolated by the researchers of KURCIS and the donated strains established by Drs Dieter G. Müller (Germany), Eric C. Henry (U.S.A.), the researchers of the Graduate School of Science, Hokkaido University, etc.. More than 1,500 strains are preserved in total, and currently about 500 strains of about 230 species are available for distribution. The collection includes the 'genome strain' of *Ectocarpus siliculosus* genome project published in 2010 as the first example of the whole genome analysis of multicellular macroalgae, and its related strains. This catalogue lists the stains available for distribution, and explains the application and donation procedures and methods of culture.

Hiroshi Kawai, Takahiro Yamagishi, Atsushi Kai (KU-MACC)

I. ORDERING STRAINS

1. Agreement for distribution

When the user agrees to the following conditions, KU-MACC shall accept his/her submission of the KU-MACC Strain Ordering and Agreement Form:

- (1) The strains (including replicates and derivatives from the strains), that are distributed from KU-MACC (Kobe University Macroalgal Culture Collection), shall be available for education, academic and industrial research purpose only. The strains are not intended for human consumption. The user hereby acknowledges and accepts any potential risks associated with the strains and shall use them in compliance with domestic and foreign laws, regulation, and guidelines.
- (2) The user shall submit the application form personally.
- (3) The user shall not acquire any intellectual property rights from the distribution of the strain.
- (4) The user shall provide written notice to KU-MACC when the purpose of the distribution changes significantly from that stated at the time of submission.
- (5) The user shall not transfer the strains, replicates and derivatives to any third party. In case of violation, these facts may be made public by KU-MACC via posting on our Web site, etc.
- (6) The user agrees to acknowledge KU-MACC as the source of the material in all publications and patent applications that reference the material. The user shall provide the KU-MACC strain code (e.g., KU-123) when a KU-MACC strain is used in research that is subsequently published, and shall send two copies of the reprint(s), PDF files (or photocopies thereof) or information of any publications to KU-MACC.

(7) The user hereby agrees that KU-MACC or its depositors shall bear no liability for an infringement of the intellectual property rights or another person's rights by using of a strain.

(8) The user hereby agrees to indemnify, defend and hold harmless KU-MACC and its depositors against all third party claims, losses, expenses and damages relating to the transfer, use, handling, disposal and other activities relating to the material, replicates or derivatives. All non-monetary settlements will be subject to KU-MACC's consent.

(9) The user shall submit the Strain the Receipt Form within thirty (30) days (the "Warranty Period") of the date of receipt of the strain. The user may request that the strain be sent again without charge (exclusive of shipping and handling charges) if the strain is seriously damaged in transit and does not show viability during this warranty period. This exclusive remedy applies under the condition that the user handles and stores Material as described in the product sheet.

Payment; Taxes; Shipping

KU-MACC issues invoice after receiving the report of survival from the user (within 30 days after the arrival of culture). Payments due to KU-MACC should be done by wire transfer to the specified bank account of Kobe University before the date specified in the invoice. Any payments not made within such twenty (20) day period will be subject to an interest charge of five percent (5%) per year or the maximum rate allowed by applicable law, whichever is less. The user is responsible for all taxes, duties, tariffs and permit fees assessed in connection with the material.

KU-MACC will package the material for shipping in accordance with applicable laws and regulations. The user is responsible for ensuring that all permits required for user to receive its order are obtained and that sufficient proof of such permits is provided to KU-MACC. KU-MACC will notify the user when orders are submitted without the necessary permits, and the user will have a two (2) month period after such notification to supply proof of the necessary permit(s) before an order will be cancelled.

2. Procedure for distribution

(1) The user shall complete the [KU-MACC Strain Ordering and Agreement Form] and send it to the following

Address:

Kobe University Organization of Advanced Science and Technology

Research Center for Inland Seas

Kobe University Macroalgal Culture Collection (KU-MACC)

Rokkodai 1-1, Nada-ku, Kobe 657-8501, Japan

Phone: +81-78-803-5781 Fax: +81-78-803-6698

Email: kumacc@kobe-u.ac.jp

Homepage: <http://www.research.kobe-u.ac.jp/rcis-ku-macc/>

(2) The user shall submit the Strain Receipt Form within thirty (30) days of the date of receipt of the strain by fax, e-mail or post.

3. Cost of strains

Universities, public institutions: 3,000 yen

Companies, commercial organizations: 6,000 yen

The cost of postage or other shipping should be paid by the users.

KU-MACC Strain Ordering and Agreement Form

For official use

Date: / /

The Obligating Officer, Kobe University

Hiroshi Kawai, Professor

Kobe University Organization of Advanced Science and Technology

Research Center for Inland Seas

I apply that Kobe University Macroalgal Culture Collection (KU-MACC) received an ordering of distribution of the strains as below.

For requester

Date:

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

Requestor' s affiliation and address:

Tel:

Fax:

E-mail:

I request the following algal culture strain(s):

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

Object of use (in detail):

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

Signature

Printed name

Date

KU-MACC Strain Receipt Form

Date:

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

Recipient' s affiliation and address:

Tel:

Fax:

E-mail:

I received the following culture strain(s) from Kobe University Macroalgal Culture Collection.

Date of strain receipt:

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

States of strain(s) received:

☐ Good (strain number)

☐ Poor (strain number)

Comments

II. DEPOSITION OF STRAINS

1. Conditions for deposit

The Kobe University Macroalgal Culture Collection (KU-MACC) will accept for deposit strains that satisfy the following conditions. In principle, all deposited strains will be available to the public after any time.

- (1) Scientifically important macroalgae, e.g. macroalgae that are significant representatives of macroalgal biodiversities, or have potential importance in scientific research and economic uses, or as environmental indicators.
- (2) The derivation of the strain should be clearly described, and its genus and speciesname should be provided; however, strains that have been used in a number of studies may be accepted even if only the genus name is known.
- (3) The strain should be stable under defined culture conditions and shall be in one of the following states:
 - Clonal
 - Unialgal

2. Agreement for deposit

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

- (1) The depositor shall deposit the strain to the KU-MACC without charge. The transfer of intellectual property is not included in the agreement. The KU-MACC may maintain, culture and distribute the strain to users.
- (2) The depositors shall submit accurate strain data to the KU-MACC, which shall include patents, properties and states of the strain (see Strain Deposit Request and Agreement Form).
- (3) The strain shall be free from any limitation, legally and contractually, pursuant to one of the following reasons:
 - The strain was isolated/developed by the depositor
 - The strain is deposited with the permission of the isolator/developer
- (4) The KU-MACC may distribute the deposited strains to users in accordance with the following condition(s):
 - The strain shall not be disclosed to the public before publication regarding the strain has been published
 - Other reason specified by the depositor

This condition will last no longer than one year, when the strain will be made available to the public, even if the depositor has stipulated conditions. If the depositor does not stipulate any conditions, then the strain will be available to the public immediately after approval by the KU-MACC representative.
- (5) The KU-MACC shall bear no responsibility for inevitable changes in the strain with the passage of time, for loss during maintenance, or for loss caused by natural disasters.
- (6) The KU-MACC may cease maintenance and distribution of the strain according to the decision of the

KU-MACC representative., after prior notification is given to the depositor.

3. Procedure for deposit

(1) The depositor should complete the “Strain Deposit Request and Agreement Form” and send it to the following

Address

Kobe University Organization of Advanced Science and Technology

Research Center for Inland Seas

Kobe University Macroalgal Culture Collection (KU-MACC)

Rokkodai 1-1, Nada-ku, Kobe 657-8501, Japan

Phone: +81-78-803-5781 Fax: +81-78-803-6698

Email: kumacc@kobe-u.ac.jp

Homepage: <http://www.research.kobe-u.ac.jp/rcis-ku-macc/>

(2) The decision regarding the deposit of the strain will be provided within one month from the date of receipt of the Strain Deposit Request and Agreement Form.

(3) If the state of the strain on receipt does not match with the description on the Strain Deposit Request and Agreement Form, or does not meet any of the conditions described above, the KU-MACC acceptance for deposit shall be withdrawn.

KU-MACC Strain Deposit Request and Agreement Form

Date:

Depositor's full name, with family name in capitals:

Depositor's affiliation and address:

Tel:

Fax:

E-mail:

I wish to deposit the following macro-algal culture strain to the Kobe University Macroalgal Culture Collection (KU-MACC).

[Basic information]

Scientific name with author name(s):

Local name (if any):

Class: Order: Family:

Synonyms (if any):

Identified by (full name, with family name in capitals):

Identification year:

Strain designation or code:

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

[Collection]

Collection date:

Collector's name (full name, with family name in capitals):

Locality information

Country:

Address (as detailed as possible):

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

Latitude and longitude:

Ocean name and nearest country:

Habitat: ☐ marine ☐ freshwater ☐ brackish (salinity: ‰)

☐ intertidal ☐ tide pool ☐ subtidal (depth: m below L.L.W.)

☐ exposed ☐ sheltered ☐ mangrove ☐ estuary ☐ harbor

☐ drift ☐ dredge sample ☐ other ()

Substrates: ☐ rock ☐ pebble or shell ☐ other macroalgae ☐ other ()

Other information or comments on the habitat:

[Isolation]

Date of isolation:

Isolator's name (full name, with family name in capitals):

Isolation source: ☐ apical tissue ☐ vegetative (non-meristematic) tissue ☐ zoospore ☐ tetraspore

☐ zygote

☐ embryo ☐ carpospore ☐ sporangium ☐ other ()

Isolation method: ☐ pipetting zooids ☐ excised from specimen ☐ other ()

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

[Strain status]

- ☐ unialgal ☐ mixed
☐ clonal ☐ non-clonal
☐ axenic ☐ non-axenic

[Preservation conditions]

Medium:

Notes for preparation of medium:

Sub-culturing conditions

Temperature (° C):

Light intensity (Lux):

Light intensity (μ E/m² sec):Light quality: ☐ white fluorescent ☐ red fluorescent ☐ blue fluorescent ☐ natural light ☐ other

L/D cycle:

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

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

[Characteristics]

Environmental characteristics

Miscellaneous characteristics

[Genetic information (please included all registered data)]

Gene name:

Accession no:

Registrant (full name, with family name in capitals):

Registration date:

[References]

Publications in which the strains were used (please provide a reference list according to the example below)
 (e.g.) Sasaki, H., Flores-Moya, A., Henry E.C., Müller, D.G. and Kawai, H. (2001) Molecular phylogeny of Phyllariaceae, Halosiphonaceae and Tilopteridales (Phaeophyceae). *Phycologia* 40: 123-134.

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

[Other]

Any other remarks and comments:

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

Signature

Printed name

Date

III. MEDIA

© In the KU-MACC, all of the strains are cultured in Provasoli' s enriched sea water (PES or PESI) or ASP₁₂.

1. Preparation of PES and PESI medium

- (1) Collect un-polluted (preferably offshore) sea water and remove particulate matter with filters
- (2) Sterilize the filtered sea water by autoclaving at 121° C for 20 min.
- (3) Add 20 ml of PES or PESI medium stock solution to 1000 ml of the sterilized sea water.

Preparation of PES stock solution

- i) Dissolve appropriate weighed quantities (APPENDIX) of Tris, NaNO₃, Na₂-glycerophosphate, Fe stock solution, P-2 metal mix, Vitamin B₁₂ stock solution, Thiamine-HCl stock solution, and Biotin stock solution, into 300 ml of distilled water.
- ii) Adjust to pH 7.8 with 1N HCl or NaOH, and then dilute to 1000 ml final volume with distilled water.
- iii) Dispense 20 ml of the medium into sealed tubes and sterilize the medium by autoclaving at 121° C for 20 min, and store at 4° C.

Preparation of PESI stock solution

- i) Dissolve appropriate weighed quantities (APPENDIX) of Tris, NaNO₃, Na₂-glycerophosphate, Fe stock solution, P-2 metal mix, KI stock solution into 300 ml of distilled water.
- ii) Adjust to pH 7.8 with 1N HCl or NaOH, and then dilute to 1000 ml of final volume with distilled water.
- iii) Dispense 20 ml of the solution into sealed tubes and sterilize by autoclaving at 121° C for 20 min, and store at 4° C.

Preparation of Fe stock solution

- i) Dissolve appropriate weighed quantities (APPENDIX), in this order, of Na₂-EDTA · 2H₂O, and Fe(NH₄)₂(SO₄)₂ · 6H₂O into about 450 ml of distilled water.
- ii) Dilute to 500 ml final volume with distilled water, and store at 4° C.

Preparation of P-2 metal mix stock solution

- i) Dissolve appropriate weighed quantities (APPENDIX), in this order, of Na₂-EDTA · 2H₂O, H₃BO₃, FeCl₃ · 6H₂O, MnSO₄ · 4H₂O, CoSO₄ · 7H₂O, and ZnSO₄ · 7H₂O into about 450 ml of distilled water.
- ii) Dilute to 500 ml final volume with distilled water, and store at 4° C.

References:

Andersen, R.A. (2005) Algal culturing techniques. Elsevier Academic Press, San Diego, California. In: Kawai, H., Motomura, T. and Okuda, K. Chapter 9, pp. 133-143.

Provasoli, L. 1966. Media and prospects for the cultivation of marine algae. In: Watanabe, A. and Hattori, A. [Eds] Cultures and Collections of algae. Proceedings of the US-Japan conference held at Hakone, 12-15 Sept. 1966. Jpn. Soc. Plant., Physiol., pp. 63-75

2. Preparation of ASP₁₂.

- i) Dissolve appropriate weighed quantities (APPENDIX) of reagents into about 900 ml of distilled water.
- ii) Adjust to pH 7.8 with 1N HCl or NaOH, and then dilute to 1000 ml of final volume with distilled water.
- iii) Sterilize the medium by autoclaving at 121° C for 20 min, and store at 4° C

References: Chihara, M. and Nishizawa, K. (1979) Techniques of Algal studying. Kyoritsu Press, Tokyo, pp. 287-288

IV. LIST OF STRAINS

1. Notes on data of strains

© The strains are listed by class in alphabetical order. Strains with the same scientific name are arranged in order of their strain number. A detailed example of a strain description is presented below.

Schizocladia ischiensis E.C. Henry, Okuda et Kawai¹⁾

Strain: KU-333²⁾. **Origin:** Ischia Isl., Naples, Italy (1987-10-21)³⁾. **Leg./Isol.** E. Henry⁴⁾. **Culture:** PES; 10°C⁵⁾. **Note:** Type culture; 18S rDNA, *rbcL*⁶⁾. **Reference:** Kawai et al. (2003)⁷⁾

- 1) Scientific name with authority
- 2) KU strain code (used with the initials “KU-”).
- 3) Collection locality and collection data in parentheses
- 4) Lego/Isolator
- 5) Culture medium and culture conditions (temperature)
- 6) Information of a strain (generation, sex, type culture, etc.), DNA sequencing region used for identification, State of cryopreservation (If strains are cryopreserved, shown as “cryopreserved”). In case of a strain deposited from Hokkaido University, the original code of Hokkaido University is described at the head of the line (e.g., [HOK-123]).
- 7) References (which are lists of studies performed using this strain, and their details are described in p. 72-74)

2. List of culture strains

[In alphabetic order within class, including strain data]

PHAEOPHYCEAE (Brown Algae)

Acinetospora crinita (Carmichael ex Harvey) Kornmann

Strain: KU-1163. **Origin:** Naples, Italy (1983-10-15). **Leg./Isol.** E.C. Henry. **Culture:** PESI; 10°C. **Note:** On *Dictyopteris membranacea*, progeny of KU-2163 (uniloc) (Acinet crin Nap U4b); *cox3*.

Agarum clathratum Dumortier

Strain: KU-314. **Origin:** Auke Bay, AK, USA (1996-4-7). **Leg./Isol.** S. Lindstrom/H. Kawai. **Culture:** PESI; 10°C. **Note:** Endophyte of *Orculifilum denticulatum*, gametophyte [JUN-1]. **Reference:** Sasaki et al. (2003)

Alaria crassifolia Kjellman

Strain: KU-1164. **Origin:** Hokkaido, Japan (1981). **Leg./Isol.** T. Funano. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Ala crass 1f); *cox3*; cryopreserved.

Strain: KU-1165. **Origin:** Hokkaido, Japan (1981). **Leg./Isol.** T. Funano. **Culture:** PESI; 10°C. **Note:** Male gametophyte (Ala crass 1f); *cox3*; cryopreserved.

Alaria esculenta (Linnaeus) Greville

Strain: KU-1166. **Origin:** Hokkaido, Japan (1981). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte; intertidal (Ala esc Aran 88-2 m); *cox3*; cryopreserved.

Strain: KU-1167. **Origin:** Inismaan, Aran Islands, Ireland (1988-9-25). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte; intertidal (Ala esc 88-4 f); *cox3*; cryopreserved.

Analipus japonicus (Harvey) Wynne

Strain: KU-883. **Origin:** Akkeshi, Hokkaido, Japan (1986-6-26). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Isolated from unizoid; *cox3*; cryopreserved.

Arthrocladia villosa (Hudson) Duby

Strain: KU-1169. **Origin:** Villefranche-sur-Mer, France (1980-8-29). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** 10 m deep, near Zoological Station (Art 16).

Asperococcus bullosus Lamouroux

Strain: KU-570. **Origin:** Ehime, Japan (1987-6). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Asexual gametophyte; *cox3*; cryopreserved.

Asteronema rhodochortonoides (Børgesen) D.G. Müller et E.R. Parodi

Strain: KU-1188. **Origin:** Port Elizabeth, South Africa (1993-7-18). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Tide pool, on *Sargassum heterophyllum* (Astero rhodo SAF 18-3).

Strain: KU-1203. **Origin:** Isla Hierro, Canary Islands, Spain (1991-10-3). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Near light house, tide pool, on *Cystoseira* sp. (Astero rhodo CI 60-3).

Botrytella micromora Bory de Saint-Vincent

Strain: KU-1161. **Origin:** Langstone Harbour, England, UK (1983-8-29). **Leg./Isol.** W. Farnham/D.G. Müller. **Culture:** PESI; 10°C. **Note:** *cox3*; cryopreserved.

Strain: KU-1162. **Origin:** Helgoland, Germany (1956-5-17). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** *cox3*; cryopreserved.

Caepidium antarcticum J. Agardh

Strain: KU-1160. **Origin:** Fuerte Bulnes, Chile (1989-1-28). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal.

Carpomitra costata (Stackhouse) Batters

Strain: KU-560. **Origin:** Seto Inland Sea, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C.

Strain: KU-1158. **Origin:** Kaikoura, Pt. Kean, New Zealand (1988-8-21). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift (Carpo NZ 88-2-6); *cox3*.

Strain: KU-1159. **Origin:** Villefranche-sur-Mer, France (1980-9-2). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Dredged from 30m deep, monoecious (Carpo VF 69); *cox3*; cryopreserved.

Chorda asiatica Sasaki et Kawai

Strain: KU-213. **Origin:** Nagasaki, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *Chorda filum* auct. japon; *cox3*; cryopreserved. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-214. **Origin:** Nagasaki, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. Japon; *cox3*; cryopreserved. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-494. **Origin:** Heigun Isl., Yamaguchi, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-495. **Origin:** Heigun Isl., Yamaguchi, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon; *cox3*; cryopreserved. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-496. **Origin:** Heigun Isl., Yamaguchi, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *Chorda filum* auct. japon; *cox3*; cryopreserved. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-497. **Origin:** Heigun Isl., Yamaguchi, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-498. **Origin:** Takahama, Fukui, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-499. **Origin:** Kamikamagari Isl. Hiroshima, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-500. **Origin:** Takahama, Fukui, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-501. **Origin:** Kamikamagari Isl. Hiroshima, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-502. **Origin:** Takahama, Fukui, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-503. **Origin:** Kamikamagari Isl., Hiroshima, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon; *cox3*; cryopreserved. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-504. **Origin:** Takahama, Fukui, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *Chorda filum* auct. japon. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-505. **Origin:** Kamikamagari Isl., Hiroshima, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *Chorda filum* auct. japon; *cox3*; cryopreserved. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Chorda filum (Linnaeus) Stackhouse

Strain: KU-353. **Origin:** Bergen, Norway (1991-8). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-1041. **Origin:** Bergen, Norway (1991-8). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte. **Reference:** Kawai et al. (2001); Sasaki & Kawai (2007).

Strain: KU-1156. **Origin:** Roscoff, France (1989-9-15). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte; intertidal; *cox3*; cryopreserved.

Strain: KU-1157. **Origin:** Roscoff, France (1989-9-15). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte; intertidal; *cox3*; cryopreserved.

Strain: KU-1148. **Origin:** Killeany Bay, Aran Islands, Ireland (1977-7-30). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (*Chorda fil Aran 9 f*); *cox3*; cryopreserved.

Strain: KU-1149. **Origin:** Killeany Bay, Aran Islands, Ireland (1977-7-30). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte (*Chorda fil Aran 7 m*); *cox3*; cryopreserved.

Chorda kikonaiensis Sasaki et Kawai

Strain: KU-200. **Origin:** Kikonai, Hokkaido, Japan (2000-7). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte. **Reference:** Sasaki & Kawai (2007).

Strain: KU-215. **Origin:** Kikonai, Hokkaido, Japan (2000-7). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte. **Reference:** Sasaki & Kawai (2007).

Chorda rigida Kawai et Arai

Strain: KU-725. **Origin:** Sado Isl., Niigata, Japan (1996). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; cryopreserved. **Reference:** Kawai et al. (2001).

Strain: KU-1042. **Origin:** Kashiwazaki, Niigata, Japan (1996-11-13). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte. **Reference:** Kawai et al. (2001).

Chordaira chordaeformis (Kjellman) Kawai et Kim

Strain: KU-448. **Origin:** Hanasaki, Hokkaido, Japan (1980-8). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Gametophyte (CHC-1); *cox3*; cryopreserved. **Reference:** Kim & Kawai (2002).

Chordaria flagelliformis (O.F. Müller) C. Agardh

Strain: KU-873. **Origin:** Elby Point, Isle of Man, UK (1999-8-25). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Gametophyte; *cox3*; cryopreserved. **Reference:** Kim & Kawai (2002).

Strain: KU-1150. **Origin:** Helgoland, Germany (1985-8-22). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal, isolated from unizoid (*Chorda fl Hel 1*); *cox3*; cryopreserved.

Chordaria magellanica Kylin

Strain: KU-1151. **Origin:** Puerto Williams, Chile (1986-2-9). **Leg./Isol.** C. Wiencke/D.G. Müller. **Culture:** PESI; 10°C. **Note:** (*Chorda mag 1*); *cox3*; cryopreserved.

Choristocarpus tenellus Zanardini

Strain: KU-1152. **Origin:** Villefranche-sur-Mer, France (1980-9-1). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** 18 m deep (*Choristoc 6*); *cox3*; cryopreserved.

Cladostephus spongiosus (Hudson) C. Agardh

Strain: KU-1153. **Origin:** Villefranche-sur-Mer, France (1997-2-11). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (*Cladost VF 4*); *cox3*.

Cladothele decaisnei J.D. Hooker et Harvey

Strain: KU-1154. **Origin:** Puerto Williams, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Cladot PW d); *cox3*.

Coelocladia arctica Rosenvinge

Strain: KU-906. **Origin:** Oshoro, Hokkaido, Japan (1988-5-24). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** *cox3*; cryopreserved. **Reference:** Kawai (1997).

Colpomenia phaeodactyla Wynne et J.N. Norris

Strain: KU-1217. **Origin:** Pangal, Robison Crusoe, Juan Fernandez, Chile (1996-12-17). **Leg./Isol.** M.E. Ramirez/D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal (Colpo phaeo RC 5-1); *cox3*.

Colpomenia sinuosa (Mertens ex Roth) Derbes et Solier

Strain: KU-1216. **Origin:** Easter Island, Chile (1996-12-9). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** 1 m deep on *Caulerpa* sp. (Colpo sin 1 IP 20).

Cutleria multifida (Turner) Greville

Strain: KU-1189. **Origin:** Villefranche-sur-Mer, France (1967-3-22). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (CMVF 1b m).

Desmarestia aculeata (Linnaeus) J.V. Lamouroux

Strain: KU-1140. **Origin:** Helgoland, Germany (1987-1-23). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte (Des ac Hel 3m); *cox3*; cryopreserved.

Strain: KU-1141. **Origin:** Helgoland, Germany (1987-1-23). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Des ac Hel 5f); *cox3*; cryopreserved.

Desmarestia distans (C. Agardh) J. Agardh

Strain: KU-1139. **Origin:** Punta Arenas, Chile (1988-1-24). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Des dist PA 1- 3b); *cox3*; cryopreserved.

Desmarestia firma (C. Agardh) Skottsberg

Strain: KU-1143. **Origin:** La Herradura, Coquimbo, Chile (1985-8). **Leg./Isol.** M.E. Ramirez/D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Des firma CH Coq 85f); *cox3*; cryopreserved.

Strain: KU-1144. **Origin:** La Herradura, Coquimbo, Chile (1985-8). **Leg./Isol.** M.E. Ramirez/D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte (Des firma CH Coq 85m); *cox3*; cryopreserved.

Desmarestia gayana Montagne

Strain: KU-1138. **Origin:** Puerto Montt, Estanquilla, Chile (1988-2-3). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Des gay a); *cox3*; cryopreserved.

Desmarestia herbacea J.V. Lamouroux

Strain: KU-1132. **Origin:** Isla Bridge, Ushuaia, Argentina (1989-2-6). **Leg./Isol.** M.E. Ramirez/D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Des herb Sam 103-1); *cox3*; cryopreserved.

Desmarestia ligulata (Stackhouse) J.V. Lamouroux

Strain: KU-1145. **Origin:** Valdivia, Niebla, La Mision, Chile (1987-1-31). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, (Des lig CH 87-14a); *cox3*; cryopreserved.

Desmarestia muelleri M.E. Ramírez et A.F. Peters

Strain: KU-1142. **Origin:** Concepcion, Tome, Chile (1988-2-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, monoecious (Des muell CH Tome 6a); *cox3*; cryopreserved.

Desmarestia viridis (O.F. Müller) J.V. Lamouroux

Strain: KU-1146. **Origin:** Helgoland, Germany (1978-6-9). **Leg./Isol.** K. Lüning/A.F. Peters. **Culture:** PESI; 10°C. **Note:** (Des vir Hel); *cox3*; cryopreserved.

Desmarestia willii Reinsch

Strain: KU-1147. **Origin:** Punta Arenas, Chile (1988-1-24). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift (Des will PA-9-1a); *cox3*; cryopreserved.

Desmerestia sp.

Strain: KU-1136. **Origin:** Valdivia, San Carlos, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Des pat. SC10); *cox3*; cryopreserved.

Desmotrichum sp.

Strain: KU-1135. **Origin:** St. Lawrence Isl., Bering Sea, Alaska, USA (1996-8-5). **Leg./Isol.** H. Kawai/D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal, rock platforms, together with *Pylaiella* (Desmo BS1); *cox3*.

Dictyopteris latiuscula (Okamura) Okamura

Strain: KU-1072. **Origin:** Awaji Isl., Hyogo, Japan (2004). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C. **Note:** *cox3*.

Dictyopteris prolifera (Okamura) Okamura

Strain: KU-960. **Origin:** Yura, Awaji Isl., Hyogo, Japan (1997-5-13). **Leg./Isol.** T. Hara/T. Shimono. **Culture:** PESI; 10°C. **Note:** *cox3*.

Dictyota dichotoma (Hudson) J. V. Lamouroux

Strain: KU-963. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-7-29). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C. **Note:** *cox3*.

Strain: KU-1070. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2004). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C. **Note:** *cox3*.

Dictyota phlyctaenodes Montagne

Strain: KU-1204. **Origin:** Pangal, Robison Crusoe, Juan Fernandez, Chile (1991-2-1). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** 1 m deep (Dict phlyct RC 8-4); *cox3*.

Strain: KU-1205. **Origin:** Fuerteventura, Lanzarote, Canary Islands, Spain (1991-9-30). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** *cox3*.

Dilophus okamurae E.Y. Dawson [= *Rugulopteryx okamurae* (Dawson) Hwang, Lee et Kim]

Strain: KU-958. **Origin:** Awaji Isl., Hyogo, Japan (unknown). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C.

Distromium decumbens (Okamura) Levring

Strain: KU-957. **Origin:** Shirahama, Wakayama, Japan (2002-6-14). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C.

Ecklonia maxima (Osbeck) Papenfuss

Strain: KU-1116. **Origin:** Cape Town, Olifant's Bay, South Africa (1993-7-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte, drift (Eck max SAf 14-1f); *cox3*; cryopreserved.

Strain: KU-1125. **Origin:** Cape Town, Olifant's Bay, South Africa (1993-7-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte, drift (Eck max SAf 14-2m); *cox3*; cryopreserved.

Ecklonia radiata (C. Agardh) J. Agardh

Strain: KU-1126. **Origin:** Karaka Bay, Wellington, New Zealand (1988-8-30). **Leg./Isol.** D.G. Müller. **Culture:**

PESI; 10°C. **Note:** Male gametophyte, low intertidal (Eck rad NZ 88-24-1m); *cox3*; cryopreserved.

Strain: KU-1127. **Origin:** Karaka Bay, Willington, New Zealand (1988-8-30). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte, low intertidal (Eck rad NZ 88-24-2f); *cox3*; cryopreserved.

Strain: KU-1133. **Origin:** Flinders, Victoria, Australia (1981-9-15). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte (Eck rad Vic 10m); *cox3*; cryopreserved.

Strain: KU-1134. **Origin:** Flinders, Victoria, Australia (1981-9-15). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Eck rad Vic 11f); *cox3*.

Ectocarpus fasciculatus Harvey

Strain: KU-1107. **Origin:** Roscoff, France (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte derived from a sporophyte, which itself was constructed from two gametophytes resulting from meiospores produced by the field-collected sporophyte Ec fas Ros 93 31 (Ec Fas ras 93-31 Z7 G12f); *cox3*. **Reference:** Stache-Crain et al. (1997).

Strain: KU-1128. **Origin:** Niebla, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte derived from meiospores of a field-collected sporophyte (Ec fas CH 92 Nie 2f); *cox3*; cryopreserved. **Reference:** Stache-Crain et al. (1997).

Strain: KU-1129. **Origin:** Niebla, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte derived from meiospores of a field-collected sporophyte (Ec fas CH 92 Nie 3m); *cox3*; cryopreserved.

Strain: KU-1130. **Origin:** Niebla, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Produced in lab from the gametophytes KU-1128 and KU-1129 (Ec fas CH 92 Nie Z3); *cox3*; cryopreserved.

Strain: KU-1131. **Origin:** Roscoff, France (1993). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote obtained in parallel with Ec Fas Ros 93 31Z7, from Ec fas Ros 93 31. An uncle of Ec Fas Ros 93 31Z7 G9 m and Ec Fas Ros 93 31Z7 G12f (Ec Ros fasfas 31 Z12); *cox3*; cryopreserved. **Reference:** Müller & Eichenberger (1995), Stache-Crain et al. (1997).

Ectocarpus siliculosus (Dillwyn) Lyngbye

Strain: KU-1101. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote obtained from a cross between Ec sil Nap R-B1 m and Ec sil Nap D-A2 f (Ec sil Na RDZ); cryopreserved. **Reference:** Stache-Crain et al. (1997).

Strain: KU-1102. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte (Ec sil Nap D-A2 f); *cox3*; cryopreserved. **Reference:** Stache-Crain et al. (1997).

Strain: KU-1103. **Origin:** Naples, Italy (1959). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte (Ec sil Nap R-B1m); *cox3*; cryopreserved. **Reference:** Müller & Eichenberger (1994).

Strain: KU-1104. **Origin:** Kelly's Island, Newfoundland, Canada (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected diploid sporophyte (Ec sil NFL 31-K1); *cox3*; cryopreserved.

Strain: KU-1105. **Origin:** Newfoundland, Canada (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte derived from a meiospore of Ec sil NFL 31 K1 (Ec sil NFL 31F7m); *cox3*; cryopreserved. **Reference:** Stache-Crain et al. (1997).

Strain: KU-1106. **Origin:** Kelly's Island, Newfoundland, Canada (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte derived from a meiospore of Ec sil NFL 31 K1 (Ec sil NFL 31E3 f); *cox3*; cryopreserved. **Reference:** Müller & Eichenberger (1994).

Strain: KU-1109. **Origin:** Akkeshi, Hokkaido, Japan (1989-7-18). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte derived from a meiospore of Ec sil Jap 16a Sp (Ec sil Jap 16a1 m); *cox3*; cryopreserved. **Reference:** Müller & Kawai (1991), Müller & Eichenberger (1994), Stache-Crain et al. (1997).

Strain: KU-1110. **Origin:** Akkeshi, Hokkaido, Japan (1989-7-18). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte derived from a meiospore of Ec sil Jap 16a Sp (Ec sil Jap 16a 8 f); cryopreserved. **Reference:** Müller & Kawai (1991), Müller & Eichenberger (1994).

Strain: KU-1111. **Origin:** Akkeshi, Hokkaido, Japan (1989-7-18). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote obtained through a cross between Ec sil Jap 16 a1 m and Ec sil Jap 16a 8 f (Ec sil Jap 16 Z1); *cox3*; cryopreserved. **Reference:** Müller & Kawai (1991), Müller & Eichenberger (1994).

Strain: KU-1112. **Origin:** Victoria, Australia (1988-12-15). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** zygote obtained from a cross between Ec sil Vic 88-12-15 f and Ec sil Vic 88-12-11 m (Ec sil VicVic Z1); *cox3*; cryopreserved.

Strain: KU-1327. **Origin:** Bergen, Blomsterdalen, Norway (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte, not virus-infected. Epiphyte on *Ascophyllum nodosum* (Ec sil Ber 21 f). **Reference:** Müller & Eichenberger (1994).

Strain: KU-1330. **Origin:** Beaufort, NC, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte on mud, intertidal (Ec sil Bft 15b m); *cox3*; cryopreserved.

Strain: KU-1332. **Origin:** La Caldera, Coquimbo, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Diploid sporophyte; epiphytic on *Gracilaria* sp. (Ec sil CH 91 Coq 6A); *cox3*; cryopreserved.

Strain: KU-1336. **Origin:** Porto Sannazzaro, Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Ec sil Na 112 f); *cox3*; cryopreserved.

Strain: KU-1342. **Origin:** Puente La Union, Puyuhuapi, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** together with *Adenocystis* sp., intertidal, sporophyte (Ec sil CH Puy Sp); *cox3*; cryopreserved.

Strain: KU-1343. **Origin:** Copenhagen, Hvidøre, Denmark (1979). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** lab-produced female gametophyte derived from a meiospore produced by the field-collected sporophyte Ec sil Cph 40a, base of *Rasmussen monument*, on large masses of drift (Ec. Sil. Cph 40-1 f); *cox3*; cryopreserved.

Strain: KU-1344. **Origin:** Porto Sannazzaro, Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Ec sil Na 108 f); *cox3*; cryopreserved.

Strain: KU-1345. **Origin:** Crystal Beach, Tampa Bay, FL, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte; entangled in reed (Ec sil Tam 18b f); *cox3*; cryopreserved.

Strain: KU-1348. **Origin:** Woods Hole, MA, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte; intertidal, on *Chordaria flagelliformis* (Ec sil Pen 10b m); *cox3*; cryopreserved.

Strain: KU-1349. **Origin:** Las Grutas, Bahia Blanca, Argentina (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On drifting *Dictyota* sp., field-collected female gametophyte, shifted to a parthenosporophyte in culture (Ec sil AR 09-4f).

Strain: KU-1352. **Origin:** Beaufort, NC, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte (Ec sil Bft 1a f); *cox3*; cryopreserved.

Strain: KU-1355. **Origin:** Tromsø, Norway (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Ec. Sil Tro 2b f); *cox3*; cryopreserved. **Reference:** Müller & Eichenberger (1994).

Strain: KU-1361. **Origin:** Castletown, Isle of Man, UK (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte; epiphytic on *Scytosiphon* sp. (Ec sil Man 14a m); cryopreserved.

Strain: KU-1362. **Origin:** La Pasada, Maullin, Puerto Montt, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal rock, sporophyte (Ec CH sil 19 a); cryopreserved.

Strain: KU-1363. **Origin:** Tampa Bay, Cockroach Bay, FL, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte; entangled between drifting wood (Ec sil Tam 12b m); *cox3*; cryopreserved.

Strain: KU-1364. **Origin:** (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote produced from a cross between Ec sil SAf 28-1 G 13m and Ec sil SAf 28-1 G 15 f (Ec. Sil SAf 28-1-z2); *cox3*; cryopreserved.

Strain: KU-1369. **Origin:** Penikese Island Woods Hole, MA, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte; intertidal, on *Chordaria flagelliformis* (Ec sil Pen 5a f); cryopreserved.

Strain: KU-1371. **Origin:** San Juan de Marcona, Peru (1988). **Leg./Isol.** A. Peters. **Culture:** PESI; 10°C. **Note:**

Female gametophyte, meiotic offspring of a field sporophyte, sexually compatible strain of genome sequencing strain (Esil 25 f). **Reference:** Cock et al. (2010).

Strain: KU-1372. **Origin:** San Juan de Marcona, Peru (1988). **Leg./Isol.** A. Peters. **Culture:** PESI; 10°C. **Note:** Male gametophyte, meiotic offspring of a field sporophyte, genome sequencing strain (Esil 32 m); *cox3*. **Reference:** Cock et al. (2010).

Strain: KU-1424. **Origin:** Fishery Harbour, Villa grecque, Villefranche-sur-mer, France (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte (Ec sil VF 18f); *cox3*; cryopreserved.

Strain: KU-1433. **Origin:** Porto Sannazzaro, Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte (Ec sil Na 70 m); *cox3*; cryopreserved.

Strain: KU-1434. **Origin:** Porto Sannazzaro, Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** *cox3*; cryopreserved.

Strain: KU-1435. **Origin:** Friedrichsort, near Kiel, Baltic Sea, Germany (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte derived from a meiospore of Ec sil Kiel 95-1 Sp, 2m deep (Ec sil Na 164 m); *cox3*; cryopreserved.

Strain: KU-1436. **Origin:** Port St Mary, Isle of Man, Irish Sea (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte, epilithic, tide pool (Ec sil Man 3c f); *cox3*; cryopreserved.

Strain: KU-1442. **Origin:** Penikese Island Woods Hole, MA, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte; intertidal, on *Chordaria flagelliformis* (Ec sil Pen 2a m); *cox3*.

Strain: KU-1443. **Origin:** Port Aransas Marine Station, Boat Harbor, University of Texas, TX, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte; all strains numbered Ec sil PAr 8 to Ec sil PAr 22 are parallel isolates from the same collection site, intertidal on rock (Ec sil PAr 14b m); *cox3*; cryopreserved.

Strain: KU-1444. **Origin:** Port Aransas Marine Station, Boat Harbor, University of Texas, TX, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte, all strains numbered Ec sil PAr 8 to Ec sil PAr 22 are parallel isolates from the same collection site, intertidal on rock (Ec sil PAr 12p f); *cox3*; cryopreserved.

Strain: KU-1710. **Origin:** Wrightsville Beach, Wilmington, NC, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Derives from a field-collected sporophyte Ec sil Wil 17 S (Ec sil Wil 17a f). **Reference:** Stache-Crain et al. (1997).

Strain: KU-1711. **Origin:** Wrightsville Beach, Wilmington, NC, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Derives from a field-collected sporophyte Ec sil Wil 18 S (Ec sil Wil 18a m); *cox3*.

Strain: KU-1712. **Origin:** Villefranche-sur-Mer, France (1971). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte (Ec sil VF 01 m). **Reference:** Müller & Eichenberger (1994)

Strain: KU-1713. **Origin:** Villefranche-sur-Mer, France (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte (Ec sil VF 05 f).

Strain: KU-1714. **Origin:** Villefranche-sur-Mer, France (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected female gametophyte (Ec sil VF 29 f).

Strain: KU-1717. **Origin:** Copenhagen, Hvidøre, Denmark (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Lab-produced male gametophyte derived from a meiospore produced by the field-collected sporophyte Ec sil Cph 40a on large masses of drift (Ec sil Cph 40-11 m); *cox3*.

Strain: KU-1720. **Origin:** Roscoff, France (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Lab-obtained sporophyte deriving from gametophytes obtained from a field-collected sporophyte, 20 m deep, epilithic on stone (Ec sil Ros Z 35-4). **Reference:** Stache-Crain et al. (1997).

Strain: KU-1724. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Tetraploid heterozygous obtained from a cross between (2n) Ec sil Nap RB1 and (2n) Ec sil Nap D-A2 (Ec sil Na TH-4). **Reference:** Müller & Eichenberger (1994).

Strain: KU-1725. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:**

Tetraploid heterozygous obtained from a cross between (2n) Ec sil Nap RB1 and (2n) Ec sil Nap D-A2 (Ec sil Na TH-7). **Reference:** Müller & Eichenberger (1994).

Strain: KU-1726. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Triploid heterozygous obtained from a cross between (n) Ec sil Nap D-A2 f and (2n) Ec sil Nap R-B1 m (Ec sil Na Tri M-1). **Reference:** Stache-Crain et al. (1997).

Strain: KU-1727. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Triploid heterozygous obtained from a cross between (2n) Ec sil Nap D-A2 f and (n) Ec sil Nap R-B1 m (Ec sil Na Tri F-3). **Reference:** Stache-Crain et al. (1997).

Strain: KU-1752. **Origin:** Crystal Beach, Tampa Bay, FL, USA (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte; entangled in reed (Ec sil Tam 19c m); *cox3*.

Strain: KU-1761. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote produced from a cross between a female and a male gametophyte belonging to the Ec sil Na RBZ and Ec sil CHCH Z9 lineages, respectively; reciprocal cross compared to Ec sil CHNA Z113 (Ec sil NaCH Z2). **Reference:** Stache-Crain et al. (1997).

Strain: KU-1763. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote produced from a cross between Ec sil Nap D-A2 f and Ec sil Na 164 m (Ec sil NANA Z6). **Reference:** Stache-Crain et al. (1997).

Strain: KU-1851. **Origin:** Naples, Italy (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Zygote derived from gametophytes produced by unilocs of Ec sil Na RDZ (Ec sil Na RDZ U93 1 Z 94).

Strain: KU-2296. **Origin:** Villefranche-sur-Mer, France (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Field-collected male gametophyte (Ec sil VF 27 m). **Reference:** Müller & Eichenberger (1994).

Elachista stellaris Areschoug

Strain: KU-1113. **Origin:** Cap d'Aille, Villefranche, France (1980-9-2). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** 30 m deep on *Nereia filiformis* (Elach VF1); *cox3*.

Strain: KU-1198. **Origin:** Fuerteventura, Lanzarote, Canary Islands, Spain (1991-9-30). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Dredged from 60 m deep (Elach stel CI 47-b1); *cox3*; cryopreserved.

Endarachne binghamiae J. Agardh

Strain: KU-1114. **Origin:** Antofagasta, Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (End bing Antof 10); *cox3*; cryopreserved.

Eudesme virescens (Carmichael ex Berkeley) J. Agardh

Strain: KU-254. **Origin:** Roscoff, France (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (EUV-1); *cox3*; cryopreserved.

Strain: KU-447. **Origin:** Akkeshi, Hokkaido, Japan (1983-6-27). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (EV-2); *cox3*; cryopreserved. **Reference:** Kawai (1986).

Feldmannia globifera (Kützinger) G. Hamel

Strain: KU-1124. **Origin:** Brannock Island, Aran Islands, Ireland (1990-9-23). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal (Feld glob Aran 38-1); *cox3*; cryopreserved.

Strain: KU-1200. **Origin:** Las Grudas, Argentina (1995-1-27). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift on *Asperococcus* (Feld glob AR 08-6); *cox3*; cryopreserved.

Feldmannia irregularis (Kützinger) G. Hamel

Strain: KU-1197. **Origin:** Isla Hierro, Canary Islands, Spain (1991-10-3). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Near light house, intertidal on *Codium adherens* without symptom (Feld irr CI 61-1 n); *cox3*; cryopreserved.

Strain: KU-1201. **Origin:** Reunion Rock, Isipingo Beach, Durban, South Africa (1993-7-24). **Leg./Isol.** D.G.

Müller. **Culture:** PESI; 10°C. **Note:** Tide pool on *Gelidium* sp. (Feld irr SAF 43-2); *cox3*; cryopreserved.

Strain: KU-1207. **Origin:** Kurakakejima Isl., Hyogo, Japan (1993-8-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On *Spathoglossum pacificum* (Feld irr Jap 53-2); *cox3*; cryopreserved.

Strain: KU-1211. **Origin:** Pangal, Robison Crusoe, Juan Fernandez, Chile (1991-2-1). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On *Codium fernandezianum* (Feld irr RC 3-1).

Feldmannia simplex (P.L. Crouan et H.M. Crouan) G. Hamel

Strain: KU-1123. **Origin:** Portdeha, Aran Islands, Ireland (1990-9-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Feld simp Aran12-6n); cryopreserved. **Reference:** Müller & Eichenberger (1994).

Strain: KU-1199. **Origin:** Las Grutas, Argentina (1995-1-27). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Epiphytic on drift *Dictyota* sp. (Feld simp AR 06-5); *cox3*; cryopreserved.

Strain: KU-1206. **Origin:** Port Elizabeth, South Africa (1993-7-21). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Tide pool, on *Codium duthieae* (Feld simp SAF 36-1); cryopreserved.

Geminocarpus geminatus (J.D. Hooker et Harvey) Skottsberg

Strain: KU-1122. **Origin:** Tierra del Fuego, Porvenir, Chile (1986-2). **Leg./Isol.** C. Wiencke/D.G. Müller. **Culture:** PESI; 10°C. **Note:** Included in *Desmarestia* sp. raw culture (Gemino Por1); *cox3*.

***Gononema* sp.**

Strain: KU-1121. **Origin:** Puerto Williams, Chile (1988-3-3). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Epiphytic on *Adenocystis utricularis* (Gono PW d); *cox3*.

Halopteris congesta (Reinke) Sauvageau

Strain: KU-1120. **Origin:** South Beach, Kaikoura, New Zealand (1981-9-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Sporophyte forming unilocs (Hal con Kai Sp c).

Halopteris flicina (Grateloup) Kützing

Strain: KU-690. **Origin:** Kuroshima, Yamaguchi, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (HF-2); *cox3*; cryopreserved. **Reference:** Kawai & Prud'homme van Reine (1998).

Strain: KU-1119. **Origin:** Fuerteventura, Canary Islands, Spain (1991-10-11). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Dredged from 16m deep, from unizoids, seamount at 20°11.44N 14.47.05W (Hal fil CI 123-2); cryopreserved.

Halopteris paniculata (Suhr) Prud'homme van Reine

Strain: KU-1117. **Origin:** South Beach, Kaikoura, New Zealand (1981-9-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Forming unilocular sporangia (Hal pan a2 Sp); *cox3*; cryopreserved.

Heteroralsia saxicola (Okamura et Yamada) Kawai

Strain: KU-882. **Origin:** Ohma, Aomori, Japan (1985-5-8). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (GS-3). **Reference:** Kawai (1989); Lim et al. (2007).

Hincksia conifera (Børgesen) I.A. Abbott

Strain: KU-1180. **Origin:** Tarumi, Kobe, Japan (1993-8-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** *cox3*; cryopreserved.

Hincksia granulosa (Smith) P.C. Silva

Strain: KU-1225. **Origin:** La Pasada, Maullin, Chile (1997-1). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Low intertidal (Giff gran CH 97-13-2).

Strain: KU-1226. **Origin:** Inis Oirr, Galway, Ireland (1996-8-23). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C.

Note: Drift on *Saccorhiza* blade, west coast (Giff gran Irl 96-24-1).

Strain: KU-1184. **Origin:** Arinaga, Gran Canaria, Canary Islands, Spain (1993-2-24). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Tide pool, on *Codium* sp. (Giff conif CI 141-1); *cox3*.

Hincksia hincksiae (Harvey) P.C. Silva

Strain: KU-1224. **Origin:** Plouescat, Roscoff, France (1993-3-27). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On old *Laminaria* blade (Giff hinck Ros 93-23-2n).

Hincksia intermedia (Rosenvinge) P.C. Silva

Strain: KU-1185. **Origin:** Lanzarote North, Canary Islands, Spain (1994-11). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Dredged from 32m on *Lobophora* sp. (Giff inter CI 222-2); *cox3*; cryopreserved.

Hincksia mitchelliae (Harvey) P.C. Silva

Strain: KU-1173. **Origin:** Maruyama, Awaji Isl., Hyogo, Japan (1993-8-28). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift on *Zostera* leaves (Giff mitch Jap 61-1); *cox3*; cryopreserved.

Strain: KU-1181. **Origin:** Ballito, Natal, South Africa (1993-7-26). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal, swimming pool on rocks, with virus symptoms (Giff mitch SAF 59-1); *cox3*; cryopreserved.

Strain: KU-1193. **Origin:** Isla Santa Clara, Juan Fernandez, Chile (1991-2-4). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On *Codium fernandezianum*, at 5 m deep on anchor (Giff mitch SC 39-1); *cox3*; cryopreserved.

Strain: KU-1195. **Origin:** Radio Isl., Beaufort, NC, USA (1963-5-15). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Sporophyte constructed from field-collected gametophyte in laboratory (Giff mitch BNC Sp 91-a); *cox3*; cryopreserved. **Reference:** Müller & Eichenberger (1994).

Strain: KU-1221. **Origin:** Naples, Italy (1983). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Giff mitch Nap 1). **Reference:** Müller & Eichenberger (1994).

Strain: KU-1223. **Origin:** Radio Island, NC, Beaufort, USA (1963). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Gametophyte (Giff mitch Gam).

Hincksia onslowensis (Amsler et Kapraun) P.C. Silva

Strain: KU-1186. **Origin:** Las Grutas, Argentina (1995-1-27). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On *Polysiphonia* sp., drift (Giff onslow AR 05-3); *cox3*; cryopreserved.

Strain: KU-1194. **Origin:** Sardina del Norte, Canary Islands, Spain (1991-10-8). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Dredged from 20 m deep on *Sporochnus boleanus* (Giff onslow CI 94-4); *cox3*; cryopreserved.

Hincksia ovata (Kjellman) P.C. Silva

Strain: KU-1190. **Origin:** Easter Island, Chile (1987-1-22). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Anakena Beach, 1 m deep, on *Dasya* sp. (Giff ov IP 12-2); *cox3*; cryopreserved.

Strain: KU-1222. **Origin:** Langstone Harbour, Portsmouth, England, UK (1983-8-28). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On *Cladostephus verticillatus* (Giff ov 1 LH); cryopreserved.

Hincksia sandriana (Zanardini) P.C. Silva

Strain: KU-1172. **Origin:** Hougham Park, Port Elizabeth, South Africa (1993-7-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Mariculture facility on *Gracilaria* sp.; diploid field-collected sporophyte (Giff sand SAF 28-2); *cox3*; cryopreserved.

Strain: KU-1182. **Origin:** Las Grutas, Argentina (1991-1-27). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift on *Asperococcus* (Giff sand AR 08-4); *cox3*; cryopreserved.

Strain: KU-1191. **Origin:** Naples, Italy (1971-3-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Grand Hotel (Giff sand Na 5); cryopreserved.

Hincksia sp.

Strain: KU-1183. **Origin:** Tarumi, Kobe, Hyogo, Japan (1993-8-5). **Leg./Isol.** H. Kawai/D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Giff Jap 56-1); *cox3*; cryopreserved.

Ishige okamurae Yendo

Strain: KU-252. **Origin:** Shimoda, Shizuoka, Japan (1989-7). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Isolated from unizoid (ISG-1).

Kuetzingiella battersii (Bornet ex Sauvageau) Kornmann

Strain: KU-1187. **Origin:** Punta Jandia, Fuerteventura, Canary Isl., Spain (1991-9-27). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** 20 m deep by scuba on rotten *Padina* sp. (Kuetz bat CI 8-2); *cox3*.

Strain: KU-1192. **Origin:** Bahia del Pardre, Robison Crusoe Isl., Juan Fernandez, Chile (1991-2-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal (Kuetz bat RC 27-2); *cox3*; cryopreserved.

Laminaria hyperborea (Gunnerus) Foslie

Strain: KU-1232. **Origin:** Roscoff, France (1989-9-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, male gametophyte (Lam hyp Ros 12-1 m).

Strain: KU-1233. **Origin:** Roscoff, France (1989-9-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, female gametophyte (Lam hyp Ros 12-2 f).

Laminaria pallida Greville

Strain: KU-1234. **Origin:** Cape Town, Olifant's Bay, South Africa (1993-7-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, female gametophyte (Lam pal SAF 11-1 f).

Strain: KU-1235. **Origin:** Cape Town, Olifant's Bay, South Africa (1993-7-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, male gametophyte (Lam pal SAF 11-3 m).

Laminarionema elsbetiae Kawai et Tokuyama

Strain: KU-356. **Origin:** Helgoland, Germany (1994-5). **Leg./Isol.** A. Peters. **Culture:** PESI; 10°C. **Note:** (LAE); *cox3*. **Reference:** Peters & Burkhardt (1998).

Leptonematella fasciculata (Reinke) P.C. Silva

Strain: KU-94. **Origin:** Rishiri Isl., Hokkaido, Japan (1990). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** *cox3*; cryopreserved.

Lessonia corrugata Lucas

Strain: KU-1274. **Origin:** Safety Cove, Tasmania, Australia (1984-9-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On rock, upper subtidal (Less cor Tas 5-3 m).

Strain: KU-1275. **Origin:** Safety Cove, Tasmania, Australia (1984-9-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On rock, upper subtidal (Less cor Tas 5-1 f).

Lessonia nigrescens Bory de Saint-Vincent

Strain: KU-1272. **Origin:** Isla Santa Maria, Antafagasta, Chile (1987-1-10). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal (Less nig Anto 87-1 m).

Strain: KU-1273. **Origin:** Isla Santa Maria, Antofagasta, Chile (1987-1-10). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal (Less nig Anto 87-1 f).

Lessonia variegata J. Agardh

Strain: KU-1270. **Origin:** Kaikoura, Pt. Kean, New Zealand (1988-8-21). **Leg./Isol.** D.G. Müller. **Culture:** PESI;

10°C. **Note:** Drift (Less var NZ 88-12 f).

Strain: KU-1271. **Origin:** Kaikoura, Pt. Kean, New Zealand (1988-8-21). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift (Less var NZ 88-11 m); *cox3*.

Macrocystis angustifolia Bory de Saint-Vincent

Strain: KU-1280. **Origin:** Long Beach, Cape Town, South Africa (1989-7-13). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte (Mac ang Saf 15-1 f); *cox3*.

Macrocystis integrifolia Bory de Saint-Vincent

Strain: KU-220. **Origin:** Bamfield, Vancouver Isl., BC, Canada (unknown). **Leg./Isol.** E. Henry. **Culture:** PESI; 10°C.

Macrocystis pyrifera (Linnaeus) C. Agardh

Strain: KU-1268. **Origin:** South Beach, Kaikoura, New Zealand (1981-9-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Tide pool, male gametophyte (Mac pyr NZ-3 m).

Strain: KU-1269. **Origin:** South Beach, Kaikoura, New Zealand (1981-9-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Tide pool (Mac pyr NZ-2 f).

Strain: KU-1276. **Origin:** Niebla, La Mision, Valdivia, Chile (1984-1-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On rock, and drift, female gametophyte (Mac pyr CH Nie 13-5 f).

Strain: KU-1277. **Origin:** Niebla, La Mision, Valdivia, Chile (1984-1-5). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On rock, and drift, male gametophyte (Mac pyr Tas 8-3 m).

Strain: KU-1282. **Origin:** Puerto Madryn, Argentina (1995-1-29). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, male gametophyte (Mac pyr AR 20-1 m).

Strain: KU-1283. **Origin:** Puerto Madryn, Argentina (1995-1-29). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Drift, female gametophyte (Mac pyr AR 20-2 f).

Melanosiphon intestinalis (Saunders) Wynne

Strain: KU-259. **Origin:** Abashiri, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** [MI-5] *cox3*; cryopreserved.

Nemacystus nova-zelandiae Kylin

Strain: KU-1174. **Origin:** Hanga Piku, Easter Island, Chile (1988-2-18). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** On *Sargassum skottsbergii* (Nema Nz IP 1 a1, Nema IP88-25). *cox3*. **Reference:** Ramirez & Müller (1991).

Nereocystis leutkeana (K. Mertens) Postels et Ruprecht

Strain: KU-466. **Origin:** Friday Harbor, WA, USA (1996-4-24). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; cryopreserved.

Padina crassa Yamada

Strain: KU-1073. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2004). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C.

Padina fernandeziana Skottsberg et Levring

Strain: KU-1175. **Origin:** Puerto Frances, Robison Crusoe, Juan Fernandez, Chile (1991-2-7). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal between bolders (Padina fern RC 61-9).

Pachydictyon coriaceum (Holmes) Okamura

Strain: KU-959. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-7-29). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C. **Note:** *cox3*.

Petalonia zosterifolia (Reinke) Kuntze

Strain: KU-260. **Origin:** Shikabe, Hokkaido, Japan (1986-3-4). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (MI-P2); *cox3*; cryopreserved. **Reference:** Kogame & Kawai (1993).

Phaeophysema sphaerocephala (Yamada) A. Tanaka, S. Uwai et H. Kawai [= *Leathesia sphaerocephala* Yamada]

Strain: KU-67. **Origin:** Akkeshi, Hokkaido, Japan (1999-7-19). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Epiphytic on *Cystoseira hakodatensis*; SAP088680; *rbcL-rbcS* spacer, *tufA*, ITS2. **Reference:** Tanaka et al. (2010).

Phaeostrophion irregularis Setchell et Gardner

Strain: KU-307. **Origin:** Strawberry Hill, OR, USA (1996-4). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Isolated from unizoid, intertidal; *cox3*; cryopreserved. **Reference:** Kawai et al. (2005).

Pilayella littoralis (Linnaeus) Kjellman

Strain: KU-1300. **Origin:** Helgoland, Germany (1956-3-19). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Pil Hel); *cox3*. **Reference:** Müller & Stache (1989).

Strain: KU-1302. **Origin:** Friday Harbor, WA, USA (1992-7). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Pil Wash 92-6).

Strain: KU-1303. **Origin:** Savoonga, St. Lawrence Isl., AK, USA (1996-8-5). **Leg./Isol.** H. Kawai/D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal, rock platforms (Pil BS 3-2n). **Reference:** Maier et al. (1998).

Pseudochorda gracilis Kawai et Nabata

Strain: KU-251. **Origin:** Isoya, Hokkaido, Japan (1986-12-5). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** **Reference:** Kawai & Nabata (1990).

Strain: KU-469. **Origin:** Isoya, Hokkaido, Japan (1986-12-5). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte (PG-2); cryopreserved. **Reference:** Kawai & Nabata (1990).

Strain: KU-485. **Origin:** Isoya, Hokkaido, Japan (1986-12-5). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte (PG-3). **Reference:** Kawai & Nabata (1990).

Strain: KU-732. **Origin:** Isoya, Hokkaido, Japan (1986-12-5). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte, clonal; cryopreserved. **Reference:** Kawai & Nabata (1990).

Saccharina angustata (Kjellman) Lane, Mayes, Druehl et Saunders [= *Laminaria angustata* Kjellman]

Strain: KU-1628. **Origin:** Muroran, Hokkaido, Japan (2000-4-11). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PESI; 10°C. **Note:** [HOK-148]; *cox3*.

Saccharina japonica (Areschoug) Lane, Mayes, Druehl et Saunders [= *Laminaria japonica* Areschoug]

Strain: KU-508. **Origin:** Muroran, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *cox3*; cryopreserved.

Strain: KU-511. **Origin:** Muroran, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *cox3*; cryopreserved.

Strain: KU-1627. **Origin:** Muroran, Hokkaido, Japan (2000-5-18). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PESI; 10°C. **Note:** [HOK-147]; *cox3*.

Saccharina latissima (Linnaeus) Lane, Mayes, Druehl et Saunders [= *Laminaria saccharina* (Linnaeus) J.V. Lamouroux]

Strain: KU-1230. **Origin:** Helgoland, Germany (1969-1-8). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:**

Northwest terrace, female gametophyte (Lam sacch Hel 1 f).

Strain: KU-1231. **Origin:** Helgoland, Germany (1969-1-8). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Northwest terrace, male gametophyte (Lam sacch Hel 1 m).

Saccharina sculpera (Miyabe) Lane, Mayes, Druehl et Saunders [= *Kjellmaniella crassifolia* Miyabe]

Strain: KU-196. **Origin:** Muroran, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *cox3*.

Strain: KU-354. **Origin:** Muroran, Hokkaido, Japan (1985-12). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Female gametophyte.

Strain: KU-1629. **Origin:** Muroran, Hokkaido, Japan (2000-9-9). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PESI; 10°C. **Note:** [HOK-149]; *cox3*.

Saccorhiza dermatodea (Bachelot de la Pylaie) Areschoug

Strain: KU-1305. **Origin:** St. Johns, Newfoundland, Canada (1981-4-17). **Leg./Isol.** R. Bugellen/D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Sacc derm NFL 15).

Saccorhiza polyschides (Lightfoot) Batters

Strain: KU-1306. **Origin:** Roscoff, France (1989-9-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Sacc poly Ros 13-1 f).

Strain: KU-1307. **Origin:** Roscoff, France (1989-9-14). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** (Sacc poly Ros 13-2 m).

Saundersella simplex (Saunders) Kylin

Strain: KU-446. **Origin:** Hanasaki, Hokkaido, Japan (1980-8-24). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Gametophyte (SS-2); *cox3*; cryopreserved.

Scytosiphon canaliculatus (Setchell et Gardner) Kogame

Strain: KU-263. **Origin:** Oshoro, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Sporophyte (SCY-5).

Scytosiphon lomentaria (Lyngbye) Link

Strain: KU-268. **Origin:** Bergen, Norway (1985-8). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Sporophyte (SCY-1).

Spatoglossum crassum J. Tanaka

Strain: KU-256. **Origin:** Shimoda, Shizuoka, Japan (1990-7). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Acidic.

Spatoglossum pacificum Yendo

Strain: KU-961. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-4-12). **Leg./Isol.** T. Shimono. **Culture:** PESI; 10°C.

Sphacelaria plumigera Holmes ex Hauck

Strain: KU-687. **Origin:** Akkeshi, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (SPP-1); *cox3*; cryopreserved.

Sphacelaria sp.

Strain: KU-221. **Origin:** Marine Gardens, OR, USA (1991-1-27). **Leg./Isol.** E. Henry. **Culture:** PESI; 10°C.

Sphaerotrichia divaricata (C. Agardh) Kylin

Strain: KU-459. **Origin:** Kurahashi Isl., Hiroshima, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Gametophyte (SD-11); *cox3*; cryopreserved. **Reference:** Kim, Peters & Kawai (2003).

Splachnidium rugosum (Linnaeus) Greville

Strain: KU-1176. **Origin:** Puerto Ingles, Robison Crusoe, Juan Fernandez, Chile (1991-2-2). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Intertidal (Spla RC 21-1); *cox3*.

Sporochnus bolleanus Montagne

Strain: KU-1178. **Origin:** Lanzarote, Playa Blanca, Canary Islands, Spain (1991-9-28). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Female gametophyte, 40 m deep by SCUBA (Sporoch boll CI 20-2 f); *cox3*.

Strain: KU-1179. **Origin:** Lanzarote, Playa Blanca, Canary Islands, Spain (1991-9-28). **Leg./Isol.** D.G. Müller. **Culture:** PESI; 10°C. **Note:** Male gametophyte, 40 m deep by SCUBA (Sporoch boll CI 20-3 m); *cox3*.

Stictyosiphon soriferus (Reinke) Rosenvinge

Strain: KU-704. **Origin:** Bergen, Norway (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (SSO-3); *cox3*; cryopreserved.

Strain: KU-707. **Origin:** Portsmouth, UK (unknown). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (SSO-1); *cox3*; cryopreserved. **Reference:** Kawai (1991).

Stypocaulon durum (Ruprecht) Okamura

Strain: KU-692. **Origin:** Abashiri, Hokkaido, Japan (1986-8). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (HS-4). **Reference:** Kawai & Prud'homme van Reine (1998).

Striaria attenuata (Greville) Greville

Strain: KU-708. **Origin:** Obota, Yashiro Isl., Yamaguchi, Japan (1986-5-15). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** Asexual gametophyte (SA-1); *cox3*; cryopreserved.

Taonia atomaria (Woodward) J. Agardh

Strain: KU-1074. **Origin:** Cap Gris Nez, Calais, France (2004). **Leg./Isol.** M. Kamiya. **Culture:** PESI; 10°C. **Note:** *cox3*.

Trachynema groenlandicum (Lund) Pedersen

Strain: KU-706. **Origin:** Muroran, Hokkaido, Japan (1980-5-31). **Leg./Isol.** H. Kawai. **Culture:** PESI; 10°C. **Note:** (LIG-1); *cox3*. **Reference:** Kawai & Kurogi (1983).

Undaria pinnatifida (Harvey) Suringar

Strain: KU-169. **Origin:** Tsurumi, Ooita, Japan (2002-4-26). **Leg./Isol.** T. Goto/S. Uwai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *cox3*; AB213038. **Reference:** Uwai et al. (2006).

Strain: KU-170. **Origin:** Charatsunai, Muroran, Hokkaido, Japan (2001-7-31). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Female gametophyte (HM0107Z-0 f b). **Reference:** Uwai et al. (2006).

Strain: KU-171. **Origin:** Charatsunai, Muroran, Hokkaido, Japan (2001-7-31). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Female gametophyte (HM0107Z-4 f b); *cox3*; AB213030. **Reference:** Uwai et al. (2006).

Strain: KU-172. **Origin:** Tsurumi, Ooita, Japan (2002-4-26). **Leg./Isol.** T. Goto/S. Uwai. **Culture:** PESI; 10°C. **Note:** **Leg./Isol.** T. Goto/S. Uwai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *cox3*; AB213038. **Reference:** Uwai et al. (2006).

Strain: KU-174. **Origin:** Charatsunai, Muroran, Hokkaido, Japan (2001-7-31). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Male gametophyte (HM0107Z-0 m b). **Reference:** Uwai et al. (2006).

Strain: KU-175. **Origin:** Tappi, Aomori, Japan (2002-5-30). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Male

gametophyte; *cox3*; AB213032. **Reference:** Uwai et al. (2006).

Strain: KU-176. **Origin:** Ohma, Aomori, Japan (2002-5-29). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Male gametophyte; *cox3*; AB213030. **Reference:** Uwai et al. (2006).

Strain: KU-177. **Origin:** Tappi, Aomori, Japan (2002-5-30). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *cox3*; AB213032. **Reference:** Uwai et al. (2006).

Strain: KU-178. **Origin:** Ohma, Aomori, Japan (2002-5-29). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** Female gametophyte; *cox3*; AB213030. **Reference:** Uwai et al. (2006).

Vimineoleathesia japonica (Inagaki) A. Tanaka, S. Uwai et H. Kawai [= *Leathesia japonica* Inagaki]

Strain: KU-66. **Origin:** Shimamaki, Hokkaido (2000-4-20). **Leg./Isol.** S. Uwai. **Culture:** PESI; 10°C. **Note:** SAP088679; *rbcL*-*rbcS* spacer, *tufA*, ITS2. **Reference:** Tanaka et al. (2010).

SCHIZOCLADIOPHYCEAE (Sister Taxon of Brown Algae)

Schizocladia ischiensis E.C. Henry, Okuda et Kawai

Strain: KU-333. **Origin:** Ischia Isl., Naples, Italy (1987-10-21). **Leg./Isol.** E. Henry. **Culture:** PES; 10°C. **Note:** Type culture [NIES-1044] [CCMP2287]; 18S rDNA, *rbcL*. **Reference:** Kawai et al. (2003).

RHODOPHYCEAE (Red Algae)

Acanthopeltis hirsuta (Okamura) Shimada, Horiguchi et Masuda

Strain: KU-1522. **Origin:** Oryuzako, Miyazaki, Japan (1993-8-2). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-77]; 18S rDNA, ITS rDNA, *rbcL*.

Actinotrichia fragilis (Forsskål) Børjesen

Strain: KU-2564. **Origin:** Susaki, Chichijima Isl., Tokyo, Japan (2005-3-16). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-186].

Strain: KU-2565. **Origin:** Susaki, Chichijima Isl., Tokyo, Japan (2005-3-16). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-187].

Strain: KU-2566. **Origin:** Miyanohama, Chichijima Isl., Tokyo, Japan (2005-3-4). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-188].

Strain: KU-2567. **Origin:** Kitakou, Hahajima Isl., Tokyo, Japan (2005-3-8). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-189].

Strain: KU-2568. **Origin:** Kitakou, Hahajima Isl., Tokyo, Japan (2005-3-10). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-190].

Strain: KU-2569. **Origin:** Shirahama, Nishimuro, Wakayama, Japan (2003-4-1). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-191].

Strain: KU-2570. **Origin:** Kasasa, Kawabe, Kagoshima, Japan (2003-2-28). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-192].

Strain: KU-2571. **Origin:** Shirahama, Nishimuro, Wakayama, Japan (2003-4-1). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-193].

Ahnfeltiopsis concinna (J. Agardh) Silva et DeCew

Strain: KU-1585. **Origin:** Oahu Isl., HI, USA (1980-11-17). **Leg./Isol.** M. Kurogi/M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-45] Female gametophyte; *rbcL*.

Strain: KU-1586. **Origin:** Okubo, Miyake Isl., Tokyo, Japan (1982-6-24). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-46] Male gametophyte; *rbcL*.

Strain: KU-1587. **Origin:** Ako, Miyake Isl., Tokyo, Japan (1982-6-23). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-47] Female gametophyte; *rbcL*.

***Ahnfeltiopsis divaricata* (Holmes) Masuda**

Strain: KU-979. **Origin:** Yura, Awaji Isl., Hyogo, Japan (1996-11-24). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15-20°C. **Note:** *rbcL*.

***Ahnfeltiopsis flabelliformis* (Harvey) Masuda**

Strain: KU-1553. **Origin:** Samani, Hokkaido, Japan (1978-4-27). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-13] Male gametophyte.

Strain: KU-1554. **Origin:** Samani, Hokkaido, Japan (1978-4-27). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-15].

Strain: KU-1555. **Origin:** Asamushi, Aomori, Japan (1978-6-29). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-14] Male gametophyte.

Strain: KU-1556. **Origin:** Shimoda, Shizuoka, Japan x Tojima, Ehime, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-16] Hybrid; *rbcL*.

Strain: KU-1558. **Origin:** Nojimasaki, Chiba, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-18] Female gametophyte; *rbcL*.

Strain: KU-1559. **Origin:** Nojimasaki, Chiba, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-19] Female gametophyte.

Strain: KU-1560. **Origin:** Tsuyazaki, Fukuoka, Japan x Nojimasaki, Chiba, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-20] Hybrid; *rbcL*.

Strain: KU-1562. **Origin:** Aomori, Japan x Aomori, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-22] Hybrid; *rbcL*.

Strain: KU-1563. **Origin:** Maizuru, Kyoto, Japan x Tosa, Kochi, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-23] Hybrid; *rbcL*.

Strain: KU-1564. **Origin:** Pusan, Korea (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-24] Male gametophyte; *rbcL*.

Strain: KU-1565. **Origin:** Kawauchi, Kagoshima, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-25] Male gametophyte; *rbcL*.

Strain: KU-1566. **Origin:** Maizuru, Kyoto, Japan x Nojimasaki, Kanagawa, Japan (1982-6-5×1982-11-19). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-26] Hybrid; *rbcL*.

Strain: KU-1567. **Origin:** Jogashima, Shizuoka, Japan (1979-8-9). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-27]; *rbcL*.

Strain: KU-1568. **Origin:** Tsuyazaki, Fukuoka, Japan x Tosa, Kochi, Japan (1981-3-3×1980-7-15). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-28] Hybrid.

Strain: KU-1569. **Origin:** Tsuyazaki, Fukuoka, Japan x Tosa, Kochi, Japan (1981-3-3×1980-7-15). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-29] Hybrid; *rbcL*.

Strain: KU-1570. **Origin:** Uwajima, Ehime, Japan x Tosa, Kochi, Japan (1982-5-22×1980-7-15). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-30] Female gametophyte, hybrid; *rbcL*.

Strain: KU-1571. **Origin:** Hakodate, Hokkaido, Japan x Tojima, Ehime, Japan (1982-2-19×1982-5-21). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-31] Hybrid; *rbcL*.

Strain: KU-1572. **Origin:** Hakodate, Hokkaido, Japan x Tojima, Ehime, Japan (1982-2-19×1982-5-21). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-32] Hybrid; *rbcL*.

Strain: KU-1573. **Origin:** Hakodate, Hokkaido, Japan x Shimoda, Shizuoka, Japan (1982-2-19×1984-6-1). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-33] Hybrid; *rbcL*.

Strain: KU-1574. **Origin:** Usu, Hokkaido, Japan (1981-8-15). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-34] Female gametophyte; *rbcL*.

Strain: KU-1575. **Origin:** Shioyazaki, Fukushima, Japan (1982-3-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-35]; *rbcL*.

Strain: KU-1576. **Origin:** Miyake Isl., Tokyo, Japan x Nojimasaki, Chiba, Japan (1986-6-25×1982-11-19). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-36] Hybrid; *rbcL*.

Strain: KU-1577. **Origin:** Matsumae, Hokkaido, Japan (1984-6-24). **Leg./Isol.** I. Mine/M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-37]; *rbcL*.

Strain: KU-1578. **Origin:** Matsumae, Hokkaido, Japan (1984-6-24). **Leg./Isol.** I. Mine/M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-38]; *rbcL*.

Strain: KU-1579. **Origin:** Shimoda, Shizuoka, Japan (1975-10-6). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-39] Male gametophyte; *rbcL*.

Strain: KU-1580. **Origin:** Shimoda, Shizuoka, Japan (1975-10-6). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-40] Female gametophyte; *rbcL*.

Strain: KU-1581. **Origin:** Shimoda, Shizuoka, Japan (1977-2-4). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-41] Male gametophyte; *rbcL*.

Strain: KU-1582. **Origin:** Tsuyazaki, Fukuoka, Japan (1977-3-2). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-42] Female gametophyte.

Strain: KU-1583. **Origin:** Tsuyazaki, Fukuoka, Japan (1977-3-2). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-43] Female gametophyte; *rbcL*.

Strain: KU-1584. **Origin:** Monbetsu, Hokkaido, Japan (1977-7-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-44] Female gametophyte; *rbcL*.

Ahnfeltiopsis sp.

Strain: KU-1551. **Origin:** Tanesashi, Aomori, Japan (1981-8-5). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-11] Female gametophyte; *rbcL*.

Strain: KU-1552. **Origin:** Tanesashi, Aomori, Japan (1981-8-5). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-12] Female gametophyte; *rbcL*.

Strain: KU-1557. **Origin:** Enoshima, Kanagawa, Japan x Tojima, Ehime, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-17] Hybrid; *rbcL*.

Strain: KU-1561. **Origin:** Bakkai, Hokkaido, Japan (1998-8-25). **Leg./Isol.** M. Masuda. **Culture:** PES; 15-20°C. **Note:** [HOK-21] Female gametophyte; *rbcL*.

Anotrichium tenue (C. Agardh) Nägeli

Strain: KU-278. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Antithamnion nipponicum Yamada et Inagaki

Strain: KU-1001. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-1-22). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** *rbcL*.

Strain: KU-1599. **Origin:** Tarumi, Kobe, Hyogo, Japan (2000-7-17). **Leg./Isol.** H. Kawaguchi/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-114]; *rbcL*.

Antithamnion sp.

Strain: KU-659. **Origin:** Koshien-hama, Nishinomiya, Hyogo, Japan (2002-11-21). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** Tetrasporophyte.

Strain: KU-1168. **Origin:** Villefranche-sur-Mer, France (1973-5-10). **Leg./Isol.** D.G. Müller. **Culture:** PES; 15°C. **Note:** With *Ectocarpus siliculosus* (Anti VF 2 T); *rbcL*.

Asparagopsis armata Harvey [= *Falkenbergia rufolanosa* (Harvey) F. Schmitz]

Strain: KU-1115. **Origin:** Aran Islands, Ireland (1988-9-26). **Leg./Isol.** D.G. Müller. **Culture:** PES; 15°C. **Note:** Tide pool (Fal Aran 88-1); *rbcL*. **Reference:** Sekimoto et al. (2008).

Strain: KU-1196. **Origin:** Isla La Graciosa, Canary Islands, Spain (1991-9-30). **Leg./Isol.** D.G. Müller. **Culture:** PES; 15°C. **Note:** South Beech, 20m deep by scuba on corraline algae (Fal CI 39-1).

Asparagopsis taxiformis (Delile) Trevisan

Strain: KU-984. **Origin:** Saikai-bashi, Oomura Bay, Nagasaki, Japan (2000-3-30). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1292).

Binghamia californica J. Agardh

Strain: KU-916. **Origin:** Iwaya, Awaji Isl., Hyogo, Japan (2001-2-16). **Leg./Isol.** Y. Ushihara/T. Yano. **Culture:** PES; 15°C. **Note:** Gametophyte (Bi-ca-1); *rbcL*.

Strain: KU-917. **Origin:** Iwaya, Awaji Isl., Hyogo, Japan (2001-2-16). **Leg./Isol.** Y. Ushihara/T. Yano. **Culture:** PES; 15°C.

Strain: KU-987. **Origin:** Namikata, Ehime, Japan (2000-6-12). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** Sporophyte; *rbcL*.

Bonnemaisonia hamifera Hariot [= *Trailliella intricata* Batters]

Strain: KU-1177. **Origin:** Punta Jandia, Fuerteventura, Canary Island, Spain (1991-9-26). **Leg./Isol.** D.G. Müller. **Culture:** PES; 15°C. **Note:** 8m deep by scuba on *Stypocaulon* sp.; *rbcL*.

Botryocladia skottsbergii (Børgesen) Levring

Strain: KU-975. **Origin:** Ishigaki Isl., Okinawa, Japan (1998-1-22). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1166).

Catenella opuntia (Goodenough et Woodward) Greville [= *Catenella caespitosa* (Withering) L.M. Irvine]

Strain: KU-974. **Origin:** Isobe-kawa, Ishigaki Isl., Okinawa, Japan (1998-1-23). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1134).

Centroceras clavulatum (C. Agardh) Montagne

Strain: KU-1000. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-1-22). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C.

Ceramium tenerrimum (Martens) Okamura

Strain: KU-989. **Origin:** Okinoerabu Isl., Kagoshima, Japan (2000-5-30). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1324); *rbcL*. **Reference:** Sekimoto et al. (2008)

Champia bifida Okamura

Strain: KU-981. **Origin:** Yura, Awaji Isl., Hyogo, Japan (1999-7-1). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1206).

Chondracanthus intermedius (Suringar) Hommersand

Strain: KU-1047. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-5-14). **Leg./Isol.** A. Kato. **Culture:** PES; 10°C.

Chondracanthus tenellus (Harvey) Hommersand

Strain: KU-918. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-8-27). **Leg./Isol.** T. Yano. **Culture:** PES; 15°C.

Note: Tetrasporophyte (Ch-te-1).

Chondria crassicaulis Harvey

Strain: KU-1056. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-7-16). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C.

Chondrus giganteus Yendo

Strain: KU-288. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-8-11). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** Tetrasporophyte (HAY-CG-1); *rbcL*.

Strain: KU-289. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-8-11). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** Tetrasporophyte (HAY-CG-2).

Chondrus nipponicus Yendo

Strain: KU-277. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai/S. Kawaguchi. **Culture:** PES; 15°C. **Note:** Tetrasporophyte; *rbcL*.

Coelarthrum muelleri (Sonder) Børgesen

Strain: KU-972. **Origin:** Shimoda, Shizuoka, Japan (1996-4-3). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1110); *rbcL*.

Cryptonemia luxurians (C. Agardh) J. Agardh

Strain: KU-1600. **Origin:** Namikata, Ehime, Japan (1986-10-9). **Leg./Isol.** H. Kawaguchi/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-115]; *rbcL*.

Dasya sessilis Yamada

Strain: KU-1060. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-7-16). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C. **Note:** *rbcL*.

Delesseria serrulata Harvey

Strain: KU-971. **Origin:** Shiranuka, Aomori, Japan (1995-3-22). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1081).

Dichotomaria apiculata (Kjellman) Kurihara et Masuda

Strain: KU-2562. **Origin:** Nijigashima, Himi, Toyama, Japan (2001-6-8). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-184].

Dichotomaria falcata (Kjellman) Kurihara et Masuda

Strain: KU-2563. **Origin:** Mugi, Kaifu, Tokushima, Japan (2003-6-4). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-185].

Dichotomaria obtusata (Ellis et Solander) Lamarck

Strain: KU-2557. **Origin:** Atsuta, Nakagusuku, Okinawa, Japan (2002-12-14). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-179].

Strain: KU-2572. **Origin:** Ei, Ibusuki, Kagoshima, Japan (2004-7-4). **Leg./Isol.** H. Shimabukuro/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-194].

Strain: KU-2573. **Origin:** Itoman, Okinawa, Japan (2002-12-15). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-196].

Dichotomaria papillata (Kjellman) Kurihara et Masuda

Strain: KU-2574. **Origin:** Tomioka, Amakusa, Kumamoto, Japan (2002-6-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-197].

Strain: KU-2575. **Origin:** Tomioka, Amakusa, Kumamoto, Japan (2002-6-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-198].

Strain: KU-2576. **Origin:** Kasasa, Kawabe, Kagoshima, Japan (2003-2-28). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-199].

Strain: KU-2577. **Origin:** Shirahama, Nishimuro, Wakayama, Japan (2003-4-1). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-200].

Dichotomaria sp.

Strain: KU-2618. **Origin:** Higashi-kou, Hahajima Isl., Tokyo, Japan (2005-3-7). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-244].

Strain: KU-2619. **Origin:** Higashi-kou, Hahajima Isl., Tokyo, Japan (2005-3-7). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-246].

Strain: KU-2620. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-3-11). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-247].

Strain: KU-2621. **Origin:** Okinoshima, Tateyama, Chiba, Japan (2003-5-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-248].

Strain: KU-2622. **Origin:** Okinoshima, Tateyama, Chiba, Japan (2003-5-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-249].

Strain: KU-2623. **Origin:** Okinoshima, Tateyama, Chiba, Japan (2003-5-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-250].

Strain: KU-2624. **Origin:** Okinoshima, Tateyama, Chiba, Japan (2003-5-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-251].

Strain: KU-2625. **Origin:** Okinoshima, Tateyama, Chiba, Japan (2003-5-18). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-252].

Strain: KU-2628. **Origin:** Kasasa, Kawabe, Kagoshima, Japan (2003-2-28). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-255].

Strain: KU-2629. **Origin:** Okidomari, Okinoerabu Isl., Kagoshima, Japan (2003-6-21). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-257].

Strain: KU-2630. **Origin:** Agarizaki, Yonaguni, Okinawa, Japan (2003-9-27). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-259].

Erythroglossum minimum Okamura

Strain: KU-998. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-1-22). **Leg./Isol.** S. Uwai. **Culture:** PES; 15-20°C. **Note:** *rbcL*.

Galaxaura articulata T. Tanaka

Strain: KU-2578. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-17). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-201].

Strain: KU-2579. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-17). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-202].

Strain: KU-2580. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-17). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-203].

Strain: KU-2581. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-17). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-204].

Strain: KU-2582. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-17). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-205].

Strain: KU-2583. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-17). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-207].

Strain: KU-2584. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-20). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-209].

Strain: KU-2585. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-4-20). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-210].

Strain: KU-2586. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-3-11). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-211].

Galaxaura divaricata (Linnaeus) Huisman et Townsend

Strain: KU-2558. **Origin:** Tahama, Haebaru, Okinawa, Japan (2003-9-25). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-180].

Galaxaura latifolia T. Tanaka [= *Galaxaura kjellmanii* Weber van Bosse]

Strain: KU-2587. **Origin:** Shishikui, Kaifu, Tokushima, Japan (2003-6-4). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-212].

Strain: KU-2588. **Origin:** Shishikui, Kaifu, Tokushima, Japan (2003-6-4). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-213].

Galaxaura pacifica T. Tanaka

Strain: KU-2589. **Origin:** kitakou, Hahajima Isl., Tokyo, Japan (2005-3-10). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-214].

Galaxaura rugosa (Ellis et Solander) J.V. Lamouroux

Strain: KU-2601. **Origin:** Shirahama, Nishimuro, Wakayama, Japan (2003-4-1). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-227].

Strain: KU-2602. **Origin:** Shirahama, Nishimuro, Wakayama, Japan (2003-4-1). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-228].

Galaxaura spp.

Strain: KU-2590. **Origin:** Nishiura, Hahajima Isl., Tokyo, Japan (2005-3-11). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-215].

Strain: KU-2591. **Origin:** Kopepehama, Chichijima Isl., Tokyo, Japan (2005-3-16). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-216].

Strain: KU-2592. **Origin:** Higashi-kou, Hahajima, Tokyo, Japan (2005-3-7). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-217].

Strain: KU-2593. **Origin:** Higashi-kou, Hahajima, Tokyo, Japan (2005-3-7). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-218].

Strain: KU-2594. **Origin:** Higashi-kou, Hahajima, Tokyo, Japan (2005-3-7). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-219].

Strain: KU-2595. **Origin:** Anijima, Tokyo, Japan (2005-6-22). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-221].

Strain: KU-2596. **Origin:** Anijima, Tokyo, Japan (2005-6-22). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-222].

Strain: KU-2597. **Origin:** Anijima, Tokyo, Japan (2005-6-22). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C.

Note: [HOK-223].

Strain: KU-2598. **Origin:** Nishiura, Hahajima, Tokyo, Japan (2005-3-10). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-224].

Strain: KU-2599. **Origin:** Nishiura, Hahajima, Tokyo, Japan (2005-3-10). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-225].

Strain: KU-2600. **Origin:** Nishiura, Hahajima, Tokyo, Japan (2005-3-10). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-226].

Strain: KU-2603. **Origin:** Shirahama, Nishimuro, Wakayama, Japan (2003-4-1). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-229].

Strain: KU-2604. **Origin:** Hatsuneura, Chichijima, Tokyo, Japan (2005-5-13). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-230].

Strain: KU-2605. **Origin:** Haemidanohama, Haebaru, Okinawa, Japan (2003-9-25). **Leg./Isol.** S. Arai/ A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-231].

Strain: KU-2606. **Origin:** Haemidanohama, Haebaru, Okinawa, Japan (2003-9-25). **Leg./Isol.** S. Arai/ A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-232].

Strain: KU-2607. **Origin:** Haemidanohama, Haebaru, Okinawa, Japan (2003-9-25). **Leg./Isol.** S. Arai/ A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-233].

Gelidium elegans Kützing

Strain: KU-970. **Origin:** Yura, Awaji Isl., Hyogo, Japan (1996-1-26). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15-20°C. **Note:** *rbcL*; cryopreserved.

Strain: KU-1048. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-5-14). **Leg./Isol.** A. Kato. **Culture:** PES; 15-20°C. **Note:** *rbcL*; cryopreserved.

Strain: KU-1506. **Origin:** Awaji Isl., Hyogo, Japan (1992-5-15). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-60]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1507. **Origin:** Kushimoto, Wakayama, Japan (1995-9-25). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-61]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1508. **Origin:** Fukaura, Aomori, Japan (1994-4-5). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-62]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1509. **Origin:** Hachijojima Isl., Tokyo, Japan (1994-7-8). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-63]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1510. **Origin:** Fukaura, Aomori, Japan (1993-6-19). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-64]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1541. **Origin:** Hinomisaki, Shimane, Japan (1994-11-19). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-1]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1542. **Origin:** Oga, Akita, Japan (1994-4-5). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-2]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1543. **Origin:** Hatijojima Isl., Tokyo, Japan (1994-7-9). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-3]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1544. **Origin:** Shimoda, Shizuoka, Japan (1992-9-24). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-4]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1545. **Origin:** Sanpoku, Niigata, Japan (1994-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-5]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1546. **Origin:** Hatinohe, Aomori, Japan (1993-6-9). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-6]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1547. **Origin:** Amakusa, Kumamoto, Japan (1993-7-29). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-7]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1548. **Origin:** Kushimoto, Wakayama, Japan (1992-9-28). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-8]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1549. **Origin:** Ise, Mie, Japan (1992-9-25). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-9]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Strain: KU-1550. **Origin:** Awaji Isl., Hyogo, Japan (1992-5-15). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-10]; ITS rDNA. **Reference:** Shimada & Masuda (2004).

Gelidium japonicum (Harvey) Okamura

Strain: KU-1623. **Origin:** Iseki, Tanegashima Isl., Kagoshima, Japan (2000-12-17). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-142]; *rbcL*.

Gelidium koshikianum Shimada, Horiguchi et Masuda

Strain: KU-1614. **Origin:** Osaki, Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-132]; *rbcL*.

Strain: KU-1622. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-17). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-140].

Gelidium pusillum (Stackhouse) Le Jolis

Strain: KU-1524. **Origin:** Omaezaki, Shizuoka, Japan (1992-9-26). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-80]; *rbcL*.

Gelidium tenuifolium Shimada, Horiguchi et Masuda

Strain: KU-1530. **Origin:** Shimoda, Shizuoka, Japan (1995-6-24). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-86]; *rbcL*.

Gelidium sp.

Strain: KU-1612. **Origin:** Anno, Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-129]; *rbcL*.

Gracilaria chilensis C.J. Bird, McLachlan et E.C. Oliveira

Strain: KU-1208. **Origin:** Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PES; 15-20°C. **Note:** Female gametophyte (Grac CH Nie 4f).

Strain: KU-1209. **Origin:** Chile (unknown). **Leg./Isol.** D.G. Müller. **Culture:** PES; 15-20°C. **Note:** Male gametophyte (Grac CH Nie 3m).

Strain: KU-1210. **Origin:** Isla Quirquina, Concepcion, Chile (1988-12-5). **Leg./Isol.** Krister Alveal/D.G. Müller. **Culture:** PES; 15-20°C. **Note:** (Grac CH Con1a T).

Gracilaria salicornia (C. Agardh) Dawson

Strain: KU-2560. **Origin:** Ishigaki Is., Okinawa, Japan (2006-5-20). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-182].

Gracilaria textorii (Suringar) Hariot

Strain: KU-290. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 15-20°C. **Note:** Tetrasporophyte; *rbcL*.

Gracilaria sp.

Strain: KU-1593. **Origin:** Ishigaki Is., Okinawa, Japan (2000-9-29). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-106].

Gracilariopsis lemaneiformis (Bory de Saint-Vincent) E.Y. Dawson, Acleto et Foldvik

Strain: KU-986. **Origin:** Four Miles Beach, Santa Cruz, CA, USA (2001-2-5). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15-20°C. **Note:** (MK1297); *rbcL*.

Grateloupia asiatica Kawaguchi et Wang

Strain: KU-1598. **Origin:** Fukutsu, Fukuoka, Japan (1999-4-5). **Leg./Isol.** S. Kawaguchi/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-111]; *rbcL*.

Grateloupia imbricata Holmes

Strain: KU-291. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai/S. Kawaguchi. **Culture:** PES; 15-20°C. **Note:** Tetrasporophyte; *rbcL*.

Grateloupia lanceolata (Okamura) Kawaguchi

Strain: KU-921. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2000-5-13). **Leg./Isol.** T. Yano. **Culture:** PES; 15-20°C. **Note:** Tetrasporophyte; *rbcL*; cryopreserved.

Griffithsia japonica Okamura

Strain: KU-1054. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-7-11). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15-20°C. **Note:** *rbcL*.

Helminthocladia australis Harvey

Strain: KU-1596. **Origin:** Fukutsu, Fukuoka, Japan (1997-5-14). **Leg./Isol.** S. Kawaguchi/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-109]; *rbcL*.

Strain: KU-976. **Origin:** Shirahama, Wakayama, Japan (1998-5-28). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15-20°C. **Note:** (MK1178); *rbcL*.

Strain: KU-2608. **Origin:** Kushimoto, Wakayama, Japan (2003-3-31). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-234].

Strain: KU-2609. **Origin:** Kushimoto, Wakayama, Japan (2003-3-31). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-235].

Strain: KU-2610. **Origin:** Kushimoto, Wakayama, Japan (2003-3-31). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-236].

Herpochondria elegans (Okamura) Itono

Strain: KU-1004. **Origin:** Tateyama, Chiba, Japan (2002-10-29). **Leg./Isol.** H. Kawai/S. Uwai. **Culture:** PES; 15°C. **Note:** Tetrasporophyte (Herp 2 tetra); *rbcL*.

Heterosiphonia pulchra (Okamura) Falkenberg

Strain: KU-1053. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-7-11). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C.

Hypnea charoides J.V. Lamouroux

Strain: KU-1057. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-7-16). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15-20°C.

Hypnea flexicaulis Yamagishi et Masuda

Strain: KU-1501. **Origin:** Unosaki, Oga, Akita, Japan (1996-9-21). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-

20°C. **Note:** [HOK-52].

Strain: KU-1502. **Origin:** Fukaura, Aomori, Japan (1996-9-23). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-53].

Strain: KU-1503. **Origin:** Fukaura, Aomori, Japan (1996-9-23). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-54].

Strain: KU-1505. **Origin:** Unosaki, Oga, Akita, Japan (1996-9-22). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-58]; *rbcL*.

Strain: KU-1589. **Origin:** Atsumi, Yamagata, Japan (1996-9-21). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-49].

Strain: KU-1590. **Origin:** Atsumi, Yamagata, Japan (1996-9-21). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-50].

Hypnea japonica T. Tanaka

Strain: KU-1504. **Origin:** Katsuura, Chiba, Japan (1998-3-4). **Leg./Isol.** Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-57].

Hypnea sp.

Strain: KU-1588. **Origin:** Moheji, Hokkaido, Japan (1995-9-11). **Leg./Isol.** K. Kogame/Y. Yamagishi. **Culture:** PES; 15-20°C. **Note:** [HOK-48].

Laurencia brongniartii J. Agardh

Strain: KU-1591. **Origin:** Ei, Kagoshima, Japan (2000-11-24). **Leg./Isol.** H. Shimabukuro/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-103].

Laurencia nipponica Yamada

Strain: KU-985. **Origin:** Charatsunai, Muroran, Hokkaido, Japan (2000-7-31). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1293); *rbcL*.

Laurencia okamurae Yamada

Strain: KU-1050. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-6-17). **Leg./Isol.** A. Kato. **Culture:** PES; 15°C. **Note:** *rbcL*.

Leveillea jungermannioides (Hering et G. Martens) Harvey

Strain: KU-1049. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-6-17). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C.

Liagora sp.

Strain: KU-2626. **Origin:** Bise, Motobu, Okinawa, Japan (2003-2-3). **Leg./Isol.** T. Abe/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-253].

Strain: KU-2627. **Origin:** Bise, Motobu, Okinawa, Japan (2003-2-3). **Leg./Isol.** T. Abe/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-254].

Lomentaria hakodatensis Yendo

Strain: KU-282. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 15-20°C. **Note:** Gametophyte (Lhak A gam 1).

Strain: KU-283. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 15-20°C. **Note:** Gametophyte (Lhak A gam2).

Strain: KU-284. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 15-20°C.

Note: Gametophyte (Lhak A gam 3).

Strain: KU-285. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 15-20°C. **Note:** Gametophyte, (Lhak B gam 1).

Strain: KU-973. **Origin:** Yura, Awaji Isl., Hyogo, Japan (1996-1-29). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15-20°C. **Note:** (MK1113); *rbcL*.

Nemalion vermiculare Suringar

Strain: KU-2611. **Origin:** Rishiri Isl., Hokkaido, Japan (2004-7-29). **Leg./Isol.** T. Abe/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-237].

Strain: KU-2612. **Origin:** Oshoro, Hokkaido, Japan (2004-7-14). **Leg./Isol.** S. Uwai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-238].

Neosiphonia japonica (Harvey) M.S. Kim et I.K. Lee [= *Polysiphonia japonica* Harvey]

Strain: KU-279. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** Tetrasporophyte.

Strain: KU-280. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** Tetrasporophyte.

Strain: KU-281. **Origin:** Nishikihama, Osaka, Japan (2002-10). **Leg./Isol.** A. Miyagawa/S. Uwai. **Culture:** PES; 15°C. **Note:** Male gametophyte.

Neosiphonia savatieri (Hariot) Kim et Lee [= *Polysiphonia savatieri* Hariot]

Strain: KU-1051. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-6-17). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C. **Note:** *rbcL*.

Plocamium cartilagineum (Linnaeus) Dixon

Strain: KU-931. **Origin:** Kurahashi Isl., Hiroshima, Japan (2000-6-30). **Leg./Isol.** J.H. Ook/T. Yano. **Culture:** PES; 15°C. **Note:** (A grade/CAR1/ion); *rbcL*. **Reference:** Yano et al. (2004)

Strain: KU-1059. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-7-16). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C. **Note:** *rbcL*. **Reference:** Yano et al. (2004)

Plocamium ovicornis Okamura

Strain: KU-953. **Origin:** Shirahama, Wakayama, Japan (2001-10-16). **Leg./Isol.** M. Kamiya/T. Yano. **Culture:** PES; 15°C. **Note:** (B grade/ion); *rbcL*. **Reference:** Yano et al. (2004).

Plocamium recurvatum Okamura

Strain: KU-934. **Origin:** Oohara, Ikuma, Chiba, Japan (2000-5-22). **Leg./Isol.** T. Yano. **Culture:** PES; 15°C. **Note:** (C grade/REC6/ion); *rbcL*. **Reference:** Yano et al. (2004).

Plocamium telfairiae (Hooker et Harvey) Harvey

Strain: KU-940. **Origin:** Yoshio, Katsuura, Chiba, Japan (2000-5-17). **Leg./Isol.** N. Kikuchi/T. Yano. **Culture:** PES; 15°C. **Note:** Gametophyte (C grade/TEL9/ion). **Reference:** Yano et al. (2004).

Strain: KU-944. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-1-29). **Leg./Isol.** T. Yano. **Culture:** PES; 15°C. **Note:** (C grade/TEL9/ion); *rbcL*. **Reference:** Yano et al. (2004).

Strain: KU-982. **Origin:** Okinoerabu Isl., Kagoshima, Japan (2000-5-30). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1276). **Reference:** Yano et al. (2004).

Polyopes lancifolius (Harvey) Kawaguchi et Wang [= *Grateloupia okamurae* Yamada]

Strain: KU-1058. **Origin:** Imagoura, Kasumi, Hyogo, Japan (2003-7-16). **Leg./Isol.** T. Shimono/A. Kato.

Culture: PES; 15°C. **Note:** *rbcL*; cryopreserved.

Polyopes prolifer (Hariot) Kawaguchi et Wang [= *Carpopeltis prolifera* (Hariot) Kawaguchi et Masuda]

Strain: KU-1052. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-5-14). **Leg./Isol.** A. Kato. **Culture:** PES; 15°C. **Note:** *rbcL*.

Polysiphonia senticulosa Harvey

Strain: KU-657. **Origin:** Koshienhama, Nishinomiya, Hyogo, Japan (2002-11-21). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C. **Note:** *rbcL*; cryopreserved. **Reference:** Sekimoto et al. (2008)

Strain: KU-950. **Origin:** Hariohigashi, Sasebo, Nagasaki, Japan (2000-3-30). **Leg./Isol.** T. Yano. **Culture:** PES; 15°C. **Note:** (Po-se-3); *rbcL*; cryopreserved.

Porphyra okamurae Ueda

Strain: KU-1595. **Origin:** Fukutsu, Fukuoka, Japan (1999-12-26). **Leg./Isol.** S. Kawaguchi/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-108] *Conchocelis*-stage; *rbcL*.

Porphyra tenera Kjellman

Strain: KU-1858. **Origin:** Kawaura, Amakusa, Kumamoto, Japan (1999-1-20). **Leg./Isol.** N. Kikuchi. **Culture:** PES; 20°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T1); *ITS1*(AB162695), *RUBISCO* spacer (AB162696). **Reference:** Niwa et al. (2005).

Strain: KU-1859. **Origin:** Tama River, Haneda airport, Tokyo, Japan (2004-10-1). **Leg./Isol.** N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T11).

Strain: KU-1860. **Origin:** Tama River, Tonomachi, Kawasaki, Kanagawa, Japan (2004-10-1). **Leg./Isol.** N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T14).

Strain: KU-1861. **Origin:** Toyo River, Toyohashi, Aichi, Japan (2000-2-26). **Leg./Isol.** N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T5); *ITS1*(AB365998), *rbc* spacer (AB366133), *rbcL* (AB455547). **Reference:** Niwa et al. (2009).

Strain: KU-1862. **Origin:** Rinkai, Edogawa, Tokyo, Japan (2007-3-23). **Leg./Isol.** K. K. Tanaka/N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T30).

Strain: KU-1863. **Origin:** Rinkai, Edogawa, Tokyo, Japan (2007-3-23). **Leg./Isol.** K. Tanaka/N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T31).

Strain: KU-1864. **Origin:** Ichinomiya River, Tyousei, Chiba, Japan (2006-2-20). **Leg./Isol.** N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T34).

Strain: KU-1865. **Origin:** Tama River, Haneda airport, Tokyo, Japan (2006-3-2). **Leg./Isol.** K. Tanaka/N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T35).

Strain: KU-1866. **Origin:** Maihama, Urayasu, Chiba, Japan (2006-3-2). **Leg./Isol.** Y. Shimamura/N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T40).

Strain: KU-1867. **Origin:** Ichinomiya river, Tyousei, Chiba, Japan (2007-2-2). **Leg./Isol.** N. Kikuchi. **Culture:** PES; 15°C. **Note:** Intertidal, brackish, *Conchocelis*-stage (UM-T42).

Porphyra yezoensis Ueda

Strain: KU-1483. **Origin:** Charatsunai, Muroran, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PES; 15-20°C. **Note:** *Conchocelis*-stage; *rbcL*, rDNA-ITS.

Strain: KU-1488. **Origin:** Iwaya, Awaji Isl., Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PES; 15-20°C. **Note:** *Conchocelis*-stage; *rbcL*, rDNA-ITS.

***Porphyra* sp.**

Strain: KU-1485. **Origin:** Charatsunai, Muroran, Hokkaido, Japan (unknown). **Leg./Isol.** H. Kawai. **Culture:** PES; 15-20°C. **Note:** *Conchocelis*-stage; *rbcL*, rDNA-ITS.

Predaea japonica Yoshida

Strain: KU-1597. **Origin:** Fukutsu, Fukuoka, Japan (1995-6-30). **Leg./Isol.** S. Kawaguchi/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-110]; *rbcL*.

Pterocladia capillacea (Gmelin) Santelices et Hommersand

Strain: KU-1512. **Origin:** Oshoro, Hokkaido, Japan (1992-9-14). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-67]; *rbcL*. **Reference:** Shimada et al. (2000).

Strain: KU-1619. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-134]; *rbcL*.

Pterocladia tenuis (Okamura) Shimada, Horiguchi et Masuda

Strain: KU-1511. **Origin:** Shimoda, Shizuoka, Japan (1992-9-24). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-66]; *rbcL*. **Reference:** Shimada et al. (2000).

***Pterocladia* sp.**

Strain: KU-1615. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-133]; *rbcL*.

Schizymenia dubyi (Chauvin ex Duby) J. Agardh

Strain: KU-977. **Origin:** Maruyama, Awaji Isl. Hyogo, Japan (1996-4-16). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1194); *rbcL*.

***Scinaia* sp.**

Strain: KU-978. **Origin:** Ihota, Hiroshima, Japan (1997-6-12). **Leg./Isol.** M. Kamiya. **Culture:** PES; 15°C. **Note:** (MK1193); *rbcL*.

Strain: KU-2613. **Origin:** Ushinohama, Akune, Kagoshima, Japan (2003-3-3). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-239].

Strain: KU-2614. **Origin:** Nijigashima, Himi, Toyama, Japan (2001-6-8). **Leg./Isol.** S. Arai/A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-240].

Symphyocladia marchantioides (Harvey) Falkenberg

Strain: KU-999. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-1-22). **Leg./Isol.** S. Uwai. **Culture:** PES; 15°C.

Symphyocladia pumila (Yendo) Uwai et Masuda

Strain: KU-276. **Origin:** Tateyama, Chiba, Japan (2002-10-29). **Leg./Isol.** H. Kawai/S. Uwai. **Culture:** PES; 15°C. **Note:** Male gametophyte (Sy. *pumila* 2).

Strain: KU-653. **Origin:** Tateyama, Chiba, Japan (2002-10-29). **Leg./Isol.** H. Kawai/S. Uwai. **Culture:** PES; 15°C. **Note:** Female gametophyte (Sy. *pumila* 1).

Strain: KU-1055. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2003-7-11). **Leg./Isol.** T. Shimono/A. Kato. **Culture:** PES; 15°C.

Trichogloea requienii (Montagne) Kützing

Strain: KU-2615. **Origin:** Sani, Amamioshima Isl., Kagoshima, Japan (2003-4-22). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-241].

***Tricleocarpa* sp.**

Strain: KU-2616. **Origin:** Touji, Shimoda, Shizuoka, Japan (2001-7-24). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-242].

Strain: KU-2617. **Origin:** Touji, Shimoda, Shizuoka, Japan (2001-7-24). **Leg./Isol.** A. Kurihara. **Culture:** PES; 15-20°C. **Note:** [HOK-243].

CHLOROPHYCEAE (Green Algae)

Blastophysa rhizopus Reinke

Strain: KU-292. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-293. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-294. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-295. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C. **Note:** cryopreserved.

Strain: KU-296. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-297. **Origin:** Shimokamagari Isl., Hiroshima, Japan (2002-8-23). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-1213. **Origin:** Pta. Cook, Easter Island, Chile (1987-1-21). **Leg./Isol.** D.G. Müller. **Culture:** PES; 10°C.

Strain: KU-1214. **Origin:** Isla La Graciosa, Canary Islands, Spain (1991-9-30). **Leg./Isol.** D.G. Müller. **Culture:** PES; 10°C.

Strain: KU-2119. **Origin:** Hydra Isl., Greece (2004-10-15). **Leg./Isol.** D.G. Müller. **Culture:** PES; 10°C.

Blidingia sp.

Strain: KU-1099. **Origin:** Sano, Awaji Isl., Hyogo, Japan (unknown). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 10°C.

Bryopsis plumosa (Hudson) C. Agardh

Strain: KU-272. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C. **Note:** Gametophyte; *rbcL*.

Strain: KU-273. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-274. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-275. **Origin:** Sakoshi, Akou, Hyogo, Japan (2002-10-26). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

Strain: KU-990. **Origin:** Koshien-hama, Nishinomiya, Hyogo, Japan (2002-11-19). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C. **Note:** Gametophyte; *rbcL*.

Bryopsis sp.

Strain: KU-1624. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** Gametophyte [HOK-143]; *rbcL*.

Caulerpa racemosa (Forsskål) J. Agardh

Strain: KU-1533. **Origin:** Tosashimizu, Kochi, Japan (2000-2-7). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-93].

Chaetomorpha gracilis Kützinger

Strain: KU-2559. **Origin:** Ishigaki Isl., Okinawa, Japan (2006-5-20). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-181].

Codium capitulatum Silva et Womersley

Strain: KU-1523. **Origin:** Kashinoura, Kochi, Japan (1996-5-3). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-78]; *rbcL*.

Codium dimorphum Svedelius

Strain: KU-1531. **Origin:** Nemoto, Chiba, Japan (1996-5-30). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-88]; *rbcL*.

Codium fragile (Suringar) Hariot

Strain: KU-654. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-8-11). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C. **Note:** Gametophyte.

Strain: KU-1519. **Origin:** Tsuyazaki, Fukuoka, Japan (1996-3-12). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-74]; *rbcL*.

Codium hubbsii Dawson

Strain: KU-1518. **Origin:** Tanegashima Isl., Kagoshima, Japan (1996-6-5). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-73].

Strain: KU-1521. **Origin:** Ebisu Isl., Shimoda, Shizuoka, Japan (1997-7-23). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-76]; *rbcL*.

Codium intricatum Okamura

Strain: KU-1520. **Origin:** Tomioka, Fukushima, Japan (1998-6-15). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-75].

Strain: KU-1592. **Origin:** Ishigaki Isl., Okinawa, Japan (2000-9-29). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-105].

Codium lucasii Setchell

Strain: KU-1617. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-136]; *rbcL*.

Codium spongiosum Harvey

Strain: KU-1616. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-135]; *rbcL*.

Codium subtubulosum Okamura

Strain: KU-1527. **Origin:** Tsuyazaki, Fukuoka, Japan (1996-3-12). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-83].

Derbesia marina (Lyngbye) Solier

Strain: KU-1155. **Origin:** Starigrad, Island of Hvar, Croatia (1972-6-20). **Leg./Isol.** D.G. Müller. **Culture:** PES; 10°C. **Note:** On *Dictyota dichotoma*. Laboratory construct: heterozygous sporophyte, (DSG T6 H5 x H2 Sp); *rbcL*.

Polyphysa sp.

Strain: KU-2500. **Origin:** Chichijima Isl., Ogasawara, Tokyo, Japan (unknown). **Leg./Isol.** H. Kawai/T. Yamagishi. **Culture:** PES; 15°C.

Strain: KU-2501. **Origin:** Kakeroma Is., Amami, Kagoshima, Japan (unknown). **Leg./Isol.** Z. Sun/T. Yamagishi. **Culture:** PES; 15°C.

Strain: KU-2502. **Origin:** Kakeroma Is., Amami, Kagoshima, Japan (unknown). **Leg./Isol.** Z. Sun/T. Yamagishi. **Culture:** PES; 15°C.

Pseudocodium okinawense Faye, Uchimura et Shimada

Strain: KU-2561. **Origin:** Awase, Okinawa, Japan (2006-5-14). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-183].

Ulva arasaki Chihara

Strain: KU-1322. **Origin:** cargo carrier vessel (2004-8-1). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 15-20°C. **Note:** Isolated from ballast water.

Ulva compressa Linnaeus [= *Enteromorpha compressa* (Linnaeus) Nees]

Strain: KU-1634. **Origin:** Akaguri, Ohi, Fukui, Japan (2005-4-28). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C.

Ulva fasciata Delile

Strain: KU-1539. **Origin:** Naruto, Tokushima, Japan (1995-10-24). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-99] Male gametophyte; ITS rDNA.

Strain: KU-1540. **Origin:** Naruto, Tokushima, Japan (1995-10-24). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-100] Female gametophyte; ITS rDNA.

Strain: KU-1666. **Origin:** Maiko, Kobe, Hyogo, Japan (2006-9-7). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1670. **Origin:** Iwaya, Awaji Isl., Hyogo, Japan (2005-4-28). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 15-20°C.

Ulva flexuosa Wulfen [= *Enteromorpha flexuosa* (Wulfen) J. Agardh]

Strain: KU-1319. **Origin:** Osaka Bay, Japan (2004-9). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 15-20°C. **Note:** cryopreserved.

Strain: KU-1526. **Origin:** Shimoda, Shizuoka, Japan (1997-7-22). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-82]; ITS rDNA.

Strain: KU-1532. **Origin:** Yoshinogawa, Tokushima, Japan (1997-10-30). **Leg./Isol.** M. Hiraoka/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-90]; ITS rDNA.

Strain: KU-1618. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-16). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-137]; *rbcL*.

Strain: KU-1653. **Origin:** Suma, Kobe, Japan (2006-9-7). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1662. **Origin:** Maiko, Kobe, Hyogo, Japan (2006-9-7). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1664. **Origin:** Kobe, Hyogo, Japan (2007-2-19). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Ulva intestinalis Linnaeus [= *Enteromorpha intestinalis* (Linnaeus) Nees]

Strain: KU-1534. **Origin:** Shimamakimura, Hokkaido, Japan (1996-6-5). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C.

Ulva lactuca Linnaeus

Strain: KU-1603. **Origin:** Rumoi, Hokkaido, Japan (2000-8-18). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:**

PES; 15-20°C. **Note:** [HOK-118]; *rbcL*.

Ulva linza Linnaeus [= *Enteromorpha linza* (Linnaeus) J. Agardh]

Strain: KU-1096. **Origin:** Futami, Sado, Niigata, Japan (unknown). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 15-20°C.

Strain: KU-1500. **Origin:** Yoshinogawa, Tokushima, Japan (1997-10-30). **Leg./Isol.** M. Hiraoka/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-51]; *rbcL*.

Strain: KU-1516. **Origin:** Oshoro, Hokkaido, Japan (1998-4-5). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-71]; ITS rDNA.

Strain: KU-1601. **Origin:** Mashike, Hokkaido, Japan (2000-8-18). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-116]; *rbcL*. **Reference:** Shimada et al. (2008).

Strain: KU-1602. **Origin:** Mashike, Hokkaido, Japan (2000-8-18). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-117]; *rbcL*. **Reference:** Shimada et al. (2008).

Strain: KU-1604. **Origin:** Furubira, Hokkaido, Japan (2000-9-14). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-119]; *rbcL*. **Reference:** Shimada et al. (2008).

Strain: KU-1613. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-131]; *rbcL*.

Strain: KU-1620. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-17). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-138]; *rbcL*.

Strain: KU-1621. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-17). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-139]; *rbcL*.

Strain: KU-1625. **Origin:** Mashike, Hokkaido, Japan (2000-8-18). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-145]; *rbcL*.

Strain: KU-1644. **Origin:** Oshoro, Hokkaido, Japan (1994-3-1). **Leg./Isol.** K. Kogame. **Culture:** PES; 15-20°C.

Strain: KU-1645. **Origin:** Oshoro, Hokkaido, Japan (1994-3-1). **Leg./Isol.** K. Kogame. **Culture:** PES; 15-20°C.

Strain: KU-1660. **Origin:** Iwaya, Awaji Isl., Hyogo, Japan (2006-7-14). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1677. **Origin:** Izumo, Shimane, Japan (2006-3-30). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 15-20°C.

Strain: KU-2631. **Origin:** Shiokawa, Motobu, Okinawa, Japan (2005-10-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-156].

Ulva ohnoi Hiraoka et Shimada

Strain: KU-1525. **Origin:** Naha, Okinawa, Japan (1994-12-9). **Leg./Isol.** M. Hiraoka/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-81]; ITS rDNA, *rbcL*.

Strain: KU-1529. **Origin:** Hakata Bay, Fukuoka, Japan (1993-9-16). **Leg./Isol.** M. Hiraoka/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-85]; ITS rDNA, *rbcL*.

Strain: KU-1656. **Origin:** Kobe, Hyogo, Japan (2006-8-24). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1657. **Origin:** Kobe, Hyogo, Japan (2006-8-24). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1663. **Origin:** Kobe, Hyogo, Japan (2006-8-24). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Ulva pertusa Kjellman

Strain: KU-1323. **Origin:** cargo carrier vessel (2004-8-1). **Leg./Isol.** T. Hanyuda. **Culture:** PES; 15-20°C. **Note:** Isolated from ballast water.

Strain: KU-1652. **Origin:** Kobe Airport, Kobe, Hyogo, Japan (2006-8-24). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1655. **Origin:** Iwaya, Awaji Isl., Hyogo, Japan (2006-7-14). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1658. **Origin:** Maiko, Kobe, Hyogo, Japan (2006-9-7). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-1659. **Origin:** Maiko, Kobe, Hyogo, Japan (2006-9-7). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

Strain: KU-2556. **Origin:** Tomakomai, Hokkaido, Japan (2005-4-17). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-177].

Ulva tanneri Hayden et Waaland

Strain: KU-1665. **Origin:** Oiso, Awaji Isl., Hyogo, Japan (2006-7-14). **Leg./Isol.** K.C. Nakamura. **Culture:** PES; 15-20°C.

***Ulva* spp. [=Enteromorpha spp.]**

Strain: KU-1605. **Origin:** Itoman, Okinawa, Japan (2000-9-27). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-120]. **Reference:** Shimada et al. (2008).

Strain: KU-1606. **Origin:** Ishigaki Isl., Okinawa, Japan (2000-9-29). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-121] *Enteromorpha* sp.1. **Reference:** Shimada et al. (2008).

Strain: KU-1607. **Origin:** Ishigaki Isl., Okinawa, Japan (2000-9-29). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-123] *Enteromorpha* sp.2; *rbcL*. **Reference:** Shimada et al. (2008).

Strain: KU-1608. **Origin:** Ishigaki Isl., Okinawa, Japan (2000-9-29). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-124] *Enteromorpha* sp.3; *rbcL*. **Reference:** Ichihara et al. (2008), (2009).

Strain: KU-1609. **Origin:** Ishigaki Isl., Okinawa, Japan (2000-9-29). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-125] *Enteromorpha* sp.4. **Reference:** Shimada et al. (2008).

Strain: KU-1610. **Origin:** Tanegashima Isl., Kagoshima, Japan (2000-12-18). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-126] *Enteromorpha* sp.5; *rbcL*. **Reference:** Shimada et al. (2008).

Strain: KU-1626. **Origin:** Ishigaki Isl., Okinawa, Japan (2000-9-29). **Leg./Isol.** N. Yokoyama/S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-146] *Enteromorpha* sp.6.

Strain: KU-2550. **Origin:** Oshoro, Hokkaido, Japan (2005-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-171].

Strain: KU-2551. **Origin:** Oshoro, Hokkaido, Japan (2005-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-172].

Strain: KU-2552. **Origin:** Oshoro, Hokkaido, Japan (2005-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-173].

Strain: KU-2553. **Origin:** Oshoro, Hokkaido, Japan (2005-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-174].

Strain: KU-2554. **Origin:** Oshoro, Hokkaido, Japan (2005-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-175].

Strain: KU-2555. **Origin:** Oshoro, Hokkaido, Japan (2005-4-4). **Leg./Isol.** S. Shimada. **Culture:** PES; 15-20°C. **Note:** [HOK-176].

Valonia macrophysa Kützting

Strain: KU-992. **Origin:** Yura, Awaji Isl., Hyogo, Japan (2002-11-21). **Leg./Isol.** S. Uwai. **Culture:** PES; 10°C.

3. Taxonomic list of culture strains

[In taxonomic order, without strain data]

PHAEOPHYCEAE

DISCOSPORANGIALES

Choristocarpaceae

Choristocarpus tenellus Zanardini: KU-1152

ISHIGEALES

Ishigeaceae

Ishige okamurae Yendo: KU-252

ECTOCARPALES *s.s.*

Ectocarpaceae

Acinetospora crinita (Carmichael ex Harvey) Kornmann: KU-1163

Asteronema rhodochoortonoides (Børgeesen) D.G. Müller et E.R. Parodi: KU-1188, KU-1203

Ectocarpus fasciculatus Harvey: KU-1107, KU-1128, KU-1129, KU-1130, KU-1131

Ectocarpus siliculosus (Dillwyn) Lyngbye: KU-1101, KU-1102, KU-1103, KU-1104, KU-1105, KU-1106, KU-1109, KU-1110, KU-1111, KU-1112, KU-1327, KU-1330, KU-1332, KU-1336, KU-1342, KU-1343, KU-1344, KU-1345, KU-1348, KU-1349, KU-1352, KU-1355, KU-1361, KU-1362, KU-1363, KU-1364, KU-1369, KU-1371, KU-1372, KU-1424, KU-1433, KU-1434, KU-1435, KU-1436, KU-1442, KU-1443, KU-1444, KU-1710, KU-1711, KU-1712, KU-1713, KU-1714, KU-1717, KU-1720, KU-1724, KU-1725, KU-1726, KU-1727, KU-1752, KU-1761, KU-1763, KU-1851, KU-2296

Feldmannia globifera (Kützinger) G. Hamel: KU-1124, KU-1200

Feldmannia irregularis (Kützinger) G. Hamel: KU-1197, KU-1201, KU-1207, KU-1211

Feldmannia simplex (P.L. Crouan et H.M. Crouan) G. Hamel: KU-1123, KU-1199, KU-1206

Geminocarpus geminatus (J.D. Hooker et Harvey) Skottsborg: KU-1122

Hinckesia conifera (Børgeesen) I.A. Abbott: KU-1180

Hinckesia granulosa (Smith) P.C. Silva: KU-1225, KU-1226, KU-1184

Hinckesia hincksiae (Harvey) P.C. Silva: KU-1224

Hinckesia intermedia (Rosenvinge) P.C. Silva: KU-1185

Hinckesia mitchelliae (Harvey) P.C. Silva: KU-1173, KU-1181, KU-1193, KU-1195, KU-1221, KU-1223

Hinckesia onslowensis (Amsler et Kapraun) P.C. Silva: KU-1186, KU-1194

Hinckesia ovata (Kjellman) P.C. Silva: KU-1190, KU-1222

Hinckesia sandriana (Zanardini) P.C. Silva: KU-1172, KU-1182, KU-1191

Hinckesia sp.: KU-1183

Laminarionema elsbetiae Kawai et Tokuyama: KU-356

Pylaiellaceae

Pylaiella littoralis (Linnaeus) Kjellman: KU-1300, KU-1302, KU-1303

Sorocarpaceae

Botrytella micromora Bory de Saint-Vincent: KU-1161, KU-1162

CHORDARIALES (ECTOCARPALES *s.l.*)

Chordariaceae

Chordaria chordaeformis (Kjellman) Kawai et Kim: KU-448

Chordaria flagelliformis (O.F. Müller) C. Agardh: KU-873, KU-1150, KU-1153

Chordaria magellanica Kylin: KU-1151

Cladothele decaisnei J.D. Hooker et Harvey: KU-1154

Eudesme virescens (Carmichael ex Berkeley) J. Agardh: KU-254, KU-447

Gononema sp.: KU-1121

Kuetzingiella battersii (Bornet ex Sauvageau) Kornmann: KU-1187, KU-1192

Saundersella simplex (Saunders) Kylin: KU-446

Sphaerotrichia divaricata (C. Agardh) Kylin: KU-459

Elachistaceae

Elachista stellaris Areschoug: KU-1113, KU-1198

Leptonematella fasciculata (Reinke) P.C. Silva: KU-94

Leathesiaceae

Leathesia japonica Inagaki [as *Vimineoleathesia japonica* (Inagaki) A. Tanaka, S. Uwai et H. Kawai]: KU-66

Leathesia sphaerocephala Yamada [as *Phaeophysema sphaerocephala* (Yamada) A. Tanaka, S. Uwai et H. Kawai]: KU-67

Phaeophysema sphaerocephala (Yamada) A. Tanaka, S. Uwai et H. Kawai [= *Leathesia sphaerocephala* Yamada]: KU-67

Vimineoleathesia japonica (Inagaki) A. Tanaka, S. Uwai et H. Kawai [= *Leathesia japonica* Inagaki]: KU-66

Spermatocnaceae

Nemacystus nova-zelandiae Kylin: KU-1174

DICTYOSIPHONALES (ECTOCARPALES *s.l.*)

Adenocystaceae

Caepidium antarcticum J. Agardh: KU-1160

Asperococcaceae

Asperococcus bullosus Lamouroux: KU-570

Melanosiphon intestinalis (Saunders) Wynne: KU-259

Punctariaceae

Desmotrichum sp.: KU-1135

Trachynema groenlandicum (Lund) Pedersen: KU-706

Striariaceae

Coelocladia arctica Rosenvinge: KU-906

Stictyosiphon soriferus (Reinke) Rosenvinge: KU-704, KU-707

Striaria attenuata (Greville) Greville: KU-708

SCYTOSIPHONALES (ECTOCARPALES *s.l.*)

Scytosiphonaceae

Colpomenia phaeodactyla Wynne et J.N. Norris: KU-1217

Colpomenia sinuosa (Mertens ex Roth) Derbes et Solier: KU-1216

Endarachne binghamiae J. Agardh [= *Petalonia binghamiae* (J. Agardh) K.L. Vinogradova]: KU-1114

Petalonia zosterifolia (Reinke) Kuntze: KU-260

Scytosiphon canaliculatus (Setchell et Gardner) Kogame: KU-263

Scytosiphon lomentaria (Lyngbye) Link: KU-268

RALFSIALES

Ralfsiaceae

Analipus japonicus (Harvey) Wynne: KU-883

Heteroralfsia saxicola (Okamura et Yamada) Kawai: KU-882

SPHACELARIALES

Sphacelariaceae

Sphacelaria plumigera Holmes ex Hauck: KU-687

Sphacelaria sp.: KU-221

Stypocaulaceae

Halopteris congesta (Reinke) Sauvageau: KU-1120

Halopteris filicina (Grateloup) Kützing: KU-690, KU-1119

Halopteris paniculata (Suhr) Prud'homme van Reine: KU-1117

Stypocaulon durum (Ruprecht) Okamura: KU-692

DICTYOTALES

Dictyotaceae

Dictyopteris latiuscula (Okamura) Okamura: KU-1072

Dictyopteris prolifera (Okamura) Okamura: KU-960

Dictyota dichotoma (Hudson) J.V. Lamouroux: KU-963, KU-1070

Dictyota phlyctaenodes Montagne: KU-1204, KU-1205

Dilophus okamurae E.Y. Dawson [= *Rugulopteryx okamurae* (Dawson) Hwang, Lee te Kim]: KU-958

Distromium decumbens (Okamura) Levring: KU-957

Pachydictyon coriaceum (Holmes) Okamura: KU-959

Padina crassa Yamada: KU-1073

Padina fernandeziana Skottsberg et Levring: KU-1175

Spatoglossum crassum J. Tanaka: KU-256

Spatoglossum pacificum Yendo: KU-961

Taonia atomaria (Woodward) J. Agardh: KU-1074

CUTLERIALES

Cutleriaceae

Cutleria multifida (Turner) Greville: KU-1189

SPOROCHNALES

Sporochnaceae

Carpomitra costata (Stackhouse) Batters: KU-560, KU-1158, KU-1159

Sporochnus bolleanus Montagne: KU-1178, KU-1179

DESMARESTIALES

Arthrocladiaceae

Arthrocladia villosa (Hudson) Duby: KU-1169

Desmarestiaceae

Desmarestia aculeata (Linnaeus) J.V. Lamouroux: KU-1140, KU-1141

Desmarestia distans (C. Agardh) J. Agardh: KU-1139

Desmarestia firma (C. Agardh) Skottsberg: KU-1143, KU-1144

Desmarestia gayana Montagne: KU-1138

Desmarestia herbacea J.V. Lamouroux: KU-1132

Desmarestia viridis (O.F. Müller) J.V. Lamouroux: KU-1146

Desmarestia ligulata (Stackhouse) Lamouroux: KU-1145

Desmarestia muelleri M.E. Ramírez et A.F. Peters: KU-1142

Desmarestia willii Reinsch: KU-1147

Desmerestia sp.: KU-1136

LAMINARIALES

Alariaceae

Alaria crassifolia Kjellman: KU-1164, KU-1165

Alaria esculenta (Linnaeus) Greville: KU-1166, KU-1167

Undaria pinnatifida (Harvey) Suringar: KU-169, KU-170, KU-171, KU-172, KU-174, KU-175, KU-176, KU-177, KU-178

Chordaceae

Chorda asiatica Sasaki et Kawai: KU-213, KU-214, KU-494, KU-495, KU-496, KU-497, KU-498, KU-499, KU-500, KU-501, KU-502, KU-503, KU-504, KU-505

Chorda filum (Linnaeus) Stackhouse: KU-353, KU-1041, KU-1156, KU-1157, KU-1148, KU-1149

Chorda kikonaiensis Sasaki et Kawai: KU-200, KU-215

Chorda rigida Kawai et Arai: KU-725, KU-1042

Costariaceae

Agarum clathratum Dumortier: KU-314

Lessoniaceae

Ecklonia maxima (Osbeck) Papenfuss: KU-1116, KU-1125

Ecklonia radiata (C. Agardh) J. Agardh: KU-1126, KU-1127, KU-1133, KU-1134

Lessonia corrugata Lucas: KU-1274, KU-1275

Lessonia nigrescens Bory de Saint-Vincent: KU-1272, KU-1273

Lessonia variegata J. Agardh: KU-1270, KU-1271

Laminariaceae

Kjellmaniella crassifolia Miyabe [as *Saccharina sculpera* (Miyabe) Lane, Mayes, Druehl et Saunders]: KU-196, KU-354, KU-1629

Laminaria angustata Kjellman [as *Saccharina angustata* (Kjellman) Lane, Mayes, Druehl et Saunders]: KU-1628

Laminaria japonica Areschoug [as *Saccharina japonica* (Areschoug) Lane, Mayes, Druehl et Saunders]: KU-508, KU-511, KU-1627

Laminaria hyperborea (Gunnerus) Foslie: KU-1232, KU-1233

Laminaria saccharina (Linnaeus) J.V. Lamouroux [as *Saccharina latissima* (Linnaeus) Lane, Mayes, Druehl et Saunders]: KU-1230, KU-1231

Laminaria pallida Greville: KU-1234, KU-1235

Macrocystis angustifolia Bory de Saint-Vincent: KU-1280

Macrocystis integrifolia Bory de Saint-Vincent: KU-220

Macrocystis pyrifera (Linnaeus) C. Agardh: KU-1268, KU-1269, KU-1276, KU-1277, KU-1282, KU-1283

Nereocystis leutkeana (K. Mertens) Postels et Ruprecht: KU-466

Saccharina angustata (Kjellman) Lane, Mayes, Druehl et Saunders [= *Laminaria angustata* Kjellman]: KU-1628

Saccharina japonica (Areschoug) Lane, Mayes, Druehl et Saunders [= *Laminaria japonica* Areschoug]: KU-508, KU-511, KU-1627

Saccharina latissima (Linnaeus) Lane, Mayes, Druehl et Saunders [= *Laminaria saccharina* (Linnaeus) J.V. Lamouroux]: KU-1230, KU-1231

Saccharina sculpera (Miyabe) Lane, Mayes, Druehl et Saunders [= *Kjellmaniella crassifolia* Miyabe]: KU-196, KU-354, KU-1629

Pseudochordaceae

Pseudochorda gracilis Kawai et Nabata: KU-251, KU-469, KU-485, KU-732

TILOPTERIDALES

Phyllariaceae

Saccorhiza dermatodea: KU-1305

Saccorhiza polyschides (Lightfoot) Batters: KU-1306, KU-1307

SCYTOTHAMNALES

Splachnidiaceae

Splachnidium rugosum (Linnaeus) Greville: KU-1176

INCERTAE SEDIS

Phaeostrophaceae

Phaeostrophion irregularis Setchell et Gardner: KU-307

SCHIZOCLADIOPHYCEAE

SCHIZOCLADIALES

Schizocladiaceae

Schizocladia ischiensis E.C. Henry, Okuda et Kawai: KU-333

RHODOPHYCEAE

BANGIALES

Bangiaceae

Porphyra okamuræ Ueda: KU-1595

Porphyra tenera Kjellman: KU-1858, KU-1859, KU-1860, KU-1861, KU-1862, KU-1863, KU-1864, KU-1865, KU-1866, KU-1867

Porphyra yezoensis Ueda: KU-1483

Porphyra sp.: KU-1485

NEMALIALES

Galaxauraceae

Actinotrichia fragilis (Forsskål) Børgesen: KU-2564, KU-2565, KU-2566, KU-2567, KU-2568, KU-2569, KU-2570, KU-2571

Dichotomaria apiculata (Kjellman) Kurihara et Masuda: KU-2562

Dichotomaria falcata (Kjellman) Kurihara et Masuda: KU-2563

Dichotomaria obtusata (Ellis et Solander) Lamarck: KU-2557, KU-2572, KU-2573

Dichotomaria papillata (Kjellman) Kurihara et Masuda: KU-2574, KU-2575, KU-2576, KU-2577

Dichotomaria sp.: KU-2618, KU-2619, KU-2620, KU-2621, KU-2622, KU-2623, KU-2624, KU-2625, KU-2628, KU-2629, KU-2630

Galaxaura articulata T. Tanaka: KU-2578, KU-2579, KU-2580, KU-2581, KU-2582, KU-2583, KU-2584, KU-2585, KU-2586

Galaxaura divaricata (Linnaeus) Huisman et Townsend: KU-2558

Galaxaura latifolia T. Tanaka [= *Galaxaura kjellmanii* Weber van Bosse]: KU-2587, KU-2588

Galaxaura pacifica T. Tanaka: KU-2589

Galaxaura rugosa (Ellis et Solander) J.V. Lamouroux: KU-2601, KU-2602

Galaxaura spp.: KU-2590, KU-2591, KU-2592, KU-2593, KU-2594, KU-2595, KU-2596, KU-2597, KU-2598, KU-2599, KU-2600, KU-2603, KU-2604, KU-2605, KU-2606, KU-2607

Scinaia sp.: KU-978, KU-2613, KU-2614

Tricleocarpa sp.: KU-2616, KU-2617

Liagoraceae

Helminthocladia australis Harvey: KU-976, KU-1596, KU-2608, KU-2609, KU-2610

Liagora sp.: KU-2626, KU-2627

Nemaliaceae

Nemalion vermiculare Suringar: KU-2611, KU-2612

Trichogloea requienii (Montagne) Kützing: KU-2615

GELIDIALES

Gelidiaceae

Acanthopeltis hirsuta (Okamura) Shimada, Horiguchi et Masuda: KU-1522

Gelidium elegans Kützing: KU-970, KU-1048, KU-1506, KU-1507, KU-1508, KU-1509, KU-1510, KU-1541, KU-1542, KU-1543, KU-1544, KU-1545, KU-1546, KU-1547, KU-1548, KU-1549, KU-1550

Gelidium japonicum (Harvey) Okamura: KU-1623

Gelidium koshikianum Shimada, Horiguchi et Masuda: KU-1614, KU-1622

Gelidium pusillum (Stackhouse) Le Jolis: KU-1524

Gelidium tenuifolium Shimada, Horiguchi et Masuda: KU-1530

Gelidium sp.: KU-1612

Pterocladia capillacea (Gmelin) Santelices et Hommersand: KU-1512, KU-1619

Pterocladia tenuis (Okamura) Shimada, Horiguchi et Masuda: KU-1511

Pterocladia sp.: KU-1615

BONNEMAISONIALES

Bonnemaisoniaceae

Asparagopsis armata Harvey [= *Falkenbergia rufolanosa* (Harvey) F. Schmitz]: KU-1115, KU-1196

Asparagopsis taxiformis (Delile) Trevisan: KU-984

Bonnemaisonia hamifera Hariot [= *Trailiella intricata*]: KU-1177

Falkenbergia rufolanosa (Harvey) F. Schmitz [as *Asparagopsis armata* Harvey]: KU-1115, KU-1196

GIGARTINALES

Caulacanthaceae

Catenella opuntia (Goodenough et Woodward) Greville [= *Catenella caespitosa* (Withering) L.M. Irvine]: KU-974

Gigartinaceae

Chondracanthus intermedius (Suringar) Hommersand: KU-1047

Chondracanthus tenellus (Harvey) Hommersand: KU-918

Chondrus giganteus Yendo: KU-288, KU-289

Chondrus nipponicus Yendo: KU-277

Halymeniaceae

Carpopeltis prolifera (Hariot) Kawaguchi et Masuda [as *Polyopes prolifera* (Hariot) Kawaguchi et Wang]: KU-1052

Cryptonemia luxurians (C. Agardh) J. Agardh: KU-1600

Grateloupia asiatica Kawaguchi et Wang: KU-1598

Grateloupia imbricata Holmes: KU-291

Grateloupia lanceolata (Okamura) Kawaguchi: KU-921

Grateloupia okamurae Yamada [as *Polyopes lancifolius* (Harvey) Kawaguchi et Wang]: KU-1058

Polyopes lancifolius (Harvey) Kawaguchi et Wang [= *Grateloupia okamurae* Yamada]: KU-1058

Polyopes prolifera (Hariot) Kawaguchi et Wang [= *Carpopeltis prolifera* (Hariot) Kawaguchi et Masuda]: KU-1052

Hypneaceae

Hypnea charoides J.V. Lamouroux: KU-1057

Hypnea flexicaulis Yamagishi et Masuda: KU-1501, KU-1502, KU-1503, KU-1505, KU-1589, KU-1590

Hypnea japonica T. Tanaka: KU-1504

Hypnea sp.: KU-1588

Nemastomataceae

Predaea japonica Yoshida: KU-1597

Phyllophoraceae

hnfeltiopsis concinna (J. Agardh) Silva et DeCew: KU-1585, KU-1586, KU-1587

Ahnfeltiopsis divaricata (Holmes) Masuda: KU-979

Ahnfeltiopsis flabelliformis (Harvey) Masuda: KU-1553, KU-1554, KU-1555, KU-1556, KU-1558, KU-1559, KU-1560, KU-1562, KU-1563, KU-1564, KU-1565, KU-1566, KU-1567, KU-1568, KU-1569, KU-1570, KU-1571, KU-1572, KU-1573, KU-1574, KU-1575, KU-1576, KU-1577, KU-1578, KU-1579, KU-1580, KU-1581, KU-1582, KU-1583, KU-1584

Ahnfeltiopsis sp.: KU-1551, KU-1552, KU-1557, KU-1561

Plocamiaceae

Plocamium cartilagineum (Linnaeus) Dixon: KU-931, KU-1059

Plocamium ovicornis Okamura: KU-953

Plocamium recurvatum Okamura: KU-934

Plocamium telfairiae (Hooker et Harvey) Harvey: KU-940, KU-944, KU-982

Schizymeniaceae

Schizymenia dubyi (Chauvin ex Duby) J. Agardh: KU-977

GRACILARIALES

Gracilariaceae

Gracilaria chilensis C.J. Bird, McLachlan et E.C. Oliveira: KU-1208, KU-1209, KU-1210

Gracilaria salicornia (C. Agardh) Dawson: KU-2560

Gracilaria textorii (Suringar) Hariot: KU-290

Gracilaria sp.: KU-1593

Gracilariopsis lemaneiformis (Bory de Saint-Vincent) E.Y. Dawson, Acleto et Foldvik: KU-986

RHODYMENIALES

Champiaceae

Champia bifida Okamura: KU-981

Lomentariaceae

Binghamia californica J. Agardh: KU-916, KU-917, KU-987

Lomentaria hakodatensis Yendo: KU-282, KU-283, KU-284, KU-285, KU-973

Rhodymeniaceae

Botryocladia skottsbergii (Børgesen) Levring: KU-975

Coelarthrum muelleri (Sonder) Børgesen: KU-972

CERAMIALES

Ceramiaceae

Anotrichium tenue (C. Agardh) Nägeli: KU-278

Antithamnion nipponicum Yamada et Inagaki: KU-1001, KU-1599

Antithamnion sp.: KU-659, KU-1168

Centroceras clavulatum (C. Agardh) Montagne: KU-1000

Ceramium tenerrimum (Martens) Okamura: KU-989

Griffithsia japonica Okamura: KU-1054

Herpochondria elegans (Okamura) Itono: KU-1004

Dasyaceae

Dasya sessilis Yamada: KU-1060

Heterosiphonia pulchra (Okamura) Falkenberg: KU-1053

Delesseriaceae

Delesseria serrulata Harvey: KU-971

Erythroglossum minimum Okamura: KU-998

Rhodomelaceae

Chondria crassicaulis Harvey: KU-1056

Laurencia brongniartii J. Agardh: KU-1591

Laurencia nipponica Yamada: KU-985

Laurencia okamurae Yamada: KU-1050

Leveillea jungermannioides (G. Martens et Hering) Harvey: KU-1049

Neosiphonia japonica (Harvey) M.S. Kim et I.K. Lee [= *Polysiphonia japonica* Harvey]: KU-279, KU-280, KU-281

Neosiphonia savatieri (Hariot) Kim et Lee [= *Polysiphonia savatieri* Hariot]: KU-1051

Polysiphonia japonica Harvey [as *Neosiphonia japonica* (Harvey) M.S. Kim et I.K. Lee]: KU-279, KU-280, KU-281

Polysiphonia senticulosa Harvey: KU-657, KU-950

Polysiphonia savatieri Hariot [as *Neosiphonia savatieri* (Hariot) Kim et Lee]: KU-1051

Symphyocladia marchantioides (Harvey) Falkenberg: KU-999

Symphyocladia pumila (Yendo) Uwai et Masuda: KU-276, KU-653, KU-1055

CHLOROPHYCEAE

ULVALES

Ulvaceae

Blidingia sp.: KU-1099

Enteromorpha compressa (Linnaeus) Nees [as *Ulva compressa* Linnaeus]: KU-1634

Enteromorpha flexuosa (Wulfen) J. Agardh [as *Ulva flexuosa* Wulfen]: KU-1319, KU-1526, KU-1532, KU-1618, KU-1653, KU-1662, KU-1664

Enteromorpha intestinalis (Linnaeus) Nees [as *Ulva intestinalis* Linnaeus]: KU-1534

Enteromorpha linza (Linnaeus) J. Agardh [as *Ulva linza* Linnaeus]: KU-1096, KU-1500, KU-1516, KU-1601, KU-1602, KU-1604, KU-1613, KU-1620, KU-1621, KU-1625, KU-1644, KU-1645, KU-1660, KU-1677, KU-2631

Ulva arasakii Chihara: KU-1322

Ulva compressa Linnaeus [= *Enteromorpha compressa* (Linnaeus) Nees]: KU-1634

Ulva fasciata Delile: KU-1539, KU-1540

Ulva flexuosa Wulfen [= *Enteromorpha flexuosa* (Wulfen) J. Agardh]: KU-1319, KU-1526, KU-1532, KU-1618, KU-1653, KU-1662, KU-1664

Ulva intestinales Linnaeus [= *Enteromorpha intestinalis* (Linnaeus) Nees]: KU-1534

Ulva lactuca Linnaeus: KU-1603

Ulva linza Linnaeus [= *Enteromorpha linza* (Linnaeus) J. Agardh]: KU-1096, KU-1500, KU-1516, KU-1601, KU-1602, KU-1604, KU-1613, KU-1620, KU-1621, KU-1625, KU-1644, KU-1645, KU-1660, KU-1677, KU-2631

Ulva ohnoi Hiraoka et Shimada: KU-1525, KU-1529, KU-1656, KU-1657, KU-1663

Ulva pertusa Kjellman: KU-1323, KU-1652, KU-1655, KU-1658, KU-1659, KU-2556

Ulva tanneri Hayden et Waaland: KU-1665, KU-1666, KU-1670

Ulva spp.: KU-1605, KU-1606, KU-1607, KU-1608, KU-1609, KU-1610, KU-1626, KU-2550, KU-2551, KU-2552, KU-2553, KU-2554, KU-2555

CLADOPHORALES

Cladophoraceae

Chaetomorpha gracilis Kützinger: KU-2559

SIPHONOCLADALES

Valoniaceae

Valonia macrophysa Kützinger: KU-992

CAULERPALES

Caulerpaceae

Caulerpa racemosa (Forsskål) J. Agardh: KU-1533

Chaetosiphonaceae

Blastophysa rhizopus Reinke: KU-292, KU-293, KU-294, KU-295, KU-296, KU-297, KU-1213, KU-1214, KU-2119

Pseudocodiaceae

Pseudocodium okinawense Faye, Uchimura et Shimada: KU-2561

CODIALES

Codiaceae

Codium capitulatum Silva et Womersley: KU-1523

Codium dimorphum Svedelius: KU-1531

Codium fragile (Suringar) Hariot: KU-654, KU-1519

Codium hubbsii Dawson: KU-1518, KU-1521

Codium intricatum Okamura: KU-1520, KU-1592

Codium lucasii Setchell: KU-1617

Codium spongiosum Harvey: KU-1616

Codium subtubulosum Okamura: KU-1527

BRYOPSIDALES

Bryopsidaceae

Bryopsis plumosa (Hudson) C. Agardh: KU-272, KU-273, KU-274, KU-275, KU-990

Bryopsis sp.: KU-1624

Derbesiaceae

Derbesia marina (Lyngbye) Solier: KU-1155

DASYCLADALES

Dasycladaceae

Polyphysa sp.: KU-2500, KU-2501, KU-2502

4. 公開系統株の分類表 (和名一覧)

[In taxonomic order, with Japanese name]

PHAEOPHYCEAE 褐藻綱**DISCOSPORANGIALES** ディクチオスポランギウム目

Choristocarpaceae コリストカルプス科

*Choristocarpus tenellus***ISHIGEAELES** イシゲ目

Ishigeaceae イシゲ科

Ishige okamurae イシゲ**ECTOCARPALES** s.s. シオミドロ目 (狭義)

Ectocarpaceae シオミドロ科

*Acinetospora crinita**Asteronema rhodoortonoides**Ectocarpus fasciculatus**Ectocarpus siliculosus* シオミドロ*Feldmannia globifera**Feldmannia irregularis* ミルシオミドロ*Feldmannia simplex**Geminocarpus geminatus**Hincksia conifera**Hincksia granulosa**Hincksia hincksiae**Hincksia intermedia**Hincksia mitchelliae* タワラガタシオミドロ*Hincksia onslowensis**Hincksia ovata**Hincksia sandriana**Hincksia* sp.*Laminarionema elsbetiae*

Pylaiellaceae ピラエラ科

Pylaiella littoralis ピラエラ

Sorocarpaceae イソブドウ科

Botrytella micromora イソブドウ**RALFSIALES** イソガワラ目

Ralfsiaceae イソガワラ科

Analipus japonicus マツモ*Heteroralfsia saxicola* イシツキゴビア**SPHACELARIALES** クロガシラ目

Cladostephaceae

Chladostephus spongiosus

Sphacelariaceae クロガシラ科

Sphacelaria plumigera ハネクロガシラ*Sphacelaria* sp.

Stypocaulaceae カシラザキ科

Halopteris congesta

Halopteris filicina カシラザキ

Halopteris paniculata

Stypocaulon durum エゾカシラザキ

DICTYOTALES アミジグサ目

Dictyotaceae アミジグサ科

Dictyopteris latiuscula ヤハズグサ

Dictyopteris prolifera ヘラヤハズ

Dictyota dichotoma アミジグサ

Dictyota phlyctaenodes

Dilophus okamurae [= *Rugulopteryx okamurae*] フクリンアミジ

Distromium decumbens フタエオオギ

Pachydictyon coriaceum サナダグサ

Padina crassa コナウミウチワ

Padina fernandeziana

Spatoglossum crassum アツバコモングサ

Spatoglossum pacificum コモングサ

Taonia atomaria

CHORDARIALES (ECTOCARPALES s.l.) ナガマツモ目 (広義のシオミドロ目)

Chordariaceae ナガマツモ科

Chordaria chordaeformis ヒモナガマツモ

Chordaria flagelliformis ナガマツモ

Chordaria magellanica

Cladothele decaisnei

Eudesme virescens ニセフトモズク

Gononema sp.

Kuetzingiella battersii

Saundersella simplex モツキチャメンソウ

Sphaerotrichia divaricata イシモズク

Elachistaceae ナミマクラ科

Elachista stellaris

Leptonematella fasciculata ナミマクラモドキ

Leathesiaceae ネバリモ科

Leathesia japonica [as *Vimineoleathesia japonica*] コゴメネバリモ

Leathesia sphaerocephala [as *Phaeophysema sphaerocephala*] ヒメネバリモ

Phaeophysema sphaerocephala [= *Leathesia sphaerocephala*] ヒメネバリモ

Vimineoleathesia japonica [= *Leathesia japonica*] コゴメネバリモ

Spermatochneaceae モズク科

Nemacystus nova-zelandiae

DICTYOSIPHONALES (ECTOCARPALES s.l.) ウイキョウモ目 (広義のシオミドロ目)

Adenocystaceae アデノキスティス科

Caepidium antarcticum

Asperococcaceae コモンブクロ科

Asperococcus bullosus コモンナガブクロ

Melanosiphon intestinalis キタイワヒゲ

Punctariaceae ハバモドキ科

Desmotrichum sp.

Trachynema groenlandicum イソヒゲモ

Striariaceae ヨコジマノリ科

Coelocladia arctica オショログサ

Stictyosiphon soriferus サメズグサ

Striaria attenuata ヨコジマノリ

SCYTOSIPHONALES (ECTOCARPALES s.l) カヤモノリ目 (広義のシオミドロ目)

Scytosiphonaceae カヤモノリ科

Colpomenia phaeodactyla

Colpomenia sinuosa フクロノリ

Endarachne binghamiae [= ***Petalonia binghamiae***] ハバノリ

Petalonia zosterifolia ホソバノセイヨウハバノリ

Scytosiphon canaliculatus カヤモドキ

Scytosiphon lomentaria カヤモノリ

CUTLERIALES ムチモ目

Cutleriaceae ムチモ科

Cutleria multifida ヒラムチモ

SPOROCHNALES ケヤリモ目

Sporochnaceae ケヤリモ科

Carpomitra costata イチメガサ

Sporochnus bolleanus

DESMARESTIALES ウルシグサ目

Arthrocladiaceae

Arthrocladia villosa

Desmarestiaceae ウルシグサ科

Desmarestia aculeata

Desmarestia distans

Desmarestia firma

Desmarestia gayana

Desmarestia herbacea

Desmarestia ligulata ウルシグサ

Desmarestia muelleri

Desmarestia viridis ケウルシグサ

Desmarestia willii

Desmerestia sp.

LAMINARIALES コンブ目

Alariaceae チガイソ科

Alaria crassifolia チガイソ

Alaria esculenta

Undaria pinnatifida ワカメ

Chordaceae ツルモ科

Chorda asiatica ツルモ

Chorda filum

Chorda kikonaiensis キコナイツルモ

Chorda rigida

Costariaceae スジメ科

Agarum clathratum アナメ

Lessoniaceae カジメ科

Ecklonia maxima

Ecklonia radiata

Lessonia corrugata

Lessonia nigrescens

Lessonia variegata

Laminariaceae コンブ科

Kjellmaniella crassifolia [as *Saccharina sculpera*] ガゴメコンブ

Laminaria angustata [as *Saccharina angustata*] ミツイシコンブ

Laminaria japonica [as *Saccharina japonica*] マコンブ

Laminaria hyperborea

Laminaria saccharina [as *Saccharina latissima*] カラフトコンブ

Laminaria pallida

Macrocystis angustifolia

Macrocystis integrifolia

Macrocystis pyrifera

Nereocystis leutkeana

Saccharina angustata [= *Laminaria angustata*] ミツイシコンブ

Saccharina japonica [= *Laminaria japonica*] マコンブ

Saccharina latissima [= *Laminaria saccharina*] カラフトコンブ

Saccharina sculpera [= *Kjellmaniella crassifolia*] ガゴメコンブ

Pseudochordaceae ニセツルモ科

Pseudochorda gracilis ホソツルモ

TILOPTERIDALES チロプテリス目

Phyllariaceae ファイラリア科

Saccorhiza dermatodea

Saccorhiza polyschides

SCYTOTHAMNALES スキトタムヌス目

Splachnidiaceae スプラクニディウム科

Splachnidium rugosum

INCERTAE SEDIS 目 所属不明

Phaeostrophaceae フェオストロフィオン科

Phaeostrophion irregularis

SCHIZOCLADIOPHYCEAE シゾクラディア藻綱

SCHIZOCLADIALES シゾクラディア目

Schizocladiaceae シゾクラディア科

Schizocladia ischiensis

RHODOPHYCEAE 紅藻綱**BANGIALES ウシケノリ目**

Bangiaceae ウシケノリ科

Porphyra okamurae クロノリ*Porphyra tenera* アサクサノリ*Porphyra yezoensis* スサビノリ*Porphyra* sp.**NEMALIALES ウミゾウメン目**

Galaxauraceae ガラガラ科

Actinotrichia fragilis ソデガラミ*Dichotomaria apiculata* ギボウシガラガラ*Dichotomaria falcata* ヒラガラガラ*Dichotomaria obtusata* フクロガラガラ*Dichotomaria papillata* パピラガラガラ*Dichotomaria* sp.*Galaxaura articulata* クダガラガラ*Galaxaura divaricata* ビロウドガラガラ*Galaxaura latifolia* ヒロハガラガラ [=*Galaxaura kjellmanii* サメハダガラガラ]*Galaxaura pacifica* チャボガラガラ*Galaxaura rugosa* ナガラガラ*Galaxaura* spp.*Scinaia* sp.*Tricleocarpa* sp.

Liagoraceae コナハダ科

Helminthocladia australis ベニモズク*Liagora* sp.

Nemaliaceae ウミゾウメン科

Nemalion vermiculare ウミゾウメン*Trichogloea requienii* アケボノモズク**GELIDIALES テングサ目**

Gelidiaceae テングサ科

Acanthopeltis hirsuta ヤタベグサ*Gelidium elegans* マクサ*Gelidium japonicum* オニクサ*Gelidium koshikianum* サツマテングサ*Gelidium pusillum* ハイテングサ*Gelidium tenuifolium* ウスバテングサ*Gelidium* sp.*Pterocladella capillacea* カタオバクサ*Pterocladella tenuis* オバクサ*Pterocladella* sp.**BONNEMAISONIALES カギケノリ目**

Bonnemaisoniaceae カギケノリ科

Asparagopsis armata [=*Falkenbergia rufolanosa*]

Asparagopsis taxiformis カギケノリ
Bonnemaisonia hamifera [= *Trailiella intricata*] カギノリ
Falkenbergia rufolanosa [as *Asparagopsis armata*]

GIGARTINALES スギノリ目
 Caulacanthaceae イソモツカ科
Catenella opuntia [= *Catenella caespitosa*] イソモツカ
 Gigartinaceae スギノリ科
Chondracanthus intermedius カイノリ
Chondracanthus tenellus スギノリ
Chondrus giganteus オオバツノマタ
Chondrus nipponicus マルバツノマタ
 Halymeniaceae ムカデノリ科
Carpopeltis prolifera [as *Polyopes prolifer*] コメノリ
Cryptonemia luxurians ヒロハノカクレイト
Grateloupia asiatica ムカデノリ
Grateloupia imbricata サクラノリ
Grateloupia lanceolata フダラク
Grateloupia okamurai [as *Polyopes lancifolius*] キョウノヒモ
Polyopes lancifolius [= *Grateloupia okamurai*] キョウノヒモ
Polyopes prolifer [= *Carpopeltis prolifera*] コメノリ
 Hypneaceae イバラノリ科
Hypnea charoides イバラノリ
Hypnea flexicaulis カズノイバラ
Hypnea japonica カギイバラノリ
Hypnea sp.
 Nemastomataceae ヒカゲノイト科
Predaea japonica ユルジギヌ
 Phyllophoraceae オキツノリ科
Ahnfeltiopsis concinna サイミ
Ahnfeltiopsis divaricata オオマタオキツノリ
Ahnfeltiopsis flabelliformis オキツノリ
Ahnfeltiopsis sp.
 Plocamiaceae ユカリ科
Plocamium cartilagineum ホソユカリ
Plocamium ovicornis ヒメユカリ
Plocamium recurvatum マキユカリ
Plocamium telfairiae ユカリ
 Schizymeniaceae ベニスナゴ科
Schizymenia dubyi ベニスナゴ

GRACILARIALES オゴノリ目
 Gracilariaceae オゴノリ科
Gracilaria chilensis
Gracilaria salicornia フシクレノリ
Gracilaria textorii カバノリ
Gracilaria sp.
Gracilariopsis lemaneiformis セイヨウオゴノリ

RHODYMENIALES マサゴシバリ目

Champiaceae ワツナギソウ科

Champia bifida ヒラワツナギソウ

Lomentariaceae フシツナギ科

Binghamia californica カエルデグサ*Lomentaria hakodatensis* コスジフシツナギ

Rhodymeniaceae マサゴシバリ科

Botryocladia skottsbergii アツカワハナノエダ*Coelarthrum muelleri* フクロツナギ

CERAMIALES イギス目

Ceramiaceae イギス科

Anotrichium tenue ケカザシグサ*Antithamnion nipponicum* フタツガサネ*Antithamnion* sp.*Centroceras clavulatum* トゲイギス*Ceramium tenerrimum* ケイギス*Griffithsia japonica* カザシグサ*Herpochondria elegans* サエダ

Dasyaceae ダジア科

Dasya sessillis エナシダジア*Heterosiphonia pulchra* シマダジア

Delesseriaceae コノハノリ科

Delesseria serrulata ヌメハノリ*Erythroglossum minimum* ヒメウスベニ

Rhodomelaceae フジマツモ科

Chondria crassicaulis ユナ*Laurencia brongniartii* ソゾノハナ*Laurencia nipponica* ウラソゾ*Laurencia okamurae* ミツデソゾ*Leveillea jungermannioides* ジャバラノリ*Neosiphonia japonica* [= *Polysiphonia japonica*] ニッポンイトグサ*Neosiphonia savatieri* [= *Polysiphonia savatieri*]*Polysiphonia japonica* [as *Neosiphonia japonica*] ニッポンイトグサ*Polysiphonia savatieri* [as *Neosiphonia savatieri*]*Polysiphonia senticulosa* ショウジョウケノリ*Symphyocladia marchantioides* コザネモ*Symphyocladia pumila* ヒメコザネモ

CHLOROPHYCEAE 緑藻綱

ULVALES アオサ目

Ulvaceae アオサ科

Blidingia sp.*Enteromorpha compressa* [as *Ulva compressa*] ヒラアオノリ*Enteromorpha flexuosa* [as *Ulva flexuosa*] キヌイトアオノリ*Enteromorpha intestinalis* [as *Ulva intestinales*] ポウアオノリ*Enteromorpha linza* [as *Ulva linza*] ウスバアオノリ

Ulva arasakii ナガアオサ
Ulva compressa [= *Enteromorpha compressa*] ヒラアオノリ
Ulva fasciata リボンアオサ
Ulva flexuosa [= *Enteromorpha flexuosa*] キヌイトアオノリ
Ulva intestinales [= *Enteromorpha intestinalis*] ボウアオノリ
Ulva lactuca オオバアオサ
Ulva linza [= *Enteromorpha linza*] ウスバアオノリ
Ulva ohnoi ミナミアオサ
Ulva pertusa アナアオサ
Ulva tanneri ヒメボタンアオサ
Ulva spp.

CLADOPHORALES シオグサ目
 Cladophoraceae シオグサ科
Chaetomorpha gracilis ワタジュズモ

SIPHONOCCLADALES ミドリゲ目
 Valoniaceae バロニア科
Valonia macrophysa タマゴバロニア

CAULERPALES イワズタ目
 Caulerpaceae イワズタ科
Caulerpa racemosa
 Chaetosiphonaceae ケートシフォン科
Blastophysa rhizopus アワミドロ

CODIALES ミル目
 Codiaceae ミル科
Codium capitulatum クビレハイミル
Codium dimorphum オオハイミル
Codium fragile ミル
Codium hubbsii ハイミルモドキ
Codium intricatum モツレミル
Codium lucasii ヒラミル
Codium spongiosum コブシミル
Codium subtubulosum クロミル

BRYOPSIDALES ハネモ目
 Bryopsidaceae ハネモ科
Bryopsis plumosa ハネモ
Bryopsis sp.
 Derbesiaceae ツユノイト科
Derbesia marina ホソツユノイト
 Pseudocodiaceae ミルモドキ科
Pseudocodium okinawense オキナワミルモドキ

DASYCLADALES カサノリ目
 Dasycladaceae カサノリ科
Polyphysa sp.

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VII. APPENDIX. MEDIA

Table 1. PES stock solution
PES medium

Tris hydroxymethyl aminomethane	5.0	g
NaNO ₃	3.5	g
Na ₂ -glycerophosphate	500	mg
Fe stock solution (Table 4-1)	250	ml
P-2 metal mix (Table 4-2)	250	ml
Vitamine B ₁₂ stock solution (0.1 mg/ml)	1.0	ml
Thiamine-HCl stock solution (1.0 mg/ml)	5.0	ml
Biotine stock solution (0.1 mg/ml)	0.5	ml
Distilled water	1000	ml

Table 2. PESI stock solution
PESI medium

Tris hydroxymethyl aminomethane	5.0	g
NaNO ₃	3.5	g
Na ₂ -glycerophosphate	500	mg
Fe stock solution (Table 4-1)	250	mg
P-2 metal mix (Table 4-2)	250	ml
KI stock solution	10	ml
Distilled water	1000	ml

Table 3. ASP₁₂
ASP₁₂

Tris hydroxymethyl aminomethane	1.0	g
NTA	(0.1 g)	
NaCl	28.0	g
MgSO ₄ · 7H ₂ O	7.0	g
MgCl ₂ · 6H ₂ O	4.0	g
KCl	0.7	g
Ca (as Cl-)	0.4	g
NaNO ₃	0.1	g
K ₃ PO ₄	10.0	mg
Na ₂ -glycerophosphate	10.0	mg
Na ₂ SiO ₃ · 9H ₂ O	150	mg
Vitamine B ₁₂ stock solution	0.2	µg
Thiamine-HCl stock solution	100	µg
Biotine stock solution	1.0	µg
PII metal mix (Table 4-3)	10.0	ml
S2 metal mix (Table 4-4)	10.0	ml
Distilled water	1000	ml

Table 4
1: Fe stock solution

Na ₂ -EDTA · 2H ₂ O	330	mg
Fe(NH ₄) ₂ (SO ₄) ₂ · 6H ₂ O	351	mg
Distilled water	500	ml

2: P-2 metal mix

Na ₂ -EDTA · 2H ₂ O	500	mg
H ₃ BO ₃	570	mg
FeCl ₃ · 6H ₂ O	24.5	mg
MnSO ₄ · 4H ₂ O	82.0	mg
CoSO ₄ · 7H ₂ O stock solution (4.8 mg/ml)	0.5	ml
ZnSO ₄ · 7H ₂ O	11.0	mg
Distilled water	500	ml

3: PII metal mix

Na ₂ -EDTA · 2H ₂ O	100	mg
Fe (as Cl-)	1.0	mg
H ₃ BO ₄	20.0	mg
Mn (as Cl-)	4.0	mg
Zn (as Cl-)	500	µg
Co (as Cl-)	100	µg
Distilled water	100	ml

4: S2

Na ₂ MoO ₄	5.0	mg
Br (as Cl-)	100	mg
Sr (as Cl-)	20.0	mg
Rb (as Cl-)	2.0	mg
Li (as Cl-)	2.0	mg
I (as K+)	100	µg
Va (as Cl-)	10.0	µg
Distilled water	100	ml

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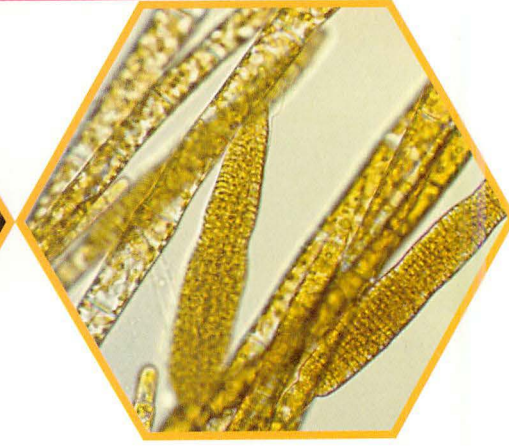
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