

# Check-list of the Basque coast benthic algae (North of Spain)

por

José M. Gorostiaga<sup>1</sup>, Alberto Santolaria<sup>1</sup>, Antonio Secilla<sup>1</sup>, Coro Casares<sup>2</sup> & Isabel Díez<sup>1</sup>

<sup>1</sup> Departamento de Biología Vegetal y Ecología, Facultad de Ciencias, Universidad del País Vasco, Apdo. 644, E-48080 Bilbao, Spain  
gvpgogaj@lg.ehu.es (corresponding author)  
gvbsadea@lg.ehu.es  
gvbseso@lg.ehu.es  
gvbdisai@lg.ehu.es

<sup>2</sup> I.E.S. Usandizaga, Av. de Felipe IV, E-20011 San Sebastián, Spain. albareno@euskalnet.net

## Abstract

An annotated check-list of the marine benthic flora of the Spanish Basque coast, based on literature records and original data, is presented. According to the present taxonomy, the known list of algae totals 372 taxa (354 species and 18 infraspecific taxa), distributed as follows: 23 Cyanophyta, 221 Rhodophyta, 74 Heterokontophyta and 54 Chlorophyta. In addition, 16 taxa are considered as *taxa inquirenda* and 8 as *taxa excludenda*. For each taxon the vertical distribution, abundance estimation, and two first published records are given. Remarks on the most noteworthy features of the flora of the study area are included. The floristic character of Spanish Basque coast flora was compared with nearby regions applying Cheney's ratio [(Rhodophyta+Chlorophyta)/Phaeophyta, or (R+C)/P]. The resulting high value (4,09) indicates its warm-water character, which was already noted at the end of the XIX century. From a physiological point of view, Basque benthic vegetation resembles more closely that of southern regions (S Portugal, Morocco). The warming process of waters off the Basque coast during summer up to 22 °C is responsible for the absence or very rare occurrence of cold temperate species like large fucoids and kelps, which are common in Galicia and Brittany, and explains the abundance of numerous warm-temperate species as ceramiaceous algae.

**Key words:** benthic marine algae, biogeography, Cantabrian Sea, Chlorophyceae, Cyanophyceae, nomenclature, Phaeophyceae, Rhodophyceae, seaweeds, taxonomy.

## Introduction

Information concerning the algal flora of the Spanish Basque coast has been sparse and late-coming compared to information on other regions of the European

## Resumen

Se presenta un catálogo de la flora bentónica marina de la costa vasco-española basado en citas bibliográficas y algunos datos originales. De acuerdo con la taxonomía actual, la lista de algas conocidas asciende a 372 táxones (354 especies y 18 táxones infraespecíficos), que se distribuyen como sigue: 23 Cyanophyta, 221 Rhodophyta, 74 Heterokontophyta y 54 Chlorophyta. Además, 16 táxones se consideran como *taxa inquirenda* y 8 como *taxa excludenda*. Para cada taxon se ofrece información sobre su distribución vertical, una estima de su abundancia y las dos primeras citas publicadas. Se incluyen comentarios sobre las características más destacables de la flora del área de estudio. Se compara el carácter florístico de la flora de la costa vasco-española con respecto a las regiones próximas aplicando el índice de Cheney [(Rhodophyta+Chlorophyta)/Phaeophyta, o (R+C)/P]. El elevado valor resultante (4,09) indica su carácter meridional, lo que ha sido señalado desde finales del siglo XIX. Desde un punto de vista fisiológico la vegetación bentónica vasca se asemeja más a la de regiones meridionales (sur de Portugal, Marruecos). El calentamiento de las aguas de la costa vasca hasta 22 °C durante el verano es responsable de la falta o rareza de especies templado-frías como las fucáceas y laminariales, comunes en Galicia y Bretaña, y explica la abundancia de numerosas especies templado-cálidas como las ceramiáceas.

**Palabras clave:** algas bentónicas marinas, biogeografía, cianofíceas, clorofíceas, feofíceas, macroalgas, mar Cantábrico, nomenclatura, rodofíceas, taxonomía.

Atlantic coast, such as England, Brittany, Galicia, Portugal and the nearby French Basque coast. The first list of marine macroalgae including Spanish Basque coast records was compiled by Colmeiro (1867) who reported 12 new records of Rhodophyta, 8 Heterokontophy-

ta and 4 Chlorophyta. Several works, mainly of Fisher-Piette (1935, 1955, 1963), increased the number of known species to 46 by the year 1965. The following noteworthy contribution was made by Hoek & Donze (1966), who reported 68 new records, including Cyanophyta. This work was the main reference source during the 1970's, a decade with few algological contributions. However, the knowledge of Basque seaweeds increased particularly during the 1980's (Angulo, 1980; Ibáñez & al., 1980; Gorostiaga, 1981; Gorostiaga & Limia, 1985; Gorostiaga & al., 1987, 1988; Casares, 1988, 1989; Casares & Seoane-Camba, 1988, 1989), when the number of known algae reached 270 taxa. Recent contributions have finally leveled the knowledge of the Spanish Basque coast algal flora with nearby areas (Gorostiaga & Santolaria, 1992; Bárbara & al., 1995; Gorostiaga, 1995; Díez & al., 1996; Secilla & al., 1997, 2000; Gorostiaga & al., 1998; Santolaria & al., 1998).

The aim of the present work is to compile for the first time the marine algal flora (Cyanophyta, Rhodophyta, Heterokontophyta and Chlorophyta) of the Spanish Basque coast. For this purpose a critical review of all published records has been carried out and we have supplemented this information with 37 new records of our collections. This check-list contributes to increasing the understanding of the biogeographical characteristics of this Atlantic area and the knowledge about its biodiversity.

## Material and Methods

The Spanish Basque coast is located in the northern part of the Iberian Peninsula, on the south-eastern corner of the Bay of Biscay (Fig. 1). It is mostly rocky with an exposed to very exposed shore and very few estuaries, all of them small. Following the coastline and including the estuaries, it extends over 300 km from Cape Higer (43°23'46"N; 1°47'24"W) in the East to Kobaron Point (43°21'01" N; 3°09'58" W) in the West. In political terms it comprises the Spanish provinces of Gipuzkoa and Bizkaia. The sea surface temperature ranges from 11 °C to 22 °C in February and August, respectively (Ibáñez, 1990; Borja & al., 2000). Biogeographically, it belongs to the warm temperate NE Atlantic sub-region (Hoek & Breeman, 1990).

The list of marine benthic algae (Cyanophyta, Rhodophyta, Heterokontophyta and Chlorophyta) was compiled after a careful review of all published records and supplemented by our own collections. Unpublished works such as M. Phil. Thesis, Ph.D. Doctoral Thesis and Technical Reports have not been considered. The data presented here date from Montagne (1842) to Díez & al. (2003). First and second records are given for each taxon.

Taxa are named with their nomenclatural authorities, and the names have been abbreviated following Brummitt & Powell (1992). In the Cyanophyta and Chlorophyta orders and families are arranged according to Silva & al. (1996), with some remarks by Komárek & Anagnostidis (1986) and Anagnostidis & Komárek (1988), for the first case. In Rhodophyta, we follow Garbary & Gabrielson (1990), with the addition of the Ahnfeltiales (Maggs & Pueschel 1989), the Gracilariales (Fredericq & Hommersand 1989) and the Plocamiales (Saunders & Kraft 1994), while the order Ceramiales is arranged according to Maggs & Hommersand (1993). The systematic treatment of Phaeophyceae follows Wynne & Kraft (1981). All genera and species are arranged alphabetically.

The present taxonomic status and nomenclatural changes of the taxa concerned have been considered. The check-list includes the synonyms under which a specific or infraspecific taxon has been recorded. Records that need to be confirmed are included in a separate list as *taxa inquirenda*. Likewise, a list of *taxa excludenda* is also given with pertinent comments and references. Specimens of most of the species included in this check-list are deposited in the herbaria of the Basque Country University (BIO), the University of Barcelona (BCF) and the University of Santiago de Compostela (SANT). Information about the abundance estimation and vertical distribution of each species is given together with an indication of the provinces (Gipuzkoa and Bizkaia) from which they have been reported.

The floristic character of Spanish Basque coast flora in relation to cold-water and warm-water poles was compared with that of southern England (Hardy & Guiry, 2003), Brittany (Feldmann, 1954; Feldmann & Magne, 1964; Coppejans, 1995), Galicia (Miranda, 1934; Donze, 1968; Pérez-Cirera, 1975a, 1975b; Niell, 1978; López Rodríguez & Pérez-Cirera, 1990, 1995, 1996; López Rodríguez & al., 1991, 2003; Gallardo & Margalet, 1992; Granja & al., 1992, 1993; Guillerme & Cremades, 1993, 1997; Guillerme & al., 1994; Bárbara & Cremades, 1996; Otero-Schmitt & Pérez-Cirera, 1996, 1998, 2002; Cremades & al., 1997b, 2002; Veiga & al., 1997, 1998a, 1998b; Bárbara & al., 2002, 2003; Calvo & Bárbara, 2002, 2003, in press; Peña & Bárbara, 2002, 2003a, 2003b), the Atlantic coast of the southern Iberian Peninsula (Ardré, 1970, 1971; Flores Moya & al., 1995a, 1995b; Conde & al., 1996; Conde & Flores Moya, 2000; Báez & al., 2001), Morocco (Benhissoune & al., 2001, 2002a, 2002b, 2003), the Canary Islands (Haroun & al., 2002) and the Mediterranean coast of Andalusia (Flores Moya & al., 1995a, 1995b; Conde & al., 1996) using Cheney's ratio [(R+C)/P] (Cheney, 1977).



**Fig. 1.** Map showing the location of the Spanish Basque Country and the regions with which its flora is compared.

## Results and Discussion

The known list of benthic marine algae from the Spanish Basque coast now totals 372 taxa (354 species and 18 infraspecific taxa): 23 Cyanophyta, 221 Rhodophyta, 74 Heterokontophyta and 54 Chlorophyta (Table 1). In addition, 16 taxa are considered as *taxa inquirenda* and 8 as *taxa excludenda*.

This flora includes several warm-temperate species which reach their northern limit of distribution in this area. Most of these species are rare or very rare on the Basque coast such as *Bryopsis pennata*, *Pedobesia simplex*, *Hydroclathrus clathratus*, *Sargassum vulgare*, *Ceramium tenerimum*, *Chrysomenia ventricosa*, *Halopitilon virgatum* and *Pleonosporium caribaeum*. However, within this group there are frequently found species such as *Colpomenia sinuosa*, *Spatoglossum solieri*, *Dasya rigidula* and *Peyssonnelia squamaria* and seasonally abundant species such as *Centroceras clavulatum* and *Hypnea musciformis*.

Various cold-temperate macrophytes (mostly fucoids and kelps) which are common along the coasts of Galicia, England and Brittany are not abundant on the Spanish Basque coast. These include: *Ascophyllum nodosum*, *Fucus ceranoides*, *F. spiralis*, *F. vesiculosus*, *Halidrys siliquosa*, *Laminaria ochroleuca*, *Pelvetia canaliculata*, *Saccorbiza polyschides*, *Chondrus crispus* and *Mastocarpus stellatus*. Other macrophytes frequently found in the nearby Atlantic regions but absent on the Basque coast are: *Chorda filum*, *Desmarestia aculeata*, *Fucus serratus*, *Himantalia elongata*, *Laminaria digitata*, *L. hyperborea*, *L. saccharina*, *Dellesseria sanguinea*, *Dilsea carnosa*, *Dumontia contorta*, *Membranoptera alata*, *Palmaria palmata*, *Phycodryus rubens* and *Rhodomela confervoides*.

The presence of *Colpomenia sinuosa*, *Hydroclathrus clathratus*, *Sargassum vulgare*, *Spatoglossum solieri*, *Centroceras clavulatum* and *Halopitilon incurva* establishes interesting floristic differences with respect to the Northwest coast of Iberian Peninsula, where these species are absent. Likewise, among the benthic marine flora from the Basque coast should be emphasized the presence of an endemism, *Fucus chalonii*. There are only two known populations of this dwarf species of *Fucus* located at Andagorria inlet (French Basque coast) and at Ogeia inlet (Spanish Basque coast).

The most common macrophytes in the subtidal zone are: *Mesophyllum lichenoides*, *Gelidium sesquipedale*, *Cystoseira baccata*, *Pterosiphonia complanata*, *Falkenbergia rufolanosa* (the tetrasporophytic phase of *Asparagopsis armata*), *Zanardinia typus*, *Corallina officinalis*, *Codium decortcatum*, *Plocamium cartilagineum* and *Dictyota dichotoma* (Gorostiaga &

al., 1998; Díez & al., 2003). In the intertidal zone the most frequent macrophytes forming belts are the chlorophytes *Blidingia minima*, *Codium adhaerens*, *Ulva clathrata*, *U. compressa*, *U. rigida*, the brown algae *Bifurcaria bifurcata*, *Cladostephus spongiosus*, *Ralfsia verrucosa* and *Stypocaulon scoparium* as well as the rhodophytes *Corallina elongata*, *Caulacanthus ustulatus*, *Ceramium ciliatum*, *Chondracanthus acicularis*, *Chondria coerulea*, *Gelidium spinosum*, *G. pusillum*, *Halopitilon incurva*, *Jania rubens*, *Lithophyllum incrustans*, *L. byssoides*, *Osmundea pinnatifida* and *Pterosiphonia complanata*.

According to the literature consulted, the Cheney's ratio for the Basque coast (4.09) is high compared with nearby regions (Table 2), indicating its warm-water character and, after data compiled by Álvarez & al. (1988), significantly greater than for the Atlantic Iberian Peninsula considered as a whole (3.10). From a physiological viewpoint, Basque benthic vegetation more closely resembles that of southern regions, due to the absence or very rare occurrence of large fucoids and kelps (in the intertidal and subtidal zones, respectively) and the presence of *Gelidium corneum* and *Cystoseira baccata* stands in the subtidal zone.

The present composition of seaweed floras at a worldwide scale is explained on the basis of species' temperature responses (in some cases in combination with photoperiod responses), and taking into account paleoclimatological aspects and the displacement of coastlines in geological periods (Athanasiadis, 1990; Hoek & al., 1990). The flora of the north coast of Spain falls within the warm temperate NE Atlantic subregion according to the phytogeographical scheme proposed by Hoek & Breeman (1990). However, on this coast, of similar latitude throughout, there are significant floristic differences between the western and eastern coasts, with the Basque coast flora showing fewer cold-temperate species and more Mediterranean species than that of Galicia. This 'southern character' of Basque coast flora may be explained by the fact that the surface water of this part of the Bay of Biscay is warmed in summer up to 22°C (August isotherm) in contrast to Galicia which only reaches 19°C. In addition, some areas of the northwest coast of Spain are affected by episodic upwelling events during summer. The warming process of waters off the Basque coast is the result of the entrainment of water masses in the southern corner of the Bay of Biscay due to the abatement of the winds and sea current regimes during summer (Borja & al., 1996).

Bornet (1892: footnote to pp. 167-168), who was apparently unfamiliar with the flora of Galicia, thought that



the flora of Biarritz (French Basque coast) extended without much change along the coast of Spain, Portugal, and Morocco. Sauvageau (1897), after seeing specimens of cold-water Fucales collected by Durieu de Maisonneuve at Gijón (Asturias) in 1835, doubted about Borne's conclusion and, to settle the matter, collected along the north coast of Spain as far west as A Coruña (Galicia). He concluded that the flora of the Basque coast was an interruption of the flora that was common to Brittany and Galicia. Similarly, Feldmann & Lami (1941) pointed out the southern character of the Basque coast, describing it as “une enclave très remarquable d'une végétation à nombreux éléments subtropicaux au sein de la région boréale tempérée”. On the basis of data gathered from

literature and supplemented by personal observations, Hoek & Donze (1966, 1967) concluded that “floristically and as regards temperature-range of the surface-water, the Côte Basque finds its logical place in between Morocco and NW. Spain.” Likewise, the same authors pointed out that the physiognomical resemblance between the algal flora of the Basque coast and that of Morocco explains the stress placed by phycologists on the southern character of the algal flora of the Basque coast. Subsequently, Álvarez Cobelas & al. (1989), studying floristic data of Iberian Peninsula, found a great similarity between Gipuzkoa and the South of Portugal. As other works before, the results from our check-list emphasises the meridional character of this Atlantic coast.

**Table 1.** Check-list of the benthic marine algae of the Spanish Basque coast. **B** = Bizkaia; **G** = Gipuzkoa; **A** = Abundance (**VR** = Very rare, occasional specimens; **R** = Rare, dispersed specimens with a low frequency of appearance; **F** = Frequent, dispersed specimens with a high frequency of appearance; **C** = Common, specimens forming patches; **VC** = Very common, specimens forming belts); **BL** = Bathymetric level (**Sd** = Deep sublittoral, >15 m depth; **Ss** = Shallow sublittoral, 0-15 m depth; **Ll** = Low littoral, zone between low spring tide level and lower limit of barnacles belt; **Lm** = Mid littoral, barnacles belt; **Lh** = High littoral, zone between upper barnacles belt and upper limit of winkles; **P** = Pools); **1<sup>st</sup> R** = first published record; **2<sup>nd</sup> R** = second published record.

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
CYANOPHYTA						
CYANOPHYCEAE						
CHROOCOCCALES						
Dermocarpellaceae						
<b>Stanieria</b>						
<i>Stanieria sublittoralis</i> (A. Lindst.) Anagn. & Pantaz.	*		F	Ll, Lm, Lh	This work	
Entophysalidaceae						
<b>Entophysalis</b>						
<i>Entophysalis deusta</i> (Menegh.) F.E. Drouet & W.A. Daily	*	*	F	Ll, Lh	110	54
Xenococcaceae (1)						
<b>Myxosarcina</b>						
<i>Myxosarcina gloeocapsoides</i> (Setch. & N.L. Gardner) Komárek & Anagn. = <i>Pleurocapsa gloeocapsoides</i> Setch. & N.L. Gardner	*		F	Ll, Lm, Lh	93	
<b>Xenococcus</b> (1)						
<i>Xenococcus schousboei</i> Thur.	*		R	Ll, Lm, Lh	This work	
OSCILLATORIALES						
Pseudoanabaenaceae						
<b>Spirocoleus</b>						
<i>Spirocoleus battersii</i> (Gomont) P.C. Silva (2) = <i>Plectonema battersii</i> Gomont	*	*	R	Lm, Lh	110	
<i>Spirocoleus fragilis</i> (Menegh.) P.C. Silva (2) = <i>Phormidium fragile</i> (Menegh.) Gomont	*		F	Ll, Lm, Lh	This work	
<i>Spirocoleus tenuis</i> (Menegh.) P.C. Silva (2) = <i>Phormidium tenue</i> (Menegh.) Gomont	*		R	Lh	This work	
Schizotrichaceae						
<b>Schizotrix</b>						
<i>Schizotrix tenerrima</i> (Gomont) F.E. Drouet = <i>Microcoleus tenerrimus</i> Gomont		*	F	Lh	110	
Oscillatoriaceae						
<b>Lyngbya</b>						
<i>Lyngbya aestuarii</i> (Mert.) Liebm.	*		C	Ll, Lm, Lh	This work	
<i>Lyngbya majuscula</i> (Dillwyn) Harv.		*	R	Lm	110	
<i>Lyngbya semiplena</i> (C. Agardh) J. Agardh		*	R	Lm, Ll	110	
<b>Oscillatoria</b>						
<i>Oscillatoria bonnemaisonii</i> (P. Crouan & H. Crouan) P. Crouan & H. Crouan	*		C	Ll, Lm, Lh		
<b>Plectonema</b>						
<i>Plectonema golenkinianum</i> Gomont (3)	*		R	Ll, Lm	This work	

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>Microcoleus</b>						
<i>Microcoleus chthonoplastes</i> (Mert.) Zanardini	*		R	Ll	This work	
<b>Phormidium</b>						
<i>Phormidium autumnale</i> (C. Agardh) Trevis. ex Gomont	*		C	Ll, Lm, Lh	93	
<i>Phormidium formosum</i> (Bory) Anagn. & Komárek	*		R	Ll, Lm, Lh	This work	
<i>Phormidium laetevirens</i> (P. Crouan & H. Crouan) Anagn. & Komárek	*		F	Ll, Lm, Lh	This work	
<i>Phormidium nigroviride</i> (Thwaites) Anagn. & Komárek	*		C	Ll, Lm, Lh	This work	
<i>Phormidium papyraceum</i> (C. Agardh) Kütz.	*		R	Lm, Lh	This work	
<b>Spirulina</b>						
<i>Spirulina labyrinthiformis</i> (Menegh.) Gomont	*		R	Ll, Lm	This work	
<b>Symploca</b>						
<i>Symploca hydroides</i> (Harv.) Kütz.	*		VC	Ll, Lm, Lh	93	
NOSTOCALES						
Nostocaceae						
<b>Isocystis</b>						
<i>Isocystis lithophila</i> Erceg.	*		R	Lm, Lh	This work	
Rivulariaceae						
<b>Calothrix</b>						
<i>Calothrix scopulorum</i> (F. Weber & D. Morh) C. Agardh ex Bornet & Flahault	*		F	Lh	110	
RHODOPHYTA						
RHODOPHYCEAE						
PORPHYRIDIALES						
Porphyridiaceae						
<b>Stylonema</b>						
<i>Stylonema alsidii</i> (Zanardini) K.M. Drew	*	*	F	Ss, Ll	40	18
= <i>Goniotrichum alsidii</i> (Zanardini) M.A. Howe						
<i>Stylonema cornu-cervi</i> Reinsch			*	F	Ss	40
= <i>Goniotrichum cornu-cervi</i> (Reinsch) Hauck						
COMPSOPOGONALES						
Erythropeltidaceae						
<b>Erythrotrichia</b>						
<i>Erythrotrichia carnea</i> (Dillwyn) J. Agardh	*		F	Ss, Ll, Lm	40	
<i>Erythrotrichia reflexa</i> (P. Crouan & H. Crouan) Thur. ex De Toni	*		R	Ss, Ll	37	
<b>Porphyrostromium</b>						
<i>Porphyrostromium boryanum</i> (Mont.) P.C. Silva	*		R	Ss	This work	
AHNFELTIALES						
Ahnfeltiaceae						
<b>Ahnfeltia</b>						
<i>Ahnfeltia plicata</i> (Huds.) Fr.	*	*	F	Ss, Ll	44	37
= <i>Gymnogongrus plicatus</i> (Huds.) Kütz.						
BANGIALES						
Bangiaceae						
<b>Bangia</b>						
<i>Bangia atropurpurea</i> (Roth) C. Agardh	*	*	C	Ll, Lm, Lh	118	166
= <i>Bangia fuscopurpurea</i> (Dillwyn) Lyngb.						
<b>Porphyra</b>						
<i>Porphyra leucosticta</i> Thur.	*	*	F	Ll, Lm	40	54
<i>Porphyra linearis</i> Grev.	*	*	C	Lh	119	27
<i>Porphyra umbilicalis</i> (L.) Kütz.	*	*	C	Lm, Lh	118	37
ACROCHAETIALES						
Acrochaetiaceae						
<b>Acrochaetium</b>						
<i>Acrochaetium codii</i> (P. Crouan & H. Crouan) Hamel		*	F	Ss, Ll, Lm	39	37
= <i>Audouinella codii</i> (P. Crouan & H. Crouan) Garbary						
<i>Acrochaetium corymbiferum</i> (Thur.) Batters	*		R	Ss	This work	
<i>Acrochaetium secundatum</i> (Lyngb.) Nägeli	*		VR	Lm	156	
<b>Colaconema</b>						
<i>Colaconema caespitosum</i> (J. Agardh) Jackelman, Stegenga & J.J. Bolton	*		F	Ss, Ll	This work	
<i>Colaconema daviesii</i> (Dillwyn) Stegenga	*		R	Ss	This work	
<b>Schmitziella</b>						
<i>Schmitziella endophloea</i> Bornet & Batters (4)	*	*	F	Ss, Ll, Ll(P)	39	84

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>NEMALIALES</b>						
Galaxauraceae						
<b>Scinia</b>						
<i>Scinia furcellata</i> (Turner) J. Agardh = <i>Scinia forcillata</i> Biv.-Bern.	*	*	F	Ss, LI, LI(P)	118	125
Nemaliaceae						
<b>Nemalion</b>						
<i>Nemalion helminthoides</i> (Velle) Batters	*	*	C	Lm	118	37
Liagoraceae						
<b>Helminthocladia</b>						
<i>Helminthocladia calvadosii</i> (J.V. Lamour. ex Duby) Setch.		*	VR	Ss	39	
<b>Liagora</b>						
<i>Liagora viscida</i> (Forssk.) C. Agardh	*		F	Ss	This work	
<b>GELIDIALES</b>						
Gelidiaceae						
<b>Gelidiella</b>						
<i>Gelidiella pannosa</i> (Feldmann) Feldmann & Hamel (5)		*	VR	Lm, Lh	110	
<b>Gelidium</b>						
<i>Gelidium corneum</i> (Huds.) J.V. Lamour. (6)	*	*	VC	Ss, LI	44	68
= <i>Gelidium sesquipedale</i> (Clemente) Thur. var. <i>pectinatum</i> Ardiss. & Straff.		*	VR	Ss, LI	39	
= <i>Gelidium pectinatum</i> Schousb. ex Mont., nom. illeg.						
<i>Gelidium crinale</i> (Turner) Gaillon	*	*	R	LI, Lm	5	37
<i>Gelidium pulchellum</i> (Turner) Kütz. (7)	*	*	C	LI, Lm	110	37
<i>Gelidium pusillum</i> (Stackh.) Le Jol. var. <i>pulvinatum</i> (C. Agardh) Feldmann	*	*	C	LI, Lm	41	114
		*	F	Lm	7	
<i>Gelidium spinosum</i> (S.G. Gmel.) P.C. Silva (8)	*	*	C	Ss, LI, Lm(P)	68	110
= <i>Gelidium latifolium</i> Bornet ex Hauck = <i>Gelidium latifolium</i> (Grev.) Bornet & Thur. (9) = <i>Gelidium attenuatum</i> (Turner) Thur. (10)						
<b>Pterocladia</b>						
<i>Pterocladia capillacea</i> (S.G. Gmel.) Santelices & Hommers. (11) = <i>Pterocladia capillacea</i> (S.G. Gmel.) Bornet & Thur.	*	*	F	Ss, LI, LI(P)	68	110
<b>HILDENBRANDIALES</b>						
Hildenbrandiaceae						
<b>Hildenbrandia</b>						
<i>Hildenbrandia crouaniorum</i> J. Agardh	*	*	R	LI, Lm(P)	18	
<i>Hildenbrandia rubra</i> (Sommerf.) Menegh. = <i>Hildenbrandia prototypus</i> Nardo	*	*	C	Lm, Lh	110	39
<b>CORALLINALES</b>						
Corallinaceae						
<b>Amphiroa</b>						
<i>Amphiroa van-bosseae</i> Me. Lemoine (12)	*		F	LI(P), Lm(P)	18	49
<i>Amphiroa rigida</i> J.V. Lamour	*	*	VR	Lm(P)	118	85
<b>Choreonema</b>						
<i>Choreonema thuretii</i> (Bornet) F. Schmitz	*		VR	LI	18	
<b>Corallina</b>						
<i>Corallina elongata</i> J. Ellis & Sol. = <i>Corallina mediterranea</i> Aresch.	*	*	VC	Ss, LI, Lm, Lm, P	118	82
<i>Corallina officinalis</i> L.	*	*	C	Ss, LI(P)	65	68
<b>Haliptilon</b>						
<i>Haliptilon squamatum</i> (L.) Johansen, L.M. Irvine & Webster = <i>Corallina squamata</i> L.	*	*	VR	Ss	82	37
<i>Haliptilon virgatum</i> (Zanardini) Garbary & H.W. Johans. = <i>Corallina granifera</i> J. Ellis & Sol.		*	VR	Ss, LI	39	37
<b>Hydrolithon</b>						
<i>Hydrolithon farinosum</i> (J.V. Lamour.) Penrose & Y.M. Chamb. = <i>Fosliella farinosa</i> (J.V. Lamour.) M. Howe	*		F	Ss, LI	39	
<b>Jania</b>						
<i>Jania longifurca</i> Zanardini	*	*	VR	Ss	82	115
<i>Jania rubens</i> (L.) J.V. Lamour. var. <i>corniculata</i> (L.) Yendo	*	*	C	Ss, LI	110	118
= <i>Jania corniculata</i> (L.) J.V. Lamour.	*	*	C	Ss, LI, Lm(P)	37	84

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>Lithophyllum</b>						
<i>Lithophyllum byssoides</i> (Lamarck) Foslie (13) = <i>Lithophyllum tortuosum</i> (Esper) Foslie = <i>Tenarea tortuosa</i> (Esper) Me. Lemoine	*	*	C	Lm	65	66
<i>Lithophyllum incrustans</i> Phil.	*	*	VC	Ss, Ll, Ll-Lm(P)	110	7
<b>Melobesia</b>						
<i>Melobesia membranacea</i> (Esper) J.V. Lamour.	*	*	F	Ss, Ll	110	39
<b>Mesophyllum</b>						
<i>Mesophyllum lichenoides</i> (J. Ellis & Sol.) Me. Lemoine	*	*	VC	Sd, Ss, Ll, Ll(P)	110	118
<b>Phymatolithon</b>						
<i>Phymatolithon lenormandii</i> (Aresch.) W.H. Adey = <i>Lithothamnion lenormandii</i> (Aresch.) Foslie	*	*	F	Ss, Ll	65	110
<b>Titanoderma</b>						
<i>Titanoderma pustulatum</i> (J.V. Lamour.) Nägeli = <i>Lithophyllum pustulatum</i> (J.V. Lamour.) Foslie = <i>Dermatolithon pustulatum</i> (J.V. Lamour.) Foslie	*	*	F	Ss, Ll	110	39
PALMARIALES						
Rhodophysemataceae						
<b>Rhodophysema</b>						
<i>Rhodophysema elegans</i> (P. Crouan & H. Crouan ex J. Agardh) P.S. Dixon	*		R	Ss	39	37
Rhodothamniellaceae						
<b>Rhodothamniella</b>						
<i>Rhodothamniella floridula</i> (Dillwyn) Feldmann = <i>Audouinella floridula</i> (Dillwyn) Woelk.	*	*	R	Ll, Lm	118	64
GIGARTINALES						
Caulacanthaceae						
<b>Catenella</b>						
<i>Catenella caespitosa</i> (With.) L.M. Irvine = <i>Catenella repens</i> (Lightf.) Batters = <i>Catenella opuntia</i> (Gooden. & Woodw.) Grev., nom. illeg.	*	*	C	Lm	44	66
<b>Caulacanthus</b>						
<i>Caulacanthus ustulatus</i> (Turner) Kütz.	*	*	C	Ll, Lm	110	118
Cystocloniaceae						
<b>Calliblepharis</b>						
<i>Calliblepharis ciliata</i> (Huds.) Kütz.	*	*	F	Sd, Ss, Ll	44	118
<i>Calliblepharis jubata</i> (Gooden. & Woodw.) Kütz.	*	*	F	Ll, Ll(P)	82	144
<b>Rhodophyllis</b>						
<i>Rhodophyllis divaricata</i> (Stackh.) Papenf.	*	*	F	Ss, Ll	5	39
Dumontiaceae						
<b>Dudresnaya</b>						
<i>Dudresnaya verticillata</i> (With.) Le Jol.	*		R	Ss	27	87
Furcellariaceae						
<b>Halarachnion</b>						
<i>Halarachnion ligulatum</i> (Woodw.) Kütz. (14)	*		VR	Ss	27	
Gigartinaceae						
<b>Chondracanthus</b>						
<i>Chondracanthus acicularis</i> (Roth) Fredericq = <i>Gigartina acicularis</i> (Roth) J.V. Lamour.	*	*	C	Ss, Ll, Lm	7	118
<i>Chondracanthus teedei</i> (Mert. ex Roth) Kütz. (15) = <i>Gigartina teedii</i> (Roth) J.V. Lamour.	*	*	R	Ss, Ll	110	118
<b>Chondrus</b>						
<i>Chondrus crispus</i> Stackh.	*	*	R	Ll	118	82
<b>Gigartina</b>						
<i>Gigartina pistillata</i> (S.G. Gmel.) Stackh.	*	*	F	Ss, Ll	5	27
Gloiosiphoniaceae						
<b>Schimmelmannia</b>						
<i>Schimmelmannia schousboei</i> (J. Agardh) J. Agardh	*	*	VR	Ss	91	52
Halymeniaceae						
<b>Cryptonemia</b>						
<i>Cryptonemia lomation</i> (Bertol.) J. Agardh = <i>Cryptonemia seminervis</i> (C. Agardh) J. Agardh	*	*	F	Sd, Ss	39	84



Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>Grateloupia</b>						
<i>Grateloupia dichotoma</i> J. Agardh	*	*	R	Ss, Ll, Lm(P)	39	87
<i>Grateloupia filicina</i> (J.V. Lamour.) C. Agardh	*	*	F	Ss, Ll, Lm(P)	44	82
var. <i>luxurians</i> A. Gepp & E. Gepp			R	Ll	39	37
<b>Halymenia</b>						
<i>Halymenia latifolia</i> P. Crouan & H. Crouan ex Kütz.	*		R	Ss	87	53
Hypneaceae						
<b>Hypnea</b>						
<i>Hypnea musciformis</i> (Wulfen) J.V. Lamour.	*	*	F	Ss, Ll, Ll(P)	90	39
Kallymeniaceae						
<b>Callophyllis</b>						
<i>Callophyllis laciniata</i> (Huds.) Kütz.	*	*	F	Sd, Ss	44	82
<b>Kallymenia</b>						
<i>Kallymenia reniformis</i> (Turner) J. Agardh	*	*	R	Ss	87	
<b>Meredithia</b>						
<i>Meredithia microphylla</i> (J. Agardh) J. Agardh	*	*	VR	Sd, Ss	39	87
= <i>Kallymenia microphylla</i> J. Agardh						
Nemastomataceae						
<b>Itonoa</b>						
<i>Itonoa marginifera</i> (J. Agardh) Masuda & Guiry	*		R	Ss	This work	
= <i>Platoma marginifera</i> (J. Agardh) Batters						
Petrocelidaceae						
<b>Mastocarpus</b>						
<i>Mastocarpus stellatus</i> (Stackh.) Guiry (16)	*	*	F	Lm	66	68
= <i>Gigartina stellata</i> (Stackh.) Batters						
Peyssonneliaceae						
<b>Peyssonnelia</b>						
<i>Peyssonnelia atropurpurea</i> P. Crouan & H. Crouan		*	F	Ss, Ll	39	
<i>Peyssonnelia coriacea</i> Feldmann	*	*	F	Sd, Ss, Ll	90	36
<i>Peyssonnelia dubyi</i> P. Crouan & H. Crouan	*		R	Ll	156	
<i>Peyssonnelia harveyana</i> P. Crouan & H. Crouan ex J. Agardh	*		R	Ss	156	
<i>Peyssonnelia rubra</i> (Grev.) J. Agardh (17)	*	*	VR	Ss	118	85
<i>Peyssonnelia squamaria</i> (S.G. Gmel.) Decne.	*	*	F	Sd, Ss, Ll	44	82
Phyllophoraceae						
<b>Ahnfeltiopsis</b>						
<i>Ahnfeltiopsis devoniensis</i> (Grev.) P.C. Silva & DeCew	*	*	C	Ss, Ll	37	18
= <i>Gymnogongrus devoniensis</i> (Grev.) Schotter						
<b>Erythrodermis</b>						
<i>Erythrodermis traillii</i> (Holmes ex Batters) Guiry & Garbary		*	VR	Ll	39	
= <i>Phyllophora traillii</i> Holmes ex Batters						
<b>Gymnogongrus</b>						
<i>Gymnogongrus crenulatus</i> (Turner) J. Agardh	*	*	F	Ss, Ll	151	89
<i>Gymnogongrus griffithsia</i> (Turner) Mart.	*	*	F	Ll, Lm	118	27
<b>Phyllophora</b>						
<i>Phyllophora crispa</i> (Huds.) P.S. Dixon	*	*	R	Ss, Ll	39	156
<b>Schottera</b>						
<i>Schottera nicaeënsis</i> (J.V. Lamour. ex Duby) Guiry & Hollenb.		*	VR	Ll	39	
<b>Stenogramme</b>						
<i>Stenogramme interrupta</i> (C. Agardh) Mont. ex Harv.	*	*	F	Sd, Ss	118	37
Schizymeniaceae						
<b>Schizymenia</b>						
<i>Schizymenia dubyi</i> (Chauv. ex Duby) J. Agardh (18)	*	*	F	Ss, Ll	110	82
Sphaerococcaceae						
<b>Sphaerococcus</b>						
<i>Sphaerococcus coronopifolius</i> Stackh. (19)	*	*	F	Sd, Ss, Ll	44	118
= <i>Rhynchococcus coronopifolia</i> (Stackh.) Kütz.						
GRACILARIALES						
Gracilariaceae						
<b>Gracilaria</b>						
<i>Gracilaria bursa-pastoris</i> (S.G. Gmel.) P.C. Silva	*		R	Ss, Ll	125	87

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<i>Gracilaria gracilis</i> (Stackh.) Steentoft, L.M. Irvine & Farnham (20)	*		C	Ss, LI	This work	
<i>Gracilaria multipartita</i> (Clemente) Harv. (21)	*	*	F	Ss, LI	39	84
BONNEMAISONIALES						
Bonnemaisoniaceae						
<b>Asparagopsis</b>						
<i>Asparagopsis armata</i> Harv. (22)	*	*	VC	Ss, LI, LI(P)	110	7
<b>Bonnemaisonia</b>						
<i>Bonnemaisonia asparagoides</i> (Woodw.) C. Agardh (23)	*	*	F	Ss, LI	118	90
<i>Bonnemaisonia clavata</i> Hamel	*		VR	Ss	150	
<i>Bonnemaisonia hamifera</i> Har. (24)	*	*	C	Ss, LI	118	39
Naccariaceae						
<b>Naccaria</b>						
<i>Naccaria wiggii</i> (Turner) Endl.	*		VR	Ss	87	
PLOCAMIALES						
Plocamiaceae						
<b>Plocamium</b>						
<i>Plocamium cartilagineum</i> (L.) P.S. Dixon = <i>Plocamium vulgare</i> J.V. Lamour.	*	*	C	Sd, Ss, LI	110	118
RHODYMENIALES						
Champiaceae						
<b>Champia</b>						
<i>Champia parvula</i> (C. Agardh) Harv.	*	*	F	Ss, LI	110	7
<b>Chylocladia</b>						
<i>Chylocladia verticillata</i> (Lightf.) Bliding	*	*	F	Ss, LI, LI(P)	5	82
<b>Gastroclonium</b>						
<i>Gastroclonium clavatum</i> (Rothpletz) Ardiss.		*	VR	LI	39	
<i>Gastroclonium ovatum</i> (Huds.) Papenf.	*	*	F	Ss, LI, LI(P)	110	118
<i>Gastroclonium reflexum</i> (Chauv.) Kütz.	*	*	F	Ss, LI	18	150
Lomentariaceae						
<b>Lomentaria</b>						
<i>Lomentaria articulata</i> (Huds.) Lyngb.	*	*	F	LI, Lm	110	118
<i>Lomentaria clavellata</i> (Turner) Gaillon	*	*	R	Ss, LI	27	39
<i>Lomentaria orcadensis</i> (Harv.) Collins ex W.R. Taylor	*		R	Ss	87	
Rhodymeniaceae						
<b>Chrysiyenia</b>						
<i>Chrysiyenia ventricosa</i> (J.V. Lamour.) J. Agardh	*	*	VR	Ss	92	
<b>Rhodymenia</b>						
<i>Rhodymenia holmesii</i> Ardiss.		*	F	Sd, Ss, LI	39	37
<i>Rhodymenia pseudopalmata</i> (J.V. Lamour.) P.C. Silva = <i>Rhodymenia palmetta</i> (J.V. Lamour.) Grev.	*	*	C	Sd, Ss, LI	90	39
CERAMIALES						
Ceramiaceae						
<b>Aglaothamnion</b>						
<i>Aglaothamnion cordatum</i> (Børgesen) Feldm.-Maz. (25) = <i>Aglaothamnion neglectum</i> Feldm.-Maz. = <i>Callithamnion cordatum</i> Børgesen = <i>Callithamnion neglectum</i> (Feldm.-Maz.) M.J. Wynne	*	*	F	Ss, LI	36	87
<i>Aglaothamnion feldmanniae</i> Halos	*	*	R	Ss	39	150
<i>Aglaothamnion gallicum</i> (Nägeli) Halos ex Ardré (26) = <i>Aglaothamnion brodiaei</i> auct. = <i>Callithamnion brodiaei</i> auct.		*	F	Ss, LI, Lm, P	39	
<i>Aglaothamnion hookeri</i> (Dilwyn) Maggs & Hommers. (27) = <i>Aglaothamnion scopulorum</i> (C. Agardh) Feldm.-Maz. = <i>Callithamnion hookeri</i> (Dilwyn) Gray = <i>Callithamnion polyspermum</i> C. Agardh	*	*	F	LI, Lm, P	110	151
<i>Aglaothamnion pseudobyssooides</i> (P. Crouan & H. Crouan) Halos		*	VR	Ss	39	37
<i>Aglaothamnion tenuissimum</i> (Bonnem.) Feldm.-Maz. (28) = <i>Aglaothamnion byssoides</i> (Arnott ex Harv.) L'Hardy-Halos & Rueness	*	*	C	Ss, P	39	87
= <i>Aglaothamnion furcellariae</i> (J. Agardh) Feldm.-Maz. <i>Aglaothamnion tripinnatum</i> (C. Agardh) Feldm.-Maz. = <i>Callithamnion tripinnatum</i> C. Agardh	*	*	F	Ss, LI	39	84

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>Anotrichium</b>						
<i>Anotrichium furcellatum</i> (J. Agardh) Baldock	*	*	F	Ss	118	37
= <i>Neomonospora furcellata</i> (J. Agardh) Feldm.-Maz. & Meslin						
= <i>Griffithsia furcellata</i> J. Agardh						
<b>Antithamnion</b>						
<i>Antithamnion amphigeneum</i> A. Millar	*		R	Ss	155	156
= <i>Antithamnion algeriense</i> M. Verlaque & Seridi						
<i>Antithamnion cruciatum</i> (C. Agardh) Nägeli	*	*	VR	Ss, LI	110	151
= <i>Antithamnion cruciatum</i> var. <i>profundum</i> Feldm.-Maz.						
<i>Antithamnion densum</i> (Suhr) Howe	*		VR	Ss, LI	18	
<i>Antithamnion villosum</i> (Kütz.) Athanas.	*		R	Ss	18	52
<b>Antithamnionella</b>						
<i>Antithamnionella boergeseni</i> (Cormaci & G. Furnari) Athanas. (29)	*		R	LI, LI(P)	54	
= <i>Antithamnionella elegans</i> var. <i>boergeseni</i> Cormaci & G. Furnari						
<i>Antithamnionella elegans</i> (Berthold) J.H. Price & D.M. John		*	R	Ss, LI	39	
<i>Antithamnionella spirographidis</i> (Schiffn.) E.M. Wollaston	*	*	F	Ss, LI	27	151
= <i>Antithamnion spirographidis</i> Schiffn.						
<i>Antithamnionella ternifolia</i> (Hook.f. & Harv.) Lyle	*	*	F	Ss, LI	37	18
= <i>Antithamnionella sarniensis</i> Lyle						
<b>Bornetia</b>						
<i>Bornetia secundiflora</i> (J. Agardh) Thur.	*	*	F	Ss, LI	5	39
<b>Callithamniella</b>						
<i>Callithamniella tingitana</i> (Schousb.) Feldm.-Maz.	*		VR	LI	150	
<b>Callithamnion</b>						
<i>Callithamnion corymbosum</i> (Sm.) Lyngb.	*	*	R	Ss, LI	39	84
<i>Callithamnion granulatum</i> (Ducluz.) C. Agardh.	*	*	F	Ss, LI	110	7
<i>Callithamnion tetragonum</i> (With.) Gray	*	*	F	Ss, LI	39	39
= <i>Callithamnion tetragonum</i> var. <i>brachiatum</i> (Bonnem.) J. Agardh (30)						
<i>Callithamnion tetricum</i> (Dillwyn) Gray	*	*	F	LI, Lm	110	89
<b>Centroceras</b>						
<i>Centroceras clavulatum</i> Mont.	*		F	LI, LI(P)	This work	
<b>Ceramium</b>						
<i>Ceramium botryocarpum</i> A.W. Griffiths ex Harv.	*		F	LI, Lm(P)	150	54
<i>Ceramium ciliatum</i> (J. Ellis) Ducluz.	*	*	C	Ss, LI	110	7
<i>Ceramium cimbricum</i> H. Petersen	*		R	Ss	150	54
<i>Ceramium codii</i> (H. Richards) Feldm.-Maz.		*	VR	Ss, LI	110	39
<i>Ceramium diaphanum</i> (Lightf.) Roth (31)	*	*	R	Ss, LI	7	118
= <i>Ceramium tenuissimum</i> (Roth) J. Agardh						
<i>Ceramium echionotum</i> J. Agardh (32)	*	*	F	Ss, LI	110	5
<i>Ceramium flaccidum</i> (Harv. ex Kütz.) Ardiss.	*		F	Ss, LI, Lm(P)	110	39
= <i>Ceramium gracillimum</i> (Kütz.) Zanardini						
<i>Ceramium gaditanum</i> (Clemente) Cremades		*	R	LI, Lm	110	5
= <i>Ceramium flabelligerum</i> J. Agardh						
<i>Ceramium pallidum</i> (Nägeli ex Kütz.) Maggs & Hommers.	*		R	Ss, LI	150	
<i>Ceramium rubrum</i> C. Agardh (33)	*	*	F	Ss, LI	44	110
= <i>Ceramium nodulosum</i> (Lightf.) Ducluz.						
<i>Ceramium secundatum</i> Lyngb. (34)		*	F	Ss, LI	39	
= <i>Ceramium rubrum</i> var. <i>barbatum</i> Feldm.-Maz.						
<i>Ceramium shuttleworthianum</i> (Kütz.) Rabenh.		*	VR	Lm	5	
= <i>Ceramium acanthonotum</i> (Carmich. ex Harv.) J. Agardh						
<i>Ceramium strictum</i> Harv.	*		VR	Ss, LI	18	
<i>Ceramium tenerrimum</i> (G. Martens) Okamura	*	*	R	Ss, LI	110	39
<b>Compsothamnion</b>						
<i>Compsothamnion decompositum</i> (J. Agardh) Maggs & L'Hardy-Halos	*	*	VR	Ss, LI	39	156
= <i>Mesothamnion distichum</i> Halos ex South & Tittley, nom. illeg.						
<i>Compsothamnion gracillimum</i> De Toni	*		R	ss, LI	This work	
<i>Compsothamnion thuyoides</i> (Sm.) Nägeli	*	*	F	Ss, LI	110	39
<b>Crouania</b>						
<i>Crouania attenuata</i> (C. Agardh) J. Agardh	*	*	R	Ss	110	39
<b>Gymnothamnion</b>						
<i>Gymnothamnion elegans</i> (Schousb. ex C. Agardh) J. Agardh	*	*	VR	Ss, LI	110	39
<b>Halurus</b>						
<i>Halurus equisetifolius</i> (Lightf.) Kütz.	*	*	F	Ss, LI	5	144, 151
<i>Halurus flosculosus</i> (J. Ellis) Maggs & Hommers.	*	*	F	LI	5	18

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
= <i>Griffithsia flosculosa</i> (J. Ellis) Batters						
<b>Microcladia</b>						
<i>Microcladia glandulosa</i> (Sol. ex Turner) Grev.	*	*	F	Ss, LI, LI(P)	125	39
<b>Monosporus</b>						
<i>Monosporus pedicellatus</i> (Sm.) Solier	*	*	R	Ss, LI	118	151
= <i>Corynospora pedicellata</i> (Sm.) J. Agardh						
<b>Pleonosporium</b>						
<i>Pleonosporium borrieri</i> (Sm.) Nägeli ex Hauck	*	*	F	Ss, LI, LI(P), Lm	7	118
<i>Pleonosporium caribaeum</i> (Børgesen) R.E. Norris			VR	LI	39	
= <i>Mesothamnion caribaeum</i> Børgesen						
<i>Pleonosporium flexuosum</i> (C. Agardh) Bornet	*	*	F	Ss, LI	110	88
<b>Pterothamnion</b>						
<i>Pterothamnion crispum</i> (Ducluz.) Nägeli			F	Ss, LI	39	37
<i>Pterothamnion plumula</i> (J. Ellis) Nägeli	*	*	F	Ss, LI	5	27
= <i>Anthithamnion plumula</i> (J. Ellis) Thur. ex Le Jol.						
<b>Ptilothamnion</b>						
<i>Ptilothamnion pluma</i> (Dillwyn) Thur.			VR	LI	39	37
<b>Seirospora</b>						
<i>Seirospora interrupta</i> (Sm.) F. Schmitz	*		R	Ss	39	
<b>Spermothamnion</b>						
<i>Spermothamnion repens</i> (Dillwyn) Rosenv.						
var. <i>flagelliferum</i> (De Not.) Feldm.-Maz.	*	*	R	Ss, LI	39	18
<b>Sphondylothamnion</b>						
<i>Sphondylothamnion multifidum</i> (Huds.) Nägeli	*	*	F	Ss	110	118
<b>Tiffaniella</b>						
<i>Tiffaniella capitata</i> (Schousb. ex Bornet) Doty & Meñez	*		F	Ss, LI	18	
= <i>Tiffaniella capitatum</i> (Schousb. ex Bornet) Doty & Meñez						
Delesseriaceae						
<b>Acrosorium</b>						
<i>Acrosorium ciliolatum</i> (Harv.) Kylin (35)	*	*	C	Ss, LI, P	44	110
= <i>Acrosorium venulosum</i> (Zanardini) Kylin						
= <i>Acrosorium uncinatum</i> sensu Kylin						
= <i>Cryptopleura uncinata</i> (fide Colmeiro, 1867)						
<b>Apoglossum</b>						
<i>Apoglossum ruscifolium</i> (Turner) J. Agardh	*	*	F	Ss, LI	5	82
<b>Cryptopleura</b>						
<i>Cryptopleura ramosa</i> (Huds.) Kylin ex L. Newton (36)	*	*	C	Sd, Ss, LI	44	110
= <i>Nitophyllum laceratum</i> (S.G. Gmel.) Grev.						
= <i>Cryptopleura lacerata</i> (S.G. Gmel.) Kütz.						
= <i>Acrosorium reptans</i> (P. Crouan & H. Crouan) Kylin						
<b>Drachiella</b>						
<i>Drachiella minuta</i> (Kylin) Maggs & Hommers. (37)	*	*	F	Ss, LI	40	87
= <i>Myriogramme minuta</i> Kylin						
<b>Erythroglossum</b>						
<i>Erythroglossum laciniatum</i> (Lightf.) Maggs & Hommers.	*		F	Sd, Ss, LI	87	
<b>Haraldiophyllum</b>						
<i>Haraldiophyllum bonnemaisonii</i> (Kylin) Zinova	*		R	Ss, LI	54	
<b>Hypoglossum</b>						
<i>Hypoglossum hypoglossoides</i> (Stackh.) Collins & Herv.	*	*	F	Ss, LI	118	85
= <i>Hypoglossum woodwardii</i> Kütz.						
<b>Nitophyllum</b>						
<i>Nitophyllum punctatum</i> (Stackh.) Grev.	*	*	C	Ss, LI, LI(P)	118	82
<b>Radicilingua</b>						
<i>Radicilingua thysanorhizans</i> (Holmes) Papenf.	*		R	Ss	156	
Dasyaceae						
<b>Dasya</b>						
<i>Dasya baillouviana</i> (S.G. Gmel.) Mont.			VR	Ss, LI	40	
<i>Dasya hutchinsiae</i> Harv. (38)	*	*	F	Ss, LI	110	5
= <i>Dasya arbuscula</i> Harv.						
<i>Dasya ocellata</i> (Gratel.) Harv.	*	*	F	Ss, LI	40	54
<i>Dasya rigidula</i> (Kütz.) Ardiss.	*	*	F	Ss, LI	40	
<b>Heterosiphonia</b>						
<i>Heterosiphonia plumosa</i> (J. Ellis) Batters	*	*	F	Sd, Ss, LI	44	125

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
Rhodomelaceae						
<b>Aiolocolax</b>						
<i>Aiolocolax pulchella</i> Pocock (39)	*		VR	LI	156	
<b>Aphanocladia</b>						
<i>Aphanocladia stichidiosa</i> (Funk) Ardré	*		R	Ss, LI	150	
<b>Boergesenella</b>						
<i>Boergesenella fruticulosa</i> (Wulfen) Kylin	*	*	F	Ss, LI, LI(P)	40	54
= <i>Polysiphonia fruticulosa</i> (Wulfen) Spreng.						
<i>Boergesenella thuyoides</i> (Harv.) Kylin	*	*	F	LI, LI(P), Lm	144, 151	37
= <i>Pterosiphonia thuyoides</i> (Harv.) Batters						
= <i>Polysiphonia thuyoides</i> Harv.						
<b>Bostrichya</b>						
<i>Bostrichya scorpioides</i> (Huds.) Mont. ex Kütz.	*		R	Lh	118	6
<b>Chondria</b>						
<i>Chondria capillaris</i> (Huds.) M.J. Wynne	*	*	VR	LI, Lm(P)	118	82
= <i>Chondria tenuissima</i> (C. Agardh) With.						
<i>Chondria coerulescens</i> (J. Agardh) Falkenb.	*	*	C	Ss, LI	110	7
<i>Chondria dasyphylla</i> (Woodw.) C. Agardh	*	*	R	Ss, LI, LI(P)	64	40
<b>Ctenosiphonia</b>						
<i>Ctenosiphonia hypnoides</i> (Welw. ex J. Agardh) Falkenb.	*		VR	LI, Lm	58	110
<b>Halopithys</b>						
<i>Halopithys incurva</i> (Huds.) Batters	*	*	VC	Ss, LI, LI(P)	118	151
= <i>Halopithys pinastroides</i> (S.G. Gmel.) Kütz.						
= <i>Halopithys incurvus</i> (Huds.) Batters						
<b>Herposiphonia</b>						
<i>Herposiphonia secunda</i> (C. Agardh) Ambronn						
f. <i>secunda</i>	*		R	Ss, LI	36	40
= <i>Herposiphonia tenella</i> (C. Agardh) var. <i>secunda</i> (C. Agardh) Hollenb.						
f. <i>tenella</i> (C. Agardh) M.J. Wynne	*	*	F	Ss, LI	110	36
= <i>Herposiphonia tenella</i> (C. Agardh) Ambronn						
<b>Laurencia</b>						
<i>Laurencia obtusa</i> (Huds.) J.V. Lamour.	*	*	F	LI, Lm	110	5
<i>Laurencia pyramidalis</i> Bory ex Kütz.	*		VR	LI, Lm	41	
<b>Lophosiphonia</b>						
<i>Lophosiphonia reptabunda</i> (Suhr ex Kütz.) Kylin	*		R	LI, Lm, Lm(P)	110	
<b>Neosiphonia</b>						
<i>Neosiphonia harveyi</i> (Bailey) M.S. Kim, H.G. Choi, Guiry & G.W. Saunders	*		R	LI, LI(P)	This work	
<b>Ophidocladus</b>						
<i>Ophidocladus simpliciusculus</i> P. Crouan & H. Crouan	*	*	F	LI, Lm	40	18
<b>Osmundea</b>						
<i>Osmundea hybrida</i> (DC.) K.W. Nam	*		VR	LI(P), Lm	18	
<i>Osmundea pinnatifida</i> (Huds.) Stackh.	*	*	C	LI, Lm	41	110
= <i>Laurencia pinnatifida</i> (Huds.) J.V. Lamour.						
<i>Osmundea truncata</i> (Kütz.) K.W. Nam & Maggs	*		VR	LI	This work	
<b>Polysiphonia</b>						
<i>Polysiphonia atlantica</i> Kapraun & J.N. Norris	*	*	F	Ss, LI, LI(P), Lm	110	27
= <i>Polysiphonia macrocarpa</i> Harv.						
<i>Polysiphonia brodiaei</i> (Dillwyn) Spreng.	*		F	Ss, LI(P)	40	
<i>Polysiphonia denudata</i> (Dillwyn) Grev. ex Harv.	*		R	Ss, LI	40	
<i>Polysiphonia devoniensis</i> Maggs & Hommers.	*		VR	Ss	52	
<i>Polysiphonia elongata</i> (Huds.) Spreng.	*		VR	Ss	40	
<i>Polysiphonia ferulacea</i> Suhr ex J. Agardh	*		VR	Ss	84	
<i>Polysiphonia fibrata</i> (Dillwyn) Harv.	*		F	LI	156	
<i>Polysiphonia fibrillosa</i> (Dillwyn) Spreng.	*		VR	Ss, LI	151	37
= <i>Polysiphonia richardsonii</i> Hook. ex Harv.						
<i>Polysiphonia fucoides</i> (Huds.) Grev.	*		VR	LI	144	
= <i>Polysiphonia nigrescens</i> (Huds.) Grev. ex Harv.						
<i>Polysiphonia furcellata</i> (C. Agardh) Harv.	*		VR	LI, Lm	40	
<i>Polysiphonia nigra</i> (Huds.) Batters	*		VR	LI	40	
<i>Polysiphonia opaca</i> (C. Agardh) Moris & De Not.	*	*	R	LI	40	54
<i>Polysiphonia polyspora</i> (C. Agardh) J. Agardh	*	*	F	Ss, LI	88	36
<i>Polysiphonia scopulorum</i> Harv. (40)	*	*	VR	LI, Lm	40	18
= <i>Lophosiphonia scopulorum</i> (Harv.) Womersley						
<i>Polysiphonia subulata</i> (Dillwyn) J. Agardh	*		VR	LI, Lm	37	



Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<i>Polysiphonia stricta</i> (Dillwyn) Grev.	*		F	Ss, LI, LI(P), Lm	This work	
<b>Pterosiphonia</b>						
<i>Pterosiphonia ardreana</i> Maggs & Hommers. (41)	*		F	Ss, LI	18	
= <i>Pterosiphonia spinifera</i> var. <i>robusta</i> Ardré, nom. illeg.						
<i>Pterosiphonia complanata</i> (Clemente) Falkenb.	*	*	VC	Sd, Ss, LI	44	110
<i>Pterosiphonia parasitica</i> (Huds.) Falkenb.	*	*	F	Ss, LI	110	40
<i>Pterosiphonia pennata</i> (C. Agardh) Falkenb.	*	*	C	Ss, LI	110	118
<i>Pterosiphonia pinnulata</i> (Kütz.) Maggs & Hommers.	*		VR	Ss, LI	156	
= <i>Pterosiphonia spinifera</i> (Kütz.) Ardré						
<b>Strebocladia</b>						
<i>Strebocladia collabens</i> (C. Agardh) Falkenb.	*	*	F	Ss, LI, Lm	18	
HETEROKONTOPHYTA						
PHAEOPHYCEAE						
ECTOCARPALES						
Ectocarpaceae						
<b>Acinetospora</b>						
<i>Acinetospora crinita</i> (Carmich. ex Harv.) Kornmann	*		R	Ss, LI, Lm(P)	40	
<b>Bachelotia</b>						
<i>Bachelotia antillarum</i> (Grunow) Gerloff	*	*	F	LI	89	18
<b>Ectocarpus</b>						
<i>Ectocarpus fasciculatus</i> Harv.	*	*	F	LI	40	156
<i>Ectocarpus siliculosus</i> (Dillwyn) Lyngb.						
var. <i>confervoides</i> (Roth) Kjellm.			F	LI, Lm(P)	40	
var. <i>hiemalis</i> (P. Crouan & H. Crouan ex Kjellm.) Gallardo	*		R	LI, Lm	This work	
var. <i>pygmaeus</i> (Aresch.) Gallardo	*		R	LI	This work	
<b>Feldmannia</b>						
<i>Feldmannia irregularis</i> (Kütz.) Hamel	*		R	LI	This work	
<i>Feldmannia paradoxa</i> (Mont.) Hamel	*	*	F	Ss, LI	40	150
= <i>Feldmannia globifera</i> (Kütz.) Hamel (42)						
<i>Feldmannia simplex</i> (P. Crouan & H. Crouan) Hamel			R	LI	40	
<b>Hincksia</b>						
<i>Hincksia granulosa</i> (Sm.) P.C. Silva	*	*	F	Ss, LI	40	84
= <i>Giffordia granulosa</i> (Sm.) Hamel						
<i>Hincksia hincksiae</i> (Harv.) P.C. Silva	*		R	Ss, LI	This work	
<i>Hincksia mitchelliae</i> (Harv.) P.C. Silva			R	LI	40	
= <i>Giffordia mitchelliae</i> (Harv.) Hamel						
<i>Hincksia ovata</i> (Kjellm.) P.C. Silva	*		VR	Ss	This work	
<i>Hincksia sandriana</i> (Zanardini) P.C. Silva			F	Ss, LI	40	
<b>Pilayella</b>						
<i>Pilayella littoralis</i> (L.) Kjellm.	*	*	R	Lm	44	40
= <i>Ectocarpus littoralis</i> (L.) Lyngb.						
Ralfsiaceae						
<b>Pseudolithoderma</b>						
<i>Pseudolithoderma extensum</i> (P. Crouan & H. Crouan) S. Lund	*		R	Ss	This work	
<b>Ralfsia</b>						
<i>Ralfsia verrucosa</i> (Aresch.) Aresch.	*	*	VC	LI, Lm	110	117
CHORDARIALES						
Myrionemataceae						
<b>Hecatonema</b>						
<i>Hecatonema terminale</i> (Kütz.) Kylin (43)	*		R	Ss, LI	150	
= <i>Hecatonema maculans</i> (Collins) Sauv.						
Elachistaceae						
<b>Elachista</b>						
<i>Elachista fucicola</i> (Velley) Aresch.	*	*	F	Lm	40	54
Leathesiaceae						
<b>Leathesia</b>						
<i>Leathesia difformis</i> (L.) Aresch.	*	*	R	LI, Lm	110	82
Chordariaceae						
<b>Liebmannia</b>						
<i>Liebmannia leveillei</i> J. Agardh	*		VR	Ss	150	
<b>Myriocladia</b>						
<i>Myriocladia tomentosa</i> P. Crouan & H. Crouan	*		VR	Ss	This work	

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
SPOROCHNALES						
Sporochnaceae						
<b>Carpomitra</b>						
<i>Carpomitra costata</i> (Stackh.) Batters (44)	*	*	R	Sd, Ss	40	150
DESMARESTIALES						
Desmarestiaceae						
<b>Desmarestia</b>						
<i>Desmarestia dudresnayi</i> J.V. Lamour. ex Léman (45)	*	*	VR	Sd	135	This work
= <i>Desmarestia pinnatinervia</i> Mont.						
<i>Desmarestia ligulata</i> (Lightf.) J.V. Lamour.	*	*	F	Sd, Ss, Ll	118	82
DICTYOSIPHONALES						
Punctariaceae						
<b>Asperococcus</b>						
<i>Asperococcus compressus</i> A.W. Griffiths ex Hook.		*	R	Ss, Ll	40	
SCYTOSIPHONALES						
Scytosiphonaceae						
<b>Colpomenia</b>						
<i>Colpomenia peregrina</i> (Sauv.) Hamel	*	*	C	Ss, Ll, Lm	110	118
<i>Colpomenia sinuosa</i> (Mert. ex Roth) Derbés. & Solier	*	*	F	Ss, Ll, Lm	110	118
<b>Hydroclathrus</b>						
<i>Hydroclathrus clathratus</i> (Bory ex C. Agardh) M. Howe	*		VR	Ss, Ll	150	
<b>Petalonia</b>						
<i>Petalonia fascia</i> (O.F. Müll.) Kuntze	*	*	F	Ll, Lm(P)	118	27
<b>Scytosiphon</b>						
<i>Scytosiphon simplicissimus</i> (Clemente) Cremades	*	*	F	Ll, Lm(P)	118	37
= <i>Scytosiphon lomentaria</i> (Lyngb.) Link						
CUTLERIALES						
Cutleriaceae						
<b>Cutleria</b>						
<i>Cutleria adspersa</i> (Mert. ex Roth) De Not. (46)	*	*	F	Ss, Ll	110	40
<i>Cutleria multifida</i> (Sm.) Grev. (47)	*	*	R	Ss, Ll	125	40
<b>Zanardinia</b>						
<i>Zanardinia typus</i> (Nardo) G. Furnari	*	*	VC	Sd, Ss, Ll	82	125
= <i>Zanardinia prototypus</i> (Nardo) Nardo						
SPHACELARIALES						
Sphacelariaceae						
<b>Sphacelaria</b>						
<i>Sphacelaria cirrosa</i> (Roth) C. Agardh	*	*	F	Ss, Ll	110	40
<i>Sphacelaria fusca</i> (Huds.) Gray		*	R	Ll, Lm	110	40
<i>Sphacelaria nana</i> Nägeli ex Kütz.	*		R	Lm	This work	
<i>Sphacelaria plumula</i> Zanardini	*		VR	Ss	156	
<i>Sphacelaria rigidula</i> Kütz.	*		F	Lm	This work	
<i>Sphacelaria tribuloides</i> Menegh.	*	*	R	Ll	40	
Cladostephaceae						
<b>Cladostephus</b>						
<i>Cladostephus spongiosus</i> (Huds.) C. Agardh	*	*	VC	Ss, Ll(P)	66	68
= <i>Cladostephus verticillatus</i> (Lightf.) C. Agardh						
Stypocaulaceae						
<b>Halopteris</b>						
<i>Halopteris filicina</i> (Gratel.) Kütz.	*	*	F	Ss, Ll	114	118
<b>Stypocaulon</b>						
<i>Stypocaulon scoparium</i> (L.) Kütz.	*	*	VC	Ss, Ll	44	68
= <i>Halopteris scoparia</i> (L.) Sauv.						
DICTYOTALES						
Dictyotaceae						
<b>Dictyopteris</b>						
<i>Dictyopteris polypodioides</i> (DC.) J.V. Lamour.	*	*	C	Ss, Ll(P)	124	118
= <i>Dictyopteris membranacea</i> (Stackh.) Batters						

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>Dictyota</b>						
<i>Dictyota dichotoma</i> (Huds.) J.V. Lamour.	*	*	C	Ss, Ll	110	118
var. <i>intrincata</i> (C. Agardh) Grev.			F	Ss, Ll	40	
<i>Dictyota spiralis</i> Mont.	*		R	Ss, Ll	118	
= <i>Dilophus spiralis</i> (Mont.) Hamel						
<b>Padina</b>						
<i>Padina pavonica</i> (L.) Thivy	*	*	C	Ss, Ll(P)	124	5
= <i>Padina pavonia</i> J.V. Lamour.						
<b>Spatoglossum</b>						
<i>Spatoglossum solieri</i> (Chauv. ex Mont.) Kütz.	*	*	F	Sd, Ss	90	87
<b>Taonia</b>						
<i>Taonia atomaria</i> (Woodw.) J. Agardh	*	*	F	Ss, Ll(P)	90	40
LAMINARIALES						
Laminariaceae						
<b>Laminaria</b>						
<i>Laminaria ochroleuca</i> Bach. Pyl.	*	*	R	Ss	85	115
Phyllariaceae						
<b>Phyllariopsis</b>						
<i>Phyllariopsis brevipes</i> (C. Agardh) E.C. Henry & South	*	*	R	Ss	90	84
= <i>Phyllaria reniformis</i> (J.V. Lamour.) Rostaf.						
<b>Saccorhiza</b>						
<i>Saccorhiza polyschides</i> (Lightf.) Batters	*	*	F	Ss, Ll	68	157
FUCALES						
Fucaceae						
<b>Ascophyllum</b>						
<i>Ascophyllum nodosum</i> (L.) Le Jol. (48)	*	*	VR	Lm	44	153
= <i>Ozothallia vulgaris</i> Decne. & Thur., nom. illeg.						
<b>Pelvetia</b>						
<i>Pelvetia canaliculata</i> (L.) Decne. & Thur. (49)	*	*	R	Lm, Lh	62	66
<b>Fucus</b>						
<i>Fucus chalonii</i> Feldmann (50)	*		R	Ll	83	18
<i>Fucus ceranoides</i> L.	*	*	F	Lm	41	90
<i>Fucus spiralis</i> L.	*	*	F	Lm		
var. <i>limitaneus</i> Mont. (51)	*		F	Lm	41	69
= <i>Fucus limitaneus</i> Mont.						
var. <i>platycarpus</i> (Thur.) Batters	*		R	Lm	153	66
= <i>Fucus platycarpus</i> Thur.						
<i>Fucus vesiculosus</i> L.	*	*	R	Lm	44	153
var. <i>vesiculosus</i>	*		R	Lm	147	
var. <i>vadorum</i> Aresch.	*		R	Lm	147	
var. <i>compressus</i> Kjellm.	*		R	Lm	147	
= var. <i>evesiculosus</i> P. Crouan & H. Crouan						
Sargassaceae						
<b>Sargassum</b>						
<i>Sargassum flavifolium</i> Kütz.		*	VR	Sd	36	40
<i>Sargassum muticum</i> (Yendo) Fensholt	*	*	F	Sd, Lm(P)	38	86
<i>Sargassum vulgare</i> C. Agardh	*		VR	Sd	44	52
Cystoseiraceae						
<b>Bifurcaria</b>						
<i>Bifurcaria bifurcata</i> R. Ross	*	*	F	Ss, Ll(P)	65	66
= <i>Bifurcaria tuberculata</i> (Huds.) Stackh.						
= <i>Bifurcaria rotunda</i> (Huds.) Papenf.						
<b>Cystoseira</b>						
<i>Cystoseira baccata</i> (S.G. Gmel.) P.C. Silva	*	*	VC	Sd, Ss, Ll(P)	44	68
= <i>Phyllacantha fibrosa</i> (Huds.) Kütz.						
= <i>Cystoseira fibrosa</i> (Huds.) C. Agardh						
<i>Cystoseira humilis</i> var. <i>myriophylloides</i> (Sauv.) J.H. Price & D.M. John	*		VR	Lm(P)	118	156
= <i>Cystoseira myriophylloides</i> Sauv.						
<i>Cystoseira tamariscifolia</i> (Huds.) Papenf.	*	*	C	Ss, Ll(P)	44	65
= <i>Halerica ericoides</i> (fide Colmeiro, 1867)						
= <i>Cystoseira ericoides</i> (L.) C. Agardh						
<i>Cystoseira usneoides</i> (L.) M. Roberts	*		R	Ss	18	81
<b>Halidrys</b>						
<i>Halidrys siliquosa</i> (L.) Lyngb.	*	*	F	Ss, Sd	44	114

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
CHLOROPHYTA						
CHLOROPHYCEAE						
CTENOCLADALES (52)						
Ulvellaceae						
<b>Entocladia</b>						
<i>Entocladia viridis</i> Reinke	*		R	LI	37	
= <i>Phaeophila viridis</i> (Reinke) Burrows						
<b>Pringsheimiella</b>						
<i>Pringsheimiella scutata</i> (Reinke) Höhn. ex Marchew.	*		R	LI	This work	
<b>Ulvelia</b>						
<i>Ulvelia lens</i> P. Crouan & H. Crouan	*		R	LI	150	
ULOTRICHALES						
Ulotrichaceae						
<b>Ulothrix</b>						
<i>Ulothrix flacca</i> (Dillwyn) Thur.	*		R	Lh	118	
<i>Ulothrix implexa</i> (Kütz.) Kütz.	*		R	LI	150	
<b>Urospora</b>						
<i>Urospora penicilliformis</i> (Roth) Aresch.	*		VR	Lh	This work	
ULVALES						
Gomontiaceae						
<b>Gomontia</b>						
<i>Gomontia polyrhiza</i> (Lagerh.) Bornet & Flahault	*		VR	LI	151	
Monostromataceae						
<b>Blidingia</b>						
<i>Blidingia marginata</i> (J. Agardh) P.J.L. Dang.	*		F	Lm, Lh	27	156
<i>Blidingia minima</i> (Nägeli ex Kütz.) Kylin	*	*	VC	Lh	110	82
<b>Monostroma</b>						
<i>Monostroma obscurum</i> (Kütz.) J. Agardh	*	*	F	Ss, LI, Lm	40	18
= <i>Ulvaria obscura</i> (Kütz.) Gayral						
<i>Monostroma oxyspermum</i> (Kütz.) Doty (53)	*		F	Lm, Lh	18	
Ulvaceae						
<b>Ulva</b> (54)						
<i>Ulva bifrons</i> Ardré	*	*	R	LI	40	18
<i>Ulva clathrata</i> (Roth) C. Agardh	*	*	C	LI, Lm	110	118
= <i>Enteromorpha muscoides</i> (Clemente) Cremades						
= <i>Enteromorpha crinita</i> (Roth) J. Agardh						
= <i>Enteromorpha ramulosa</i> (Sm.) Carmich.						
<i>Ulva compressa</i> L.	*	*	C	Lm, Lh(P)	44	5
= <i>Enteromorpha compressa</i> (L.) Nees						
<i>Ulva curvata</i> (Kütz.) De Toni	*		R	Lh(P)	This work	
<i>Ulva flexuosa</i> Wulfen	*	*	F	LI, Lm	37	
= <i>Enteromorpha flexuosa</i> (Wulfen ex Roth) J. Agardh						
<i>Ulva intestinalis</i> L.	*	*	C	Lm, Lh(P)	44	118
= <i>Enteromorpha intestinalis</i> (L.) Link						
<i>Ulva linza</i> L.	*	*	R	Lm, Lh	118	37
= <i>Enteromorpha linza</i> (L.) J. Agardh						
<i>Ulva pseudocurvata</i> Koeman & C. Hoek	*		C	Ss, LI	18	
<i>Ulva prolifera</i> O.F. Müll.	*	*	F	LI, Lm, Lh	40	
= <i>Enteromorpha prolifera</i> (O.F. Müll.) J. Agardh						
<i>Ulva rigida</i> C. Agardh	*	*	VC	Ss, LI, Lm(P)	44	110
= <i>Phycoseris rigida</i> (fide Colmeiro, 1867)						
<i>Ulva scandinavica</i> Bliding	*		R	LI	150	
<b>Umbraulva</b>						
<i>Umbraulva olivascens</i> (P.J.L. Dang.) E.H. Bae & I.K. Lee (55)	*		R	Ss	52	87
= <i>Ulva olivascens</i> P.J.L. Dang.						
CLADOPHORALES						
Cladophoraceae						
<b>Chaetomorpha</b>						
<i>Chaetomorpha aerea</i> (Dillwyn) Kütz. (56)	*		F	Lh	5	162
<i>Chaetomorpha linum</i> (O.F. Müll.) Kütz. (56)	*	*	F	LI, Lm, lh	110	144
<i>Chaetomorpha mediterranea</i> (Kütz.) Kütz. (57)	*		F	Ss, LI, Lm(P)	110	156
= <i>Chaetomorpha capillaris</i> (Kütz.) Børgesen						

Table 1 (continuation)

Taxa	B	G	A	BL	1 <sup>st</sup> R	2 <sup>nd</sup> R
<b>Cladophora</b>						
<i>Cladophora albida</i> (Nees) Kütz.	*	*	F	Ss, Ll, Lm	110	40
<i>Cladophora coelothrix</i> Kütz.	*	*	R	Ll	110	7
<i>Cladophora dalmatica</i> Kütz.	*	*	VR	Ll, Lm	110	40
<i>Cladophora hutchinsiae</i> (Dillwyn) Kütz.	*	*	F	Ss, Ll	110	40
<i>Cladophora laetevirens</i> (Dillwyn) Kütz.	*	*	F	Ll, Lm	110	5
<i>Cladophora lehmanniana</i> (Lindenb.) Kütz.	*	*	C	Ss, Ll, Lm	40	150
<i>Cladophora nigrescens</i> Zanardini ex Frauenf.	*		R	Ss	110	
<i>Cladophora pellucida</i> (Huds.) Kütz. (58) = <i>Cladophora pseudopellucida</i> C.Hoek	*	*	C	Ss, Ll	110	88
<i>Cladophora prolifera</i> (Roth) Kütz.	*	*	F	Ss, Ll	110	118
<i>Cladophora rupestris</i> (L.) Kütz.	*	*	R	Ll	166	27
<i>Cladophora socialis</i> Kütz. (59)	*		VR	Ll	110	40
<b>Rhizoclonium</b>						
<i>Rhizoclonium riparium</i> (Roth) Harv. (60)	*	*	R	Lm, Lh	64	40
<i>Rhizoclonium tortuosum</i> (Dillwyn) Kütz. (60)	*	*	F	Ss, Ll, Lm	40	
BRYOPSIDALES						
Bryopsidaceae						
<b>Bryopsis</b>						
<i>Bryopsis duplex</i> De Not.	*		VR	Ll	40	
= <i>Bryopsis balbisiana</i> J.V. Lamour.						
<i>Bryopsis feldmannii</i> Gallardo & G. Furnari (61) = <i>Bryopsis cupressoides</i> Kütz.	*	*	VR	Lm(P)	36	40
<i>Bryopsis hypnoides</i> J.V. Lamour.	*	*	R	Ss, Ll	40	52
<i>Bryopsis pennata</i> J.V. Lamour.	*		VR	Ll	40	
<i>Bryopsis plumosa</i> (Huds.) C. Agardh	*	*	C	Ss, Ll, Lm(P)	110	118
<b>Derbesia</b>						
<i>Derbesia tenuissima</i> (Moris & De Not.) P. Crouan & H. Crouan (62)	*	*	F	Ss, Ll	118	37
<b>Pedobesia</b>						
<i>Pedobesia simplex</i> (Kütz.) M.J. Wynne & Leliaert (63) = <i>Pedobesia lamourouxii</i> (J. Agardh) Feldmann, Loreau, Codomier & Couté = <i>Bryopsis simplex</i> Kütz.	*	*	VR	Ss, Ll	36	52
Codiaceae						
<b>Codium</b>						
<i>Codium adhaerens</i> C. Agardh	*	*	C	Ss, Ll	68	110
<i>Codium decorticans</i> (Woodw.) M. Howe	*	*	VC	Ss, Ll	44	68
<i>Codium fragile</i> (Suringar) Har. subsp. <i>atlanticum</i> (Cotton) P.C. Silva subsp. <i>tomentosoides</i> (Goor) P.C. Silva	*	*	C	Ll, Lm Ss, Ll, Lm	110 40	82
<i>Codium tomentosum</i> Stackh. var. <i>mucronatum</i> (Hamel) Ardré	*	*	F	Ss, Ll, Lm Ss, Ll	110 68	40 118
<i>Codium vermilara</i> (Olivi) Delle Chiaje	*	*	F	Ss, Ll	40	18

Table 2. Cheney's ratio [(Rhodophyta+Chlorophyta)/Phaeophyta] for the Spanish Basque coast and nearby areas (only taxa at species level).

Area	Chlorophyta	Phaeophyta	Rhodophyta	Total	(R+C/P)
Basque coast	51	65	215	331	4.09
Galicia	90	125	297	512	3.09
Brittany	104	156	334	594	2.81
Southern England	78	140	275	493	2.52
Atlantic coast of the southern Iberian Peninsula	41	60	184	285	3.75
Mediterranean coast of Andalusia	76	81	268	425	4.25
Morocco	102	131	379	612	3.67
Canary Islands	117	125	385	627	4.02



## Notes

1. After several works (e.g., Feldmann & Feldmann, 1953) which concluded that *Dermocarpa* P. Crouan & H. Crouan and *Xenococcus* Thur. were indistinguishable, Komárek & Anagnostidis (1986) adopted *Xenococcus*, and subsequently the family *Xenococcaceae* Ercegović as the names that have priority, because they considered the type species *Dermocarpa violacea* P. Crouan & H. Crouan to be taxonomically doubtful. However, Silva & al. (1996) pointed out that presently *Dermocarpaceae* and *Dermocarpa* are the correct names because no formal proposals have been submitted to reject them.
2. This species was assigned by Anagnostidis & Komárek (1988) to genus *Leptolyngbya*. Hoffman & Compère (1990) pointed out that the name *Leptolyngbya* Anagnostidis & Komárek was initially superfluous since the genus to which it applied included *Spirocoleus lagerheimii* Möbius, the type of *Spirocoleus*. After that, Silva & al. (1996) assigned it to the genus *Spirocoleus*.
3. This species was assigned by Anagnostidis & Komárek (1988) to *Leptolyngbya*, which resulted superfluous (Hoffman & Compère, 1990), so we have decided to maintain the name used in Geitler's treatment.
4. The systematic position of this taxon is uncertain and probably does not belong to the Acrochaetiaceae. According to Pueschel (1989) it probably belongs to Gigartinales.
5. Guiry (1997) recommends a revision of the generic placement of this species.
6. According to Silva & al. (1996) although the identity of *Gelidium corneum* has been ascertained by the examination of the type specimen (Dixon, 1967), most authors in the 20<sup>th</sup> century have unjustifiably rejected the name as being ambiguous. Likewise, Silva & al. (1996) add that *G. corneum* should be applied to the species currently known in Europe as *G. sesquipedale*.
7. We follow Fredriksen & al. (1994) in considering that *Gelidium pulchellum* and *G. pusillum* represent distinct entities at the species level.
8. We follow Silva & al. (1996) in their proposal of *Gelidium spinosum* as a new combination with *Gelidium latifolium* as a synonym.
9. See Silva & al. (1996) for the rejection of the nomenclatural authority of *Gelidium latifolium*.
10. Hoek & Donze (1966) reported *Gelidium latifolium* and *G. attenuatum* as distinct entities.
11. We follow Santelices & Hommersand (1997) in their proposal of *Pteroclatiella* as a new genus.
12. According to Cremades & al. (1997a), most reports of *Amphiroa rigida* and *Amphiroa beauvoisii* J.V. Lamour. from European Atlantic coast should be referred to *A. van-bossea*.
13. This species has been reported under the misapplied epithet 'tortuosa', either as *Tenarea tortuosa* or as *Lithophyllum tortuosum*. According to Woelkerling (1988) the correct name for this alga is *Lithophyllum byssoides*.
14. There are no voucher specimens from Borja & al. (1982) and Fernández & al. (1982) citations. From the revision of the material cited by Díez & al. (1996) and deposited in BIO, we conclude that material identified as *Halarachnion ligulatum* are scarcely developed specimens of *Graleloupia filicina*. The sporophytic stage *Cruria rosea* (P. Crouan & H. Crouan) P. Crouan & H. Crouan has not been reported.
15. Silva & al. (1996) pointed out that the epithet commemorates Teede (the collector) and 'teedii' is corrected to 'teedei' in accordance with Rec. 60C.1(a) and Art. 60.11.
16. This taxon includes the tetrasporophytic stage, *Petrocelis cruenta* J. Agardh for which the first record was given by Bárbara & al. (1995). Despite its late discovery, both stages are frequent in the Basque coast.
17. Angulo (1980), Ibáñez & al. (1980) and Gorostiaga & al. (1981) reported this meridional taxon from the Basque coast, but no voucher specimens could be found until now.
18. This taxon includes the tetrasporophytic stage *Haematocelis rubens* J. Agardh which corresponds to the first citation of this species in the Basque coast (Hoek & Donze, 1966). The gametophytic stage was firstly reported by Gorostiaga (1981). Both stages are frequent in the study area.
19. The sporophytic stage *Haematocelis fissurata* P. Crouan & H. Crouan has not been reported.
20. According to Haroun & al. (2002) *Gracilaria gracilis* is an illegitimate name for *G. confervoides* (L.) Grev. These authors also consider that it falls within the original concept of *G. verrucosa* (Huds.) Papenf., part of which belongs to *Gracilariopsis longissima* (S.G. Gmel.) Steentoft & al., also an illegitimate name.
21. The record of *Gracilaria foliifera* (Forssk.) Børgesen by Casares & Seoane-Camba (1988) is included. The conspicuity of *Gracilaria multipartita* and *G. foliifera* was proposed by Børgesen (1932). However, Guiry & Freamhainn (1985) suggested that *G. multipartita* is a distinct species confined to the eastern North Atlantic coasts.
22. This species includes the sporophytic stage *Falkenbergia rufofolanosa* (Harv.) F. Schmitz, which is the dominant stage in the Basque coast. The first records including the gametophytic stage were Angulo (1980) and Ibáñez & al. (1980).
23. The sporophytic stage *Hymenoclonium serpens* (P. Crouan & H. Crouan) Batters has not been recorded.
24. This species includes the sporophytic stage, *Trailiella intricata* Batters. The gametophytic stage is more abundant in the Basque coast. The first citations of this species included both stages.
25. We follow Athanasiadis (1987) in considering *Aglaothamnion neglectum* as a synonym of *A. cordatum*; Silva & al. (1996) listed them as distinct species.
26. We follow Maggs & Hommersand (1993) in referring to this species as *Aglaothamnion brodiaei* and *Callithamnion brodiaei* based on Feldmann-Mazoyer's concept of *A. brodiaei* ('brodiaei').
27. We follow Dixon & Price (1981) in considering *Aglaothamnion scopulorum* and *Callithamnion polyspermum* to be synonym of *A. bookeri*. According to Maggs & Hommersand (1993) further critical biosystematic studies are needed.
28. We follow Furnari & al. (1998) in considering *Aglaothamnion byssoides* conspecific with *A. tenuissimum*.
29. A revision of the material reported as *Antithamnionella elegans* in Díez & al. (1999), kept at BIO, reveals that it corresponds to *A. elegans* var. *boergesenii*. We follow Athanasiadis (1996) in recognising *A. boergesenii* as a distinct species, segregated from *A. elegans* var. *breviramosa*, *A. elegans* var. *elegans* and *A. elegans* var. *sublittoralis*. These 4 taxa were previously recognised by Cormaci & Furnari (1988) as separate varieties of *A. elegans*.
30. *Callithamnion tetragonum* var. *brachiatum* is currently considered to be a growth form of *C. tetragonum* (Dixon & Price, 1981).
31. Following Maggs & Hommersand (1993) records of *C. tenuissimum* are included in *C. diaphanum*.
32. This species includes var. *corticatum* Mazoyer.
33. We follow P.C. Silva (1996) who proposed conserving *Ceramium rubrum* with a neotype in contrast to Maggs & Hommersand (1993) whom proposed the name *C. nodulosum* for this species.
34. As Abdelahad & D'Archino (1998) did for Mediterranean records, we refer *Ceramium rubrum* var. *barbatum* records from the Basque coast to *C. secundatum*.
35. According to Wynne (1989) *Acrosorium uncinatum* is conspecific with *A. venulosum* from the Mediterranean Sea. Like-

- wise, records of *Cryptopleura uncinata* [= *Nitophyllum uncinatum* J. Agardh] have been referred to *A. venulosum*. John & al. (2004) considered *A. uncinatum* and *Nitophyllum uncinatum* as synonyms of *A. ciliolatum*.
36. Records of *Acrosorium reptans* have been considered as a postulate growth form of *Cryptopleura ramosa* following Wynne (1989).
  37. The transfer of *Myriogramme minuta* into *Drachiella minuta* (Maggs & Hommersand, 1993) appears to be unjustified according to Wynne (1994).
  38. *Dasya arbuscula* (Dillwyn) C. Agardh is based on *Conferva arbuscula* Dillwyn, a species that should be referred to the genus *Aglaothamnion* (Maggs & Hommersand, 1993). However, we refer to *D. hutchinsiae* all the records of *D. arbuscula* from the Basque coast, considering that they fall within Harvey's (1849: pl. 224) taxonomic concept of the species.
  39. The systematic position of this taxon is uncertain (Stegenga & al., 1997).
  40. Records of *Polysiphonia caespitosa* (Pocock) Hollenb. cited as *Falkenbergiella caespitosa* Pocock (Bárbara & al., 1995; Secilla & al., 2000) are included here because they are considered to be a misidentification of *Polysiphonia scopulorum*.
  41. We refer to this species the *Pterosiphonia spinifera* records since we think that authors most probably referred to *P. spinifera* var. *robusta* Ardré, nom. illeg. (= *P. ardreana*).
  42. Santolaria & al. (1998) cited both *Feldmannia paradoxa* and *F. globifera*, which are synonyms.
  43. According to Fletcher (1987) *Hecatonema terminale* is a taxonomic synonym of *H. maculans*; however, according to Wynne (1998), the former name has priority with the basionym *Ectocarpus terminalis* Kütz. As several authors have pointed out (Fletcher, 1987; Wynne, 1998) this entity may represent the microthalli of various taxa, including *Punctaria* (Clayton, 1974), *Myriotrichia* (Loiseaux, 1969) and *Asperococcus* (Pedersen, 1984).
  44. Records from Gipuzkoa correspond to drift material.
  45. Montagne (1842) reported one specimen of *Desmarestia pinnatinervia* from the San Sebastián harbour. This species was considered later as a synonym of *Desmarestia dudresnayi* by Sauvageau (1925). According to Guiry & Nic Dhonncha (2003) the taxonomical position of *D. pinnatinervia* is dubious. Recently, we have found 2 specimens of *D. dudresnayi* at 30 m depth on an old wrecked ship in the locality of Zierbena (Bizkaia).
  46. This species includes the sporophytic stage, *Aglaozonia melanoidea* Schousboe ex Bornet.
  47. The first record corresponds to the sporophytic stage *Aglaozonia parvula*. The gametophytic stage was firstly reported by Casares & Seoane (1989) as drift material, being the first attached specimens cited by Santolaria & al. (1998).
  48. At present, only a small population of this species occurs in the Spanish Basque coast (Txatxarramendi). In addition, the scarce specimens show a stunted morphology.
  49. This species was firstly observed by G. Hamel in Cap Higer (in Feldmann & Lami, 1941: 133).
  50. Chalon (1905) pointed out the presence of a small form of *Fucus limitaneus* at Andagorria inlet (French Basque coast) and Cape Higer. After that, Feldmann (1941) described it as a new species, *Fucus chalonii*. Two facts lead us to consider Chalon's *F. limitaneus* from Cape Higer as really *Fucus spiralis* var. *limitaneus*: 1) presently, *F. chalonii* does not occur at Cape Higer, and 2) the habitat of *F. chalonii* is very different. Therefore, we consider that record as the first of *F. spiralis* var. *limitaneus* for the Spanish Basque coast.
  51. In this variety, proposed as a new combination by Pérez-Ruzafa (Gómez-Garreta, 2001), we have included all records of *Fucus* with the epithet of '*limitaneus*' or '*nanus*' at the level of species, variety or form. However, on the Basque coast there is a variety of *F. spiralis* of a reduced size with a morphology and habitat which does not fall under the description given for *F. spiralis* var. *limitaneus*. Seoane-Camba (1975) described this reduced variety of *F. spiralis* as "Type C", one of the four morphological types that he recognized at Cape Higer. Its thallus is 6 cm long, has long cylindrical receptacles without a sterile edge, and lives in the upper eulittoral level of very exposed wave areas. Further investigations are needed to determine the taxonomic status of this variety.
  52. The taxonomy of this green algae group originally assigned to the Chaetophoraceae is in a changeable state. We follow Silva & al. (1996), who adopted an arbitrary compromise with references to alternative opinions.
  53. Contrary to Gayral (1965), Golden & Garbary (1984) consider *Ulvaria* as a subgenus of *Monostroma*. In the check-list of the Mediterranean Chlorophyceae, Gallardo & al. (1993) retain *Ulvaria* as a genus, considering *Monostroma oxyspermum* as a synonym of *U. oxysperma* (Kütz.) Bliding.
  54. Recent works (Tan & al., 1999; Hayden & al., 2003) have provided evidences that *Ulva* and *Enteromorpha* are not distinct evolutionary entities, with *Ulva* being the oldest name.
  55. Bae & Lee (2001) have recently proposed *Umbraulva* as a new genus to which *Ulva olivascens* was assigned.
  56. In contrast to Burrows (1991) who considers that *Chaetomorpha aerea* is conspecific with *C. linum*, we follow Blair (1983) in considering these species to be distinct.
  57. We follow Gallardo & al. (1993), who consider *Chaetomorpha mediterranea* a separate taxonomic identity from *Rhizoclonium tortuosum*, in contrast to Silva & al. (1996).
  58. This species includes *Cladophora pseudopellucida* (Hoek 1979).
  59. Hoek (1963) previously recorded this species floating on salt-marsh pools near Hondarribia (Gipuzkoa).
  60. We follow Silva & al. (1996) in considering *Rhizoclonium riparium* and *R. tortuosum* as distinct species. Gallardo & al. (1993) however, consider them as synonyms.
  61. See Gallardo & al. (1993) in relation to the proposal of this new name for *Bryopsis cupressoides* Kütz. *sensu* J. Feldmann and *B. cupressoides* J.V. Lamour. *sensu* Kütz.
  62. Records of the gametophytic stage, known as *Halicystis parvula* Schmitz ex Murray, are included. Gorostiaga & Díez (1996) firstly reported this stage from the Basque coast.
  63. *Pedobesia simplex* is a new name for *P. lamourouxii* Wynne & Leliaert (2001).

## Taxa Inquirenda

### Cyanophyceae

*Schizotrix calcicola* (C. Agardh) Gomont.—The presence of this taxon in the Basque coast, reported by Hoek & Donze (1966), needs to be confirmed since its habitat is not marine.

### Rhodophyceae

*Gymnogongrus patens* (Gooden. et Woodw.) J. Agardh.—This cold-water taxon has been reported by Angulo (1980), Ibáñez & al. (1980) and Gorostiaga (1981), but no voucher specimens could be found until now. After studying the material kept at BIO, we conclude that all the specimens identified as *G. patens* are *Abnfeltiopsis devoniensis*, thus the

occurrence of the first in the Basque coast should be confirmed.

*Phyllophora herediae* (Clemente) J. Agardh.—This taxon has not been mentioned after Colmeiro (1867); its presence in the Basque coast needs to be confirmed.

*Phymatolithon calcareum* (Pall.) Adey & D.L. McKibbin.—Hoek & Donze (1966) reported *Lithothamnion polymorphum* (L.) Aresch. nom. illeg. [currently regarded as a synonym of *P. calcareum*] from Cape Higuer, growing on turf-forming algae subzone. This habitat does not correspond to the free-living *P. calcareum*, which occurs in the sublittoral zone up to 25 m depth.

*Polysiphonia foetidissima* Cocks ex Bornet.—This species was reported only by Gorostiaga & Díez (1996), but there are no voucher specimens to confirm its presence in the Basque coast.

*Polysiphonia lanosa* (L.) Tandy.—Angulo (1980) and Ibáñez & al. (1980) reported this species as *Vertebrata lanosa* (L.) T.A. Christensen from only one locality, and associated to *Ascophyllum nodosum*. Recent surveys in this locality have not confirmed the occurrence of *P. lanosa*.

*Rhodymenia coespitosella* L'Hardy-Halos.—Gorostiaga & al. (1987) and Gorostiaga & Díez (1996) reported this taxon from the Basque coast, but its occurrence needs to be confirmed. After studying the *R. coespitosella* specimens kept at BIO, we conclude that all specimens should be referred to *R. holmesii*.

#### Phaeophyceae

*Cystoseira barbata* (Stackh.) C. Agardh.—No further information was given for this Mediterranean taxon after Lázaro Ibiza (1893).

*Cystoseira foeniculacea* (L.) Grev.—Colmeiro (1867) cited this species as *C. abrotanifolia* (L.) C. Agardh; no further information was given for this taxon.

*Cystoseira platyclada* Sauv.—This taxon was reported by Casares (1989) and Casares & Seoane-Camba (1989). However, according to the morphology and habitat described by Casares (1987), we consider that it should be better referred to *C. usneoides*.

*Dictyota implexa* J.V. Lamour.—No further information was given for this meridional taxon after Colmeiro (1867). Probably, he referred to *D. dichotoma* var. *implexa* (Desf.) Gray, a taxonomic synonym of *D. dichotoma* var. *intrincata*.

*Elachista scutulata* (Sm.) Duby.—The only record by Casares & Seoane-Camba (1989) corresponds to drift material.

*Isthmoplea sphaerophora* (Carmichael) Kjellm.—The

taxonomical position of *Isthmoplea sphaerophora* is unclear (Jaasund, 1960). Its occurrence in the Basque coast should be confirmed since there is only one report (Borja & al., 1982) and no voucher specimens could be found.

*Sargassum acinarium* (L.) Setch.—Lázaro Ibiza (1893) reported this meridional taxon as *Sargassum linifolium* C. Agardh. No further information was given.

#### Chlorophyceae

*Codium effusum* (Raf.) Delle Chiaje.—Fischer-Piette (1963) reported this taxon as *C. difforme* Kütz.; this species has a meridional distribution and no further information has been given for it, therefore its occurrence in the Basque coast should be confirmed.

*Urospora bangioides* (Harv.) Holmes et Batters.—This taxon has been only reported by Fernández & al. (1982). Its occurrence in the Basque coast should be confirmed since it mainly has a northerly distribution and there are no voucher specimens to confirm its presence in the Basque coast. On the other hand, the status of this taxon is in some way dubious and requires further investigation (Guiry & Dhonncha, 2003).

#### Taxa Excludenda

##### Rhodophyceae

*Aglaothamnion bipinnatum* (P. Crouan & H. Crouan) Feldm.-Maz.—After studying the specimens cited by Secilla & al. (2000), kept at BIO, we conclude that they belong in *A. tripinnatum*.

*Antithamnion tenuissimum* (Hauck) Schiffner.—Casares (1988, 1989) reported this taxon from Guipúzcoa. According to Athanasiadis (1996), extra-Mediterranean records of *A. tenuissimum* are *A. villosum*.

*Palmaria palmata* (L.) Kuntze.—Angulo (1980), Borja & al. (1982), Fernández & al. (1982) and Pérez-Celorio & al. (1995) reported *Rhodymenia palmata* (L.) Grev., a synonym of *P. palmata*. These records should be a misspelling for *R. palmetta* [currently regarded as *R. pseudopalmata*], a frequent taxon in the area studied.

##### Phaeophyceae

*Himantalia elongata* (L.) Gray.—All records (Angulo, 1980; Casares, 1989) of this northern taxon correspond to drift material.

*Laminaria digitata* (Huds.) J.V. Lamour.—Colmeiro (1867) and Ibáñez & al. (1980) reported this species from the Basque coast. Seoane-Camba (1966) concluded that all Iberian Peninsula records



of this northern taxon are misidentifications for, mainly, *L. ochroleuca*.

*Laminaria hyperborea* (Gunnerus) Foslie.—This northern taxon is absent in the Basque coast (Seoane-Camba, 1966). The record of Ibáñez & al. (1980) corresponds to drift material.

### Chlorophyceae

*Bryopsisidella neglecta* (Berthold) Rietema.—After studying the specimens cited by Gorostiaga & Díez (1996) as *Bryopsisidella halymeniae* (Berthold) Feldmann (kept in BIO), we conclude that they belong in *Derbesia tenuissima*.

*Ulva lactuca* L.—Several authors have reported this species from the Basque coast (e.g., Hoek & Donze, 1966; Angulo, 1980; or Ibáñez & al., 1980). According to Bliding (1968) this species has a more northern distribution (Arctic region, Scandinavia and Great Britain). On the basis of its geographical distribution this species should be excluded from the Basque coast, as Hoeksema & Hoek (1983) excluded it from Roscoff (Brittany, France). According to Ibáñez & al. (1980), the records of *U. lactuca* from the Basque coast should be referred to *U. gigantea* (Kütz.) Bliding, but we consider that they are *U. pseudocurvata*.

### Acknowledgements

We are very grateful to P.C. Silva who criticised and greatly improved a previous version of the manuscript. We also thank Silvia Calvo from the Universidad de A Coruña (Dpto. de Biología Animal, Biología Vegetal y Ecología) for her assistance in the identification of the blue-green algae, as well as two anonymous reviewers by their valuable contributions that have greatly improve this work.

### References

- Abdelahad, N. & D'Archino, R. 1998. An illustrated flora of coastal marine algae from Lazio (Central Italy). I. Rhodophyta. Part I. Ceramiales: Ceramiaceae. *Journal of the Quekett Microscopical Club* 38: 102-143.
- Álvarez Cobelas, M., Gallardo García, T. & Navarro Toro, M.J. 1989. Una biogeografía de la flora de algas bentónicas marinas de la Península Ibérica. *Anales del Jardín Botánico de Madrid* 46: 9-19.
- Álvarez, M., Gallardo, T., Ribera, M.A. & Gómez Garreta, A. 1988. A reassessment of Northern Atlantic seaweed biogeography. *Phycologia* 27: 221-233.
- Anagnostidis, K. & Komárek, J. 1988. Modern approach to the classification system of cyanophytes. 3. Oscillatoriales. *Archiv für Hydrobiologie. Supplementband. Algological Studies* 80: 327-472, figs. 1-35, tabs. 1-13.
- Angulo, R. 1980. *Sistemática de las algas marinas de la Costa Vasca*. Sociedad Cultural INSUB. Publ. n.º 1. San Sebastián.
- Angulo, R. 1982. Distribución y estratificación de algas bentónicas de la zona intermareal de varios lugares de la Costa Vasca. *Actas del I Simposio Ibérico de Estudios del Bentos Marino*: 24-36.
- Angulo, R., Campoy, R. & Ibáñez, M. 1978. Ecología de la Costa Guipuzcoana I. *Bulletin de Centre d'Études et de Recherches Scientifiques. Biarritz* 12: 157-184.
- Ardré, F. 1970. Contribution à l'étude des algues marines du Portugal. I. La Flore. *Portugaliae Acta Biologica, Serie B* 10: 1-143.
- Ardré, F. 1971. Contribution à l'étude des algues marines du Portugal. II. Ecologie et chorologie. *Centre d'Études et de Recherches Scientifiques. Biarritz* 8: 359-574.
- Athanasiadis, A. 1987. *A survey of the seaweeds of the Aegean Sea with taxonomic studies on species of the tribe Antithamnieae (Rhodophyta)*. University of Gothenburg. Kungälv.
- Athanasiadis, A. 1990. Evolutionary biogeography of the North Atlantic Antithamnioid algae. In: Garbary, D.J. & Robin South, G. (eds.), *Evolutionary Biogeography of the Marine Algae of the North Atlantic*: 219-240. Nato Asi Series. Series G, Ecological Sciences 22, Springer.
- Athanasiadis, A. 1996. Morphology and classification of the Ceramioideae (Rhodophyta) based on phylogenetic principles. *Opera Botanica* 127: 1-221.
- Bae, E.H. & Lee, I.K. 2001. Umbraulva, a new genus based on *Ulva japonica* (Holmes) Papenfuss (Ulveae, Chlorophyta). *Algae (The Korean Journal of Phycology)* 16: 217-231.
- Báez, J.C., Conde, F. & Flores Moya, A. 2001. Notas corológicas del macrofitobentos de Andalucía (España). V. *Acta Botanica Malacitana* 26: 193-196.
- Bárbara, I., Calvo, S., Cremades, J., Díez, P., Dosil, J., Peña, V., López Varela, C., Novo, T., Veiga, A.J. & López Rodríguez, M.C. 2003. Fragmenta Chorologica Occidentalia, Algae, 8641-8747. *Anales del Jardín Botánico de Madrid* 60: 409-416.
- Bárbara, I. & Cremades, J. 1996. Seaweeds of the Ría de A Coruña (NW Iberian Peninsula, Spain). *Botanica Marina* 39: 371-388.
- Bárbara, I., Cremades, J., Veiga, A.J., Dosil, J., Calvo, S., Peña, V. & López Rodríguez, M.C. 2002. Fragmenta Chorologica Occidentalia, Algae, 7814-7892. *Anales del Jardín Botánico de Madrid* 59: 292-297.
- Bárbara, I., Gorostiaga, J.M., Secilla, A., Díez, I. & Santolaria, A. 1995. Fragmenta Chorologica Occidentalia, Algae, 5551-5577. *Anales del Jardín Botánico de Madrid* 53: 235-237.
- Benhissoune, S., Boudouresque, C.-F. & Verlaque, M. 2001. A checklist of marine seaweeds of the Mediterranean and Atlantic coasts of Morocco I. Chlorophyceae Wille s. l. *Botanica Marina* 44: 171-182.
- Benhissoune, S., Boudouresque, C.-F. & Verlaque, M. 2002. A checklist of the seaweeds of the Mediterranean and Atlantic coasts of Morocco. II. Phaeophyceae. *Botanica Marina* 45: 217-230.
- Benhissoune, S., Boudouresque, C.-F., Perret-Boudouresque, M. & Verlaque, M. 2002. A checklist of the seaweeds of the Mediterranean and Atlantic coasts of Morocco. III. Rhodophyceae (Excluding Ceramiales). *Botanica Marina* 45: 391-412.
- Benhissoune, S., Boudouresque, C.-F., Perret-Boudouresque, M. & Verlaque, M. 2003. A checklist of the seaweeds of the Mediterranean and Atlantic coasts of Morocco. IV. Rhodophyceae - Ceramiales. *Botanica Marina* 46: 55-68.
- Blair, S.M. 1983. Taxonomic treatment of the Chaetomorpha and Rhizoclonium species (Cladophorales; Chlorophyta) in New England. *Rhodora* 85: 175-211.
- Bliding, C. 1968. A critical survey of European taxa in Ulvales. II. *Ulva*, *Ulvaria*, *Monostroma*, *Kormmannia*. *Botaniska Notiser* 121: 535-629.
- Børgesen, F. 1932. A revision of Forsskål's algae mentioned in Flora Aegyptiaco-Arabica and found in his herbarium in the Botanical Museum of the University of Copenhagen. *Dansk Botanisk Arkiv Udgvjet af Dansk Botanisk Forening* 8: 1-15.

26. Borja, A., Egaña, J., Valencia, V., Franco, J. & Castro, R. 2000. 1947-1997, estudio y validación de una serie de datos diarios de temperatura del agua de mar en San Sebastián, procedente de su Aquarium. *Oceanografika* 3: 139-152.
27. Borja, A., Fernández, J.A. & Orive, E. 1982. Aplicación de métodos numéricos al estudio de la distribución de los organismos bentónicos del intermareal rocoso de Vizcaya. *Oecologia Aquatica* 6: 147-157.
28. Borja, A., Uriarte, A., Valencia, V., Motos, L. & Uriarte, A. 1996. Relationships between anchovy (*Engraulis encrasicolus*) recruitment and the environment in the Bay of Biscay. *Scientia Marina* 60 (supl. 2): 179-192.
29. Bornet, M. 1892. Les Algues de P.K.A Schousboe. *Mémoires de la Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg* 28: 165-376.
30. Brummitt, R.K. & Powell, C.E. 1992. *Authors of Plant Names. A List of Authors of Scientific Names of Plants, with Recommended Standard Forms of these Names, Including Abbreviations*. Royal Botanic Gardens. Kew.
31. Burrows, E.M. 1991. *Seaweeds of the British Isles. Vol. 2 Chlorophyta*. Natural History Museum. London.
32. Calvo, S. & Bárbara, I. 2002 [2003]. Algas bentónicas de marismas de Galicia. *Nova Acta Científica Compostelana (Biología)* 12: 5-34.
33. Calvo, S. & Bárbara, I. 2003. Cyanophyceae from Galician salt-marshes (NW Spain). *Algological Studies* 109: 139-170.
34. Calvo, S. & Bárbara, I. (in press). Vaucheria species from Galician salt-marshes (NW Spain). *Algological Studies* 111: 105-114.
35. Casares, C. 1987. *Estudio de la flora bentónica marina de la costa de Guipuzcoa*. Ph.D. Thesis. Universidad de Barcelona.
36. Casares, C. 1988. Nuevos datos sobre la bigeografía del Cantábrico oriental. *Actes del Simposi Internacional de Botànica Pius Font i Quer* 1: 99-103.
37. Casares, C. 1989. Catálogo de la flora bentónica marina de la costa de Guipuzcoa. *Centre d'Études et de Recherches Scientifiques. Biarritz* 15: 83-118.
38. Casares, C., Gómez, A., Ribera, M.A. & Seoane-Camba, J.A. 1987. Sargassum muticum (Yendo) Fensholt, nueva cita para la Península Ibérica. *Collectanea Botanica (Barcelona)* 17: 151.
39. Casares, C. & Seoane-Camba, J.A. 1988. Fragmenta chorologica occidentalia, Algae, 1215-1281. *Anales del Jardín Botánico de Madrid* 45: 281-287.
40. Casares, C. & Seoane-Camba, J.A. 1989. Fragmenta chorologica occidentalia, Algae, 1777-1848. *Anales del Jardín Botánico de Madrid* 45: 515-521.
41. Chalon, J. 1905. *Liste des Algues marines observées jusqu'à ce jour entre l'embouchure de l'Escaut et La Corogne (Incl. Iles Anglo-Normandes)*. Anvers.
42. Cheney, D.F. 1977. R+C/P, a new and improved ratio for comparing seaweed floras. *Journal of Phycology* 13 (suppl.): 12.
43. Clayton, M.N. 1974. Studies on the development, life history and taxonomy of the Ectocarpales (Phaeophyta) in Southern Australia. *Australian Journal of Botany* 22: 743-813.
44. Colmeiro, M. 1867. Enumeración de las Criptógamas de España y Portugal. II. *Revista de los Progresos de las Ciencias, Madrid*. 16-17: 1-160.
45. Conde, F. & Flores Moya, A. 2000. Nuevas adiciones al conocimiento de las macroalgas marinas de la isla de Alborán (Mediterráneo Occidental). *Acta Botanica Malacitana* 25: 180-184.
46. Conde, F., Flores-Moya, A., Soto, J., Altamirano, M. & Sánchez, A. 1996. Check-list of Andalusia (S Spain) seaweeds. III. Rhodophyceae. *Acta Botanica Malacitana* 21: 7-33.
47. Coppejans, E. 1995. *Flora algologique des côtes du Nord de la France et de la Belgique*. Jardin Botanique National de la Belgique. Meise.
48. Cormaci, M. & Furnari, G. 1988. *Antithamnionella elegans* (Bethold) Cormaci et Furnari (Ceramiaceae, Rhodophyta) and related species, with the description of two new varieties. *Phycologia* 27: 340-346.
49. Cremades, J., Bárbara, I. & Veiga, A.J. 1997. Amphiroa vanbosseae (Corallinales, Rhodophyta) on European Atlantic coasts. *Cryptogamie - Algologie* 18: 11-17.
50. Cremades, J., Bárbara, I., Granja, A. & Veiga, A.J. 1997. Fragmenta Chorologica Occidentalia, Algae, 5957-6058. *Anales del Jardín Botánico de Madrid* 55: 433-440.
51. Cremades, J., Bárbara, I., Veiga, A.J. & López Rodríguez, M.C. 2002. Fragmenta Chorologica Occidentalia, Algae, 7776-7812. *Anales del Jardín Botánico de Madrid* 59: 289-291.
52. Díez, I., Gorostiaga, J.M., Secilla, A. & Santolaria, A. 1996. Contribution to marine algal flora from the Basque coast: new records and rare species. *Oceanografika* 1: 65-80.
53. Díez, I., Santolaria, A. & Gorostiaga, J.M. 2003. Relationships of environmental factors with the structure and distribution of subtidal seaweed vegetation of the western Basque coast (N Spain). *Estuarine, Coastal and Shelf Science* 56: 1041-1054.
54. Díez, I., Secilla, A., Santolaria, A. & Gorostiaga, J.M. 1999. Phytobenthic intertidal community structure along an environmental pollution gradient. *Marine Pollution Bulletin* 38: 463-472.
55. Dixon, P.S. 1967. The typification of *Fucus cartilagineus* L. and *F. corneus* Huds. *Blumea* 15: 55-62.
56. Dixon, P.S. & Price, J.H. 1981. The genus *Callithamnion* (Rhodophyta: Ceramiaceae) in the British Isles. *Bulletin of the British Museum (Natural History). Botany* 9: 99-141.
57. Donze, M. 1968. The algal vegetation of the Ría de Arosa (NW Spain). *Blumea* 16: 159-192.
58. Feldmann, J. 1931. Le *Ctenosiphonia hypnoides* (Welw.) Schmitz sur la Côte Basque. *Revue Algologique* 5: 431-432.
59. Feldmann, J. 1941. Sur une nouvelle espèce de *Fucus* de la côte Basque: *Fucus chalonii* nov. sp. *Bulletin de la Société Botanique de France* 88: 143-147.
60. Feldmann, J. 1954. Inventaire de la Flore Marine de Roscoff. Algues, champignons, lichens et spermatophytes. *Travaux Station Biologique de Roscoff, Nouvelle Série, Suppl.* 6: 1-152.
61. Feldmann, J. & Feldmann, G. 1953. Observations sur les genres *Dermocarpa* et *Dermocarpella* (Cyanophyceae). *Österreichischen Botanischen Zeitschrift* 100 (4/5): 505-514.
62. Feldmann, J. & Lami, R. 1941. Flore et végétation marines de la côte basque française. *Bulletin de la Société Botanique de France* 88: 123-142.
63. Feldmann, J. & Magne, F. 1964. Additions à l'inventaire de la flore marine de Roscoff algues, champignons, lichens. *Travaux Station Biologique de Roscoff, Nouvelle Série* 15 (New supplement): 1-23.
64. Fernández, J.A., Borja, A. & Orive, E. 1982. Distribución del macrofitobentos en el intermareal rocoso del entorno de la desembocadura del Nervión. *Kobie* 12: 87-99.
65. Fischer-Piette, E. 1935. Quelques remarques bionomiques sur le côte basque française et espagnole. *Bulletin du Laboratoire Maritime de Saint-Servan* 14: 1-14.
66. Fischer-Piette, E. 1952. La distribution des Fucacées sur le côte nord d'Espagne en 1949. *Bulletin du Laboratoire Maritime du Dinard* 37: 1-13.
67. Fischer-Piette, E. 1955. Repartition le long des côtes septentrionales de l'Espagne du principales espèces peuplant les roches intercotidiaux. *Annales de l'Institut Océanographique* 3: 37-75.
68. Fischer-Piette, E. 1963. La distribution des principaux organismes intercotidiaux Nord-Iberiques en 1954-1955. *Annales de l'Institut Océanographique* 40: 165-312.



69. Fischer-Piette, E. & Dupérier, R. 1961. Situation des Fucacées de la Côte Basque en 1960. *Bulletin de Centre d'Études et de Recherches Scientifiques. Biarritz* 3: 403-419.
70. Fletcher, R.L. 1987. *Seaweeds of the British Isles. Vol. 3 Fuco-phyceae (Phaeophyceae). Part 1*. British Museum (Natural History). London.
71. Flores-Moya, A., Soto, J., Sánchez, A., Altamirano, M., Reyes, G. & Conde, F. 1995a. Check-list of Andalusia (S Spain) seaweeds. I. Phaeophyceae. *Acta Botanica Malacitana* 20: 5-18.
72. Flores-Moya, A., Soto, J., Sánchez, A., Altamirano, M., Reyes, G. & Conde, F. 1995b. Check-list of Andalusia (S Spain) seaweeds. II. Chlorophyceae. *Acta Botanica Malacitana* 20: 19-26.
73. Fredericq, S. & Hommersand, M.H. 1989. Proposal of the Gracilariales ord. nov. (Rhodophyta) based on an analysis of the reproductive development of *Gracilaria verrucosa*. *Journal of Phycology* 25: 213-227.
74. Fredriksen, S., Guiry, M.D. & Rueness, J. 1994. Morphological and biosystematic studies of *Gelidium pusillum* and *G. pulchellum* (Gelidiaceae, Rhodophyta) from Europe. *Phycologia* 33: 462-470.
75. Furnari, G., L'Hardy-Halos, M.-T., Rueness, J. & Serio, D. 1998. On the conspecificity of *Aglaothamnion tenuissimum* and *A. byssoides* (Ceramiaceae, Rhodophyta). *Taxon* 47: 843-849.
76. Gallardo, T., Gómez Garreta, A., Ribera, M.A., Cormaci, M., Furnari, G., Giaccone, G. & Boudouresque, C.-F. 1993. Check-list of Mediterranean Seaweeds, II. Chlorophyceae Wille s.l. *Botanica Marina* 36: 399-421.
77. Gallardo, T. & Margalet, J.L. 1992. Aportación al conocimiento de la flora bentónica marina del noroeste de la ría de Foz (Lugo, España). *Actas del Simposi Internacional de Botànica Pius Font i Quer* 1: 119-122.
78. Garbary, D.J. & Gabrielson, P.W. 1990. Taxonomy and evolution. In: Cole, K. M. & Sheath, R. G. (eds.), *Biology of the Red Algae*: 477-498. Cambridge University Press, Cambridge.
79. Gayral, P. 1965. *Monostroma Thuret*, *Ulvaria Rupr.* emend. Gayral, *Ulvopsis* Gayral. (Chlorophycées, Ultrichales): structure, reproduction, cycles, position systématique. *Revue Générale de Botanique* 72: 627-638.
80. Golden, L. & Garbary, D. 1984. Studies on *Monostroma* (Monostromataceae, Chlorophyta) in British Columbia with emphasis on spore release. *Japanese Journal of Phycology* 32: 319-332.
81. Gómez Garreta, A. 2001. *Flora Phycologica Iberica. 1. Fucales*. Universidad de Murcia.
82. Gorostiaga, J.M. 1981. Contribución al estudio biogeográfico de las algas de S. J. de Gaztelugatxe (Costa de Vizcaya). *Lurralde* 4: 213-228.
83. Gorostiaga, J.M. 1994. *Fucus chalonii* or *Fucus vesiculosus* var. *linearis*? *The Phycologist* 37: 43-44.
84. Gorostiaga, J.M. 1995. Sublittoral seaweed vegetation of a very exposed shore on the Basque coast (N Spain). *Botanica Marina* 38: 9-16.
85. Gorostiaga, J.M., Angulo, R. & Ibáñez, M. 1981. Nueva cita de *Saccorhiza polyschides* y *Laminaria ochroleuca* en la costa vasca. *Lurralde* 4: 265-270.
86. Gorostiaga, J.M., Casares, C., Fernández, J.A., Pérez, B. & Sarasua, A. 1988. Sobre la expansión de *Sargassum muticum* (Yendo) Fensholt en la costa atlántica europea. Su presencia en la costa vasca. *Lurralde* 11: 437-443.
87. Gorostiaga, J.M. & Díez, I. 1996. Changes in the sublittoral benthic marine macroalgae in the polluted area of Abra de Bilbao and proximal coast (Northern Spain). *Marine Ecology: Progress Series* 130: 157-167.
88. Gorostiaga, J.M. & Limia, J.M. 1985. Sobre dos algas que alcanzan su límite de distribución septentrional en la costa vasca: *Polysiphonia polyspora* (C. Agardh) y *Pleonosporium fleuosum* (C. Agardh) Bornet. *Lurralde* 8: 53-59.
89. Gorostiaga, J.M., Limia, J.M. & Bengoetxea, D. 1987. Flora bentónica litoral de un área sometida a una intensa polución: el estuario del Abra de Bilbao y su entorno (NE España). I Zonación. *Actas del VI Simposio Nacional de Botánica Criptogámica*: 57-69.
90. Gorostiaga, J.M. & Renobales, G. 1987. Vegetación litoral: algas y líquenes de la costa vasca. In: Ayerbe, E. (ed.), *It-sasoa.2. El mar de Euskalerría. La naturaleza, el hombre y su historia*: 81-99. Etor. San Sebastián.
91. Gorostiaga, J.M. & Santolaria, A. 1992. On the presence of *Schimmelmannia schousboei* J. Agardh (Gloiosiphoniaceae, Rhodophyta) in European coastal waters. *British Phycological Journal* 27: 90.
92. Gorostiaga, J.M., Santolaria, A., Secilla, A. & Díez, I. 1998. Sublittoral benthic vegetation of eastern Basque coast (N Spain): structure and environmental factors. *Botanica Marina* 41: 455-465.
93. Gorostiaga, J.M., Santolaria, A., Secilla, A., Tajadura, J., Corcuera, I., Díez, I. & Calvo, S. 2000. A preliminary study of the intertidal epilithic phytobenthos of the heavily polluted estuary of Bilbao (Northern Spain). *31<sup>st</sup> Annual Symposium of the Estuarine and Coastal Sciences Association*: 59.
94. Granja, A., Cremades, J. & Bárbara, I. 1992. Catálogo de las algas bentónicas marinas de la Ría de Ferrol (Galicia, NO de la Península Ibérica) y consideraciones biogeográficas sobre su flora. *Nova Acta Científica Compostelana (Biología)* 3: 3-21.
95. Granja, A., Cremades, J. & Bárbara, I. 1993. Contribución al conocimiento de la flora bentónica marina del noroeste de la Península Ibérica I. Primeros datos sobre el carácter florístico del litoral de Lugo (Galicia). *Nova Acta Científica Compostelana (Biología)* 4: 15-23.
96. Guillerme, I. & Cremades, J. 1993. Algunas algas interesantes de las comunidades del fouling del puerto de Vigo (Galicia, España). *Anales del Jardín Botánico de Madrid* 50: 142-145.
97. Guillerme, I. & Cremades, J. 1997. *Apoglossocolax pusilla* (Delesseriaceae, Rhodophyta), adelfoparásito exclusivo de *Apoglossum ruscifolium*, en las costas de la Península Ibérica. *Actas del XII Simposio Nacional de Botánica Criptogámica*: 78.
98. Guillerme, I., Cremades, J. & Pérez Cirera, J.L. 1994 [1995]. Primeros resultados sobre la composición florística y sucesión de las comunidades algales de "fouling" en el puerto de Vigo (Galicia: NO España). *Studia Botanica* 13: 31-37.
99. Guiry, M.D. 1997. Benthic red, brown and green algae. In: Howson, C.M. & Picton, B. E. (eds.), *The Species Directory of the Marine Fauna and Flora of the British Isles and Surrounding Seas*: 341-367. Ulster Museum and Marine Conservation Society. Belfast and Ross-on-Wye.
100. Guiry, M.D. & Freamhainn, M.T. 1985. Biosystematics of *Gracilaria foliifera* (Gigartinales, Rhodophyta). *Nordic Journal of Botany* 5: 629-637.
101. Guiry, M.D. & Nic Dhonncha, E. 2003. *AlgaeBase version 2.0*. World-wide electronic publication, National University of Ireland, Galway. [http://www.algaebase.org].
102. Haroun, R.J., Gil-Rodríguez, M.C., Díaz de Castro, J. & Prud'homme van Reine, W.F. 2002. A checklist of the marine plants from the Canary Islands (central eastern Atlantic Ocean). *Botanica Marina* 45: 139-169.
103. Hardy, G. & Guiry, M.D. 2003. *A check-list and Atlas of the Seaweeds of Britain and Ireland*. British Phycological Society. Galway.
104. Harvey, W.H. 1849. *Phycologia Britannica*. London.
105. Hayden, H.S., Blomster, J., Maggs, C.A., Silva, P.C., Stanhope, M.J. & Waaland, J.R. 2003. Linnaeus was right all along: *Ulva* and *Enteromorpha* are not distinct genera. *European Phycological Journal* 38: 227-294.

106. Hoek, C. van den. 1963. *Revision of the European species of Cladophora*. Leiden.
107. Hoek, C. van den. 1979. The phytogeography of Cladophora (Chlorophyceae) in the northern Atlantic Ocean, in comparison to that of other benthic algal species. *Helgoländer wissenschaftliche Meeresuntersuchungen* 32: 374-393.
108. Hoek, C. van den & Breeman, A.M. 1990. Seaweeds biogeography of the North Atlantic: where are we now? In: Garbary, D. J. & Souths, G.R. (eds.), *Evolutionary Biogeography of the Marine Algae of the North Atlantic*: 55-86. Springer-Verlag, Berlin.
109. Hoek, C van den, Breeman, A.M. & Stam, W.T. 1990. The geographical distribution of seaweeds species in relation to temperature: present and past. In: Beukema, J.J., Wolff, W.J. & Brouns, J.J.W.M. (eds.), *Expected Effects of Climatic Change on Marine Coastal Ecosystems*: 55-67. Kluwer Academic Publishers, Netherlands.
110. Hoek, C. van den & Donze, M. 1966. The algal vegetation of the rocky côte basque (SW France). *Bulletin de Centre d'Études et de Recherches Scientifiques. Biarritz* 6: 289-319.
111. Hoek, C. van den & Donze, M. 1967. Algal phytogeography of the European Atlantic coasts. *Blumea* 15: 63-89.
112. Hoeksema, B.W. & Hoek, C. van den 1983. The taxonomy of Ulva (Chlorophyceae) from the coastal region of Roscoff (Brittany, France). *Botanica Marina* 26: 65-86.
113. Hoffman, L. & Compère, P. 1990. Nomenclatural notes in Cyanophyceae. *Taxon* 39: 307-310.
114. Ibáñez, M. 1978. Características biogeográficas del litoral de la Costa Vasca. *Lurralde* 1: 121-127.
115. Ibáñez, M. 1983. Biogeografía costera de Euskal Herria. *Eusko Ikaskuntza. Sociedad Estudios Vascos, Sección de Historia y Geografía* 1: 117-138.
116. Ibáñez, M. 1990. El Golfo de Vizcaya: meridionalización "versus" continentalización. *Actas del VI Simposio Nacional de Botánica Criptogámica*: 491-502.
117. Ibáñez, M., Aguirrezabalaga, F., Arnedo, M., Fernández, J.A., López, J.C. & Romero, A. 1987. Ecología de la costa guipuzcoana. II: Estratificación de especies en la zona intermareal de San Sebastián (entre la desembocadura del Urumea y Punta Mompas). *Lurralde* 10: 91-107.
118. Ibáñez, M., Angulo, R. & Iribar, X. 1980. *Biogeografía de la Costa Vasca*. L. Haramburu. San Sebastián.
119. Ibáñez, M. & Villar, B. 1981. Ciclo estacional de macrófitas en la zona mediolitoral superior de la costa guipuzcoana. *Oecologia Aquatica* 5: 75-78.
120. Irastorza, A.J. & Ibáñez, M. 1981. Estudio de los pigmentos en las algas macrófitas de la zona intermareal de la costa vasca. *Munibe* 33: 51-62.
121. Jaasund, E. 1960. Fosliea curta (Fosl.) Reinke and Isthmoplea sphaerophora (Carm.) Kjellman. *Botanica Marina* 2: 174-181.
122. John, D.M., Prud'homme van Reine, W.F., Lawson, G.W., Kostermans, T.B. & Price, J.H. 2004. A taxonomic and geographical catalogue of the seaweeds of the western coast of Africa and adjacent islands. *Beihfte zur Nova Hedwigia* 127: 1-339.
123. Komárek, J. & Anagnostidis, K. 1986. Modern approach to the classification system of cyanophytes. 2. Chroococcales. *Archiv für Hydrobiologie. Supplementband. Algological Studies* 73: 157-226, figs. 1-28, tabs. 1-6.
124. Lázaro Ibiza, B. 1893. Contribuciones a la flora de la Península Ibérica. Notas críticas acerca de la flora española (primera serie). *Anales de la Sociedad Española de Historia Natural* 22: 19-46.
125. Limia, J.M. & Gorostiaga, J.M. 1987. Flora marina bentónica sublitoral del tramo comprendido entre Pta. Covarón y Pta. Muskes (Vizcaya, NE España). *Actas del VI Simposio Nacional de Botánica Criptogámica*: 81-88.
126. Loiseaux, S. 1969. Sur une espece de Myriotrichia obtenue en culture à partir zoïdes d'Hecatonema maculans Sauv. *Phycologia* 8: 11-15.
127. López Rodríguez, M.C., Bárbara, I. & Cremades, J. 2003. Morfología y distribución de Choreocolax polysiphoniae y Harveyella mirabilis (Gigartinales, Rhodophyta), dos parásitos marinos en la Península Ibérica. *Anales del Jardín Botánico de Madrid* 60: 213-215.
128. López Rodríguez, M.C., Cremades, J. & Bárbara, I. 1991. Fragmenta Chorologica Occidentalia, Algae, 3260-3284. *Anales del Jardín Botánico de Madrid* 49: 97-100.
129. López Rodríguez, M.C. & Pérez-Cirera, J.L. 1990. Caposiphon fulvescens (C. Agardh) Setchell and Gardner (Chlorophyta), en la Ría de Pontevedra, Noroeste peninsular. *Anales del Jardín Botánico de Madrid* 47: 496-497.
130. López Rodríguez, M.C. & Pérez-Cirera, J.L. 1995. Fragmenta Chorologica Occidentalia, Algae, 5157-5166. *Anales del Jardín Botánico de Madrid* 52: 197-198.
131. López Rodríguez, M.C. & Pérez-Cirera, J.L. 1996. Cianófitos en medios alterados por la contaminación industrial en el noroeste de la Península Ibérica. *Anales del Jardín Botánico de Madrid* 54: 43-49.
132. Maggs, C.A. & Hommersand, M.H. 1993. *Seaweeds of the British Isles. Vol. 1 Rhodophyta. Part 3A. Ceramiales*. British Museum (Natural History). London.
133. Maggs, C.A. & Pueschel, C.M. 1989. Morphology and development of Ahnfeltia plicata (Rhodophyta): proposal of Ahnfeltiales ord. nov. *Journal of Phycology* 25: 333-351.
134. Miranda, F. 1934. Materiales para una flora marina de las rías bajas gallegas. *Boletín de la Real Sociedad Española de Historia Natural. Sección Biológica* 34: 165-180.
135. Montagne, C. 1842. Troisième centurie de plantes cellulaires exotiques nouvelles. Décades V, VI, VII et VIII. *Annales des Sciences Naturelles. Botanique. Ser. 2* 18: 241-282, pl. 7.
136. Niell, F.X. 1978. Catálogo florístico y fenológico de las algas superiores y cianofíceas bentónicas de las Rías Bajas Gallegas. *Investigación Pesquera* 42: 365-400.
137. Otero-Schmitt, J. & Pérez-Cirera, J.L. 1996. Epiphytism on Cystoseira (Fucales, Phaeophyta) from the Atlantic Coast of Northwest Spain. *Botanica Marina* 39: 445-465.
138. Otero-Schmitt, J. & Pérez-Cirera, J.L. 1998. Caracterización de las biocenosis bentónicas de cubetas litorales en una costa expuesta de la Ría de Muros (Galicia, NO de España). *Nova Acta Científica Compostelana (Biología)* 8: 15-38.
139. Otero-Schmitt, J. & Pérez-Cirera, J.L. 2002. Infralittoral benthic biocenoses from northern Ría de Muros, Atlantic coast of northwest Spain. *Botanica Marina* 45: 93-122.
140. Pedersen, P.M. 1984. Studies on primitive brown algae (Fucoephyceae). *Opera Botanica* 74: 1-76.
141. Peña, V. & Bárbara, I. 2002 [2003]. Caracterización florística y zonación de las algas bentónicas marinas del puerto de A Coruña (NO Península Ibérica). *Nova Acta Científica Compostelana (Biología)* 12: 35-66.
142. Peña, V. & Bárbara, I. 2003a. Ceramium cimbricum H. Petersen in Rosenvinge y Seirospora interrupta (J.E. Smith) F. Schmitz (Ceramiales, Rhodophyta) en el noroeste de la Península Ibérica. *Anales del Jardín Botánico de Madrid* 60: 443-447.
143. Peña, V. & Bárbara, I. 2003b. Stanieria sphaerica, Myxosarcina gloeocapsoides y Xenococcus cladophorae, tres cianófitos del puerto de La Coruña con interés corológico para la Península Ibérica. *Anales del Jardín Botánico de Madrid* 60: 437-440.

144. Pérez-Celorrío, B., Uriarte, A. & Ibáñez, M. 1985. Estructura y variaciones estacionales del macrofitobentos intermareal en Fuenterrabía (Guipúzcoa). *Lurralde* 8: 61-80.
145. Pérez-Cirera, J.L. 1975a. Catálogo florístico de las algas bentónicas de la Ría de Corme y Lage, NO de España. *Anales del Instituto Botánico A. J. Cavanilles* 32: 5-87.
146. Pérez-Cirera, J.L. 1975b. Notas sobre la vegetación ficológica bentónica de la Ría de Cedeira (NO de España). *Anales del Instituto Botánico A. J. Cavanilles* 32: 161-171.
147. Pérez-Ruzafa, I., Gallardo, T. & Gómez-Cancio, R. 1993. Numerical taxonomy of some taxa of the genus *Fucus* in the Iberian peninsula. *Hydrobiologia* 260/261: 81-90.
148. Pueschel, C.M. 1989. An expanded survey of the ultrastructure of red algal pit plugs. *Journal of Phycology* 25: 625-636.
149. Santelices, B. & Hommersand, M.H. 1997. Pterocladia, a new genus in the Gelidiales (Gelidiales, Rhodophyta). *Phycologia* 36: 114-119.
150. Santolaria, A., Gorostiaga, J.M., Secilla, A. & Díez, I. 1998. Fragmenta Chorologica Occidentalia, Algae, 6059-6083. *Anales del Jardín Botánico de Madrid* 55: 440-442.
151. Sarasua, A., Uriarte, A. & Ibáñez, M. 1985. Aportación al estudio de la estructura del macrofitobentos en la rasa intermareal de Zumaia (Gipuzkoa). *Lurralde* 8: 81-96.
152. Saunders, G.W. & Kraft, G.T. 1994. Small-subunit rRNA gene sequences from representatives of selected families of the Gigartinales and Rhodymeniales (Rhodophyta). I. Evidence for the Plocamiales ord. nov. *Canadian Journal of Botany* 72: 1250-1263.
153. Sauvageau, C. 1897. Note préliminaire sur les Algues marines du Golfe de Gascogne. *Journal de Botanique, Paris* 11: 166-174, 175-179, 202-206, 207-214, 252-257, 263-274, 275-288, 301-306, 307-311.
154. Sauvageau, C. 1925. A propos de la rencontre du *Desmarestia dudresnayi* Lamx. dans le Golfe de Gascogne. *Revue Algologique* 1: 1-13.
155. Secilla, A., Gorostiaga, J.M., Díez, I. & Santolaria, A. 1997. *Antithamnion amphigeneum* (Rhodophyta, Ceramiales) from the European Atlantic Waters. *Botanica Marina* 40: 329-332.
156. Secilla, A., Gorostiaga, J.M., Santolaria, A. & Díez, I. 2000. Fragmenta Chorologica Occidentalia, Algae, 7135-7159. *Anales del Jardín Botánico de Madrid* 57: 375-377.
157. Seoane-Camba, J. 1966. Las Laminarias de España y su distribución. *Publicaciones Técnicas de la Junta Estudios de Pesca, Madrid* 5: 425-436.
158. Seoane-Camba, J. 1975. Características de la vegetación marina de la costa de Guipúzcoa. *Anales del Instituto Botánico A. J. Cavanilles* 32: 173-183.
159. Silva, P.C., Basson, P.W. & Moe, R.L. 1996. Catalogue of the benthic marine algae of the Indian Ocean. *University of California Publications in Botany* 79: 1-1259.
160. Stegenga, H., Bolton, J.J. & Anderson, R.J. 1997. *Seaweeds of the South African west coast*. Bolus Herbarium, University of Cape Town. Cape Town.
161. Tan, I.H., Blomster, J., Hansen, G., Leskinen, E., Maggs, C.A., Mann, A., Sluiman, H.J. & Stanhope, M.J. 1999. Molecular phylogenetic evidence for a reversible morphogenetic switch controlling the gross morphology of two common genera of green seaweeds, *Ulva* and *Enteromorpha*. *Molecular Biology and Evolution* 16: 1011-1018.
162. Uriarte, A., Ascacibar, M. & Ibáñez, I. 1983. Aplicación del modelo log-lineal de Motomura en el estudio del bentos intermareal. II: Estudio del macrofitobentos y consideraciones generales. *Lurralde* 6: 21-33.
163. Veiga, A.J., Cremades, J. & Bárbara, I. 1997. *Gononema aecidioides* (Ectocarpaceae), un nuevo feófito para la Península Ibérica. *Anales del Jardín Botánico de Madrid* 55: 155-156.
164. Veiga, A.J., Cremades, J. & Bárbara, I. 1998a. A catalogue of the marine benthic algae of the Sisargas Islands (NW Iberian Peninsula). *Boletim do Museu Municipal do Funchal* 5: 481-483.
165. Veiga, A.J., Cremades, J. & Bárbara, I. 1998b. Fragmenta Chorologica Occidentalia, Algae, 6283-6307. *Anales del Jardín Botánico de Madrid* 56: 121-123.
166. Villar, B., Angulo, R. & Ibáñez, M. 1981. Estudio cuantitativo de las algas macrofitas de la zona intermareal de Guipúzcoa. *Oecologia Aquatica* 5: 79-85.
167. Wynne, M.J. 1989. Towards the resolution of taxonomic and nomenclatural problems concerning the typification of *Acrosorium uncinatum* (Delesseriaceae: Rhodophyta). *British Phycological Journal* 24: 245-252.
168. Wynne, M.J. 1994. Book Review. *Seaweeds of the British Isles. V. I Rhodophyta, Part 3A. Ceramiales*. By Maggs & Hommersand. The Natural History Museum. London. 1993. *Phycologia* 33: 138-139.
169. Wynne, M.J. 1998. A checklist of benthic marine algae of the tropical and subtropical western Atlantic: first revision. *Beihft zur Nova Hedwigia* 116: 1-155.
170. Wynne, M.J. & Kraft, G. T. 1981. Appendix: Classification summary. In: Lobban, C.S. & Wynne, M.J. (eds.), *The Biology of Seaweeds*: 743-750. Blackwell Scientific Publications. London.
171. Wynne, M. J. & Leliaert F. 2001. *Pedobesia simplex* (Kützting) comb. nov. (Chlorophyta), a new name for *P. lamourouxii* and its first report from the Indian Ocean. *Cryptogamie, Algologie* 22: 3-14.

Received: 19-VII-2004  
Accepted: 15-XI-2004