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Elie POULIN, Anne CHENUIL & Thomas SAUCÈDE

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# The marine vegetation of the Kerguelen Islands: history of scientific campaigns, inventory of the flora and first analysis of its biogeographical affinities

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## ABSTRACT

Conceived as a baseline for the management and conservation of the marine protected area of the French Southern Territories (réserve naturelle nationale des Terres australes françaises), the checklist of marine macroalgae of the Kerguelen Islands was updated based on an extensive review of the literature and scientific databases, from the first report of the Ross expedition, in 1840, to the most

**KEY WORDS**

Checklist,  
macroalgae,  
Rhodophyta,  
Chlorophyta,  
Ochrophyta-Phaeophyceae,  
Southern Ocean,  
coastal benthos,  
global change,  
natural reserve,  
French Southern,  
proteker,  
scientific diving.

**MOTS CLÉS**

Inventaire,  
macroalgues,  
Rhodophyta,  
Chlorophyta,  
Ochrophyta-Phaeophyceae,  
Océan Austral,  
benthos côtier,  
changement global,  
réserve naturelle,  
Terres australes françaises,  
proteker,  
plongée scientifique.

recent works. This work was also conceived as a starting point for forthcoming investigations using molecular systematics tools and for monitoring the effects of global change on sub-Antarctic marine ecosystems. After a brief history of scientific campaigns, a list of 166 species was established (103 Rhodophyta, 35 Chlorophyta and 28 Ochrophyta [Phaeophyceae]). Molecular systematics studies have shown the existence of recurrent discrepancies between the established, morphology-based taxonomy and molecular species delimitation, calling for a revision of systematics. Nevertheless, a first analysis of biogeographical affinities of the marine flora of the Kerguelen Islands is carried out and preliminary results are partially congruent with the main regions currently recognized in the Southern Ocean suggesting the importance of long-distance dispersal to explain the observed distribution patterns.

**RÉSUMÉ**

*La végétation marine des îles Kerguelen, inventaire de la flore et première analyse de ses affinités biogéographiques.*

Conçu comme une base de référence indispensable à la gestion et à la conservation de la flore marine dans l'aire marine protégée des Terres australes françaises (réserve naturelle nationale des Terres australes françaises), l'inventaire de la flore marine des îles Kerguelen a été mis à jour sur la base d'un examen approfondi de la littérature et des bases de données scientifiques, du premier rapport de l'expédition Ross, en 1840, jusqu'aux travaux les plus récents. Ce travail a aussi pour objectif de constituer un point de départ pour de futures investigations utilisant les outils de la systématique moléculaire, et pour le suivi des effets du changement global sur les écosystèmes marins subantarctiques. Après un bref historique des campagnes scientifiques menées, une liste de 166 espèces a été établie (103 Rhodophyta, 35 Chlorophyta et 28 Ochrophyta [Phaeophyceae]). Les travaux récents ont montré l'existence de divergences récurrentes entre la taxinomie actuelle, établie sur des caractères morphologiques et la délimitation moléculaire des espèces, préconisant une révision de la systématique des macroalgues. Une première analyse des affinités biogéographiques de la flore marine des îles Kerguelen a été cependant réalisée et les résultats préliminaires se sont révélés en partie congruents avec les grandes régions actuellement reconnues dans l'océan Austral, suggérant l'importance du phénomène de dispersion sur de longues distances pour expliquer les motifs de distribution observés.

**INTRODUCTION**

The Kerguelen Islands (49°20'S, 69°20'E) are in the Southern Ocean (hereafter SO), 3900 km southeast of South Africa, 1 950 km north of Antarctica and 4000 km west of Australia (Fig. 1). They were officially discovered by the French navigator Yves-Joseph de Kerguelen-Trémarec on February 12<sup>th</sup>, 1772, aboard the *fluyt* (Dutch sailing cargo vessel) *La Fortune* and the maritime gabare (sailing scow) *Le Gros Ventre*. First scientific investigations however began with Captain James Cook's exploration four years later. Cook reached the Kerguelen Islands on December 25<sup>th</sup>, 1776 on his third circumnavigation onboard the HMS *Resolution* and HMS *Discovery*. Soon after being discovered, the islands were regularly visited by whalers and seal hunters (mainly British, American, and Norwegian) during the 19<sup>th</sup> century. The Kerguelen Islands (7215 km<sup>2</sup>) consist of a main island, the so-called Grande Terre, surrounded by around 300 smaller islands and islets (Fig. 2). They emerge in the flow of the Antarctic Circumpolar Current (hereafter ACC), in the vicinity of the Antarctic Convergence where distinct water masses meet (Antarctic Surface Waters, Polar Front Surface Waters and sub-Antarctic Surface Waters). The Kerguelen Plateau also emerges 450 km southeast of the Kerguelen Islands at Heard and McDonald Islands.

Since the discovery of the islands, marine coastal habitats have been little impacted by direct anthropogenic disturbance (Lecomte *et al.* 2013). They are still pristine marine ecosystems that constitute effective sentinels to assess the effects of global change. The proximity of the sub-Antarctic and Polar fronts put the marine biota of the Kerguelen Islands particularly at risk, exposing them to the effects of climate change. The distinct water masses are predicted to shift southwards in the future, resulting in drastic environmental changes and affecting coastal marine species and ecosystem functioning (Park *et al.* 2014; Féral *et al.* 2016a, b, 2019). Significant impacts can be expected on local benthic communities in which many species have limited resilience ability (Stenni *et al.* 2017; Gutt *et al.* 2018; Guillaumot *et al.* 2018; Saucède *et al.* 2019). To mitigate the impacts of environmental changes and protect marine living resources, the Kerguelen Islands were made part of the National Nature Reserve of the French Southern Territories (réserve naturelle nationale des Terres australes françaises: RNN-TAF) (decree n°2016-1700 of December 12<sup>th</sup> 2016), and marine coastal areas have been placed on the status of enhanced protection (Ia IUCN category) (Day *et al.* 2012).

Interpreting ecological changes in marine life and implementing appropriate management plans require setting up long-term and cross-disciplinary field observing systems of

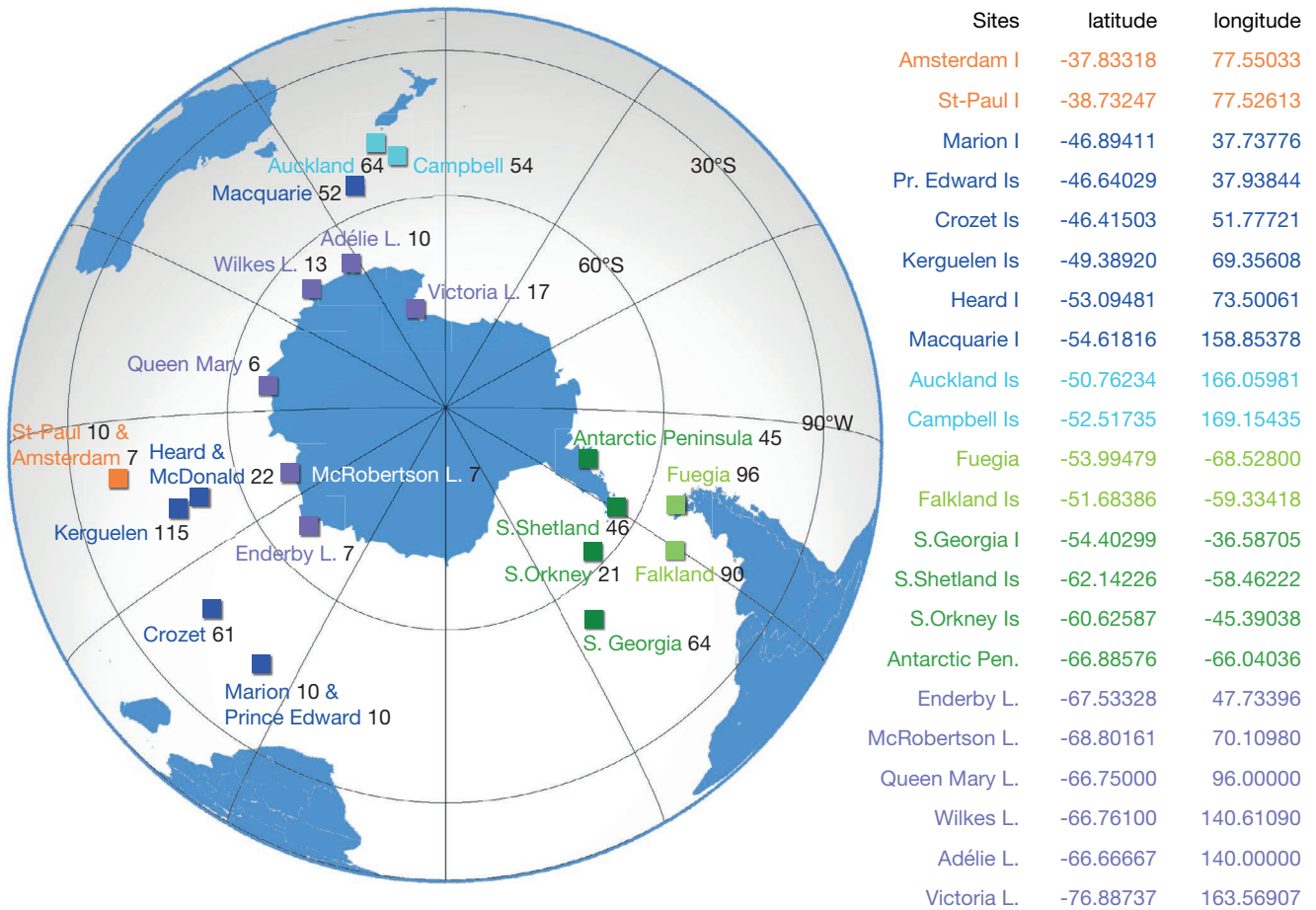


FIG. 1. — Sub-Antarctic and Antarctic regions considered in the biogeographical analysis of the Kerguelen Islands marine macroalgae also occurring elsewhere in the Southern Ocean. Colours: **orange**, temperate Southern Africa; **blue**, sub-Antarctic Islands; **light blue**, sub-Antarctic New Zealand; **light green**, Magellanic region; **green**, Scotia Sea; **violet**, continental High Antarctic (after Spalding *et al.* 2007). Geographical coordinates are given in the inset.

physical processes and ecosystem changes (Kennicutt *et al.* 2016; Cárdenas *et al.* 2018; Gutt *et al.* 2018; Féral *et al.* 2019). For this purpose, the French Long Term Ecological Research PROTEKER observatory was implemented to monitor coastal marine habitats of the Kerguelen Islands (Féral *et al.* 2016a, b, 2019). Objectives are to identify, monitor and predict changes in marine coastal ecosystems as a basis for vulnerability assessments and appropriate management planning.

As a key component of the benthos (habitats, primary producers, ecosystem engineers, dispersal vectors, etc.), marine macroalgae can constitute useful bio-indicators of the health of coastal marine habitats (Féral *et al.* 2016a, b, 2019). Unfortunately, “our knowledge of the biodiversity of Antarctic macroalgae is still hampered by the limited database available” (Wiencke *et al.* 2014). Moreover, very few phylogeographical studies in macroalgae have included samples from the Kerguelen Islands to revise species taxonomy and assess the connectivity between populations across habitats and SO regions (Fraser *et al.* 2009b, 2018). Thus, the taxonomic status and the occurrence of many species of macroalgae (e.g. *Lessonia nigrescens*) still requires verification.

In the present work, in-depth survey and analysis of the dedicated literature and scientific data bases were conducted

to update the checklist of marine macroalgae of the Kerguelen Islands for the use of benthic ecologists, conservation biologists, and nature reserve managers. The updated checklist was subsequently used to carry on a first analysis of floristic affinities between the Kerguelen Islands and the adjacent regions of the SO. This work is primarily aimed at providing a review and starting point for forthcoming integrative phylogeographical and biogeographical studies using new samplings and molecular analyses.

## MATERIAL AND METHODS

### ESTABLISHING THE LIST OF THE MARINE MACROALGAE OF THE KERGUELEN ISLANDS

The updated taxonomic checklist of macroalgae recorded in the Kerguelen Islands was compiled from an in-depth review of the scientific literature and resources of the library of the Station Marine d’Endoume (Aix Marseille Université) and of the Plateforme Macrophytes of the Institut Méditerranéen d’Océanographie (Aix Marseille Université). The following world-wide databases were also consulted: AlgaeBase (Guiry & Guiry 2021), the Sonnerat Herbarium database (Sonnerat



Herbarium database 2020), and the Macroalgal Herbarium Portal (Macroalgal Herbarium Portal 2020). Reference specimens were not re-examined here.

Macroalgal species were organized by taxa (phylum, class, order, and family), and listed in alphabetical order. Taxon names follow the currently accepted taxonomy according to the World Register of Marine Species (WoRMS Editorial Board 2021) and AlgaeBase (Guiry & Guiry 2021). Original names with known sampling sites are also provided. Occurrence records and sampling sites of the most significant scientific expeditions and works can also be found in the Appendices.

#### DISTRIBUTION OF KERGUELEN MARINE MACROALGAE IN OTHER SUB-ANTARCTIC AND ANTARCTIC REGIONS.

The distribution of marine macroalgae recorded in coastal waters of the Kerguelen Islands was reviewed and is reported for 21 Sub-Antarctic and Antarctic regions (Fig. 1). The taxa described from the Northern Hemisphere, cosmopolitan species and those with questionable status or identification were not considered.

Data were issued from (Hooker 1844; Harvey 1849; Kützing 1849, 1855, 1856, 1858, 1859, 1861, 1865, 1866, 1869; Dickie 1876a, b, c, d, e, f, 1877, 1879; Hariot 1889; Reinsch 1890; Foslie 1899, 1905, 1908; Barton 1902; Gepp & Gepp 1905a, b, 1907, 1912, 1917; Skottsberg 1907, 1923, 1941, 1953; Gain 1912; Lemoine 1913; Kyling & Skottsberg 1919; Levring 1944, 1945; Papenfuss 1964a, b; Zaneveld 1964, 1966a, b, 1968, 1988; Delépine *et al.* 1966; Zinova 1966; Arnaud 1974; Lamb *et al.* 1975; Moe & DeLaca 1976; Moe & Silva 1977, 1979, 1980, 1983; Prescott 1979; South 1979; Zaneveld & Sanford 1980; Zielinski 1981, 1990; Furmanczyk & Zielinski 1982; Hay *et al.* 1985; Hay 1986; Ricker 1987; Lawson 1988; Cinelli *et al.* 1989; Conde & Gallardo 1991; Cormaci *et al.* 1992, 2000; Adams 1994; Chung *et al.* 1994, 2000; John *et al.* 1994a, b; Wiencke 1996; Klöser *et al.* 1996; Clayton *et al.* 1997; Mendoza 1999; Gallardo *et al.* 1999; Kim *et al.* 2001a, b; Quartino *et al.* 2001; Wiencke & Clayton 2002; Alongi *et al.* 2002; Hommersand 2007; Asensi & Reviere 2009; Hommersand *et al.* 2009; Broom *et al.* 2010; Nelson & Broom 2010; Macaya & Zuccarello 2010a; Ramírez 2010; Wells *et al.* 2011; Wiencke & Amsler 2012; Boraso de Zaixso 2013; Wynne 2013; Mystikou *et al.* 2014, 2016; Nelson *et al.* 2014; Wiencke *et al.* 2014; Lindstrom *et al.* 2015; Pellizzari *et al.* 2017; Díaz-Tapia *et al.* 2020; Guiry & Guiry 2021; Hughey *et al.* 2020; Oliveira *et al.* 2020, except for species reported from “Antarctica” without precise localities).

#### MACROALGAL SIMILARITY BETWEEN REGIONS

The analysis is based on data from the literature, some of which are old and only reported as a simple name in a checklist, with no diagnosis for species identification nor discussion of the taxonomic status. Without direct examination of specimens, it was impossible to assess the quality of identifications. The species described in the Northern Hemisphere were *a priori* rejected because of a high risk of misidentification. For example, Hommersand *et al.* (2009) noted that unpublished rbcL

sequence analyses by S. Fredericq show that *Plocamium* “*cartilagineum*” from Antarctica is distinct from all other species of *Plocamium* investigated so far. Amphitropical species exist but they seem to be rare, and belong to taxonomic groups with a wide distribution (e.g. very tolerant Chlorophyta of upper coastal levels like *Prasiola*, *Rosenvingiella*, *Ulva* and *Urospora*; Dubrasquet *et al.* 2021) and therefore may be poorly indicative for a regional biogeographical analysis. Consequently, only a subsample of 115 “southern” species was processed.

The known distribution of Kerguelen macroalgae in the SO was explored through a network analysis of occurrence data using the software Gephi v.0.9.2 (Bastian *et al.* 2009). In the network display, regions and species correspond to the nodes (n = 135) and links between species and regions are shown by edges (n = 827) with no other assumption, species being linked to the studied regions. A force layout (Jacomy *et al.* 2014) algorithm was used to untangle the network, and facilitate the reading by dispersing groupings and leaving space around the largest nodes, thereby emphasizing complementarities between regions and preventing nodes overlapping. A special feature of the force-directed graph is that each node is placed according to connections with other nodes. The position of each node should not be interpreted on its own, but in relation with other nodes. The algorithm provides an intuitive way to spatialize the network and display a comprehensive “map”.

## RESULTS

#### FORMER SCIENTIFIC RESEARCHES ON MARINE MACROALGAE OF THE KERGUELEN ISLANDS

Following Cook’s exploration, the Kerguelen Islands were not scientifically surveyed until the Ross expedition, a voyage of exploration of the Antarctic undertaken from 1839 to 1843 aboard the two former warships HMS *Erebus* and HMS *Terror*, which were converted for the scientific expedition. The expedition made substantial zoological and botanical observations, resulting in one zoological monograph and a series of four detailed botanical monographs by Joseph Dalton Hooker, collectively named *Flora Antarctica* (Hooker 1844; Hooker & Harvey 1845; Harvey 1847, 1849). The Part II (Hooker 1844) contains the first data on marine macroalgae collected between 1840, May 7<sup>th</sup> and 1841 January 20<sup>th</sup> at Christmas Harbour, the northernmost embayment in Kerguelen (Fig. 2; Appendix 1). Friedrich Traugott Kützing reported and illustrated several marine macroalgae collected in the Kerguelen Islands during this expedition (Kützing 1849, 1855, 1856, 1858, 1859, 1861, 1865, 1866, 1869) (Appendix 2).

A few decades later, the scientific expedition of the HMS *Challenger* explored the Kerguelen-Heard Plateau under command of Captain G.S. Nares and leadership of Wyville Thomson. During her circumnavigation (1872-1876), she sailed along the coasts of the Kerguelen Islands from 1873, December 7<sup>th</sup> to 1874, January 31<sup>st</sup>. On that occasion, macroalgae were collected by Henry Nottidge Moseley in the vicinity of Christmas Harbour and along the eastern coast as



FIG. 2. — Location of historical collections of macroalgae in the Kerguelen Islands. Precise locations are not given by all reports and should be partly inferred. The map shows the sites visited during 1, the Ross expedition (Hooker 1844-1847); 2, the Challenger expedition (Dickie 1876a, b, c, e); 3, the US (Farlow 1876); 4, English (Dickie 1876d, f); and 5, German (Askenasy 1889); 6, Venus transit expeditions, as well as the German south polar expedition (Foslie 1908, Reinbold 1908). 7, The Hopeful Bay (Zinova 1973) was added.

far as Betsy Cove (Fig. 2). Specimens were studied by George Dickie (Dickie 1876a, c, d, f, 1877, 1879) and William Gilson Farlow (Farlow 1876) (Appendices 3; 5).

In 1874-1875, United States, German, and British expeditions visited the Kerguelen Islands to observe the Transit of Venus (1874, December 9<sup>th</sup>). Scientists took the opportunity to make naturalist observations in the vicinity of land based

astronomic observatories. The American expedition, aboard the screw sloop USS Swatara (1873), commanded by Captain Ralph Chandler, was based in the Baie du Morbihan (Pointe Molloy, Baie de l'Observatoire, Fig. 2) from 1874, September 10<sup>th</sup> to 1875, January 11<sup>th</sup>. The SMS *Gazelle* (expedition 1874-1876), a German corvette commanded by Captain Georg Emil Gustav von Schleinitz, was anchored in the



Anse Betsy (on Baie Accessible, northern coast of Kerguelen) from 1874, October 26<sup>th</sup> to 1875, February 6<sup>th</sup>. The English expedition also established in the Baie du Morbihan (Baie de l'Observatoire) in about the same period (1874, November 5<sup>th</sup> to 1875, February 27<sup>th</sup>). Captain Henry Fairfax, commander of the HMS *Volage*, made it possible for Alfred Edwin Eaton to explore the Baie des Swains (Fig. 2) on the southern coast of Kerguelen (January 1875) (Appendix 3).

George Dickie made a compilation of the specimens collected by several expeditions and estimated the total number of native marine macroalgae native to 71 (Dickie 1879) (Appendix 4). This estimate was based on collections made by [1] Hooker (Antarctic expedition, May-July 1840, chiefly in Baie de l'Oiseau, 39 species), [2] Moseley [Challenger expedition, January-February 1874, Baie de l'Oiseau, Anse Betsy (in Baie Accessible), 37 species], and [3] Kidder (U.S. Transit of Venus expedition, September 1874-January 1875, Pointe Molloy and Baie du Morbihan, 22 species).

Eugen Askenasy published the results of observations made on macroalgae collected during the expedition of the SMS *Gazelle* (Askenasy 1889) (Appendix 6).

The geologist Erich Dagobert von Drygalski led the first German South Polar expedition aboard the RV *Gauss* to explore the unknown area of Antarctica lying south of the Kerguelen Islands (1901-1903). A small party of the expedition was stationed in the Baie de l'Observatoire, while the main party proceeded further south. Works on the algae collected in the Kerguelen during the expedition were published by Mikael Foslie (Foslie 1908) and Theodor (Karl August) Reinbold (Reinbold 1908) (Appendix 7).

In his report on the second French Antarctic expedition (1908-1910), Louis Gain compiled a list of 100 species for the Kerguelen marine flora, based on reports of previous expeditions (Gain 1912) (Appendix 8) and reviewed taxonomy changing former taxon names of macroalgae for those in use in his time.

Tore Levring recorded the macroalgae collected during the expedition of the Norwegian sealer SS *Solglimt* (1907-1908), commanded by Captain Anders Harboe-Ree, in the Crozet and the Kerguelen Islands. He listed 37 species from the Kerguelen Islands (including 14 species previously reported by Dickie 1879). Levring specified that all the sampling information was lost (Levring 1944) (Appendix 9).

In 1958 Anna Dmitrievna Zinova published her work on a collection of macroalgae sampled in the Kerguelen Islands during the 1<sup>st</sup> Soviet Antarctic Expedition (April 1956, RV *Ob* commanded by captain I.A. Man) (Zinova 1958), which she completed in 1963 with a publication on the Delesseriaceae (Zinova 1963). A third more specific paper listing the macroalgae collected in the Baie du Hopeful (north coast of Kerguelen, Fig. 2) was published (Zinova 1973) (Appendix 10).

The most recent published synthesis on macroalgae of the Kerguelen Islands was written by George Frederick Papenfuss who reported 138 taxa in his catalogue (Papenfuss 1964a) (Appendix 11).

Following up the establishment of Port-aux-Français Research Station in 1951 and the consecutive chartering of the FV

*La Japonaise* (1970), RV *Marion Dufresne* (1970) and RV *La Curieuse* (1990), coastal waters of the Kerguelen Islands were then thoroughly investigated by regular research programs (Améziane *et al.* 2011; Féral & Poulin 2011; Hureau 2011). Marine macroalgae were studied by René Delépine, Aldo Asensi and coworkers among whom Paul Grua who was a pioneer scuba diver (Delépine 1962, 1964, 1966, 1976; Grua 1963, 1964a, b, 1965, 1968, 1971; Delépine & Grua 1964; Delépine & Hureau 1966; Delépine *et al.* 1970, 1979; Delépine & Asensi 1975). At the same time, Michael Neushul undertook similar studies in Antarctic coastal waters (Neushul 1961, 1965).

In the 1970s, a new impetus was given by R. Delépine who co-authored the macroalgae chapter of the F.A.O. (Food and Agriculture Organization of the United Nations) species identification sheets for the SO and listed 24 species of macroalgae among which 18 have been reported in the Kerguelen Islands as a potential commercial resource (Delépine *et al.* 1985; Duchêne 1989). In 1996, a more comprehensive list of macroalgae reported from the Kerguelen, Crozet, Saint Paul and Amsterdam Islands (R. Delépine, personal communication to J.-P. Féral) was produced as a contribution to the proposal for the creation of a nature reserve in the French sub-Antarctic islands (Jouventin *et al.* 1996). This list included 212 taxa, of which 149 were considered to be present in the Kerguelen Islands (Appendix 12).

The commercial potential of macroalgae has been the main focus of research projects carried out in biology, ecology, and chemistry in the Kerguelen Islands since the 1950s, mainly on large Phaeophyceae (e.g. genera *Macrocystis* and *Durvillaea*) (Sannié 1951; Delépine 1964, 1976, 1983; Delépine & Asensi 1978; Asensi *et al.* 1981; Lambert *et al.* 1988; Nicod *et al.* 1988; Belsher & Mouchot 1992). The taxonomy and biological cycles of the Phaeophyceae *Adenocystis utricularis* and *Utriculidium durvillei* and the role of light and temperature in species physiology were also studied by Bruno de Reviers (Reviers de 1980). A few papers also assessed the energetic content of intertidal macroalgae (Lawrence 1986; Lawrence & McClintock 1987).

#### THE UPDATED CHECKLIST OF THE MARINE MACROALGAE OF THE KERGUELEN ISLANDS

A total of 166 taxa of marine macroalgae from the Kerguelen Islands are listed here, compiled from the comprehensive survey of the former scientific literature, and modified following currently accepted taxonomy and classification (Table 1). The Kerguelen Islands are type locality of 35 taxa, among which 25 species (4 Chlorophyta, 3 Phaeophyceae and 18 Rhodophyta) are currently accepted taxon names (Table 2A), six species were synonymized, and four species remain of uncertain taxonomic status (Table 2B).

To date, the Rhodophyta is the most represented phylum with 103 species (62 % of the total species richness), followed by the Chlorophyta (35 species, 21%) and the Phaeophyceae (28 species, 17%). The Delesseriaceae (22 species) and Rhodomelaceae (10 species) are the richest families in the Rhodophyta, the Cladophoraceae (11 species) in the

TABLE 1. —. Amended checklist of Kerguelen Islands' marine macroalgae based on Delépine (personal communication 1996) (R.D.), Zinova 1958, 1963, 1973 (A.Z.), Papenfuss 1964a (G.P.), Levring 1944 (T.L.), Gain 1912 (L.G.), Reinbold 1908 and Foslie 1908 (R./F.), Askenasy 1889 (E.A.), Dickie 1879 (GD.2), Dickie 1876a-f (GD.1), Farlow 1876 (W.F.), Kützing, 1849, 1855, 1856, 1858, 1859, 1861, 1865, 1866, 1869 (F.T.K), Hooker & Harvey 1845 (H&H), Hooker 1844 (J.D.H). (?), taxa with uncertain taxonomic status or uncertain identification; \*, taxa described in the Northern Hemisphere; ◆, taxa reported only from Kerguelen Islands in the Southern Ocean.

		JD.H	H&H	FT.K	W.F.	GD.1	GD.2	E.A.	R./F.	L.G.	T.L.	G.P.	A.Z.	R.D.
<b>CHLOROPHYTA</b>														
Trebouxiophyceae														
Prasiolales														
Prasiolaceae														
	<i>Prasiola crisper</i> subsp. <i>antarctica</i> (Kützing) Knebel								•			•		•
	<i>Prasiola cristata</i> (J.D.Hooker & Harvey) J.Agardh	•		•		•							•	•
	<i>Prasiola filiformis</i> Reinsch												•	•
Ulvophyceae														
Bryopsidales														
Bryopsidaceae														
	<i>Bryopsis plumosa</i> (Hudson) C.Agardh *					•	•			•		•		•
Codiaceae														
	<i>Codium adhaerens</i> Agardh *				•	•	•					•		•
	<i>Codium decorticatum</i> (Woodward) M.A.Howe *											•		•
	<i>Codium effusum</i> (Rafinesque) Delle Chiaje *							•	•	•		•		•
	<i>Codium fragile</i> (Suringar) Hariot *											•		•
	<i>Codium galeatum</i> J.Agardh											•		•
	<i>Codium tomentosum</i> Stackhouse *	•				•				•		•		•
Cladophorales														
Cladophoraceae														
	<i>Chaetomorpha kerguelensis</i> Levring										•	•		•
	<i>Chaetomorpha linum</i> (O.F.Müller) Kützing *	•				•								•
	<i>Chaetomorpha litorea</i> Harvey *									•				•
	<i>Cladophora flexuosa</i> (O.F.Müller) Kützing (?)					•	•			•	•	•	•	•
	<i>Cladophora incompta</i> (J.D.Hooker & Harvey)								•	•		•		•
	J.D.Hooker & Harvey													
	<i>Cladophora repens</i> var. <i>antarctica</i> Gain (?)													•
	<i>Cladophora rupestris</i> (Linnaeus) Kützing *	•				•				•		•		•
	<i>Cladophora subsimplex</i> Kützing					•	•		•	•		•		•
	<i>Pseudorhizoclonium africanum</i> (Kützing) Boedeker									•				•
	in Boedeker <i>et al.</i> (?)													
	<i>Rhizoclonium ambiguum</i> (J.D.Hooker & Harvey)	•	•			•				•		•		•
	Kützing													
	<i>Rhizoclonium riparium</i> (Roth) Harvey *					•				•		•		•
Ulotrichales														
Monostromataceae														
	<i>Monostroma grevillei</i> (Thuret) Wittrock *											•		•
	<i>Monostroma hariotii</i> Gain											•		•
Ulotrichaceae														
	<i>Acrosiphonia arcta</i> (Dillwyn) Kützing *					•	•	•	•	•		•		•
	<i>Spongomorpha aeruginosa</i> (Linnaeus) Hoek *											•		•
	<i>Spongomorpha pacifica</i> (Montagne) Kützing							•	•	•	•	•	•	•
	<i>Ulothrix flacca</i> (Dillwyn) Thuret *													•
	<i>Urospora penicilliformis</i> (Roth) Areschoug, including								•	•	•	•		•
	<i>Codiolum gregarium</i> phase *													
Ulvales														
Ulvaceae														
	<i>Ulva compressa</i> Linnaeus *	•		•		•	•		•	•		•		•
	<i>Ulva hookeriana</i> (Kützing) Hayden, Blomster,	•							•	•	•	•	•	•
	Maggs, Silva, Stanhope & Waaland													
	<i>Ulva intestinalis</i> Linnaeus *	•				•				•		•		•
	<i>Ulva lactuca</i> auct (non Linnaeus) (?)								•	•		•		•
	<i>Ulva lactuca</i> f. <i>latissima</i> auct (non Linnaeus) (?)	•			•	•	•	•				•		•
	<i>Ulva rigida</i> C.Agardh *											•	•	•
Ulvellaceae														
	<i>Ulvella viridis</i> (Reinke) R. Nielsen, C.J.O'Kelly &											•	•	•
	B.Wysor *													
<b>OCHROPHYTA</b>														
Phaeophyceae														
Desmarestiales														
Desmarestiaceae														
	<i>Desmarestia chordalis</i> J.D. Hooker & Harvey	•	•	•		•	•				•		•	•
	<i>Desmarestia confervoides</i> (Bory de Saint-Vincent)								•	•	•	•	•	•
	M.E.Ramírez & A.F.Peters													
	<i>Desmarestia ligulata</i> (Stackhouse) J.V. Lamouroux											•		•
	(?)													
	<i>Desmarestia menziesii</i> J.Agardh					•	•			•		•		•
	<i>Desmarestia rossii</i> J.D.Hooker & Harvey					•	•	•		•		•		•
	<i>Desmarestia viridis</i> (O.F.Müller) J.V.Lamouroux *	•		•	•	•	•	•						•
Ectocarpales														
Acinetosporaceae														
	<i>Geminocarpus geminatus</i> J.D.Hooker & Harvey)					•	•	•	•	•		•	•	•
	Skottsberg													
	<i>Pylaiella littoralis</i> (Linnaeus) Kjellman *											•	•	•

TABLE 1. — Continuation.

		JD.H	H&H	FT.K	W.F.	GD.1	GD.2	E.A.	R./F.	L.G.	T.L.	G.P	A.Z.	R.D.
Adenocystaceae	<i>Adenocystis utricularis</i> (Bory de Saint-Vincent) Skottsberg	•	•	•	•	•	•		•	•	•	•	•	•
	<i>Caepidium antarcticum</i> J.Agardh								•	•	•		•	
	<i>Chordariopsis capensis</i> (C.Agardh) Kylin							•		•	•		•	
	<i>Cladothole decaisnei</i> J.D.Hooker & Harvey												•	
	<i>Utriculidium durvillei</i> Skottsberg								•	•	•	•	•	
Chordariaceae	<i>Elachista flaccida</i> (Dillwyn) Fries *				•	•				•	•		•	
Ectocarpaceae	<i>Ectocarpus constanciae</i> Hariot							•		•	•		•	
	<i>Ectocarpus fasciculatus</i> Harvey *							•					•	
Scytosiphonaceae	<i>Colpomenia sinuosa</i> (Mertens ex Roth) Derbès & Solier *				•	•				•	•		•	
	<i>Petalonia fascia</i> (O.F.Müller) Kuntze *												•	•
	<i>Scytosiphon lomentaria</i> (Lyngbye) Link *	•				•				•	•		•	
Fucales														
Durvillaeaceae	<i>Durvillaea antarctica</i> (Chamisso) Hariot	•			•	•	•		•	•	•	•	•	•
Laminariales														
Laminariaceae	<i>Macrocystis pyrifera</i> (Linnaeus) C. Agardh	•			•	•	•	•	•	•	•	•	•	•
Lessoniaceae	<i>Lessonia flavicans</i> Bory de Saint-Vincent	•		•						•	•		•	
	<i>Lessonia nigrescens</i> Bory de Saint Vincent									•				
Scytothamnales														
Splachnidiaceae	<i>Scytothamnus fasciculatus</i> (J.D.Hooker & Harvey) A.D.Cotton	•				•			•	•	•		•	
	<i>Stereocladon rugulosus</i> (Bory de Saint-Vincent) Hariot													•
Sphacelariales														
Sphacelariaceae	<i>Sphacelaria affinis</i> Dickie ♦				•	•				•	•		•	•
Styopocaulaceae	<i>Halopteris corymbosa</i> (Dickie) Draisma, Prud'homme & H.Kawai				•	•			•		•		•	•
	<i>Halopteris funicularis</i> (Montagne) Sauvageau				•		•	•		•				
RHODOPHYTA														
Bangiophyceae														
Bangiophycidae														
Bangiales														
Bangiaceae	<i>Porphyra capensis</i> Kützting												•	•
	<i>Porphyra purpurea</i> (Roth) C.Agardh *	•				•								
	<i>Porphyra umbilicalis</i> Kützting *									•				
	<i>Pyropia columbina</i> (Montagne) W.A.Nelson													•
	<i>Pyropia leucostica</i> (Thuret) Neefus & J.Brodie *									•				
Florideophyceae														
Ahnfeltiophycidae														
Ahnfeltiales														
Ahnfeltiaceae	<i>Ahnfeltia plicata</i> (Hudson) E.M.Fries *	•		•		•	•			•	•	•	•	•
Corallinophycidae														
Corallinales														
Lithophyllaceae	<i>Titanoderma pustulatum</i> (J.V.Lamouroux) Nägeli *	•												
Lithothamniaceae	<i>Lithothamnion granuliferum</i> Foslie										•			•
	<i>Lithothamnion kerguelenum</i> (Dickie) Foslie					•	•		•	•			•	•
	<i>Phymatholithon calcareum</i> (Pallas) Adey & McKibbin ex Woelkerling & Irvine *									•				
	<i>Phymatolithon lenormandii</i> (Areschoug) W.H.Adey *								•	•			•	•
Spongitaceae	<i>Spongites discoideus</i> (Foslie) D.Penrose & Woelkerling								•	•	•	•	•	•
Hapalidiales														
Hapalidiaceae	<i>Synarthrophyton neglectum</i> (Foslie) M.L. Mendoza								•	•			•	•
Mesophyllumaceae	<i>Carlskottsbergia antarctica</i> (J.D.Hooker & Harvey) Athanasiadis					•	•	•		•	•	•	•	•
	<i>Clathromorphum obtectulum</i> (Foslie) Adey								•	•			•	•
Hildenbrandiophycidae														
Hildenbrandiales														
Hildenbrandiaceae	<i>Hildenbrandia kerguelensis</i> (Askenasy) Y.M. Chamberlain										•		•	•
	<i>Hildenbrandia lecannellieri</i> Hariot												•	•
	<i>Hildenbrandia rubra</i> (Sommerfelt) Meneghini *									•				
Nemaliophycidae														
Acrochaetiales														
Rhodochortonaceae	<i>Rhodochorton purpureum</i> (Lightfoot) Rosenvinge *					•	•			•			•	•
Balliales														
Balliaceae	<i>Ballia callitricha</i> (C.Agardh) Kützting	•		•	•	•	•	•	•	•	•	•	•	•
Nemaliales														



TABLE 1. — Continuation.

		JD.H	H&H	FT.K	W.F.	GD.1	GD.2	E.A.	R./F.	L.G.	T.L.	G.P	A.Z.	R.D.
Scinaiceae	<i>Nothogenia fastigiata</i> (Bory de Saint-Vincent) P.G.Parkinson	•		•		•	•	•	•	•	•	•	•	•
	<i>Nothogenia variolosa</i> (Montagne) Montagne			•										
Palmariales														
Palmariceae	<i>Palmaria decipiens</i> (Reinsch) R.W Ricker										•	•		•
	<i>Palmaria georgica</i> (Reinsch) R.W.Ricker					•	•	•	•	•		•	•	•
Rhodymeniophycidae														
Bonnemaisoniales														
Bonnemaisoniaceae	<i>Delisea pulchra</i> (Greville) Montagne	•				•		•		•		•		•
	<i>Ptilonia magellanica</i> (Montagne) J.Agardh	•	•	•	•	•	•		•	•	•	•	•	•
Ceramiales														
Callithamniaceae	<i>Dasyptilon ptilota</i> (J.D.Hooker & Harvey)					•	•	•		•	•	•		•
	Athanasiadis													
	<i>Plumariopsis eatonii</i> (Dickie) De Toni					•	•			•	•	•		•
Ceramiaceae	<i>Ceramium diaphanum</i> (Lightfoot) Roth *	•				•				•		•		•
	<i>Ceramium involutum</i> Kützing										•	•		
	<i>Ceramium virgatum</i> Roth *					•	•	•	•	•		•		•
	<i>Pterothamnion simile</i> (J.D.Hooker & Harvey) Nägeli	•	•	•		•	•			•		•	•	•
Dasyaceae	<i>Colacodasya inconspicua</i> (Reinsch) F.Schmitz										•	•		•
	<i>Heterosiphonia berkeleyi</i> Montagne	•				•	•	•	•	•	•	•	•	•
Delesseriaceae	<i>Anisocladella serratodentata</i> (Skottsberg)											•		•
	Skottsberg													
	<i>Cladodonta lyallii</i> (J.D.Hooker & Harvey) Skottsberg	•	•			•	•	•	•	•	•	•	•	•
	<i>Erythrogloum laciniatum</i> (Lightfoot) Maggs & Hommersand *	•				•	•		•	•				•
	<i>Haraldiophyllum crispatum</i> (J.D.Hooker & Harvey) Lin, Hommersand & Nelson							•		•		•		•
	<i>Hymenena laciniata</i> (J.D.Hooker & Harvey) Kylin					•	•			•	•	•	•	•
	<i>Myriogramme kerguelensis</i> Levring										•	•	•	•
	<i>Myriogramme livida</i> (J.D.Hooker & Harvey) Kylin					•	•	•	•	•		•	•	•
	<i>Myriogramme multilobata</i> A.D.Zinova											•	•	•
	<i>Myriogramme smithii</i> (J.D. Hooker & Harvey) Kylin							•	•	•		•	•	•
	<i>Paraglossum crassinervium</i> (Montagne) Lin, Fredericq & Hommersand	•		•		•	•		•			•		•
	<i>Paraglossum crozetii</i> (Levring) S.-M. Lin & Hommersand										•			•
	<i>Paraglossum epiglossum</i> (J.Agardh) J.Agardh									•		•		•
	<i>Paraglossum lancifolium</i> (J.Agardh) J.Agardh											•	•	
	<i>Paraglossum larsenii</i> (Skottsberg) Lin, Fredericq & Hommersand										•	•	•	•
	<i>Phycodrys quercifolia</i> (Bory de Saint-Vincent) Skottsberg					•	•	•		•		•		•
	<i>Platylinia fuegiensis</i> Skottsberg													•
	<i>Platylinia fuscobra</i> (J.D.Hooker & Harvey) Levring	•	•			•	•	•		•	•	•	•	•
	<i>Polycoryne compacta</i> A.D. Zinova											•	•	•
	<i>Pseudophycodrys phyllophora</i> (J.Agardh) Skottsberg									•		•		•
	<i>Schizoseris condensata</i> (Reinsch) R.W. Ricker										•	•	•	•
	<i>Schizoseris dichotoma</i> (J.D.Hooker & Harvey) Kylin					•		•	•	•		•	•	•
	<i>Schizoseris griffithsia</i> (Suhr) M.J.Wynne					•	•	•		•		•		•
Rhodomelaceae	<i>Bostrychia vaga</i> J.D. Hooker & Harvey	•	•	•		•				•		•		•
	<i>Colacopsis velutina</i> (Martin & Pocock) Norris											•		•
	<i>Lophurella gaimardii</i> (Gaudichaud ex C.Agardh) De Toni					•	•							
	<i>Lophurella hookeriana</i> (J. Agardh) Falkenberg					•	•		•	•	•	•		•
	<i>Lophurella patula</i> (J.D.Hooker & Harvey) De Toni							•		•		•		•
	<i>Polysiphonia abscissa</i> J.D. Hooker & Harvey					•	•		•	•		•		•
	<i>Polysiphonia anisogona</i> J.D. Hooker & Harvey					•				•	•	•	•	•
	<i>Polysiphonia atricapilla</i> J. Agardh													•
	<i>Polysiphonia flabelliformis</i> J.D.Hooker & Harvey													•
	<i>Polysiphonia urbanoides</i> Levring, 1944										•	•		•
Wrangeliaceae	<i>Griffithsia antarctica</i> J.D.Hooker & Harvey								•	•		•		•
Gigartinales														
Caulacanthaceae	<i>Catenella fusiformis</i> (J.Agardh) Skottsberg												•	
Cystocloniaceae	<i>Acanthococcus antarcticus</i> J.D. Hooker & Harvey								•	•		•		•
	<i>Calliblepharis fimbriata</i> (Greville) Kützing *		•	•										
	<i>Rhodophyllis reptans</i> (Suhr) Papenfuss					•	•			•		•		•
Gigartinaceae	<i>Iridaea cordata</i> (Turner) Bory de Saint-Vincent									•	•	•		•
	<i>Iridaea undulosa</i> Bory de Saint-Vincent											•		•

TABLE 1. — Continuation.

		JD.H	H&H	FT.K	W.F.	GD.1	GD.2	E.A.	R./F.	L.G.	T.L.	G.P	A.Z.	R.D.
	<i>Mazzaella capensis</i> (J.Agardh) Fredericq					•						•		•
	<i>Mazzaella laminarioides</i> (Bory de Saint-Vincent) Fredericq					•				•	•	•		•
	<i>Rhodoglossum gigartinooides</i> (Sonder) Edyvane & Womersley					•	•			•		•		•
	<i>Sarcopeltis skottsbergii</i> (Setchell & N.L.Gardner) Hommersand, Hughey, Leister & Gabrielson												•	•
	<i>Sarcothalia papillosa</i> (Bory de Saint-Vincent) Leister												•	•
	<i>Sarcothalia radula</i> (Esper) Edyvane & Womersley	•			•	•	•		•	•			•	•
Kallymeniaceae	<i>Callocolax neglectus</i> F.Schmitz ex Batters *										•			•
	<i>Callophyllis angustifrons</i> (Harvey) G.R.South & N.M.Adams								•				•	•
	<i>Callophyllis atrosanguinea</i> (J.D.Hooker & Harvey) Hariot							•		•			•	•
	<i>Callophyllis fastigiata</i> (J.Agardh) J Agardh					•	•						•	•
	<i>Callophyllis tenera</i> J.Agardh					•	•		•	•	•		•	•
	<i>Callophyllis variegata</i> (Bory de Saint-Vincent) Kützting	•			•	•	•	•	•	•	•	•	•	•
	<i>Kallymenia lacinifolia</i> Levring										•	•		•
Phylloporaceae	<i>Gymnogongrus durvillei</i> (Bory) Calderon & Boo ♦							•		•				•
	<i>Gymnogongrus turquetii</i> Hariot												•	•
Gracilariales														
Gracilariaceae	<i>Crassiphycus proliferus</i> (Harvey) Gurgel, J.N.Norris & Fredericq (?)			•										
	<i>Gracilaria pulvinata</i> Skottsberg												•	•
Halymeniales														
Halymeniaceae	<i>Grateloupia cutleriae</i> Kützting													•
Plocamiales														
Plocamiaceae	<i>Plocamium cartilagineum</i> (Linnaeus) P.S.Dixon *												•	•
	<i>Plocamium cruciferum</i> Harvey													•
	<i>Plocamium hookeri</i> Harvey	•	•	•		•	•			•			•	•
	<i>Plocamium secundatum</i> (Kützting) Kützting									•	•		•	•
Sarcodiaceae	<i>Sarcodia dentata</i> (Suhr) R.E.Norris ex M.J.Wynne					•	•			•			•	•
	<i>Sarcodia palmata</i> Sonder								•	•			•	•
Rhodymeniales														
Rhodymeniaceae	<i>Rhodymenia capensis</i> J. Agardh ♦								•	•			•	•
	<i>Rhodymenia coccocarpa</i> (Montagne) M.J.Wynne	•				•	•			•			•	•
	<i>Rhodymenia corallina</i> (Bory de Saint-Vincent) Greville	•			•	•				•				
	<i>Rhodymenia dichotoma</i> J.D.Hooker & Harvey					•				•			•	•
	<i>Rhodymenia obtusa</i> (Greville) Womersley									•			•	•
	<i>Rhodymenia variolosa</i> J.D.Hooker & Harvey	•	•		•	•	•		•	•			•	•

Chlorophyta and the Desmarestiaceae (6 species) in the Phaeophyceae (Fig. 3A). The relatively low proportions of uncertain species names over accepted names as well as the low number of species names also reported in the Northern Hemisphere suggest that taxonomy of Rhodophyta could be currently the most reliable compared to the Phaeophyceae and Chlorophyta (Fig. 3B).

Our knowledge of Kerguelen macroalgae has shown a constant progress through time with a continuous increase of species description along the 20<sup>th</sup> century to reach the present-day total (166 species), over four times the number of species reported in the first part of the 19<sup>th</sup> century (39 species) (Fig. 4).

#### FLORISTIC AFFINITIES OF THE MARINE FLORA OF THE KERGUELEN ISLANDS IN THE SOUTHERN OCEAN

In the Southern Ocean, three species have been reported only from the Kerguelen Islands: the endemic *Sphacelaria affinis*,

the South African *Rhodymenia capensis* and *Gymnogongrus durvillei* although considered to be widespread in other oceans. More than a third of the species reported from the Kerguelen Islands have been firstly described in the Northern Hemisphere, which makes it necessary to reassess their taxonomic status (amphi-equatorial species or misidentifications). In total, 51 species are not considered here, 41 of them being described from the Northern Hemisphere, and 7 of them are of doubtful occurrence in the Kerguelen Islands. Consequently, floristic affinities of Kerguelen species were analysed on a selected reliable subset of 115 species over the 166 species from the whole list (Table 3).

The network analysis of occurrence data for the 115 selected species of Kerguelen marine macroalgae relies on no other assumption than the reported species co-occurrence data that determine the network structure (that is, links between species and regions). The network is displayed as a graph (Fig. 5) in which regions are mainly positioned according to

TABLE 2. — Marine macroalgae described from the Kerguelen Islands: **A**, species currently accepted taxonomically. **B**, species reduced at a synonym rank and taxa with uncertain taxonomic status. (1) The Chlorophyta *Ulva tessellata* J.D.Hooker & Harvey described from the Kerguelen Islands is a synonym of the fungus *Mastodia tessellata* (J.D.Hooker & Harvey) J.D.Hooker & Harvey.

Accepted name	Basionym	Reference
<b>A</b>		
CHLOROPHYTA (1)		
<i>Chaetomorpha kerguelensis</i> Levring	–	Levring 1944
<i>Prasiola cristata</i> (J.D.Hooker & Harvey in J.D. Hooker) J.Agardh	<i>Ulva cristata</i> J.D.Hooker & Harvey in J.D. Hooker	Hooker 1847
<i>Prasiola filiformis</i> Reinsch	–	Reinsch 1890
<i>Rhizoclonium ambiguum</i> (J.D.Hooker & Harvey) Kützing	<i>Conferva ambigua</i> J.D.Hooker & Harvey	Hooker & Harvey 1845
OCHROPHYTA - Phaeophyceae		
<i>Desmarestia chordalis</i> J.D.Hooker & Harvey	–	Hooker & Harvey 1845
<i>Halopteris corymbosa</i> (Dickie) Draisma, Prud'homme & H.Kawai	<i>Sphacelaria corymbosa</i> Dickie	Dickie 1876f
<i>Sphacelaria affinis</i> Dickie	–	Dickie 1876f
RHODOPHYTA		
<i>Bostrychia vaga</i> J.D.Hooker & Harvey	–	Hooker & Harvey 1845
<i>Carlskottsbergia antarctica</i> (J.D.Hooker & Harvey) Athanasiadis	<i>Melobesia verrucata</i> var. <i>antarctica</i> J.D.Hooker & Harvey in Harvey & J.D. Hooker	Hooker 1847
<i>Cladodonta lyallii</i> (J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> J.D.Hooker & Harvey	Hooker & Harvey 1845
<i>Clathromorphum obtectulum</i> (Foslie) W.H.Adey	<i>Lithothamnion kerguelenum</i> f. <i>obtectula</i> Foslie	Foslie 1899
<i>Hildenbrandia kerguelensis</i> (Askenasy) Y.M.Chamberlain	<i>Hildenbrandia prototypus</i> var. <i>kerguelensis</i> Askenasy	Askenasy 1889
<i>Kallymenia laciniifolia</i> Levring	–	Levring 1944
<i>Lithothamnion kerguelenum</i> (Dickie) Foslie	<i>Melobesia kerguelena</i> Dickie	Dickie 1876f
<i>Myriogramme kerguelensis</i> Levring	–	Levring 1944
<i>Myriogramme multilobata</i> A.D.Zinova 1963: 56	–	Zinova 1963
<i>Platyclinia fuscobrunnea</i> (J.D.Hooker & Harvey) Levring	<i>Nitophyllum fuscobrunneum</i> J.D.Hooker & Harvey	Hooker & Harvey 1845
<i>Plocamium hookeri</i> Harvey in J.D. Hooker & Harvey	–	Hooker & Harvey 1845
<i>Plumariopsis eatonii</i> (Dickie) De Toni	<i>Ptilota eatonii</i> Dickie	Dickie 1876f
<i>Polycoryne compacta</i> A.D.Zinova	–	Zinova 1963
<i>Polysiphonia urbanoidea</i> Levring	–	Levring 1944
<i>Pseudolithophyllum consociatum</i> (Foslie) Me.Lemoine	<i>Lithophyllum consociatum</i> Foslie	Foslie 1905
<i>Pterothamnion simile</i> (J.D.Hooker & Harvey in Harvey & J.D.Hooker) Nägeli	<i>Callithamnion simile</i> J.D.Hooker & Harvey in Harvey & J.D.Hooker	Hooker & Harvey 1845
<i>Rhodymenia variolosa</i> J.D.Hooker & Harvey	–	Hooker & Harvey 1845
<i>Synarthrophyton neglectum</i> (Foslie) M.L.Mendoza in Acosta Polo	<i>Lithothamnion muelleri</i> f. <i>neglecta</i> Foslie	Foslie 1900
<b>B</b>		
Basionym	Reference	Accepted name/Uncertain status
CHLOROPHYTA		
<i>Enteromorpha ramellosa</i> Kützing	Kützing 1849	uncertain taxonomic status
<i>Rhizoclonium hookeri</i> Kützing	Kützing 1849	<i>Pseudorhizoclonium africanum</i> (Kützing) Boedeker in Boedeker <i>et al.</i>
RHODOPHYTA		
<i>Delesseria belayevii</i> A.D.Zinova	Zinova 1963	<i>Paraglossum lancifolium</i> (J.Agardh) J.Agardh
<i>Lithothamnion annulatum</i> Foslie	Foslie 1905	<i>Phymatolithon lenormandii</i> (Areschoug) W.H.Adey
<i>Rhodymenia hookeri</i> Harvey in J.D.Hooker & Harvey (as <i>Rhodomenia hookeri</i> )	Hooker & Harvey 1845	<i>Calliblepharis fimbriata</i> (Greville) Kützing
<i>Rhodymenia hookeri</i> var. <i>latissima</i> J.D.Hooker & Harvey	Hooker & Harvey 1845	uncertain taxonomic status
<i>Rhodymenia hookeri</i> var. <i>lacerata</i> J.D.Hooker & Harvey	Hooker & Harvey 1845	uncertain taxonomic status
<i>Rhodymenia hookeri</i> var. <i>prolifera</i> J.D.Hooker & Harvey	Hooker & Harvey 1845	uncertain taxonomic status
<i>Schizoseris kerguelensis</i> A.D.Zinova	Zinova 1963	<i>Schizoseris dichotoma</i> (J.D.Hooker & Harvey) Kylin
<i>Schizoseris laciniata</i> f. <i>latiloba</i> A.D.Zinova	Zinova 1963	<i>Schizoseris condensata</i> (Reinsch) R.W.Ricker

their geographical position: South Indian Ocean (Crozet and Kerguelen islands), Magellanic Province (Falkland Islands and Fuegia), South Pacific Ocean (Auckland, Campbell and Macquarie islands), Maritime Antarctica including the South Shetlands and the West Antarctic Peninsula, the Scotia Arc (the South Orkneys Islands and South Georgia). Regions with

a low number of co-occurring species (less than 22) are in a more “central” position on the graph. The location of regions is mostly consistent with their geographical position, Heard Island excepted (Fig. 5). The graph structure is mostly stable, whatever the number of computed iterations. Only links to regions with a small number of recorded species (East Ant-



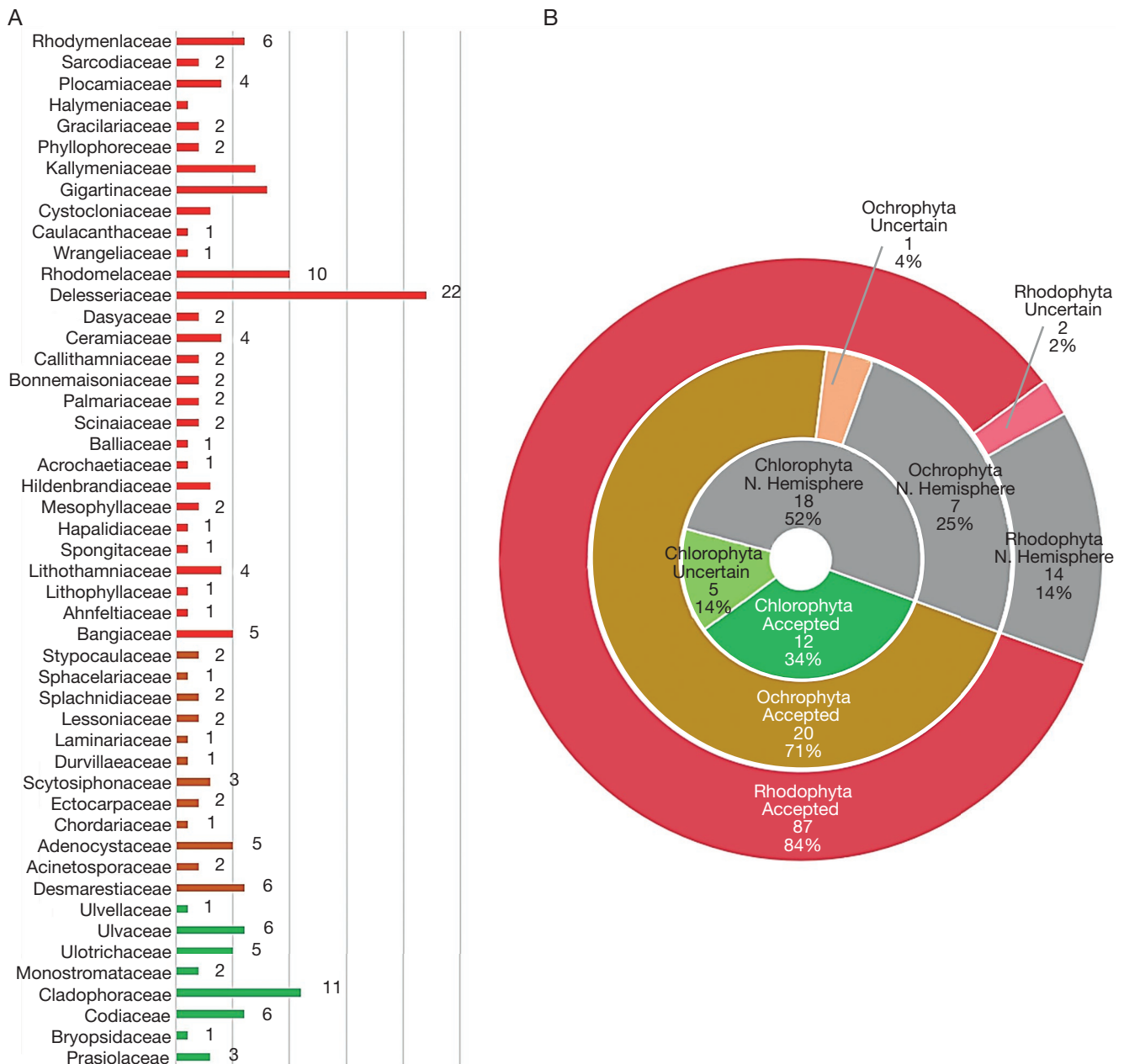


FIG. 3. — **A**, Number of nominal species per family of marine macroalgae of the Kerguelen Islands; **B**, taxonomic status (accepted, uncertain, co-occurrence in the Northern Hemisphere) of the species for the three considered phyla (Chlorophyta, Ochrophyta-Phaeophyceae and Rhodophyta).

arctica, Marion and Prince Edward Islands, and Saint-Paul and Amsterdam Islands) shift with first iterations until the structure becomes stable.

Based on the current state of our knowledge of species distribution in the 21 considered regions, it appears that most Kerguelen species are also reported in the Magellanic Province: in Fuegia (96 species) and the Falkland Islands (90 species). High co-occurrence levels are also suggested with the Scotia Sea region: South Georgia (64 species), the Sub-Antarctic Islands of Crozet (61 species) and Macquarie (52 species), and the New Zealand Sub-Antarctic Islands of Auckland (64 species)

and Campbell (54 species). Co-occurrences are limited with the Antarctic Peninsula (45 species) and the South Shetlands Islands (46 species) (Fig. 1; Table 3). A small number of species are reported to co-occur in other regions of the SO: [1] in the Sub-Antarctic islands: Heard & McDonald Islands (22 species), Marion and Prince Edward Islands (10 species), and the South Orkney Islands (21 species), [2] along the East Antarctic coasts of Wilkes (13 species), Victoria (17 species), Adélie (10 species), MacRobertson (7 species), Queen Mary (6 species) and Enderby lands (7 species), and [3] in the subtropical islands: Saint Paul (10 species) and Amsterdam Islands (7 species) (Fig. 1; Table 3).

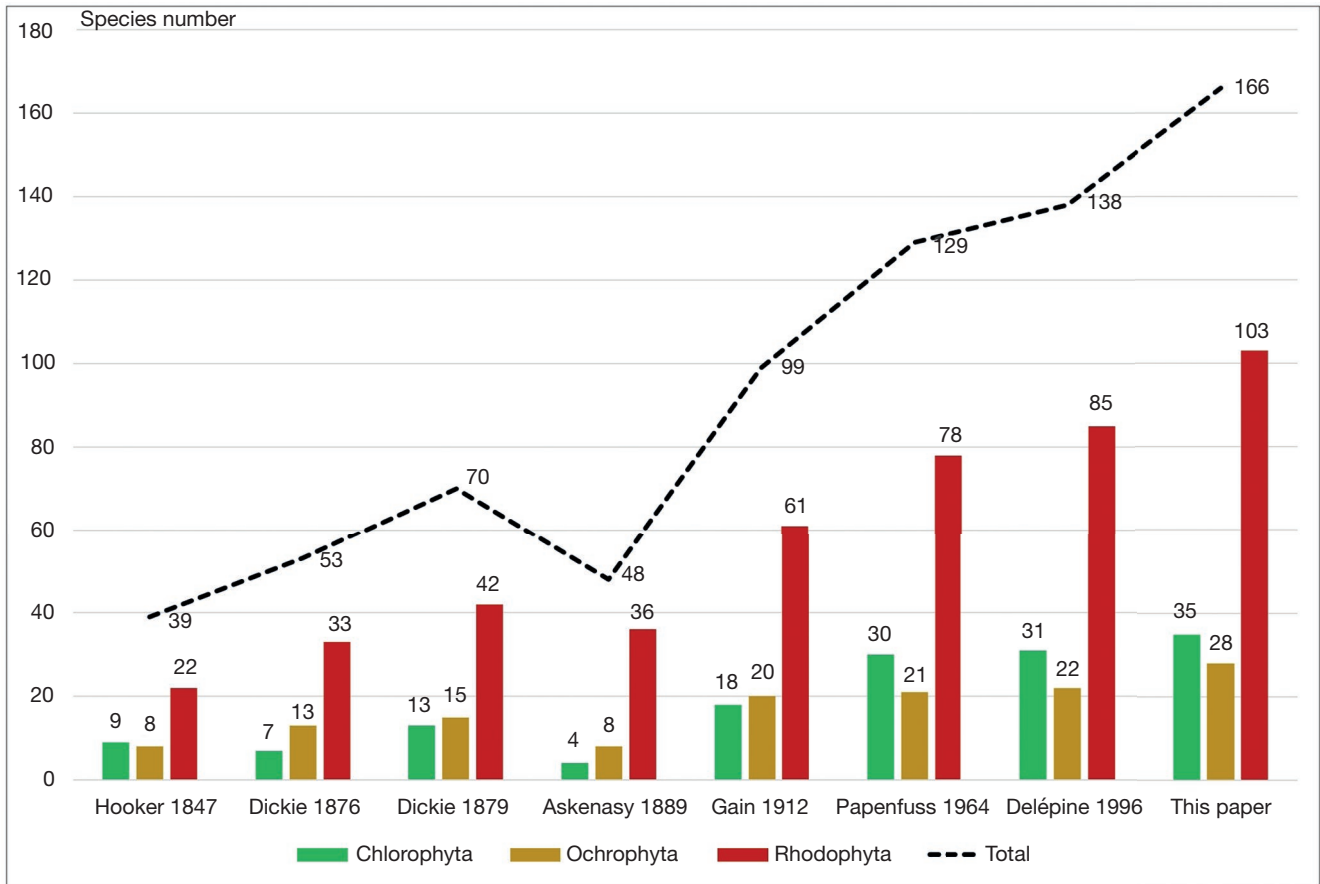


FIG. 4. — Number of marine macroalgae species reported in the Kerguelen Islands since the Ross expedition (1840), in each phylum (Delépine 1996 is a personal communication to J.-P. Féral).

## DISCUSSION

### RELEVANCE OF THE PRESENT INVENTORY AND LIMITATIONS

“The taxonomic information available (on the Antarctic marine macroalgal flora) is far from comprehensive and any generalizations should be regarded with caution” (Clayton 1994).

The use of molecular data in algal systematics has increased as high throughput sequencing (HTS) has become more accessible, generating and accelerating the discovery of algal species, also leading to a more stable and natural classification (Oliveira *et al.* 2018).

However, current available data show that the taxonomy of SO macroalgae is far from being firmly established and several limitations may impact the interpretation of the present review and updated checklist: 1) some taxa are considered not to be correctly identifiable when not using molecular tools (e.g. genera *Ulva*, *Ulvella*, *Porphyra*, *Pyropia*); 2) some species have been attributed to Northern Hemisphere taxa solely on the basis of morphological and anatomical criteria (e.g. *Ulva* spp., *Desmarestia* spp. or *Ceramium* spp.); 3) the taxonomy and systematics of several species-rich genera have been updated and new combinations have been proposed, showing that the diversity of this genus was often

overestimated [e.g. *Polysiphonia* Greville (Kim & Lee 1999; Díaz-Tapia *et al.* 2017; Bustamante *et al.* 2021)]; and 4) new or cryptic species were recently discovered in some species or genera of the present inventory [e.g. *Callophyllis* (Arakaki *et al.* 2011), *Sarcopeltis skottsbergii* (Billard *et al.* 2015, Hughey *et al.* 2020), *Nothogenia* (Lindstrom *et al.* 2015), *Phycodrys* (Preuss & Zuccarello 2018), *Lessonia* (Mansilla *et al.* 2020)].

### CRYPTIC DIVERSITY AND DISTRIBUTION RANGE

“The observed levels of cryptic diversity in algae, combined with the shift in methods used to characterize them, have resulted in a rampant uncertainty about the status of many older species” (De Clerck *et al.* 2013).

The increasing use of molecular techniques, have led to much uncertainty about the status of an increasing number of “nominal” species and have revealed the importance of cryptic species (Fraser *et al.* 2009b; Bittner *et al.* 2011; González *et al.* 2012; Lin *et al.* 2012; De Clerck *et al.* 2013; Mystikou *et al.* 2014, 2016; Yang *et al.* 2014; Billard *et al.* 2015; Lindstrom *et al.* 2015; Díaz-Tapia *et al.* 2018; Dubrasquet *et al.* 2018; Chenuil *et al.* 2019; De Jode *et al.* 2019; Ocaranza-Barrera *et al.* 2019; Hughey *et al.* 2020).

TABLE 3. — Co-occurrence of marine macroalgae in Kerguelen Islands waters and elsewhere in the Southern Ocean. Black crosses (+) correspond to type areas (the presence of two crosses on a same line indicates that the sampling site was not well defined). The cosmopolitan taxa and those described in the North Hemisphere or with uncertain status have not been considered. Sites: **AMS**, Amsterdam I.; **SPA**, Saint Paul I.; **MAR**, Marion I.; **PED**, Prince Edwards I.; **KER**, Kerguelen Is.; **CRO**, Crozet Is.; **HEA**, Heard and McDonald Is.; **MAQ**, Macquarie I.; **AUK**, Auckland I.; Antipodes I.; Stewart I. and South I.; **CAM**, Campbell I.; **FUE**, Fuegia; **FAL**, Falkland Is.; **SGI**, South Georgia Is.; **SSI**, South Shetland Is. including King Georges I.; **SOI**, South Orkney Is.; **APE**, Antarctic Peninsula; **END**, Enderby L.; **McR**, MacRobertson L.; **QMA**, Queen Mary L.; **WIL**, Wilkes L.; **ADE**, Adelie L.; **VIC**, Victoria L. and Ross Sea. Ecoregions: **TSA**, Temperate Southern Africa; **SUB**, Subantarctic Islands; **NZS**, Subantarctic New Zealand; **MAG**, Magellanic Province; **SCO**, Scotia Sea province; **CHA**, Continental High Antarctic. Geographical coordinates are given Fig. 1 (inset).

		Ecoregions																					
		TSA			SUB			NZS			MAG		SCO			CHA							
		AMS	SPA	MAR	PED	KER	CRO	HEA	MAQ	AUK	CAM	FUE	FAL	SGI	SSI	SOI	APE	END	McR	QMA	WIL	ADE	VIC
<b>CHLOROPHYTA</b>																							
<i>Chaetomorpha</i>	<i>kerguelensis</i>					+					•	•											
<i>Cladophora</i>	<i>incompta</i>					•				•	•	•	•										
<i>Cladophora</i>	<i>subsimplex</i>					•	•			•	•	•	•										
<i>Codium</i>	<i>galeatum</i>					•	•			•		•											
<i>Monostroma</i>	<i>hariotii</i>					•			•	•	•		•	•	•	•		•		•	•	•	•
<i>Prasiola</i>	<i>crispa</i>					•	•		•	•	•	•	•	•	•	•				•	•	•	•
<i>Prasiola</i>	<i>cristata</i>					+	•						•										
<i>Prasiola</i>	<i>filiformis</i>					+	•						•										
<i>Rhizoclonium</i>	<i>ambiguum</i>					+		•	•	•	•	•	•		•								
<i>Spongomorpha</i>	<i>pacifica</i>					•	•	•	•	+	•	•	•	•	•	•							
<i>Ulva</i>	<i>hookeriana</i>					•	•	•	•	•	•	•	•	•	•	•		•					
Total		0	0	0	0	11	7	3	5	8	7	8	8	6	5	2	3	0	2	0	2	2	2
<b>OCHROPHYTA-Phaeophyceae</b>																							
<i>Adenocystis</i>	<i>utricularis</i>			•		•	•		•	•	•	•	+	•	•	•	•	•					
<i>Caepidium</i>	<i>antarcticum</i>					•						•	•	•	•	•							
<i>Chordariopsis</i>	<i>capensis</i>					•			•	•	•	•	•										
<i>Cladothele</i>	<i>decaisnei</i>					•	•					•	•	•									
<i>Desmarestia</i>	<i>chordalis</i>			•		+		•	•			•	•	•	•	•	•	•			•	•	•
<i>Desmarestia</i>	<i>confervoides</i>			•	•	•	•	•	•	•	•	•	•	•	•	•							•
<i>Desmarestia</i>	<i>menziesii</i>					•	•	•	•	•	•	•	•	•	+	•	•	•	•	•	•	•	•
<i>Desmarestia</i>	<i>rossii</i>	•	•	•	•	•	•	•	•	•		+	+	•	•	•							•
<i>Durvillaea</i>	<i>antarctica</i>					•	•	•	•	•	•	•	•	•	•	•							
<i>Ectocarpus</i>	<i>constanciae</i>					•	•	•	•	•	•	•	+	•	•	•							•
<i>Geminocarpus</i>	<i>geminatus</i>					•	•	•	•	•	•	•	+	•	•	•					•		•
<i>Halopteris</i>	<i>corymbosa</i>					+	•		•						•								
<i>Halopteris</i>	<i>funicularis</i>					•			•	+	•	•	•										
<i>Lessonia</i>	<i>flavicans</i>					•	•	•	•	•	•	•	+	•	•	•							
<i>Lessonia</i>	<i>nigrescens</i>					•		•				•	+	•									
<i>Macrocystis</i>	<i>pyrifera</i>	•	•	•		•	•	•	•	•	•	•	•	•	•								
<i>Scytothamnus</i>	<i>fasciculatus</i>					•	•		•	+	•	•	•	•	•	•							•
<i>Stereocladon</i>	<i>rugulosus</i>					•			•			•	•	•									
<i>Utriculidium</i>	<i>durvillei</i>					•	•			•	•	•	•	•	•		•						
Total		2	3	4	3	19	13	6	14	10	11	18	18	14	12	6	7	3	1	1	3	2	6
<b>RHODOPHYTA</b>																							
<i>Acanthococcus</i>	<i>antarcticus</i>					•						•	+	•	•	•							
<i>Anisocladella</i>	<i>serratodentata</i>					•	•		•			•	•	•	•	•					•	•	•
<i>Ballia</i>	<i>callitricha</i>			•	•	•	•		•	•	•	•	•	+	•	•		•	•	•		•	•
<i>Bostrychia</i>	<i>vaga</i>					+		•	•	•	•	•	•	•	•								
<i>Callophyllis</i>	<i>angustifrons</i>					•						•	•										
<i>Callophyllis</i>	<i>atrosanguinea</i>					•						•	•	•	+	•							
<i>Callophyllis</i>	<i>fastigiata</i>					•	•	•				•	•	•	•	•							
<i>Callophyllis</i>	<i>tenera</i>					•	•			•	•	•	•	•	•	•	+	•	•				
<i>Callophyllis</i>	<i>variegata</i>	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•					
<i>Carlskottsbergia</i>	<i>antarctica</i>					•	•	•	•	•	•	•	•	•	•	•	•						
<i>Catenella</i>	<i>fusiformis</i>					•						•	•	•	•	•							
<i>Ceramium</i>	<i>involutum</i>					•	•			•	•	•	+	•	•					•	•		
<i>Cladodonta</i>	<i>lyallii</i>			•	•	•	•		•			•	•	•	•	•							
<i>Clathromorphum</i>	<i>obtectulum</i>					+	•		•			•	•	•	•	•	•						•
<i>Colacodasya</i>	<i>inconspicua</i>					•			•			•	•	•	•	•	+						
<i>Colacopsis</i>	<i>velutina</i>					•	•					•											
<i>Dasyptilon</i>	<i>ptilota</i>					•	+		•			•			•								
<i>Delisea</i>	<i>pulchra</i>					•		•	•			•		•	•	•	•						
<i>Gracilaria</i>	<i>pulvinata</i>					•	•			•		•	•										•
<i>Grateloupia</i>	<i>cutleriae</i>					•	•					•											
<i>Griffithsia</i>	<i>antarctica</i>			•	•	•			•	•	•	+	•	•		•							•
<i>Gymnogongrus</i>	<i>turquetii</i>					•		•				•	•	•	•	•	+						
<i>Haraldiophyllum</i>	<i>crispatum</i>					•	•			•	+	•	•										
<i>Heterosiphonia</i>	<i>berkeleyi</i>			•	•	•	•		•	•	•	•	+	•	•								
<i>Hildenbrandia</i>	<i>kerguelensis</i>					+				•		•	•										



TABLE 3. — Continuation.

		Ecoregions																						
		TSA		SUB				NZS		MAG		SCO			CHA									
		AMS	SPA	MAR	PED	KER	CRO	HEA	MAQ	AUK	CAM	FUE	FAL	SGI	SSI	SOI	APE	END	McR	QMA	WIL	ADE	VIC	
<i>Hildenbrandia</i>	<i>lecancellieri</i>					•		•	•	•	+	•		•		•							•	
<i>Hymenena</i>	<i>laciniata</i>					•		•				+	+	•										
<i>Iridaea</i>	<i>cordata</i>					•	•	•	•			+	•	•	•		•		•		•	•	•	•
<i>Iridaea</i>	<i>undulosa</i>					•						•	+				•							
<i>Kallymenia</i>	<i>laciniifolia</i>					•	•							•										
<i>Lithothamnion</i>	<i>granuliferum</i>					•	•					•	•			•								
<i>Lithothamnion</i>	<i>kerquelenum</i>					+	•					•	•			•								
<i>Lophurella</i>	<i>gaimardii</i>					•				•			+											
<i>Lophurella</i>	<i>hookeriana</i>					•	•		•	•	•	+	+											
<i>Lophurella</i>	<i>patula</i>				•	•	•		•	•	•	•	+	•										
<i>Mazzaella</i>	<i>capensis</i>					•	•		•	•	•	•	•											
<i>Mazzaella</i>	<i>laminarioides</i>					•	•		•			•	•											
<i>Myriogramme</i>	<i>kerquelenensis</i>					+		•				•	•	•										
<i>Myriogramme</i>	<i>livida</i>					•	•		•			•	+			•		•						
<i>Myriogramme</i>	<i>multilobata</i>					+	•					•	•	•										
<i>Myriogramme</i>	<i>smithii</i>					•	•					•	+	•	•		•							
<i>Nothogenia</i>	<i>fastigiata</i>					•	•		•	•	•	•	+	•										
<i>Nothogenia</i>	<i>variolosa</i>					•			•			•												
<i>Palmaria</i>	<i>decipiens</i>					•	•	•	•	•	•	•	•	+	•	•	•	•	•	•	•	•	•	•
<i>Palmaria</i>	<i>georgica</i>					•	•	•		•	•	•	•	+	•					•				•
<i>Paraglossum</i>	<i>crassinervium</i>					•				+	•		•											
<i>Paraglossum</i>	<i>crozetii</i>					•		+																
<i>Paraglossum</i>	<i>epiglossum</i>					•		•					+	•				•						
<i>Paraglossum</i>	<i>lancifolium</i>					•		•	•	•		+	•	•	•	•	•							
<i>Paraglossum</i>	<i>larsenii</i>					•						•	•	+										
<i>Phycodryx</i>	<i>quercifolia</i>					•			•	•	•	•	+	•	•		•					•		•
<i>Platyclinia</i>	<i>fuégiensis</i>					•	•					•												
<i>Platyclinia</i>	<i>fuscobruba</i>					+	•							•										
<i>Plocamium</i>	<i>cruciferum</i>					•	•		•	•														
<i>Plocamium</i>	<i>hookeri</i>	•	•			+						•	•	•	•	•	•							
<i>Plocamium</i>	<i>secundatum</i>					•	•	•				+	•	•	•	•	•							
<i>Plumariopsis</i>	<i>eatonii</i>					+		•	•				•	•			•							
<i>Polycoryne</i>	<i>compacta</i>					+	•					•	•				•					•		
<i>Polysiphonia</i>	<i>abscissa</i>					•	•			•		+	•	•	•		•					•	•	
<i>Polysiphonia</i>	<i>anisogona</i>	•	•			•	•	•				+	+	•										
<i>Polysiphonia</i>	<i>atricapilla</i>	•	•			•																		
<i>Polysiphonia</i>	<i>flabelliformis</i>					•	•																	
<i>Polysiphonia</i>	<i>urbanooides</i>					+	+			•	•	•												
<i>Porphyra</i>	<i>capensis</i>	•	•			•	•		•	•	•													
<i>Pseudophycodryx</i>	<i>phylophora</i>					•		•				•	+	•			•							
<i>Pterothamnion</i>	<i>simile</i>					•		•	•					•				•						
<i>Ptilonia</i>	<i>magellanica</i>					•						+	•	•			•							
<i>Pyropia</i>	<i>columbina</i>					•	•	•	•															
<i>Rhodoglossum</i>	<i>gigartinoides</i>					•	•		•	•		•	•	•			•							
<i>Rhodophyllis</i>	<i>reptans</i>			•		•			•			•	•								•			
<i>Rhodymenia</i>	<i>coccolcarpa</i>					•		•	•	•		•	+			•		•			•			
<i>Rhodymenia</i>	<i>corallina</i>					•						•	•											
<i>Rhodymenia</i>	<i>dichotoma</i>			•		•			•	+		•	•	•						•				•
<i>Rhodymenia</i>	<i>obtusa</i>			•	•	•			•			•												
<i>Rhodymenia</i>	<i>variolosa</i>				•	•			•			•												
<i>Sarcodia</i>	<i>dentata</i>					•			•															
<i>Sarcodia</i>	<i>palmata</i>					•			•	•		•	•											
<i>Sarcopeltis</i>	<i>skottsbergii</i>					•						+	+	•	•	•	•							
<i>Sarcothalia</i>	<i>papillosa</i>					•	•					•	+			•	•	•						
<i>Sarcothalia</i>	<i>radula</i>					•						•	•											
<i>Schizoseris</i>	<i>condensata</i>					•	•	•	•	•		•	•	•	+	•								
<i>Schizoseris</i>	<i>dichotoma</i>			•		•		•	+	+		•	•	•	•		•							
<i>Schizoseris</i>	<i>griffithsia</i>					•			•	•		•	•	•										
<i>Spongites</i>	<i>discoideus</i>					•	•		•			•	•	•	•	•	•	•						
<i>Synarthrophyton</i>	<i>neglectum</i>					+	•		•	•		•	•											
Total		5	7	6	7	85	41	13	33	46	36	70	64	44	29	13	35	4	4	4	5	8	6	9
Grand total		7	10	10	10	115	61	22	52	64	54	96	90	64	46	21	45	7	7	6	13	10	17	

In SO macroalgae, contrasting genetic patterns have been documented, some taxa having wide biogeographical distributions (including the sub-Antarctic zone and Antarctic coasts)

while others show narrow range distributions with strong genetic structures and cryptic species (Guillemin *et al.* 2016; Díaz-Tapia *et al.* 2018; Ocaranza-Barrera *et al.* 2019; Hughey *et al.* 2020).

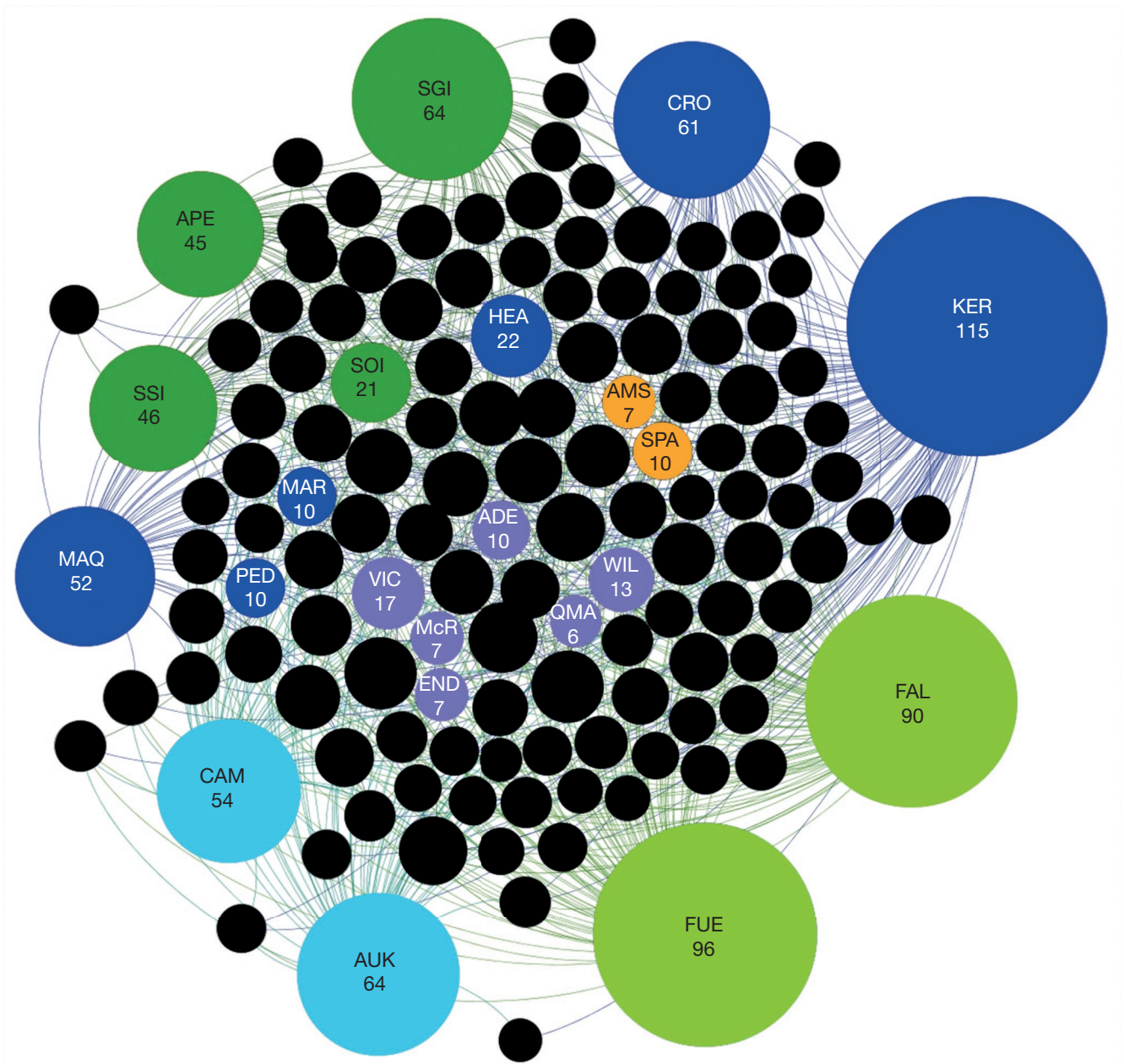


FIG. 5. — Graph of the similarity network between regions (coloured nodes) based on the Kerguelen macroalgae (black nodes) co-occurrence dataset (using ForceAtlas2 layout algorithm). Colour codes are the same as in Figure 1. Nodes size is relative to the number of species co-occurring in the Kerguelen Islands. 51 species of doubtful taxonomic status were not considered. Sites: AMS, Amsterdam I.; SPA, Saint-Paul I.; MAR, Marion I.; PED, Prince Edwards Is.; CRO, Crozet Is.; HEA, Heard and McDonald Is.; MAQ, Macquarie I.; AUK, Auckland Is.; CAM, Campbell Is.; FUE, Fuegia; FAL, Falkland Is.; SGI, South Georgia Is.; SSI, South Shetland Is.; SOI, South Orkney Is.; APE, Antarctic Peninsula; END, Enderby L.; McR, MacRobertson L.; QMA, Queen Mary L.; WIL, Wilkes L.; ADE, Adélie L.; VIC, Victoria L.

The Antarctic marine flora is characterized by a high number of endemic species, approximately 27% of species restricted to areas south of Antarctic Polar Front, i.e., Antarctica, Antarctic and sub-Antarctic islands (with latitude higher than 55°S) (Oliveira *et al.* 2020). In its current state, the present inventory reports species with wide distribution ranges and inversely, narrow range and potentially, endemic species. Macroalgae recorded in the Kerguelen Islands include cosmopolitan and highly tolerant species (e.g. genus *Ulva* and other

fouling species) as well as invasive species (e.g. potentially, species such as *Codium fragile*; Provan *et al.* 2005). Widely distributed species are also represented by floating algae (e.g. *Macrocystis pyrifera*, *Durvillaea antarctica*) (Fraser *et al.* 2020a, b; Velásquez *et al.* 2020) or epiphytic species that drift attached to them (e.g. *Ballia callitrichia*, *B. sertularioides* (Ávila *et al.* 2020)). However, several Kerguelen algae have been attributed to species with an apparent broad distribution while having low dispersal capacities. These species may also correspond to

a complex of cryptic species and their identification requires confirmation, like *Nothogenia fastigiata*, with which seven other species had been confused (Lindstrom *et al.* 2015). Overall, the high number of mono- or bispecific genera in SO macroalgae suggests that cryptic diversity may have been under-estimated. Compared to species-rich genera such as *Callophyllis* Kützing, *Mazzaella* G. De Toni f., *Nothogenia* Montagne or *Paraglossum* J.Agardh (Arakaki *et al.* 2011; Lin *et al.* 2012; Lindstrom *et al.* 2015), the genera with few species such as: *Acanthococcus* J.D.Hooker & Harvey, *Anisocladella* Skottsberg, *Caepidium* J.Agardh, *Carlskottsbergia* Athanasiadis, *Chordariopsis* Kylin, *Cladodonta* Skottsberg, *Cladothela* J.D.Hooker & Harvey, *Geminocarpus* Skottsberg, *Plumariopsis* De Toni, *Polycoryne* Skottsberg, *Pseudophycodrys* Skottsberg, *Scytothamnus* J.D.Hooker & Harvey, *Stereocladon* J.D.Hooker & Harvey and *Utriculidium* Skottsberg, would deserve further investigations. In contrast, the monospecific genus *Macrocystis* is a counterexample, with a very wide distribution, it shows that no general rule should be laid down and that genetic patterns are highly contrasting within SO macroalgae (Coyer *et al.* 2001; Macaya & Zuccarello 2010a, b; Astorga *et al.* 2012).

Among the problematic species, there are non-floating species (e.g. some species of *Durvillaea*; Fraser *et al.* 2020a, b; Velásquez *et al.* 2020), non-epiphytic encrusting algae (e.g. Corallinaceae; Alongi *et al.* 2002), non-epiphytic species with a short life cycle (e.g. genera *Porphyra*, *Pyropia*; Broom *et al.* 2010), and some Rhodophyta from the intertidal algal turf (e.g. genus *Lophurella*; Díaz-Tapia *et al.* 2020).

The increasing availability of sequences from several cytoplasmic and nuclear DNA regions is beginning to highlight the likely amphiequatorial distribution of certain species, but this is still less well documented than in the case of *Macrocystis pyrifera*. A first case study concerns the intertidal species *Acrosiphonia arcta* (Chlorophyta) and *Desmarestia viridis/willii* (Phaeophyta), which show extremely similar ITS sequences (Van Oppen *et al.* 1993). This led Van Oppen *et al.* (1993) to hypothesize recurrent deep-sea dispersal of microthalli across the equator during cooling temperature events of the Pleistocene with survival to extreme temperature (Last Glacial Maximum, LGM). In a more recent paper, Dubrasquet *et al.* (2021) highlighted the strong correspondence (>95%) between sequences of Antarctic species and those obtained for species of Chlorophyta from the Northern Hemisphere such as *Acrosiphonia arcta* (Dillwyn) Gain, *Prasiola crispa* (Lightfoot) Kützing and *Prasiola antarctica* Kützing, confirming the possibility of amphiequatorial distribution, and also underlining the potential risk of invasion linked to the globalisation of human activities.

#### SOME CLUES ON THE BIOGEOGRAPHY OF KERGUELEN MARINE FLORA

Our knowledge of SO macroalgae is far from being sufficient for conducting large-scale biogeographical studies. Hu *et al.* (2016) reported only 126 papers published on seaweed phylogeography between 1994 and 2014 for the world's flora (50% on brown algae, 50% of which dealt only with

2 genera, *Fucus* and *Sargassum*, which do not occur in the SO). Since Hu *et al.*'s review, seven papers only have been published on Antarctic and sub-Antarctic macroalgae. Overall, the SO is a key region for which our phylogeographic knowledge is poor, but it is almost reduced to zero for many marine macroalgae.

While keeping in mind all aforementioned limitations, one can note that biogeographical patterns of Kerguelen macroalgae (based on the selected subset of 115 macroalgal species on a total of 166) are partially in line with Spalding *et al.* (2007)'s regionalization of the SO. In the network analysis (Fig. 5), the Kerguelen Islands cluster together with most other sub-Antarctic regions, including Patagonia and the Falklands, Heard, Crozet and Macquarie islands, and in a less significant manner, with maritime Antarctica including the South Shetlands, the West Antarctic Peninsula and the Scotia Arc islands (South Georgia and the South Orkney Islands). This first grouping corresponds to four biogeographic regions: the south Magellanic Province, South Indian sub-Antarctic islands, New Zealand sub-Antarctic islands, and Macquarie. A second group includes all regions of East Antarctica, generally recognized as a single biogeographic region (Koubbi *et al.* 2014). Finally, two other smaller groups include 1) Marion/Prince Edwards islands; and 2) Saint-Paul/Amsterdam Islands. The low number of species occurring both in the Kerguelen and in the Saint-Paul/Amsterdam group can be easily explained by the distinct environmental conditions prevailing in sub-Antarctic and subtropical islands. In contrast, the absence of common species in the Marion/Prince Edwards group was less expected and could result from the incompleteness of surveys. Patagonia and the Falkland Islands are the regions where a maximum of species are also recorded, with 83 and 78% of the 115 Kerguelen species, respectively. This relatively high number of species and genus also occurring in the Magellanic and sub-Antarctic regions has already been observed for other taxonomic groups, such as sponges (Downey *et al.* 2012), echinoids (Pierrat *et al.* 2013), starfish (Moreau *et al.* 2017) and bivalves (Griffiths *et al.* 2009). Interestingly, this is not a common pattern in gastropods despite the existence of close relationships between algalivorous species and macroalgae (Linse *et al.* 2006; Griffiths *et al.* 2009; Pierrat *et al.* 2013).

Molecular data tend to demonstrate that long-distance dispersal across the ocean may represent an effective mechanism if dispersal factors operate steadily over long periods of time, some species succeeding at maintaining a constant gene flow between remote populations (Thiel & Gutow 2005; Thiel & Haye 2006; Sanmartín *et al.* 2007; Macaya *et al.* 2016; López *et al.* 2017; Tala *et al.* 2019). Macroalgae can disperse either through dispersal of vegetative propagules, spores, or zygotes, rafting or accidental human introduction. As for other marine organisms, it was demonstrated that even poor dispersers may reach remote areas (Thiel & Gutow 2005). Biogeographical affinities between the Kerguelen Islands and the southern Magellanic region likely result from dispersal of diaspores over long distances through the Antarctic Circumpolar Current (ACC) (Waters 2008), and the occurrence of



similar environmental conditions in both regions facilitating their settlement. The role of the ACC as a dispersal vector is believed to have enabled coastal marine organisms to disperse across the whole sub-Antarctic area since the end of the LGM, as sea ice retreated southward (Fraser *et al.* 2012). Rafting may have permitted the colonization and “natural” invasion of remote islands (De Queiroz 2005; Thiel & Gutow 2005; Gillespie *et al.* 2012; Nikula *et al.* 2012; Ávila *et al.* 2020; Macaya *et al.* 2020). This could be the case for buoyant algae like the bull-kelp *Durvillaea antarctica* and the giant kelp *Macrocystis pyrifera* for which passive oceanic drift is believed to be the predominant mechanism of long-distance dispersal (Fraser *et al.* 2009a, 2010, 2020a, b; Macaya & Zuccarello 2010a, b; González-Wevar *et al.* 2016a, b; Moon *et al.* 2017; Tala *et al.* 2019).

Effective dispersal and settlement of macroalgae is also determined by intrinsic factors. If dispersal vectors are critical to connectivity between populations, they are often ineffective at maintaining gene flow among populations if local conditions do not permit the survival of propagules (“founders take all”; Waters *et al.* 2013; see also Montecinos *et al.* 2012; Fraser *et al.* 2015; Parada *et al.* 2017). Kelp rafting is favoured at mid/high latitudes but it was suggested that in polar waters (beyond 60°S), low temperatures and light limitations may impede growth of floating seaweeds (Tala *et al.* 2016). Temperature requirements for growth and survival of some Antarctic-cold temperate and endemic Antarctic species were summarized by Wiencke *et al.* (2014). Finally, contemporaneous human driven introductions may also have contributed to observed current distribution patterns (Ricciardi 2016; Ricciardi *et al.* 2017). The accidental dispersal of marine macroalgae over long distances by human activities is attested worldwide (Hewitt *et al.* 2007, Dubrasquet *et al.* 2021), and the maritime traffic (hull fouling and ballast waters) is undoubtedly partly responsible for the wide present-day distribution range of some marine species, especially opportunistic and tolerant cryptogenic species (Carlton 1996).

The relatively high number of common species co-occurring in the Kerguelen Islands and South Georgia (70%), the South Shetlands (56%) and West Antarctic Peninsula (55%) challenged an old paradigm that the Antarctic Polar Front (APF) would represent an impervious barrier separating cold Antarctic waters and warmer sub-Antarctic waters, thus preventing north-south dispersal in the SO (Poulin *et al.* 2014; Chown *et al.* 2015). A multi-year survey provided evidence that rafting organisms may currently disperse across this front (Fraser *et al.* 2017, 2018, 2020a, b). Recent discoveries of non-native kelp species washed up upon some coasts of the Antarctic Peninsula show how red algae species such as *Ballia callitricha* can also travel through the AFP by rafting (Avila *et al.* 2020). In addition, Macaya *et al.* (2020) report a total of 39 species (3 Chlorophyta, 14 Ochrophyta, and 22 Rhodophyta) drifting, stranded or floating in Antarctica or crossing APF and DNA analyses of rafting communities stressed the role of strong wind events to explain biogeographical patterns (Garden *et al.* 2014). Fraser *et al.* (2018, 2020a, b) underlined the consequences of the break of the ecological isolation of Antarctica

by storm-driven dispersal and warming. This evidence raises questions about the permeability of the APF and the ACC for species dispersal (Avila *et al.* 2020; Macaya *et al.* 2020). However, counterexamples exist like the red alga *Gigartina skottsbergii* Setchell & N.L. Gardner, described in *Fuegia* and reported from both South America and Antarctica, a distribution pattern that far exceeds its dispersal capacity. Hughey *et al.* (2020) showed that lineages from South America and Antarctica, previously assigned to the genus *Gigartina* Stackhouse, were specifically distinct and had to be positioned in the new genus *Sarcopeltis* Hommersand, with the South American species *S. skottsbergii* (Setchell & NLGardner) Hommersand *et al.* as the holotype species and a new species, *S. antarctica* Hommersand *et al.*, for the Antarctic Peninsula lineage. Also, studies of mitochondrial marker sequences suggested the persistence of populations on each side of the Drake Passage during glacial maxima and the existence of dispersal barrier due to the reinforcement of the ACC. A similar pattern was recently shown in *Iridaea cordata* between populations of the Antarctic Peninsula and the Magellanic Province (Ocaranza-Barrera *et al.* 2019).

## CONCLUSION

The present checklist of marine macroalgae of the Kerguelen Islands will certainly be amended in a near future. Molecular works are needed to improve the relevance of taxonomy and our knowledge of species biogeography. The present study is therefore fragmentary and imperfect, but it was intended to constitute a starting point for forthcoming phylogeographical studies. Filling the gaps in our knowledge of SO macroalgae systematics and biogeography implies that integrative molecular and anatomical approaches be adopted using big datasets, as large as possible both in record number and geography. Considering the different fields of research and the huge geographical coverage involved, a concerted international effort is here required.

Macroalgae have developed remarkable adaptations to cope with the high levels of environmental disturbances that are common features of SO marine ecosystems. However, they may be highly vulnerable to present and intensifying threats on marine biota induced by climate change in the region (Guillemin *et al.* 2020). Along the western Antarctic Peninsula, a recent rapid regional warming with a sea surface temperature (SST) increase of 3.7°C per century has been recorded, 87% of glaciers are retreating, the sea ice season has shortened by about 90 days, and perennial ice does not occur any more at this location. This provides new habitats for algal colonization along rocky coastlines. On the other hand, climatic changes are associated with a higher probability of iceberg calving, and scouring by drifting icebergs may have a highly detrimental effect on benthic assemblages (Müller *et al.* 2009). The prolonged influx of glacial meltwater reduces salinity and increases water turbidity due to a higher sediment and nutrients load. These nutrient in-put can stimulate phytoplankton growth



and in turn decrease the availability of light for benthic productivity (Huovinen & Gómez 2020). High levels of ultraviolet-B radiation (UVBR) due to stratospheric ozone depletion could also induce negative effects on macroalgae (Bartsch *et al.* 2012). Lastly, global change can also alter in large-scale ocean circulation, gyre and eddy kinetics in the SO, leading to breaches in dispersal barriers (APF and ACC) established since the Eocene / Oligocene transition. When coupled with the intensification of maritime transport (linked to both touristic and scientific activities), these oceanic changes could lead to an increase in propagule pressure and introduction of non-native species (Gómez & Huovinen 2020a, b; Guillemain *et al.* 2020; Pellizzari *et al.* 2020). Climate warming, ozone depletion and invasive species are not the only threats to the Antarctic biota. Among other concerns are ocean acidification and the increase of pollution generating new and not well-understood threats (Gómez & Huovinen 2020a, b). How other feedbacks related, e.g., with transient and persistent contaminants, ocean acidification and local freshening will impact the underwater light climate in the Antarctic and their consequences for the biota are difficult to predict (Huovinen & Gómez, 2020). Macroalgae have distinct photosynthetic responses to low temperatures and low irradiance conditions across the SO, with some adaptations demonstrated at the genetic level (Navarro *et al.* 2019). Local conditions of temperature and salinity can be key factors for their reproductive cycle (e.g. inhibition of spore germination) and their development at high latitudes (Wiencke *et al.* 2007; Fredersdorf *et al.* 2009; Rodríguez *et al.* 2019). For example, *Macrocystis pyrifera* and *Durvillaea antarctica* show distinct eco-physiological acclimation patterns of photosynthetic periods according to latitude, the combination of increasing radiation and moderate temperature stimulating growth in both species (Marambio *et al.* 2017). We can therefore expect that global warming would facilitate the settlement of some macroalgae at higher latitudes (Putman 2018).

In conclusion, complex implications for seaweeds are to be expected from global and local changes, ranging from beneficial to harmful, depending on local processes as well as on the structure and function of macroalgal communities. In the Kerguelen Islands and some other sub-Antarctic islands (e.g. Marion and Macquarie iIslands), a marked climate change, expressed as increases in temperature and declines of precipitation, has begun to be observed as harbingers of global warming. Because of the proximity of these islands to the APF, a relatively mobile but major marine front, the direct impact of climate shifts and their consequences on the potential invasion of alien species has already drawn the attention of ecologists working on terrestrial ecosystems (Huovinen & Gómez 2012). However, further studies supported by molecular analyses and biogeographical modelling are needed to infer more consistent information concerning the synergistic or antagonistic effects of on-going environmental changes on marine biota. The present work may constitute a baseline that will prove helpful to track these effects on the SO marine flora.

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## Authors' contributions

J.P.F. conceptualized the review. He performed the literature search and data analysis. He also wrote the original draft. M.V. completed the literature search and validated the taxonomy. All authors provided critical feedback and helped shape the research. Critical revision of the article was more specifically done by M.V. for systematics, by J.P.F., E.P. and A.C. for phylogeography, by T.S. and S.R. for ecology and ecophysiology. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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## APPENDICES

APPENDIX 1. — Macroalgae collected during the Ross expedition in the Kerguelen Islands (Hooker 1844-47) consisting in 42 taxa corresponding to 40 currently accepted species names.

accepted name		reported as	collection site
<b>CHLOROPHYTA</b>			
<i>Chaetomorpha linum</i>	(O.F.Müller) Kützing	<i>Conferva linum</i> , Ag.	–
<i>Cladophora rupestris</i>	(Linnaeus) Kützing	<i>Cladophora rupestris</i> , Linn.	Christmas Harbour
<i>Codium tomentosum</i>	Stackhouse	<i>Codium tomentosum</i> , Stackh.	–
<i>Prasiola cristata</i>	(J.D.Hooker & Harvey) J.Agardh	<i>Ulva cristata</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Rhizoclonium ambiguum</i>	(J.D.Hooker & Harvey) Kützing	<i>Conferva ambigua</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Rhizoclonium riparium</i>	(Roth) Harvey	<i>Cladophora riparia</i> , Roth	Christmas Harbour
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> , Grev.	–
<i>Ulva intestinalis</i>	Linnaeus	<i>Enteromorpha intestinalis</i> , Link.	–
<i>Uncertain status</i>	–	<i>Ulva latissima</i> , Linn.	–
<b>OCHROPHYTA-Phaeophyceae</b>			
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis lessoni</i> , Hook. fil. et Harv.	–
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Desmarestia viridis</i>	(O.F.Müller) J.V.Lamouroux	<i>Desmarestia viridis</i> , Lamourx	–
<i>Durvillaea antarctica</i>	(Chamisso) Hariot	<i>D'Urvillea utilis</i> , Bory	–
–	–	<i>D. harveyi</i> Hook.	–
<i>Lessonia flavicans</i>	Bory de Saint-Vincent	<i>Lessonia fuscescens</i> , Bory	Christmas Harbour
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> , Agardh	–
<i>Scytosiphon lomentaria</i>	(Lyngbye) Link	<i>Chorda lomentaria</i> , Grev.	Christmas Harbour
<i>Scytothamnus fasciculatus</i>	(J.D.Hooker & Harvey) A.D.Cotton	<i>Dictyosiphon fasciculatus</i> , Hook. fil. et Harv.	Christmas Harbour
<b>RHODOPHYTA</b>			
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Gigartina plicata</i> , Grev.	Christmas Harbour
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia brunonia</i> , Harv.	Christmas Harbour
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey	<i>Stictosiphonia vaga</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Rhodymenia variegata</i> , Montagne	Christmas Harbour
<i>Ceramium diaphanum</i>	(Lightfoot) Roth	<i>Ceramium diaphanum</i> , Ag.	Christmas Harbour
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> , Ag.	Christmas Harbour
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Delisea pulchra</i>	(Greville) Montagne	<i>Delisea pulchra</i> , Mont.	Christmas Harbour
<i>Heterosiphonia berkeleyi</i>	Montagne,	<i>Polysiphonia (Heterosiphonia) berkeleyi</i> , Mont.	–
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Notogenia variolosa</i> , Mont.	Christmas Harbour
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria crassinervia</i> , Mont.	Christmas Harbour
<i>Platyclinia fuscorubra</i>	(J.D.Hooker & Harvey) Levring	<i>Nitophyllum fusco-rubrum</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> , Harv.	Christmas Harbour
<i>ErythroGLOSSUM laciniatum</i>	Lightfoot) Maggs & Hommersand	<i>Porphyra laciniata</i> , Ag.	–
–	–	<i>Ulva umbilicata</i>	–
<i>Porphyra purpurea</i>	(Roth) C.Agardh	<i>Porphyra vulgaris</i> , Ag.	–
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Callithamnion simile</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Plocamium ? magellanicum</i> , Hook. fil. et Harv.	–
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Phyllophora cuneifolia</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Rhodymenia corallina</i>	(Bory de Saint-Vincent) Greville	<i>Rhodymenia corallina</i> , Bory	Christmas Harbour
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Rhodymenia variolosa</i> , Hook. fil. et Harv.	Christmas Harbour
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Iridaea radula</i> , Bory	–
<i>Titanoderma pustulatum</i>	(J.V.Lamouroux) Nägeli	<i>Melobesia verrucata</i> , Lamx.	–

APPENDIX 2. — Macroalgae from the Kerguelen Islands reported by Kützing (1849, 1855, 1856, 1858, 1859, 1861, 1865, 1866, 1869).

accepted name		reported as
CHLOROPHYTA	–	–
<i>Prasiola cristata</i>	(J.D.Hooker & Harvey) J.Agardh	<i>Ulva (?) cristata</i> Hook fil. & Harvey
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha complanata</i> Kützing
<i>Uncertain status</i>	–	<i>Enteromorpha ramellosa</i> Kützing
OCHROPHYTA Phaeophyceae	–	–
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis lessonii</i> major
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> Hook. fil. et Harvey
<i>Desmarestia viridis</i>	(O.F. Müller) J.V. Lamouroux	<i>Desmarestia viridis</i> Lamour.
<i>Lessonia flavicans</i>	Bory de Saint-Vincent	<i>Lessonia fuscescens</i> Bory
RHODOPHYTA	–	–
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Gymnogongrus plicatus</i> Kützing
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> Mont.
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey	<i>Bostrychia vaga</i> Hook. fil. & Harv.
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> f. <i>pulcherrima</i> Hook. fil.
<i>Nothogenia variolosa</i>	(Montagne) Montagne	<i>Nothogenia variolosa</i> Montagne
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Hypoglossum crassinervium</i> Kützing
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> Harvey
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Callithamnion simile</i> Hook. fil. & Harvey
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Thamnocarpus magellanicus</i> Kützing
<i>Rhodymenia variolosa</i>	J.D. Hooker & Harvey	<i>Epymenia variolosa</i> Kützing



APPENDIX 3. — Macroalgae collected during the Challenger expedition by H.N. Moseley (Dickie 1876a, c) and during the English Venus transit expedition by A.E. Eaton (Dickie 1876d). Sampling sites were in the Baie du Morbihan (Royal Sound) and in the Swains's Bay (Fig. 2).

accepted name		reported as	collection sites
<b>CHLOROPHYTA</b>			
<i>Acrosiphonia arcta</i>	(Dillwyn) Gain	<i>Cladophora arcta</i> Ktz.	Observatory Bay, Royal Sound
<i>Bryopsis plumosa</i>	(Hudson) C.Agardh	<i>Bryopsis plumosa</i> Grev.	Observatory Bay
<i>Cladophora flexuosa</i>	(O.F.Müller) Kützing	<i>Cladophora flexuosa</i> Griff.	Observatory Bay
<i>Cladophora subsimplex</i>	Kützing	<i>Cladophora simpliciuscula</i> H. f. & Harv.	Observatory Bay
<i>Codium adhaerens</i>	C.Agardh	<i>Codium adhaerens</i> Ag.	Swain's Bay
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> Link	
Uncertain status	–	<i>Ulva latissima</i>	Swain's Bay
<b>OCHROPHYTA-Phaeophyceae</b>			
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis lessonii</i> H. f. & Harv.	Observatory Bay
<i>Colpomenia sinuosa</i>	(Mertens ex Roth) Derbès & Solier	<i>Asperococcus sunuosus</i> Roth.	
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> H.f. & Harv.	
<i>Desmarestia menziesii</i>	J.Agardh	<i>Desmarestias media</i> Grev.	
<i>Desmarestia rossi</i>	J.D.Hooker & Harvey	<i>Desmarestia rossi</i> H.f. & Harv.	Observatory Bay
<i>Desmarestia viridis</i>	(O.F.Müller) J.V.Lamouroux	<i>Desmarestia viridis</i> Grev.	Observatory Bay
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>D'urvillea utilis</i> , Bory	
<i>Elachista flaccida</i>	(Dillwyn) Fries	<i>Elachista flaccida</i> Aresch	Royal Sound
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Ectocarpus geminatus</i> H. f. & Harv.	Observatory Bay
<i>Halopteris corymbosa</i>	(Dickie) Draisma, Prud'homme & H.Kawai	<i>Sphacelaria corymbosa</i> n.sp.	
<i>Halopteris funicularis</i>	(Montagne) Sauvageau	<i>Sphacelaria funicularis</i> Mont. ?	Observatory Bay
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> Ag.	Observatory Bay
<i>Sphacelaria affinis</i>	Dickie	<i>Sphacelaria affinis</i>	–
<b>RHODOPHYTA</b>			
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Ahnfeltia plicata</i> Huds.	–
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> Ag.	Observatory
<i>Callophyllis tenera</i>	J.Agardh	<i>Callophyllis tenera</i> J. Ag.	Swain's Bay
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> Bory	Swain's Bay
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Melobesia lichenooides</i> Ell. & Sol.	Observatory Bay
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> Ag.	–
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> H. f. & Harv.	Swain's Bay
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Callithamnion ptilota</i> H. & H.	Swain's Bay
<i>Erythrogloussum laciniatum</i>	(Lightfoot) Maggs & Hommersand	<i>Porphyra laciniata</i> Ag.	Observatory Bay
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Dasya berkeleyi</i> Mont.	Swain's Bay, Observatory Bay
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum laciniatum</i> H. f. & Harv.	Swain's Bay
<i>Lithothamnion kerguelenum</i>	(Dickie) Foslie	<i>Melobesia kerguelena</i> n.sp.	Swain's Bay
<i>Lophurella gaimardii</i>	(Gaudichaud ex C.Agardh) De Toni	<i>Rhodomela gaimardi</i> Mont.	Swain's Bay
<i>Lophurella hookeriana</i>	(J.Agardh) Falkenberg	<i>Rhodomela hookeriana</i> J. Ag.	Swain's Bay
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum lividum</i> H. f. & Harv.	Swain's Bay
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium variolosum</i> Mont.	Swain's Bay, Observatory Bay
<i>Palmaria georgica</i>	(Reinsch) R.W. Ricker	<i>Rhodymenia palmata</i> L.	–
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria crassinervia</i> Mont.	Swain's Bay
<i>Phycodrys quercifolia</i>	(Bory de Saint-Vincent) Skottsberg	<i>Delesseria quercifolia</i> Bory	Swain's Bay
<i>Platyclinia fuscorubra</i>	(J.D.Hooker & Harvey) Levring	<i>Nitophyllum fusco-rubrum</i> H. f. & Harv.	Swain's Bay
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> Har.	Swain's Bay
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Ptilota eatoni</i> n.sp.	Swain's Bay
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> H. f. & Harv.	Swain's Bay
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Callithamnion simile</i> H. f. & Harv.	Swain's Bay
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> Mont.	
<i>Rhodochorton purpureum</i>	(Lightfoot) Rosenvinge	<i>Callithamnion rothii</i> Lyngb.	Observatory Bay
<i>Rhodoglossum gigartinoides</i>	(Sonder) Edyvane & Womersley	<i>Halymenia latissima</i> H. f. & Harv.	Swain's Bay, Observatory Bay
<i>Rhodophyllis reptans</i>	(Suhr) Papenfuss	<i>Rhodophyllis capensis</i> Ktz.	Observatory Bay
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Phyllophora cuneifolia</i> H. f. & Harv.	Swain's Bay
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> H. f. & Harv.	Swain's Bay
<i>Sarcodia dentata</i>	(Suhr) R.E.Norris	<i>Kallymenia dentata</i> Suhr. Var a.	–
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Gigartina radula</i> Esp.	Swain's Bay
<i>Schizoseris griffithsia</i>	(Suhr) M.J.Wynne	<i>Delesseria davisii</i> H. f. & Harv.	Observatory Bay

APPENDIX 4. — Macroalgae collected during the US Venus transit expedition (Farlow 1876). No sampling sites were mentioned but specimens were likely collected in the Royal Sound (presently Baie du Morbihan) in the Observatory Bay and near Pointe Molloy. (Fig. 2).

accepted name		reported as
CHLOROPHYTA		–
<i>Codium adhaerens</i>	C.Agardh	<i>Codium adhaerens</i> , Ag.
Uncertain status	–	<i>Ulva latissima</i>
OCHROPHYTA-Phaeophyceae		–
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis lessonii</i> , H. & H.
<i>Desmarestia viridis</i>	(O.F.Müller) J.V.Lamouroux	<i>Desmarestia viridis</i> Lam.
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>D'Urvillea viridis</i> , Bory / <i>D'Urvillea harveyi</i> , Hook.
<i>Halopteris funicularis</i>	(Montagne) Sauvageau	<i>Sphacellaria funicularis</i> , Mont.
<i>Macrocystis pyriferia</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyriferia</i> , Ag.
RHODOPHYTA		–
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> , Ag.
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> , Ag.
<i>Ceramium</i>	(Lyngbye) C.Agardh	<i>Ceramium rubrum</i> var. <i>secundatum</i> , Lyngb.
<i>Cladodonta rubrum</i> var. <i>secundatum</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> , H. & H.
<i>Dasyptilon lyallii</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Callithamnion ptilotum</i> , H. & H.
<i>Heterosiphonia ptilotum</i>	Montagne	<i>Dasya</i> ( <i>Polysiphonia</i> , H. & H.) <i>bekerleyi</i> , Ag.
<i>Lophurella gaimardii</i>	(Gaudichaud ex C.Agardh) De Toni	<i>Rhodomela gaimardii</i> , Mont.
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum lividum</i> , H. & H.
<i>Palmaria georgica</i>	(Reinsch) R.W. Ricke	<i>Rhodymenia palmata</i> , Grev.
<i>Platyclinia fuscobrunnea</i>	(J.D.Hooker & Harvey) Levring	<i>Nitophyllum fusco-rubrum</i> , H. & H.
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> , Ag.
<i>Rhodymenia corallina</i>	(Bory de Saint-Vincent) Greville	<i>Rhodymenia corallina</i> , Grev.
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Rhodymenia variolosa</i> , H. & H.
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Gigartina radula</i> , Ag.

APPENDIX 5. — Dickie (1879) published a new list of the macroalgae from the Kerguelen Islands, compiling Moseley's (Challenger expedition 1873-74), Hooker's (Ross expedition 1840) and Farlow's (US Venus transit expedition 1874-75) datasets and improving the number of collection sites by addition of Baie de l'Oiseau (Christmas Harbour) (Fig. 2)

accepted name		reported as	collection sites
CHLOROPHYTA		–	–
<i>Acrosiphonia arcta</i>	(Dillwyn) Gain	<i>Cladophora arcta</i> Ktz.	Observatory Bay, Royal Sound
<i>Bryopsis plumosa</i>	(Hudson) C.Agardh	<i>Bryopsis plumosa</i> Grev.	Observatory Bay
<i>Chaetomorpha linum</i>	(O.F.Müller) Kützing	<i>Chaetomorpha linum</i>	Christmas Harbour
<i>Cladophora flexuosa</i>	(O.F.Müller) Kützing	<i>Cladophora flexuosa</i> Griff.	Observatory Bay, Swain's Bay
<i>Cladophora rupestris</i>	(Linnaeus) Kützing	<i>Cladophora rupestris</i> Linn.	Christmas Harbour
<i>Cladophora subsimplex</i>	Kützing	<i>Cladophora simpliciuscula</i> H. f. & Harv.	Observatory Bay
<i>Codium adhaerens</i>	C.Agardh	<i>Codium adhaerens</i> Ag.	Swain's Bay
<i>Codium tomentosum</i>	Stackhouse	<i>Codium tomentosum</i> Stackh.	Christmas Harbour
<i>Prasiola cristata</i>	(J.D.Hooker & Harvey) J.Agardh	<i>Ulva? cristata</i> Hook. F. & Harv.	Christmas Harbour
<i>Rhizoclonium ambiguum</i>	(J.D.Hooker & Harvey) Kützing	<i>Rhizoclonium ambiguum</i> Kütz.	Christmas Harbour
<i>Rhizoclonium riparium</i>	(Roth) Harvey	<i>Rhizoclonium riparium</i> Roth.	Christmas Harbour
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> Link	Christmas Harbour, Royal Sound, Swain's Bay
<i>Ulva intestinalis</i>	Linnaeus	<i>Enteromorpha intestinalis</i> Linn.	Christmas Harbour
OCHROPHYTA-Phaeophyceae		–	–
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis lessonii</i> H. f. & Harv.	Observatory Bay, Christmas Harbour, Royal Sound
<i>Colpomenia sinuosa</i>	(Mertens ex Roth) Derbès & Solier	<i>Asperococcus sinuosus</i> Roth.	Royal Sound intertidal, Observatory Bay
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> H.f. & Harv.	Swain's Bay, Christmas Harbour
<i>Desmarestia menziessi</i>	J.Agardh	<i>Desmarestias aculeata</i> var. <i>media</i> Grev.	Swain's Bay
<i>Desmarestia rossi</i>	J.D.Hooker & Harvey	<i>Desmarestia rossi</i> H.f. & Harv.	Swain's Bay 3 fathoms
<i>Desmarestia viridis</i>	(O.F.Müller) J.V.Lamouroux	<i>Desmarestia viridis</i> Grev.	Observatory Bay, Christmas Harbour, Royal Sound, Swain's Bay
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>D'urvillea utilis</i> , Bory / <i>D'urvillea harveyi</i>	–
<i>Elachista flaccida</i>	(Dillwyn) Fries	<i>Elachista flaccida</i> Aresch	Observatory Bay
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Ectocarpus geminatus</i> H. f. & Harv.	Observatory Bay, Christmas Harbour, Swain's Bay
<i>Halopteris corymbosa</i>	(Dickie) Draisma, Prud'homme & H.Kawai	<i>Sphacellaria corymbosa</i> n.sp.	Pointe Molloy

## APPENDIX 5. — Continuation.

accepted name		reported as	collection sites
<i>Lessonia flavicans</i>	Bory de Saint-Vincent	<i>Lessonia fuscescens</i> Bory	–
<i>Macrocyctis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocyctis pyrifera</i> Ag.	–
<i>Scytosiphon lomentaria</i>	(Lyngbye) Link	<i>Scytosiphon lomentarium</i> Grev. ?	Christmas Harbour
<i>Scytothamnus fasciculatus</i>	(J.D.Hooker & Harvey) A.D.Cotton	<i>Dictyosiphon fasciculatus</i> Hook. F. & Harv.	Port Christymas
<i>Sphacelaria affinis</i>	Dickie	<i>Sphacelaria affinis</i>	Swain's Bay
RHODOPHYTA		–	–
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Ahnfeltia plicata</i> Huds.	Observatory Bay intertidal lower, Christmas Harbour
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> Ag.	Observatory Bay, Swain's Bay, Christmas Harbour
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey	<i>Bostrychia vaga</i> Hook. F. & Harv.	Christmas Harbour
<i>Callophyllis tenera</i>	J.Agardh	<i>Callophyllis tenera</i> J. Ag.	Swain's Bay
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> Bory	Swain's Bay, Christmas Harbour, Royal Sound
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Melobesia antarctica</i> H. f. & Harv.	Swain's Bay, Christmas Harbour
–	–	<i>Melobesia lichenoides</i> Ell. & Sol.	Swain's Bay
<i>Ceramium diaphanum</i>	(Lightfoot) Roth	<i>Ceramium diaphanum</i> J. Ag. ??	Christmas Harbour
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> Ag.	Swain's Bay, Christmas Harbour
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> H. f. & Harv.	Observatory Bay + Swain's Bay, Christmas Harbour
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Callithamnion ptilota</i> H. & H.	Royal Sound
<i>Delisea pulchra</i>	(Greville) Montagne	<i>Delisea pulchra</i> Mont.	Christmas Harbour, Swain's Bay, Royal Sound
<i>Erythrogllossum laciniatum</i>	(Lightfoot) Maggs & Hommersand	<i>Porphyra laciniata</i> Ag.	Observatory Bay, Christmas Harbour
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Dasya berkeleyi</i> Mont.	Swain's Bay, Royal Sound
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum laciniatum</i> H. f. & Harv.	Swain's Bay
<i>Lithothamnion kerguelenum</i>	(Dickie) Foslie	<i>Melobesia kerguelena</i> n.sp.	Swain's Bay
<i>Lophurella hookeriana</i>	(J.Agardh) Falkenberg	<i>Rhodomela hookeriana</i> J. Ag.	Swain's Bay, Observatory Bay, Pointe Molloy
<i>Mazzaella capensis</i>	(J.Agardh) Fredericq	<i>Iridaea capensis</i> J.Ag.	–
<i>Mazzaella laminarioides</i>	(Bory de Saint-Vincent) Fredericq	<i>Iridaea laminarioides</i> Bory	–
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin, 1924	<i>Nitophyllum lividum</i> H. f. & Harv.	Swain's Bay, Royal Sound
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium variolosum</i> Mont.	Observatory Bay, Christmas Harbour, Swain's Bay
<i>Palmaria georgica</i>	(Reinsch) R.W. Ricke	<i>Rhodymenia palmata</i> L.	Swain's Bay, Observatory Bay
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria crassinervia</i> Mont.	Swain's Bay, Observatory Bay
<i>Phycodrys quercifolia</i>	(Bory de Saint-Vincent) Skottsberg	<i>Delesseria quercifolia</i> Bory	Swain's Bay
<i>Platyclinia fuscorubra</i>	(J.D.Hooker & Harvey) Levring	<i>Nitophyllum fusco-rubrum</i> H. f. & Harv.	Swain's Bay, Christmas Harbour
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> Har.	Swain's Bay, Christmas Harbour
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Ptilota eatoni</i> Dickie	Swain's Bay
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> H. f. & Harv.	Observatory Bay
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey	<i>Polysiphonia anisogona</i> Hook. F. & Harv.	–
<i>Porphyra purpurea</i>	(Roth) C.Agardh	<i>Porphyra vulgaris</i> Ag.	Christmas Harbour
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Callithamnion simile</i> H. f. & Harv.	Christmas Harbour, Swain's Bay, Observatory Bay
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> Mont.	Swain's Bay
<i>Rhodochorton purpureum</i>	(Lightfoot) Rosenvinge	<i>Callithamnion rothii</i> Lyngb.	Observatory Bay, Swain's Bay
<i>Rhodoglossum gigartinoides</i>	(Sonder) Edyvane & Womersley	<i>Halymenia latissima</i> H. f. & Harv.	Observatory Bay, Swain's Bay
<i>Rhodophyllis reptans</i>	(Suhr) Papenfuss	<i>Rhodophyllis capensis</i> Ktz.	Swain's Bay
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Phyllophora cuneifolia</i> H. f. & Harv.	Swain's Bay, Christmas Harbour
<i>Rhodymenia corallina</i>	(Bory de Saint-Vincent) Greville	<i>Rhodymenia corallina</i> Grev.	Christmas Harbour
<i>Rhodymenia dichotoma</i>	J.D.Hooker & Harvey	<i>Callophyllis dichotoma</i> Kütz.	Swain's Bay
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> H. f. & Harv.	Swain's Bay, Christmas Harbour, Royal Sound
<i>Sarcodia dentata</i>	(Suhr) R.E.Norris	<i>Kallymenia dentata</i> Suhr. Var a.	Swain's Bay
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Gigartina radula</i> Esp.	Swain's + Observatory Bays, Christmas Harbour
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum multinerve</i> Hook. f. & Harv.	Christmas Harbour
<i>Schizoseris griffithsia</i>	(Suhr) M.J.Wynne	<i>Delesseria davisii</i> H. f. & Harv.	Swain's Bay



APPENDIX 6. — Askenasy (1889) published the report on the macroalgae collected during the German Venus transit expedition (1874-75). The Gazelle was anchored in the Baie Accessible, north coast of Péninsule Courbet (Fig. 2). Most samples were taken in Betsy Cove.

accepted name		reported as	collection sites
CHLOROPHYTA		–	–
<i>Acrosiphonia arcta</i>	(Dillwyn) Gain	<i>Cladophora (Spongomorpha) arcta</i> (Dillw.) Kütz.	Betsy Cove
<i>Cladophora aegiceras</i>	(Montagne) Kützing	<i>Cladomorpha (Spongomorpha) aegiceras</i> (Mont.) Kütz.	Betsy Cove
<i>Codium effusum</i>	(Rafinesque) Delle Chiaje	<i>Codium difforme</i> Kützing	Betsy Cove
Uncertain status	–	<i>Ulva lactuca</i> (L.) Le Jolis, var. <i>latissima</i>	–
OCHROPHYTA-Phaeophyceae		–	–
<i>Chordariopsis capensis</i>	(C.Agardh) Kylin	<i>Chordaria capensis</i> Kütz.	Betsy Cove
<i>Desmarestia rossii</i>	J.D.Hooker & Harvey	<i>Desmarestia rossii</i> Hook. f. & Harv.	Betsy Cove
<i>Desmarestia viridis</i>	(O.F.Müller) J.V.Lamouroux	<i>Desmarestia viridis</i> Lamour.	Betsy Cove
<i>Ectocarpus constanciae</i>	Hariot	<i>Ectocarpus constanciae</i> Hariot	–
<i>Ectocarpus fasciculatus</i>	Harvey	<i>Ectocarpus fasciculatus</i>	–
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Ectocarpus geminatus</i> Hook. f. et Harvey	Betsy Cove
<i>Halopteris funicularis</i>	(Montagne) Sauvageau	<i>Sphacelaria funicularis</i> Mont.	–
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> Agardh	Betsy Cove
RHODOPHYTA		–	–
<i>Ahnfeltiopsis concinna</i>	(J.Agardh) P.C.Silva & DeCew	<i>Ahnfeltia concinna</i> J. Ag.	Betsy Cove
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> (Ag.) Montagne	Betsy Cove
<i>Callophyllis atrosanguinea</i>	(J.D.Hooker & Harvey) Hariot	<i>Callophyllis variegata</i> var. <i>atrosanguinea</i> Hook. F. et Harvey	Cascade Bay
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> (Bory) Kützing	Betsy Cove
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Melobesia antarctica</i> Hooker f. et Harvey	–
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> (Huds.) C. Ag.	Betsy Cove, Cascade Bay
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> Hooker f. et Harvey	Betsy Cove
<i>Delisea pulchra</i>	(Greville) Montagne	<i>Delisea pulchra</i> (Grev.) Montagne	Betsy Cove
<i>Griffithsia antarctica</i>	J.D.Hooker & Harvey	<i>Griffithsia antarctica</i> Hook. f. et Harv.	–
<i>Haraldiophyllum crispatum</i>	(J.D.Hooker & Harvey) S.M.Lin, Hommersand & W.A.Nelson	<i>Nitophyllum crispatum</i> Hooker f. et Harvey	Betsy Cove
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Dasya berkeleyi</i> (Mont.) J. Ag.	Betsy Cove
<i>Hildenbrandia kerguelensis</i>	(Askenasy) Y.M.Chamberlain	<i>Hildenbranchia prototypus</i> var. <i>kerguelensis</i>	–
<i>Lophurella patula</i>	(J.D.Hooker & Harvey) De Toni	<i>Rhodomela patula</i> Hooker f. et Harvey	–
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum lividum</i> Hooker f. et Harvey	–
<i>Myriogramme smithii</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum smithii</i> Hooker f. et Harvey	Betsy Cove
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium variolosum</i> (Mont.) J. Ag.	–
<i>Palmaria georgica</i>	(Reinsch) R.W. Ricke	<i>Rhodymenia palmata</i> (L.) Grev.	–
<i>Phycodrys quercifolia</i>	(Bory de Saint-Vincent) Skottsberg	<i>Delesseria quercifolia</i> Bory	Successful Harbour
<i>Phymatolithon calcareum</i>	(Pallas) W.H.Adey & D.L.McKibbin ex Woelkerling & L.M.Irvine	<i>Lithothamnion polymorphum</i> (L.) Aresch.	–
<i>Plocanium hookeri</i>	Harvey	<i>Plocanium hookeri</i> Hooker f. et Harvey	–
<i>Plocanium secundatum</i>	(Kützing) Kützing	<i>Plocanium secundatum</i> Kützing	Successful Harbour
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Ptilota eatoni</i> Dickie	–
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> Hook. f. et Harv.	Betsy Cove
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey	<i>Polysiphonia anisogona</i> Hooker f. et Harvey	Betsy Cove
<i>Pseudophycodrys phyllophora</i>	(J.Agardh) Skottsberg	<i>Delesseria phyllophora</i> J. Ag.	Betsy Cove, Cascade Bay
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Callithamnion simile</i> Hook. f. et Harvey	–
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i>	Betsy Cove, Cascade Bay, Harbour Island, Irish Bay
<i>Rhodophyllis reptans</i>	(Suhr) Papenfuss	<i>Rhodophyllis capensis</i> Kütz.	Betsy Cove
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Phyllophora cuneifolia</i> Hook. f. et Harvey	–
<i>Rhodymenia corallina</i>	(Bory de Saint-Vincent) Greville	<i>Rhodymenia corallina</i> (Bory) Grev.	–
<i>Rhodymenia obtusa</i>	(Greville) Womersley	<i>Epymenia obtusa</i> (Grev.) Kützing	Betsy Cove
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> (Hook. f. et Harvey) Kütz.	Betsy Cove
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Gigartina radula</i> (Esp.) J. Ag.	Betsy Cove
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Delesseria pleurospora</i> Harvey	Betsy Cove
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Delesseria dichotome</i> Hooker f. et Harvey	Cascade Bay
–	–	<i>Nitophyllum mutinerve</i> Hooker f. et Harvey	Cascade Bay
<i>Schizoseris griffithsia</i>	(Suhr) M.J.Wynne	<i>Delesseria diavisi</i> Hooker f. et Harvey	Betsy Cove

APPENDIX 7. — The macroalgae collected during the first German South Polar expedition in 1901-03 (Observatory Bay) were identified by Reinbold (1908) and Foslie (1908).

accepted name		reported as	Collection sites
<b>Reinbold (1908)</b>			
CHLOROPHYTA			
<i>Prasiola crispa</i>	(Lightfoot) Kützing	<i>Prasiola crispa</i> (Lightf.) Ag.	—
<i>Codium effusum</i>	(Rafinesque) Delle Chiaje	<i>Codium difforme</i> Kg.	—
<i>Cladophora incompta</i>	(J.D.Hooker & Harvey) J.D.Hooker & Harvey	<i>Cladophora incompta</i> Hook. f. et Harv. F. tenuis n.f.	—
<i>Cladophora subsimplex</i>	Kützing	<i>Cladophora subsimplex</i> Kg.	—
<i>Acrosiphonia arcta</i>	(Dillwyn) Gain	<i>Cladophora arcta</i> (Dillw.) Kg.	—
<i>Spongomorpha pacifica</i>	(Montagne) Kützing	<i>Cladophora (Spongomorpha) pacifica</i> (Mont.) Kg.	—
<i>Urospora penicilliformis</i>	(Roth) Areschoug	<i>Urospora penicilliformis</i> (Roth) Aresch.	—
—	—	<i>Codiolum gregarium</i> A. Br.	—
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> (L.) Grev.	—
<i>Ulva hookeriana</i>	(Kützing) Hayden, Blomster, Maggs, P.C.Silva, M.J.Stanhope & J.R.Waaland	<i>Enteromorpha bulbosa</i> (Suhr) Kg.	—
<i>Ulva lactuca</i>	Linnaeus	<i>Ulva lactuca</i> (L.) Le Jol.	—
—	—	<i>Monostroma lactuca</i> (L.) J. Agh.	—
OCHROPHYTA-Phaeophyceae			
<i>Desmarestia confervoides</i>	(Bory de Saint-Vincent) M.E.Ramírez & A.F.Peters	<i>Desmarestia willii</i> Reinsch.	—
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Geminocarpus geminatus</i> (Hook. f. & Harv.) Skottsberg.	—
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis utricularis</i> (Bory) Skottsberg.	—
<i>Caepidium antarcticum</i>	J.Agardh	<i>Caepidium antarcticum</i> J. Ag.	—
<i>Utriculidium durvillei</i>	Skottsberg	<i>Utriculidium durvillei</i> (Bory) Hook. f. & Harv.) Skottsberg.	—
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>Durvillea utilis</i> Bory	—
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> (Turn.) Ag.	—
<i>Scytothamnus fasciculatus</i>	(J.D.Hooker & Harvey) A.D.Cotton	<i>Dictyosiphon fasciculatus</i> Hook. & Harv.	—
<i>Halopteris corymbosa</i>	(Dickie) Draisma, Prud'homme & H.Kawai	<i>Alethocladus corymbosus</i> (Dick.) Sauv.	—
RHODOPHYTA			
<i>Acanthococcus antarcticus</i>	J.D.Hooker & Harvey	<i>Acanthococcus antarcticus</i> Hook. & Harv.	—
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> (Ag.) Mont.	—
<i>Callophyllis angustifrons</i>	(Harvey) G.R.South & N.M.Adams	<i>Rhodophyllis angustifrons</i> Hook. & Harv.	—
<i>Callophyllis tenera</i>	J.Agardh	<i>Callophyllis tenera</i> J. Ag.	—
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> (Bory) Kg.	—
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> (Huds.) Ag.	—
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Delesseria lyallii</i> Hook.& Harv.	—
<i>Erythrogloussum laciniatum</i>	(Lightfoot) Maggs & Hommersand	<i>Porphyra laciniata</i> (Lightf.) Ag.	—
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Heterosiphonia berkeleyi</i> Mont.	—
<i>Lophorella hookeriana</i>	(J.Agardh) Falkenberg	<i>Lophorella hookeriana</i> (J. Ag.) Falkbg.	—
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium variolosum</i> (Mont.) J. Ag.	—
<i>Palmaria georgica</i>	(Reinsch) R.W. Ricke	<i>Rhodymenia palmata</i> (L.) Grev.	—
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria (Hypoglossum) crassinervia</i> Kg.	—
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> Hook. & Harv.	—
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> (Mont.) J. Ag.	—
<i>Rhodymenia capensis</i>	J.Agardh	<i>Rhodymenia capensis</i> J. Ag. ?	—
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> (Hook. & Harv.) Kg.	—
<i>Sarcodia palmata</i>	Sonder	<i>Sarcodia palmata</i> Sond?	—
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Gigartina radula</i> (Esp.) J. Ag.	—
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Delesseria pleurospora</i> J. Ag.	—
—	—	<i>Nitophyllum multinerve</i> Hook. & Harv.	—
<b>Foslie (1908)</b>			
RHODOPHYTA			
<i>Clathromorphum obtectulim</i>	(Foslie) Adey	<i>Lithothamnion obtectulum</i> Foslie	Royal Sound
<i>Lithothamnion kerguelenum</i>	(Dickie) Foslie	<i>Lithothamnion kerguelenum</i> Dickie	Swain's Bay
<i>Phymatolithon lenormandii</i>	(Areschoug) W.H. Adey	<i>Lithothamnion annulatum</i> Foslie	Betsy Cove
<i>Spongites discoideus</i>	(Foslie) D.Penrose & Woelkerling	<i>Lithophyllum consociatum</i> Foslie	Royal Sound, Observatory Bay, Betsy Cove
—	—	<i>Lithophyllum consociatum</i> f. <i>connata</i> Foslie	—
—	—	<i>Lithophyllum consociatum</i> f. <i>typica</i> Foslie	—
<i>Synarthrophyton neglectum</i>	(Foslie) M.L. Mendoza	<i>Lithothamnion neglectum</i> Foslie	Swain's Bay, Royal Sound, Observatory Bay
—	—	<i>Lithothamnion neglectum</i> f. <i>fragilis</i> Foslie	—
—	—	<i>Lithothamnion neglectum</i> f. <i>typica</i> Foslie	—

APPENDIX 8. — Gain (1912) published a compiled list of macroalgae based on Hooker's reports on the Venus Transit and Challenger expeditions.

accepted name		reported as
<b>CHLOROPHYTA</b>		
<i>Acrosiphonia arcta</i>	(Dillwyn) Gain	<i>Acrosiphonia arcta</i> (Dillw.) J.Arg.
<i>Bryopsis plumosa</i>	(Hudson) C.Agardh	<i>Bryopsis plumosa</i> Ag.
<i>Chaetomorpha littorea</i>	Harvey	<i>Chaetomorpha littorea</i> Harv.
<i>Cladophora aegiceras</i>	(Montagne) Kützing	<i>Cladophora aegiceras</i> (Mont.) Kg.
<i>Cladophora flexuosa</i>	(O.F.Müller) Kützing	<i>Cladophora flexuosa</i> Hook. & Harv.
<i>Cladophora incompta</i>	(J.D.Hooker & Harvey) J.D.Hooker & Harvey	<i>Cladophora incompta</i> Hook. F. & Harv.
<i>Cladophora rupestris</i>	(Linnaeus) Kützing	<i>Cladophora rupestris</i> Kg.
<i>Cladophora subsimplex</i>	Kützing	<i>Cladophora subsimplex</i> Kg.
<i>Codium effusum</i>	(Rafinesque) Delle Chiaje	<i>Codium difforme</i> Kg
<i>Codium tomentosum</i>	Stackhouse,	<i>Codium tomentosum</i> Stackh.
<i>Rhizoclonium ambiguum</i>	(J.D.Hooker & Harvey) Kützing	<i>Rhizoclonium ambiguum</i> Kg.
<i>Rhizoclonium riparium</i>	(Roth) Harvey	<i>Rhizoclonium riparium</i> (Roth) Aresch.
		<i>Cladophora riparia</i> (Roth)
<i>Spongomorpha pacifica</i>	(Montagne) Kützing	<i>Cladophora pacifica</i> (Mont.) Kg.
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> Grev
<i>Ulva hookeriana</i>	(Kützing) Hayden, Blomster, Maggs, P.C.Silva, M.J.Stanhope & J.R.Waaland	<i>Enteromorpha bulbosa</i> (Suhr) Kg
<i>Ulva intestinalis</i>	Linnaeus	<i>Enteromorpha intestinalis</i> Link
<i>Ulva lactuca</i>	Linnaeus	<i>Monostroma lactuca</i> (L.) J.Ag.
		<i>Ulva lactuca</i> (L.) Le Jolis
<i>Urospora penicilliformis</i>	(Roth) Areschoug	<i>Urospora penicilliformis</i> (Roth)
		<i>Codiolum gregarium</i> A.Braun
<b>OCHROPHYTA-Phaeophyceae</b>		
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis lessonii</i> Hook. & Harv.
<i>Caepidium antarcticum</i>	J.Agardh	<i>Caepidium antarcticum</i> J.Ag.
<i>Chordariopsis capensis</i>	(C.Agardh) Kylin	<i>Chordaria capensis</i> Kg.
<i>Colpomenia sinuosa</i>	(Mertens ex Roth) Derbès & Solier	<i>Colpomenia sinuosa</i> (Roth) Derb. & Sol.
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> Hook. f. & Harv.
<i>Desmarestia confervoides</i>	(Bory de Saint-Vincent) M.E.Ramirez & A.F.Peters	<i>Desmarestia willi</i> Reinsch
<i>Desmarestia menziesii</i>	J.Agardh	<i>Desmarestia compressa</i> (Reinsch) Skottsb.
<i>Desmarestia rossi</i>	J.D.Hooker & Harvey	<i>Desmarestia rossii</i> Hook. f. & Harv.
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>Durvillea antarctica</i> (Cham.) Hariot
		<i>Durvillea harveyi</i> Hook. f.
<i>Ectocarpus constanciae</i>	Hariot	<i>Ectocarpus constanciae</i> Hariot
<i>Elachista flaccida</i>	(Dillwyn) Fries	<i>Elachistea flaccida</i> Aresch. (?)
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsb.	<i>Geminocarpus geminatus</i> (Hook. f. & Harv.) Skottsb.
<i>Halopteris funicularis</i>	(Montagne) Sauvageau	<i>Halopteris funicularis</i> (Mont.) Sauv.
<i>Lessonia flavicans</i>	Bory de Saint-Vincent	<i>Lessonia flavicans</i> Bory
<i>Lessonia nigrescens</i>	Bory de Saint-Vincent	<i>Lessonia nigrescens</i> Bory
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> (L.) C.A. Ag.
<i>Scytosiphon lomentaria</i>	(Lyngbye) Link	<i>Scytosiphon lomentaria</i> (Lyngb.) J. Ag.
<i>Scytothamnus fasciculatus</i>	(J.D.Hooker & Harvey) A.D.Cotton	<i>Dictyosiphon fasciculatus</i> Hook. & Harv.
<i>Sphacelaria affinis</i>	Dickie	<i>Sphacelaria affinis</i> Dickie
<i>Utriculidium durvillei</i>	Skottsb.	<i>Utriculidium durvillei</i> (Bory? Hook. & Harv.) Skottsb.
<b>RHODOPHYTA</b>		
<i>Acanthococcus antarcticus</i>	J.D.Hooker & Harvey	<i>Acanthococcus antarcticus</i> Hook. f. & Harv.
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Ahnfeltia plicata</i> Fries
<i>Ahnfeltiopsis concinna</i>	(J.Agardh) P.C.Silva & DeCew	<i>Ahnfeltia concinna</i> J. Ag.
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> Mont.
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey	<i>Bostrychia vaga</i> (Hook. f. & Harv.) J. Ag.
<i>Callophyllis atrosanguinea</i>	(J.D.Hooker & Harvey) Hariot	<i>Callophyllis atro sanguinea</i> (Hook. & Harv.) Hariot
		<i>Rhodophyllis angustiformis</i> Hook & Harv.
<i>Callophyllis tenera</i>	J.Agardh	<i>Callophyllis tenera</i> J. Ag.
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> Kg.
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Lithothamnion antarcticum</i> (Hook. & Harv.) Fosl.
<i>Ceramium diaphanum</i>	(Lightfoot) Roth	<i>Ceramium diaphanum</i> Roth
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> Ag.
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsb.	<i>Delesseria lyallii</i> Hook. & Harv.
<i>Clathromorphum obtectulum</i>	(Foslie) Adey	<i>Lithothamnion obtectulum</i> Fosl.
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Antithamnion ptilota</i> (Hook. & Harv.) Neag.
<i>Delisea pulchra</i>	(Greville) Montagne	<i>Delisea pulchra</i> (Mont.) Grev.
<i>Erythrogloum laciniatum</i>	C.Agardh	<i>Porphyra laciniata</i> Ag.
<i>Griffithsia antarctica</i>	J.D.Hooker & Harvey	<i>Bornelia antactica</i> (Hook. & Harv.)
<i>Haraldiophyllum crispatum</i>	(J.D.Hooker & Harvey) S.M.Lin, Hommersand & W.A.Nelson	<i>Nitophyllum crispatum</i> Hook. f. & Harv.
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Heterosiphonia berkeleyi</i> Mont.
<i>Hildenbrandia rubra</i>	(Sommerfelt) Meneghini	<i>Hildenbranchia prototypus</i> Nardo



## APPENDIX 8. — Continuation.

accepted name		reported as
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum laciniatum</i> Hook. f. & Harv.
<i>Iridaea cordata</i>	(Turner) Bory de Saint-Vincent	<i>Iridaea cordata</i> (Turner) J. ag. (?)
<i>Lithothamnion kerguelenum</i>	(Dickie) Foslie	<i>Lithothamnion kerguelenum</i> (Dick.) Fosl.
<i>Lophurella hookeriana</i>	(J.Agardh) Falkenberg	<i>Lophurella hookeriana</i> (J. Ag.) Schm.
<i>Lophurella patula</i>	(J.D.Hooker & Harvey) De Toni	<i>Lophurella patula</i> (Hook. & Harv) Schm.
<i>Mazzaella laminarioides</i>	(Bory de Saint-Vincent) Fredericq	<i>Iridaea laminarioides</i> Bory
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum grayanum</i> J. Ag.
—	—	<i>Nitophyllum lividum</i> Hook. f. & Harv.
<i>Myriogramme smithii</i>	(J.D.Hooker & Harvey) Kylin	<i>Nitophyllum smithii</i> Hook. f. & Harv.
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium variolosum</i> (Mont.) J .Ag.
<i>Palmaria georgica</i>	(Reinsch) R.W. Ricke	<i>Rhodymenia palmata</i> Grev.
<i>Paraglossum epiglossum</i>	(J.Agardh) J.Agardh	<i>Delesseria epiglossum</i> J. Ag.
<i>Phycodrys quercifolia</i>	(Bory de Saint-Vincent) Skottsberg	<i>Delesseria quercifolia</i> Bory
<i>Phymatolithon lenormandii</i>	(Areschoug) W.H.Adey	<i>Lithothamnion lenormandii</i> (Aresch.) Fosl.
<i>Platyclinia fuscobrunnea</i>	(J.D.Hooker & Harvey) Levring	<i>Nitophyllum fusco-rubrum</i> Hook. f. & Harv.
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> Harv.
<i>Plocamium secundatum</i>	(Kützing) Kützing	<i>Plocamium secundatum</i> Kg.
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Ptilota eatoni</i> Dickie
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> Hook. & Harv.
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey	<i>Polysiphonia anisogonia</i> Hook. & Harv.
<i>Porphyra umbilicalis</i>	Kützing	<i>Ulva umbilicalis</i> L.
<i>Pseudophycodrys phyllophora</i>	(J.Agardh) Skottsberg	<i>Delesseria phyllophora</i> J. Ag.
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Antithamnion simile</i> (Hook. & Harv.) J. Ag.
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> J. Ag.
<i>Pyropia leucosticta</i>	(Thuret) Neefus & J.Brodie	<i>Porphyra leucosticta</i> Thuret
<i>Rhodochorton purpureum</i>	(Lightfoot) Rosenvinge	<i>Rhodochorton rothii</i> Lyngb.
<i>Rhodoglossum gigartinoides</i>	(Sonder) Edyvane & Womersley	<i>Iridaea latissima</i> (Hook. & Harv.) Grun.
<i>Rhodophyllis reptans</i>	(Suhr) Papenfuss	<i>Rhodophyllis capensis</i> Kg.
<i>Rhodymenia capensis</i>	J.Agardh	<i>Rhodymenia capensis</i> Kg.
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Phyllophora cuneifolia</i> Hook. & Harv.
<i>Rhodymenia corallina</i>	(Bory de Saint-Vincent) Greville	<i>Rhodymenia corallina</i> (Bory) Grev.
<i>Rhodymenia dichotoma</i>	J.D.Hooker & Harvey	<i>Rhodymenia ? dichotoma</i> Hook. & Harv.
<i>Rhodymenia obtusa</i>	(Greville) Womersley	<i>Epymenia obtusa</i> Kg.
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> (Hook. & Harv.) Kg.
<i>Sarcodia dentata</i>	(Suhr) R.E.Norris	<i>Callymenia dentata</i> Suhr
<i>Sarcodia palmata</i>	Sonder	<i>Sarcodia palmata</i> ? Sond
<i>Sarcothalia radula</i>	(Esper) Edyvane & Womersley	<i>Gigartina radula</i> J. Ag.
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Delesseria pleurospora</i> Harv.
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Delesseria dichotoma</i> Hook. & Harv.
<i>Schizoseris griffithsia</i>	(Suhr) M.J.Wynne	<i>Delesseria davisii</i> Hook. & Harv.
<i>Spongites discoideus</i>	(Foslie) D.Penrose & Woelkerling	<i>Lithophyllum consociatum</i> Fosl.
<i>Synarthrophyton neglectum</i>	(Foslie) M.L.Mendoza	<i>Lithothamnion neglectum</i> Fosl.

APPENDIX 9. —Levring (1944) recorded macroalgae collected during the Solglimt expedition.

accepted name		reported as
<b>CHLOROPHYTA</b>		
<i>Chaetomorpha kerguelensis</i>	Levring	—
<i>Monostroma hariotii</i>	Gain	<i>Chaetomorpha kerguelensis</i> n.sp.
<i>Spongomorpha pacifica</i>	(Montagne) Kützing	<i>Monostroma hariotii</i> Gain
<i>Ulva hookeriana</i>	(Kützing) Hayden, Blomster, Maggs, P.C.Silva, M.J.Stanhope & J.R.Waaland	<i>Acrosiphonia pacifica</i> (Mont.) J. Ag.
<i>Ulva rigida</i>	C.Agardh	<i>Enteromorpha bulbosa</i> (Suhr) Kütz
<i>Ulvella viridis</i>	(Reinke) R.Nielsen, C.J.O'Kelly & B.Wysor	<i>Ulva rigida</i> C. Ag.
<b>OCHROPHYTA-Phaeophyceae</b>		
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis utricularis</i> (Bory) Skottsbg.
<i>Desmarestia confervoides</i>	(Bory de Saint-Vincent) M.E.Ramírez & A.F.Peters	<i>Desmarestias willi</i> Reinsch
<i>Durvillaea antarctica</i>	(Chamisso) Hariot	<i>Durvillea</i> sp.
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Geminocarpus geminatus</i> (Hook. F. & Harv.) Skottsbg.
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> (L.)
<b>RHODOPHYTA</b>		
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	—
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ahnfeltia plicata</i> (Huds.) Fries, J. Agardh
<i>Callophyllis tenera</i>	J.Agardh	<i>Ballia callitricha</i> (C. Ag.) Mont.
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis tenera</i> J. Ag.
<i>Ceramium involutum</i>	Kützing	<i>Callophyllis variegata</i> (Bory) L. Agardh
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Ceramium involutum</i> Kütz.
<i>Colacodasya inconspicua</i>	(Reinsch) F.Schmitz	<i>Cladodonta lyallii</i> (Hook. F. & Harv.) Skottsbg.
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Colacodasya inconspicua</i> (Reinsch) Schmitz
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Antithamnion ptilota</i> (Hook; f. & Harv.) De Toni
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin	<i>Heterosiphonia berkeleyi</i> Mont.
<i>Kallymenia laciniifolia</i>	Levring	<i>Hymenena laciniata</i> (Hook. F. & Harv.) Kylin
<i>Lophurella hookeriana</i>	(J.Agardh) Falkenberg	<i>Kallymenia laciniifolia</i> n.sp.
<i>Mazzaella laminarioides</i>	(Bory de Saint-Vincent) Fredericq	<i>Lophurella hookeriana</i> (J. Ag.) Falkenb.
<i>Myriogramme kerguelensis</i>	Levring	<i>Iridaea boryana</i> (Setch. & Gardn) Skottsberg
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Myriogramme kerguelensis</i> n.sp.
<i>Palmaria decipiens</i>	(Reinsch) R.W.Ricker	<i>Chaetangium fastigiatum</i> (Bory) J. Ag.
<i>Paraglossum epiglossum</i>	(J.Agardh) J.Agardh	<i>Leptosarca alcornis</i> Skottsbg. Kylin & Skottsberg
<i>Paraglossum larsenii</i>	(Skottsberg) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria epiglossum</i> J. Ag.
<i>Platyclinia fuscobrunnea</i>	(J.D.Hooker & Harvey) Levring	<i>Pseudolaingia larsenii</i> (Skottsbg.) Levr. Nov. Comb
<i>Plocamium secundatum</i>	(Kützing) Kützing	<i>Myriogramme fuscobrunnea</i> (Hook. F. & Harv.) Levr. Nov. Comb.
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Plocamium secundatum</i> Kütz, Kylin & Skottsberg
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey	<i>Plumariopsis eatoni</i> (Dickie) De Toni
<i>Polysiphonia urbanoides</i>	Levring	<i>Polysiphonia anisogona</i> Hook. F. & Harv.
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Polysiphonia urbanoides</i> n.sp.
<i>Schizoseris condensata</i>	(Reinsch) R.W.Ricker	<i>Ptilonia magellanica</i> (Mont.) J. Ag.
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Schizoseris laciniata</i> (Kütz.) Kylin
		<i>Lithothamnion antarcticum</i> (Hook. f. & Harv.) Heydr.

APPENDIX 10. — Zinova (1958, in blue) reported on marine macroalgae collected during the 1<sup>st</sup> Soviet Antarctic Expedition (1956-57). She completed her list in 1963 with "Delesseriaceae". A list of algae sampled in the Hopeful Bay was also published in 1973.

		reported as [1958 (blue) & 1963 (black)]	1973 (Baie du Hopeful)
<b>CHLOROPHYTA</b>			
<i>Cladophora repens</i> var. <i>antarctica</i>	(Gain, 1912)	–	<i>Cladophora repens</i> f. <i>antarctica</i> Gain
<i>Spongomorpha pacifica</i>	(Montagne) Kützing, 1854	–	<i>Acrosiphonia pacifica</i> (Mont.) J.Ag.
<i>Ulva hookeriana</i>	(Kützing) Hayden, Blomster, Maggs, P.C.Silva, M.J.Stanhope & J.R.Waaland, 2003	–	<i>Enteromorpha bulbosa</i> (Suhr) Kütz.
<i>Ulva rigida</i>	C.Agardh, 1823	<i>Ulva rigida</i> Ag.	<i>Ulva rigida</i> Ag.
<b>OCHROPHYTA</b>			
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg, 1907	<i>Adenocystis utricularis</i> (Bory) Skottsberg.	<i>Adenocystis utricularis</i> (Bory) Skottsberg.
<i>Chordariopsis capensis</i>	(C.Agardh) Kylin, 1940	<i>Chordariopsis capensis</i> (Ag.) Kyl./ <i>Callithamnion gracile</i> H. & H.	–
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey, 1845	<i>Desmarestia chordalis</i> H. & H.	–
<i>Desmarestia confervoides</i>	(Bory de Saint-Vincent) M.E.Ramírez & A.F.Peters, 1993	<i>Desmarestia willii</i> Reinsch	<i>Desmarestia willii</i> Reinsch
<i>Desmarestia rossii</i>	J.D.Hooker & Harvey, 1845	<i>Desmarestia rossii</i> H. & H.	–
<i>Durvillea antarctica</i>	(Chamisso) Hariot, 1892	<i>Durvillea caepestipes</i> (Mont.) Skottsberg.	<i>Durvillea antarctica</i> (Cham.) Hariot
<i>Ectocarpus fasciculatus</i>	Harvey, 1841	–	<i>Ectocarpus fasciculatus</i> (Griff.) Harv.
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg, 1907	–	<i>Geminocarpus geminatus</i> (Hook. & Harv. Skottsberg.
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh, 1820	<i>Macrocystis pyrifera</i> (L.) Ag.	<i>Macrocystis pyrifera</i> (L.) Ag.
<i>Pylaiella littoralis</i>	(Linnaeus) Kjellman, 1872	–	<i>Pylaiella littoralis</i> (L.) Kjellm.
<i>Stereocladon rugulosus</i>	(Bory de Saint-Vincent) Hariot 1889	–	<i>Stereocladon rugulosus</i> (Bory) Hariot
<b>RHODOPHYTA</b>			
<i>Balia callitricha</i>	(C.Agardh) Kützing, 1843	–	<i>Balia callitricha</i> (Ag.) Kütz.
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey, 1845	<i>Bostrychia vaga</i> H. & H.	–
<i>Callophyllis atosanguinea</i>	(J.D.Hooker & Harvey) Hariot, 1887	–	<i>Callophyllis atosanguinea</i> (Hook. & Harv.) Hariot
<i>Callophyllis</i> ?	–	–	<i>Callophyllis</i> sp.?
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg, 1923	<i>Cladodonta lyallii</i> (Hook. & Harv.) Skottsberg.	<i>Cladodonta lyallii</i> (Hook. & Harv.) Skottsberg.
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis, 1996	<i>Antithamnion ptilota</i> (H. & H.) De Toni	–
<i>Heterosiphonia berkeleyi</i>	Montagne, 1842	–	<i>Heterosiphonia berkeleyi</i> Mont.
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin, 1924	<i>Hymenena laciniata</i> (Hook. & Harv.) Kylin.	–
<i>Iridaea cordata</i>	(Turner) Bory de Saint-Vincent, 1826	<i>Iridaea micans</i> Bory	–
<i>Lithothamnion</i> ?	–	–	<i>Lithothamnion</i> ?
<i>Myriogramme kerguelensis</i>	Levring, 1944	<i>Myriogramme kerguelensis</i> Levr.	<i>Myriogramme kerguelensis</i> Levr.
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin, 1924	<i>Myriogramme livida</i> (Hook. & Harv.) Kylin	<i>Myriogramme livida</i> (Hook. & Harv.) Kylin
<i>Myriogramme multilobata</i>	A.D.Zinova, 1963	<i>Myriogramme multilobata</i> n.sp.	–
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson, 1983	<i>Chaetangium fastigiatum</i> (Bory) J. Ag.	<i>Chaetangium fastigiatum</i> (Bory) J.Ag.
<i>Palmaria georgica</i>	(Reinsch) R.W.Ricker, 1987	<i>Rhodymenia palmatifomis</i> Skottsberg.	<i>Rhodymenia palmatifomis</i> Skottsberg.
<i>Paraglossum lancifolium</i>	(J.Agardh) J.Agardh, 1898	<i>Delesseria uschakovii</i> n.sp./ <i>Delesseria belayevii</i> n.sp.	<i>Delesseria belayevii</i> A. Zin.
<i>Paraglossum larsenii</i>	(Skottsberg) S.-M.Lin, Fredericq & Hommersand, 2012	<i>Pseudolaingia larsenii</i> (Skottsberg.) Levr.	–
<i>Platyclinia fuscorubra</i>	(J.D.Hooker & Harvey) Levring, 1960	<i>Platyclinia fusco-rubra</i> (Hook. & Harv.) Levr.	–
<i>Plocanium secundatum</i>	(Kützing) Kützing, 1866	<i>Plocanium secundatum</i> Kütz.	–
<i>Polycoryne compacta</i>	A.D.Zinova, 1963	<i>Polycoryne compacta</i> n.sp.	–
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey, 1845	–	<i>Polysiphonia anisogona</i> Hook. & Harv.
<i>Porphyra columbiana</i>	(Montagne) W.A.Nelson, 2011	<i>Porphyra columbiana</i> Mont.	<i>Porphyra columbiana</i> Mont.
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli, 1862	–	<i>Antithamnion simile</i> (Hook. & Harv.) J.Ag.
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh, 1852	–	<i>Ptilonia magellanica</i> (Mont.) J.Ag.
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne, 2007	–	<i>Rhodymenia cuneifolia</i> (JHook. & Harv.) Taylor
<i>Sarcothalia papillosa</i>	(Bory de Saint-Vincent) Leister, 1993	–	<i>Gigartina papillosa</i> (Bory) Stech. & Gardn.
<i>Schizoseris condensata</i>	(Reinsch) R.W.Ricker, 1987	<i>Schizoseris laciniata</i> (Kuetz.) Kylin	–
<i>S. dichotoma</i>	(J.D.Hooker & Harvey) Kylin, 1924	<i>Schizoseris kerguelensis</i> n.sp.	<i>Schizoseris kerguelensis</i> A. Zin.
<i>S. laciniata</i> var. <i>latiloba</i>	A.D. Zinovia 1963	<i>Schizoseris latiloba</i> n.sp.	–



APPENDIX 11. — Papenfuss (1964a) listed 138 taxa of macroalgae in his catalogue, the most recent published synthesis on the Kerguelen Islands.

accepted name		reported as
<b>CHLOROPHYTA</b>		
<i>Acrosiphonia arcta</i>	(Dillwyn) Gain	<i>Spongomorpha arcta</i> (Dillwyn) Kützing
<i>Bryopsis plumosa</i>	(Hudson) C.Agardh	<i>Bryopsis plumosa</i> (Hudson) C.Agardh
<i>Chaetomorpha kerguelensis</i>	Levring	<i>Chaetomorpha kerguelensis</i> Levring
<i>Cladophora flexuosa</i>	(O.F.Müller) Kützing	<i>Cladophora flexuosa</i> auct.
<i>Cladophora incompta</i>	(J.D.Hooker & Harvey) J.D.Hooker & Harvey	<i>Cladophora incompta</i> (J.D.Hooker & Harvey) J.D.Hooker & Harvey
<i>Cladophora rupestris</i>	(Linnaeus) Kützing	<i>Cladophora rupestris</i> (Linnaeus) Kützing
<i>Cladophora subsimplex</i>	Kützing	<i>Cladophora subsimplex</i> Kützing
<i>Codium adhaerens</i>	C.Agardh	<i>Codium adhaerens</i> C.Agardh
<i>Codium decorticatum</i>	(Woodward) M.A.Howe	<i>Codium decorticatum</i> (Woodward) Howe
<i>Codium effusum</i>	(Rafinesque) Delle Chiaje	<i>Codium diffforme</i> Kützing
<i>Codium fragile</i>	(Suringar) Hariot	<i>Codium fragile</i> (Suringar) Hariot
<i>Codium galeatum</i>	J.Agardh	<i>Codium galeatum</i> J. Agardh
<i>Codium tomentosum</i>	Stackhouse	<i>Codium tomentosum</i> Stackhouse
<i>Monostroma grevillei</i>	(Thuret) Wittrock	<i>Monostroma grevillei</i> (Thuret) Wittrock
<i>Monostroma hariotii</i>	Gain	<i>Monostroma hariotii</i> Gain
<i>Prasiola crispa</i>	(Lightfoot) Kützing	<i>Prasolia crispa</i> subsp. <i>antarctica</i> (Kützing)
<i>Prasiola cristata</i>	(J.D.Hooker & Harvey) J.Agardh	<i>Prasolia cristata</i> (J.D.Hooker & Harvey) J.Agardh
<i>Prasiola filiformis</i>	Reinsch	<i>Prasiola filiformis</i> Reinsch
<i>Rhizoclonium ambiguum</i>	(J.D.Hooker & Harvey) Kützing	<i>Rhizoclinum ambiguum</i> (J.D.Hooker & Harvey) Kützing
<i>Rhizoclonium riparium</i>	(Roth) Harvey	<i>Rhizoclinum riparium</i> (Roth) Harvey
<i>Spongomorpha aeruginosa</i>	(Linnaeus) Hoek	<i>Chlorochytrium inclusum</i> Kjellman
<i>Spongomorpha pacifica</i>	(Montagne) Kützing	<i>Spongomorpha pacifica</i> (Montagne) Kützing
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> Linnaeus Greville
<i>Ulva hookeriana</i>	(Kützing) Hayden, Blomster, Maggs, P.C.Silva, M.J.Stanhope & J.R.Waaland	<i>Enteromorpha bulbosa</i> (Suhr) Montagne
<i>Ulva intestinalis</i>	Linnaeus	<i>Enteromorpha intestinalis</i> (Linnaeus) Greville
Uncertain status	–	<i>Ulva lactuca</i> auct.
Uncertain status	–	<i>Ulva lactuca</i> var. <i>latissima</i> auct.
<i>Ulva rigida</i>	C.Agardh	<i>Ulva rigida</i> (C.Agardh) Thuret
<i>Ulvella viridis</i>	(Reinke) R.Nielsen, C.J.O'Kelly & B.Wysor	<i>Entocladia viridis</i> Reinke
<i>Urospora penicilliformis</i>	(Roth) Areschoug	<i>Codiolum gregarum</i> Braun
–	–	<i>Urospora penicilliformis</i> (Roth) J.E.Areschoug
<b>OCHROPHYTA-Phaeophyceae</b>		
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis utricularis</i> (Bory) Skottsberg
<i>Caepidium antarcticum</i>	J.Agardh	<i>Caepidium antarcticum</i> J.Agardh
<i>Chordariopsis capensis</i>	(C.Agardh) Kylin	<i>Chordariopsis capensis</i> (C.Agardh) Kylin
<i>Colpomenia sinuosa</i>	(Mertens ex Roth) Derbès & Solier	<i>Colpomenia sinuosa</i> (Roth) Derbes & Solier
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> J.D.Hooker & Harvey
<i>Desmarestia confervoides</i>	(Bory de Saint-Vincent) M.E.Ramírez & A.F.Peters	<i>Desmarestia willii</i> Reinsch
<i>Desmarestia menziesii</i>	J.Agardh	<i>Desmarestia menziesii</i> J.Agardh
<i>Desmarestia rossii</i>	J.D.Hooker & Harvey	<i>Desmarestia rossii</i> J.D.Hooker & Harvey
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>Durvillea antarctica</i> (Chamisso) Hariot
–	–	<i>Durvillea caepaestipes</i> (Montagne) Chapman & Aiken
<i>Ectocarpus constanciae</i>	Hariot	<i>Ectocarpus constanciae</i> Hariot
<i>Elachista flaccida</i>	(Dillwyn) Fries	<i>Elachista flaccida</i> (Dillwyn) Fries
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Geminocarpus geminatus</i> (J.D. Hooker & Harvey) Skottsberg
<i>Halopteris corymbosa</i>	(Dickie) Draisma, Prud'homme & H.Kawai	<i>Alethocladus corymbosus</i> (Dickie) Sauvageau
<i>Lessonia flavicans</i>	Bory de Saint-Vincent	<i>Lessonia fuscescens</i> Bory
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> (Linnaeus) C. Agardh
<i>Petalonia fascia</i>	(O.F.Müller) Kuntze	<i>Petalonia fascia</i> (O.F. Müller) O. Kuntze
<i>Pylaiella littoralis</i>	(Linnaeus) Kjellman	<i>Pylaiella littoralis</i> (Linnaeus) Kjellman
<i>Scytosiphon lomentaria</i>	(Lyngbye) Link	<i>Scytosiphon lomentaria</i> (Lyngbye) Endlicher
<i>Scytothamnus fasciculatus</i>	(J.D.Hooker & Harvey) A.D.Cotton	<i>Scytothamnus fasciculatus</i> (J.D. Hooker & Harvey) Cotton
<i>Sphacelaria affinis</i>	Dickie	<i>Sphacelaria affinis</i> Dickie
<i>Utriculidium durvillei</i>	Skottsberg	<i>Utriculidium durvillei</i> (Bory) Skottsberg
<b>RHODOPHYTA</b>		
<i>Acanthococcus antarcticus</i>	J.D.Hooker & Harvey,	<i>Acanthococcus antarcticus</i> J.D. Hooker & Harvey
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Ahnfeltia plicata</i> (Hudson) E.M. Fries
<i>Anisocladella serratodentata</i>	(Skottsberg) Skottsberg	<i>Erythrogloussum bipinnatifidum</i> (Montagne) J.Agardh
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> (C.Agardh) Kützing
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey	<i>Bostrychia vaga</i> J.D.Hooker & Harvey
<i>Callophyllis angustifrons</i>	(Harvey) G.R.South & N.M.Adams	<i>Callophyllis angustifrons</i> J.D.Hooker & Harvey
<i>Callophyllis atosanguinea</i>	(J.D.Hooker & Harvey) Hariot	<i>Callophyllis atosnaguinea</i> (J.D. hooker & Harvey) Hariot
<i>Callophyllis fastigiata</i>	(J.Agardh) J.Agardh	<i>Callophyllis factigiata</i> (J.Agardh) J.Agardh
<i>Callophyllis tenera</i>	J.Agardh	<i>Callophyllis tenera</i> J.Agardh
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> (Bory) Kützing
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Lithothamnium antarcticum</i> (J.D.Hooker & Harvey) Foslie
<i>Catenella fusiformis</i>	(J.Agardh) Skottsberg	<i>Catanella fusiformis</i> (J.Agardh) Skottsberg
<i>Ceramium diaphanum</i>	(Lightfoot) Roth	<i>Ceramium diaphanum</i> (Lightfoot) Roth

## APPENDIX 11. — Continuation.

accepted name		reported as
<i>Ceramium involutum</i>	Kützing	<i>Ceramium involutum</i> Kützing
<i>Ceramium virgatum</i>	Roth,	<i>Ceramium rubrum</i> (Hudson) C.Agardh
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Cladodonta lyallii</i> (J.D.Hooker & Harvey) Skottsberg
<i>Clathromorphum obtectulum</i>	(Foslie) Adey	<i>Lithothamnium obtectulum</i> (Foslie) Foslie
<i>Colacodasya inconspicua</i>	(Reinsch) F.Schmitz	<i>Colacodasya inconspicua</i> (Reinsch) Schmitz
<i>Colacopsis velutina</i>	(M.T.Martin & M.A.Pocock) R.E.Norris	<i>Melanocolax vetulina</i> Martin & Pocock
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Antithamnion ptilota</i> (J.D.Hooker & Harvey) Gibson
<i>Delisea pulchra</i>	(Greville) Montagne	<i>Delisea pulchra</i> (Greville) Montagne
<i>Gracilaria pulvinata</i>	Skottsberg	<i>Gracilaria pulvinata</i> Skottsberg
<i>Griffithsia antarctica</i>	J.D.Hooker & Harvey	<i>Griffithsia antarctica</i> J.D.Hooker & Harvey
<i>Gymnogongrus turquetii</i>	Hariot	<i>Phyllophora appendiculata</i> Skottsberg
<i>Haraldiophyllum crispatum</i>	(J.D.Hooker & Harvey) S.M.Lin, Hommersand & W.A.Nelson	<i>Myriogramme crispata</i> (J.D.Hooker & Harvey) Kylin
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Heterosiphonia berkeleyi</i> Montagne
–	–	<i>Heterosiphonia merenia</i> Falkenberg
<i>Hildenbrandia kerguelensis</i>	(Askenasy) Y.M.Chamberlain	<i>Hildenbranchia kerguelensis</i> (Askenasy) Chamberlain
<i>Hildenbrandia lecancellieri</i>	Hariot	<i>Hildenbranchia lecancellieri</i> Hariot
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin	<i>Hymenena laciniata</i> (J.D.Hooker & Harvey) Kylin
<i>Iridaea cordata</i>	(Turner) Bory de Saint-Vincent	<i>Iridaea obovata</i> Kützing
<i>Iridaea undulosa</i>	Bory de Saint-Vincent	<i>Iridaea undulosa</i> Bory
<i>Kallymenia laciniifolia</i>	Levring	<i>Kallymenia laciniifolia</i> Levring
<i>Lithothamnium kerguelenum</i>	(Dickie) Foslie	<i>Lithothamnium kerguelenum</i> (Dickie) Foslie
<i>Lophurella hookeriana</i>	(J.Agardh) Falkenberg	<i>Lophurella hookeriana</i> (J.Agardh) Falkenberg
<i>Lophurella patula</i>	(J.D.Hooker & Harvey) De Toni	<i>Lophurella patula</i> (J.D.Hooker & Harvey) De Toni
<i>Mazzaella capensis</i>	(J.Agardh) Fredericq	<i>Iridaea capensis</i> J. Agardh
<i>Mazzaella laminarioides</i>	(Bory de Saint-Vincent) Fredericq	<i>Iridaea boryana</i> (Setchell & Gardner) Skottsberg
–	–	<i>Iridaea laminarioides</i> Bory
<i>Myriogramme kerguelensis</i>	Levring	<i>Myriogramme kerguelensis</i> Levring
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin	<i>Myriogramme livida</i> (J.D.Hooker & Harvey) Kylin
<i>Myriogramme multilobata</i>	A.D.Zinova	<i>Myriogramme multilobata</i> A. Zinova
<i>Myriogramme smithii</i>	(J.D.Hooker & Harvey) Kylin	<i>Myriogramme smithii</i> (J.D.Hooker & Harvey) Kylin
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium fastigiatum</i> (Bory) J.Agardh
<i>Palmaria decipiens</i>	(Reinsch) R.W.Ricker	<i>Leptosomia alcornis</i> (Skottsberg) Kylin
<i>Palmaria georgica</i>	(Reinsch) R.W.Ricker	<i>Rhodymenia palmatiformis</i> Skottsberg
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria crassinervia</i> Montagne
<i>Paraglossum epiglossum</i>	(J.Agardh) J.Agardh	<i>Delesseria epiglossum</i> J.Agardh
<i>Paraglossum lancifolium</i>	(J.Agardh) J.Agardh	<i>Delesseria belayevii</i> A. Zinova
<i>Paraglossum larsenii</i>	(Skottsberg) S.-M.Lin, Fredericq & Hommersand	<i>Pseudolaingia larsenii</i> (Skottsberg) Levring
<i>Phycodrys quercifolia</i>	(Bory de Saint-Vincent) Skottsberg	<i>Phycodrys quercifolia</i> (Bory) Skottsberg
<i>Phymatolithon lenormandii</i>	(Areschoug) W.H.Adey	<i>Lithothamnium lenormandii</i> (J.E.Areschoug) Foslie
<i>Platyclinia fuscorubra</i>	(J.D.Hooker & Harvey) Levring	<i>Platyclinia fuscorubra</i> (J.D.Hooker & Harvey) Levring
<i>Plocamium cartilagineum</i>	(Linnaeus) P.S.Dixon	<i>Plocamium coccineum</i> (Hudson) Lyngbye
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> Harvey
<i>Plocamium secundatum</i>	(Kützing) Kützing	<i>Plocamium secundatum</i> (Kützing) Kützing
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Plumariopsis eatoni</i> (Dickie) De Toni
<i>Polycoryne compacta</i>	A.D.Zinova	<i>Polycoryne compacta</i> A. Zinova
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> (J.D.Hooker & Harvey)
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey	<i>Polysiphonia anisogona</i> J.D.Hooker & Harvey
<i>Polysiphonia urbanoides</i>	Levring	<i>Polysiphonia urbanoides</i> Levring
<i>Porphyra capensis</i>	Kützing	<i>Porphyra capensis</i> Kützing
<i>Pseudophycodrys phyllophora</i>	(J.Agardh) Skottsberg	<i>Pseudophycodrys phyllophora</i> (J.Agardh) Skottsberg
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Antithamnion simile</i> (J.D.Hooker & Harvey) J.Agardh
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> (Montagne) J.Agardh
<i>Rhodochorton purpureum</i>	(Lightfoot) Rosenvinge	<i>Rhodochorton purpureum</i> (Lightfoot) Rosenvinge
<i>Rhodoglossum gigartinoides</i>	(Sonder) Edyvane & Womersley	<i>Iridaea latissima</i> (J.D.Hooker & Harvey) Grunow
<i>Rhodophyllis reptans</i>	(Suhr) Papenfuss	<i>Rhodophyllis reptans</i> (Suhr) Papenfuss
<i>Rhodymenia capensis</i>	J.Agardh	<i>Epymenia capensis</i> (J.Agardh) Papenfuss
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Rhodymenia cuneifolia</i> (J.D.Hooker & Harvey) Taylor
<i>Rhodymenia dichotoma</i>	J.D.Hooker & Harvey	<i>Rhodymenia dichotoma</i> J.D.Hooker & Harvey
<i>Rhodymenia obtusa</i>	(Greville) Womersley	<i>Epymenia obtusa</i> (Greville) Kützing
<i>Rhodymenia</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> (J.D.Hooker & Harvey) Kützing
<i>Sarcodia</i>	Sonder	<i>Sarcodia palmata</i> Sonder ?
<i>Sarcothalia</i>	(Bory de Saint-Vincent) Leister	<i>Gigartina papillosa</i> (Bory) Setchell & Gardner
<i>Schizoseris</i>	(Reinsch) R.W.Ricker	<i>Schizoseris laciniata</i> (Kützing) Kylin
<i>Schizoseris</i>	(J.D.Hooker & Harvey) Kylin	<i>Myriogramme multinervis</i> (J.D.Hooker & Harvey) Kylin
–	–	<i>Schizoseris dichotoma</i> (J.D.Hooker & Harvey) Kylin
–	–	<i>Schizoseris kerguelensis</i> A.Zinova
–	–	<i>Schizoseris laciniata</i> f. <i>latiloba</i> A.Zinova
<i>Schizoseris</i>	(Suhr) M.J.Wynne	<i>Schizoseris davissi</i> (J.D.Hooker & Harvey) Kylin
<i>Spongites</i>	(Foslie) D.Penrose & Woelkerling	<i>Pseudolithophyllum consociatum</i> (Foslie) Lemoine
<i>Synarthrophyton</i>	(Foslie) M.L.Mendoza	<i>Lithothamnium neglectum</i> (Foslie) Foslie

APPENDIX 12. — In 1996, Delépine made the last compilation of macroalgae from the French Austral Islands to be included in an application document to create a Nature Reserve of the French sub-Antarctic Islands (personal communication, JPF, Jouventin *et al.* 1996).

accepted name		reported as
<b>CHLOROPHYTA</b>		
<i>Acrosiphonia arcta</i>	(Dillwyn) Kützing	—
<i>Bryopsis plumosa</i>	(Hudson) C.Agardh	<i>Spongiomorpha arcta</i> (Dillw.) <i>Bryopsis plumosa</i> Agardh
<i>Chaetomorpha kerguelensis</i>	Levring	<i>Chaetomorpha kerguelensis</i> Levring
<i>Cladophora flexuosa</i>	(O.F.Müller) Kützing	<i>Cladophora flexuosa</i> H. & H.
<i>Cladophora incompta</i>	(J.D.Hooker & Harvey) J.D.Hooker & Harvey	<i>Cladophora incompta</i> H. & H.
<i>Cladophora rupestris</i>	(Linnaeus) Kützing	<i>Cladophora rupestris</i> (L.)
<i>Cladophora subsimplex</i>	Kützing	<i>Cladophora subsimplex</i> Kütz.
<i>Codium adhaerens</i>	C.Agardh	<i>Codium adhaerens</i> Agardh
<i>Codium decorticatum</i>	(Woodward) M.A.Howe	<i>Codium decorticum</i> (Woodward)
<i>Codium effusum</i>	(Rafinesque) Delle Chiaje	<i>Codium difforme</i> Kütz.
<i>Codium fragile</i>	(Suringar) Hariot	<i>Codium fragile</i> (Suringar)
<i>Codium galeatum</i>	J.Agardh	<i>Codium galatheum</i> Agardh
<i>Codium tomentosum</i>	Stackhouse	<i>Codium tomentosum</i> Stackhouse
<i>Monostroma grevillei</i>	(Thuret) Wittrock	<i>Monostroma grevillei</i> Thuret
<i>Monostroma hariotii</i>	Gain	<i>Monostroma hariotii</i> Gain
<i>Prasiola crispa</i>	(Lightfoot) Kützing	<i>Prasiola crispa</i> (Kütz.)
<i>Prasiola cristata</i>	(J.D.Hooker & Harvey) J.Agardh	<i>Prasiola cristata</i> (Hooker & Harvey)
<i>Prasiola filiformis</i>	Reinsch	<i>Prasiola filiformis</i> Reinsch
<i>Rhizoclonium ambiguum</i>	(J.D.Hooker & Harvey) Kützing	<i>Rhizoclonium ambiguum</i> (Hooker & Harvey)
<i>Rhizoclonium riparium</i>	(Roth) Harvey	<i>Rhizoclonium riparium</i> (Roth)
<i>Spongomorpha aeruginosa</i>	(Linnaeus) Hoek	<i>Chlorochytrium inclusum</i> Kjellman, 1883
<i>Spongomorpha pacifica</i>	(Montagne) Kützing	<i>Spongiomorpha pacifica</i> (Montagne)
<i>Ulothrix flacca</i>	(Dillwyn) Thuret	<i>Ulothrix pseudoflacca</i> Wille
<i>Ulva compressa</i>	Linnaeus	<i>Enteromorpha compressa</i> L.
<i>Ulva hookeriana</i>	(Kützing) Hayden, Blomster, Maggs, P.C.Silva, M.J.Stanhope & J.R.Waaland	<i>Enteromorpha bulbosa</i> (Suhr)
<i>Ulva intestinalis</i>	Linnaeus	<i>Enteromorpha intestinalis</i> L.
<i>Ulva lactuca</i>	Linnaeus	<i>Ulva lactuca</i> (L.)
Uncertain status	—	<i>Ulva latissima</i> auct.
<i>Ulva rigida</i>	C.Agardh	<i>Ulva rigida</i> (Agardh)
<i>Ulvella viridis</i>	(Reinke) R.Nielsen, C.J.O'Kelly & B.Wysor	<i>Entocladia viridis</i> Reinke
<i>Urospora penicilliformis</i>	(Roth) Areschoug	<i>Codiolum gregarium</i> A. Braun 1855
<b>OCHROPHYTA-Phaeophyceae</b>		
<i>Adenocystis utricularis</i>	(Bory de Saint-Vincent) Skottsberg	<i>Adenocystis utricularis</i> (Bory)
<i>Caepidium antarcticum</i>	J.Agardh	<i>Caepidium antarcticum</i> Agardh
<i>Chordariopsis capensis</i>	(C.Agardh) Kylin	<i>Chordariopsis capensis</i> (Agardh)
<i>Cladothele decaisnei</i>	J.D.Hooker & Harvey	<i>Cladothele decaisnei</i> Hooker & Harvey
<i>Colpomenia sinuosa</i>	(Mertens ex Roth) Derbès & Solier	<i>Colpomenia sinuosa</i> (Roth)
<i>Desmarestia chordalis</i>	J.D.Hooker & Harvey	<i>Desmarestia chordalis</i> Hooker & Harvey = <i>D. rossii</i>
<i>Desmarestia confervoides</i>	(Bory de Saint-Vincent) M.E.Ramírez & A.F.Peters	<i>Desmarestia confervoides</i>
<i>Desmarestia ligulata</i>	(Stackhouse) J.V.Lamouroux	<i>Desmarestia ligulata</i> (Lightf.)
<i>Desmarestia menziesii</i>	J.Agardh	<i>Desmarestia menziesii</i> Agardh
<i>Durvillea antarctica</i>	(Chamisso) Hariot	<i>Durvillea antarctica</i> (Chamisso in Choris) = <i>D. caepestipes</i>
<i>Ectocarpus constanciae</i>	Hariot	<i>Ectocarpus constanciae</i> Hariot
<i>Elachista flaccida</i>	(Dillwyn) Fries	<i>Elachista flaccida</i> (Dillw.)
<i>Geminocarpus geminatus</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Geminocarpus geminatus</i> (Hooker & Harvey)
<i>Halopteris corymbosa</i>	(Dickie) Draisma, Prud'homme & H.Kawai	<i>Alethocladus corymbosum</i> (Dickie)
<i>Lessonia flavicans</i>	Bory de Saint-Vincent	<i>Lessonia flavicans</i> Bory
—	—	<i>Lessonia fuscescens</i> Bory
<i>Macrocystis pyrifera</i>	(Linnaeus) C.Agardh	<i>Macrocystis pyrifera</i> (L.)
<i>Petalonia fascia</i>	(O.F.Müller) Kuntze	<i>Petalonia fascia</i> (Müller)
<i>Pylaiella littoralis</i>	(Linnaeus) Kjellman	<i>Pylaiella littoralis</i> (L.)
<i>Scytosiphon lomentaria</i>	(Lyngbye) Link	<i>Scytosiphon lomentaria</i> Lyngbye
<i>Scytothamnus fasciculatus</i>	(J.D.Hooker & Harvey) A.D.Cotton	<i>Scytothamnus fasciculatus</i> Hooker & Harvey
<i>Sphacelaria affinis</i>	Dickie	<i>Sphacelaria affinis</i> Dickie
<i>Utriculidium durvillei</i>	Skottsberg	<i>Utriculidium durvillei</i> (Bory)
<b>RHODOPHYTA</b>		
<i>Acanthococcus antarcticus</i>	J.D.Hooker & Harvey	<i>Acanthococcus antarcticus</i> Hooker & Harvey
<i>Ahnfeltia plicata</i>	(Hudson) E.M.Fries	<i>Ahnfeltia plicata</i> (Hudson)
<i>Anisocladella serratodentata</i>	(Skottsberg) Skottsberg	<i>Erythrogloussum bipinnatifidum</i> (Montagne)
<i>Ballia callitricha</i>	(C.Agardh) Kützing	<i>Ballia callitricha</i> (Agardh)
<i>Bostrychia vaga</i>	J.D.Hooker & Harvey	<i>Bostrychia vaga</i> (Hooker & Harvey)
<i>Callocolax neglectus</i>	F.Schmitz ex Batters	<i>Callocolax neglectus</i> Schmitz
<i>Callophyllis angustifrons</i>	(Harvey) G.R.South & N.M.Adams	<i>Rhodophyllis angustifrons</i> Harvey
<i>Callophyllis atosanguinea</i>	(J.D.Hooker & Harvey) Hariot	<i>Callophyllis atosanguinea</i> (Hooker & Harvey)
<i>Callophyllis fastigiata</i>	(J.Agardh) J.Agardh	<i>Callophyllis fastigiata</i> (Agardh)
<i>Callophyllis tenera</i>	J.Agardh	<i>Callophyllis tenera</i> Agardh



## APPENDIX 12. — Continuation.

accepted name		reported as
<i>Callophyllis variegata</i>	(Bory de Saint-Vincent) Kützing	<i>Callophyllis variegata</i> (Bory)
<i>Carlskottsbergia antarctica</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Lithothamnion antarcticum</i> (Hooker & Harvey)
<i>Ceramium diaphanum</i>	(Lightfoot) Roth	<i>Ceramium diaphanum</i> (Lightf.)
<i>Ceramium virgatum</i>	Roth	<i>Ceramium rubrum</i> (Hudson)
<i>Cladodonta lyallii</i>	(J.D.Hooker & Harvey) Skottsberg	<i>Cladodonta lyalli</i> (Hooker & Harvey)
<i>Clathromorphum obtectulum</i>	(Foslie) Adey	<i>Lithothamnion obtectulum</i> (Foslie)
<i>Colacodasya inconspicua</i>	(Reinsch) F.Schmitz	<i>Colacodasya inconspicua</i> (Reinsch)
<i>Colacopsis velutina</i>	(M.T.Martin & M.A.Pocock) R.E.Norris	<i>Melanocolax velutina</i> Martin & Pocock
<i>Dasyptilon ptilota</i>	(J.D.Hooker & Harvey) Athanasiadis	<i>Antithamnion ptilota</i> (Hooker & Harvey)
<i>Delisea pulchra</i>	(Greville) Montagne	<i>Delisea pulchra</i> (Greville)
<i>Erythrogloussum laciniatum</i>	(Lightfoot) Maggs & Hommersand	<i>Porphyra laciniata</i> (Lightf.)
<i>Gracilaria pulvinata</i>	Skottsberg	<i>Gracilaria pulvinata</i> Skotts.
<i>Grateloupia cutleriae</i>	Kützing	<i>Grateloupia cutleriae</i> Kütz.
<i>Griffithsia antarctica</i>	J.D.Hooker & Harvey	<i>Griffithsia antarctica</i> Hooker & Harvey
<i>Gymnogongrus turquetii</i>	Hariot	<i>Phyllophora appendiculata</i> Skotts.
<i>Haraldiophyllum crispatum</i>	(J.D.Hooker & Harvey) S.M.Lin, Hommersand & W.A.Nelson	<i>Myriogramme crispata</i> (Hooker & Harvey)
<i>Heterosiphonia berkeleyi</i>	Montagne	<i>Heterosiphonia berkleyi</i> Montagne
—	—	<i>Heterosiphonia merenia</i> Falkenb.
<i>Hildenbrandia kerguelensis</i>	(Askenasy) Y.M.Chamberlain	<i>Hildenbranchia kerguelensis</i> (Askenasy)
<i>Hildenbrandia lecanellieri</i>	Hariot	<i>Hildenbranchia lecanellieri</i> Hariot
<i>Hymenena laciniata</i>	(J.D.Hooker & Harvey) Kylin	<i>Hymenena laciniata</i> (Hooker & Harvey)
<i>Iridaea cordata</i>	(Turner) Bory de Saint-Vincent	<i>Iridaea cordata</i> Turner
<i>Iridaea undulosa</i>	Bory de Saint-Vincent	<i>Iridaea undulosa</i> Bory
<i>Kallymenia lacinifolia</i>	Levring	<i>Kallymenia lacinifolia</i> Levring
<i>Lithothamnion granuliferum</i>	Foslie	<i>Lithothamnion granuliferum</i> Foslie
<i>Lithothamnion kerguelenum</i>	(Dickie) Foslie	<i>Lithothamnion kerguelenum</i> (Dickie)
<i>Lophurella hookeriana</i>	(J.Agardh) Falkenberg	<i>Lophurella hookeriana</i> (Agardh)
<i>Lophurella patula</i>	(J.D.Hooker & Harvey) De Toni	<i>Lophurella patula</i> (Hooker & Harvey)
<i>Mazzaella capensis</i>	(J.Agardh) Fredericq	<i>Iridaea capensis</i> Agardh
<i>Mazzaella laminarioides</i>	(Bory de Saint-Vincent) Fredericq	<i>Iridaea boryana</i> (Setchell & Gardner)
—	—	<i>Iridaea laminarioides</i> Bory
<i>Myriogramme kerguelensis</i>	Levring	<i>Myriogramme kerguelensis</i> Levring
<i>Myriogramme livida</i>	(J.D.Hooker & Harvey) Kylin	<i>Myriogramme livida</i> (Hooker & Harvey) / <i>M. crozieri</i> (Hooker & Harvey)
<i>Myriogramme multilobata</i>	A.D.Zinova	<i>Myriogramme multilobata</i> Zinova
<i>Myriogramme smithii</i>	(J.D.Hooker & Harvey) Kylin	<i>Myriogramme smithii</i> (Hooker & Harvey)
<i>Nothogenia fastigiata</i>	(Bory de Saint-Vincent) P.G.Parkinson	<i>Chaetangium fastigiatum</i> (Bory)
<i>Palmaria decipiens</i>	(Reinsch) R.W.Ricker	<i>Leptosomia simplex</i> (Gepp & Gepp)
<i>Palmaria georgica</i>	(Reinsch) R.W.Ricker	<i>Rhodymenia palmatiformis</i> Skotts.
<i>Paraglossum crassinervium</i>	(Montagne) S.-M.Lin, Fredericq & Hommersand	<i>Delesseria crassinervia</i> Montagne
<i>Paraglossum crozetii</i>	(Levring) S.-M.Lin & Hommersand	<i>Delesseria crozeti</i> Levring
<i>Paraglossum epiglossum</i>	(J.Agardh) J.Agardh	<i>Delesseria epiglossum</i> Agardh
<i>Paraglossum larsenii</i>	(Skottsberg) S.-M.Lin, Fredericq & Hommersand	<i>Pseudolaingia larsenii</i> (Skotts.)
<i>Phycodrys quercifolia</i>	(Bory de Saint-Vincent) Skottsberg	<i>Phycodrys quercifolia</i> (Bory)
<i>Phymatolithon lenormandii</i>	(Areschoug) W.H.Adey	<i>Lithothamnion lenormandii</i> (Areschoug)
<i>Platyclinia fuegiensis</i>	Skottsberg	<i>Platyclinia fuegiensis</i> Skotts.
<i>Platyclinia fuscobrunnea</i>	(J.D.Hooker & Harvey) Levring	<i>Platyclinia fuscobrunnea</i> (Hooker & Harvey)
<i>Plocamium cartilagineum</i>	(Linnaeus) P.S.Dixon	<i>Plocamium cartilagineum</i> (L.) = <i>P. coccineum</i> Lyngbye
<i>Plocamium cruciferum</i>	Harvey	<i>Plocamium cruciferum</i> Harvey
<i>Plocamium hookeri</i>	Harvey	<i>Plocamium hookeri</i> Harvey
<i>Plocamium secundatum</i>	(Kützing) Kützing	<i>Plocanium secundatum</i> (Kütz.)
<i>Plumariopsis eatonii</i>	(Dickie) De Toni	<i>Plumaropsis eatoni</i> (Dickie)
<i>Polycoryne compacta</i>	A.D.Zinova	<i>Polycoryne compacta</i> Zinova
<i>Polysiphonia abscissa</i>	J.D.Hooker & Harvey	<i>Polysiphonia abscissa</i> Hooker & Harvey
<i>Polysiphonia anisogona</i>	J.D.Hooker & Harvey	<i>Polysiphonia anisogona</i> Hooker & Harvey
<i>Polysiphonia atricapilla</i>	J.Agardh	<i>Polysiphonia atricapilla</i> Agardh
<i>Polysiphonia flabelliformis</i>	J.D.Hooker & Harvey	<i>Polysiphonia flabelliformis</i> Hooker & Harvey
<i>Polysiphonia urbanoides</i>	Levring	<i>Polysiphonia urbanoides</i> Levring
<i>Porphyra capensis</i>	Kützing	<i>Porphyra capensis</i> Kütz.
<i>Pseudophycodrys phyllophora</i>	(J.Agardh) Skottsberg	<i>Pseudophycodrys phyllophora</i> (Agardh)
<i>Pterothamnion simile</i>	(J.D.Hooker & Harvey) Nägeli	<i>Antithamnion simile</i> (Hooker & Harvey)
<i>Ptilonia magellanica</i>	(Montagne) J.Agardh	<i>Ptilonia magellanica</i> (Montagne)
<i>Rhodochorton purpureum</i>	(Lightfoot) Rosenvinge	<i>Rhodochorton purpureum</i> (Lightf.)
<i>Rhodoglossum gigartinoides</i>	(Sonder) Edyvane & Womersley	<i>Iridaea latissima</i> (Hooker & Harvey)
<i>Rhodophyllis reptans</i>	(Suhr) Papenfuss	<i>Rhodophyllis reptans</i> (Suhr)
<i>Rhodymenia capensis</i>	J.Agardh	<i>Epymenia capensis</i> (Agardh)
<i>Rhodymenia coccocarpa</i>	(Montagne) M.J.Wynne	<i>Rhodymenia cuneifolia</i> (J.D. Hooker & Harvey)
<i>Rhodymenia dichotoma</i>	J.D.Hooker & Harvey	<i>Rhodymenia dichotoma</i> Hooker & Harvey

APPENDIX 12. — Continuation.

accepted name		reported as
<i>Rhodymenia obtusa</i>	(Greville) Womersley	<i>Epymenia obtusa</i> (Greville)
<i>Rhodymenia variolosa</i>	J.D.Hooker & Harvey	<i>Epymenia variolosa</i> (Hooker & Harvey)
<i>Sarcodia palmata</i>	Sonder, 1871	<i>Sarcodia palmata</i> Sonder
<i>Sarcopeltis skottsbergii</i>	(Setchell & N.L.Gardner) Hommersand, Hughey, Leister & Gabrielson	<i>Gigartina skottsbergii</i> Setchell & Gardner
<i>Sarcothalia papillosa</i>	(Bory de Saint-Vincent) Leister	<i>Gigartina papillosa</i> (Bory)
<i>Schizoseris condensata</i>	(Reinsch) R.W.Ricker	<i>Schizoseris laciniata</i> (Kütz.) & var. <i>latiloba</i> Zinova
<i>Schizoseris dichotoma</i>	(J.D.Hooker & Harvey) Kylin	<i>Myriogramme multinervis</i> (Hooker & Harvey)
—	—	<i>Schizoseris dichotoma</i> (Hooker & Harvey)
—	—	<i>Schizoseris kerguelensis</i> A.D.Zinova
<i>Schizoseris griffithsia</i>	(Suhr) M.J.Wynne	<i>Schizoseris davisii</i> (Hooker & Harvey)
<i>Spongites discoideus</i>	(Foslie) D.Penrose & Woelkerling	<i>Lithophyllum subantarcticum</i> (Foslie)
—	—	<i>Pseudolithophyllum consociatum</i>
<i>Synarthrophyton neglectum</i>	(Foslie) M.L.Mendoza	<i>Lithothamnion neglectum</i> (Foslie)