

**Checklist of the Marine Benthic Algae  
from the Palau Archipelago  
Based on Past References**

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## Introduction

The preliminary checklist of marine benthic algae focuses on the islands of the Palau (Belau) Archipelago (Figure 1) which possesses the most diverse marine flora within the Micronesian region. The species listing is based on the compilation from past references applicable to the marine benthic algae (Tsuda and Wray, 1977; Tsuda, 1981a) from Palau, and subsequent phycological studies in Palau. The richness of Palau's marine flora is best exemplified by the ten species of seagrasses inhabiting its waters (Tsuda et al., 1977; McMillan, 1980, Tsuda and Kamura, 1990); Palau possesses three additional species not found within the other Micronesian islands.

Floristic and ecological studies on the marine benthic algae in the Palau Islands were initiated by the Japanese (Okamura, 1904, 1916; Tokida, 1939; Motoda, 1939; Kanda, 1942, 1944). Schmidt (1928) included three species of *Caulerpa* from Palau in his compilation of 484 species of marine benthic algae from the tropical western Pacific Ocean. Trono (1968, 1969, 1971) published his Ph.D. dissertation studies on the marine benthic algae of the Caroline Islands which included algae from Palau, Yap, Chuuk (Truk), Pohnpei (Ponape), Kosrae (Kusaie) and adjacent atolls. Tsuda (1981b) reported 51 algal species from Ngcheangel Atoll (Kayangel Atoll).

Other studies targeted selected genera which included species from Palau, i.e., *Udotea* (Yamada, 1930), *Galaxaura* (Tanaka, 1936; Itono, 1980), *Caulerpa* (Yamada, 1940, 1944; Taylor, 1977), *Halimeda* (Kanda, 1940a; Yamada, 1941, 1944), *Valonia* (Kanda, 1940b), *Polysiphonia* (Hollenberg, 1968a, 1968b), *Herposiphonia* (Hollenberg, 1968c), *Ulva* (Tsuda, 1968, 1982), *Laurencia* (Saito, 1969), *Sargassum* (DeWreede, 1973; Tsuda, 1976, 1988), *Rhipilia* (Gilbert, 1978), *Avrainvillea* (Olsen-Stojkovich, 1985) and *Gracilaria* (Tsuda, 1985; Meneses and Abbott, 1987).

The Research Center for the Pacific Islands (formerly Research Center for the South Pacific) at Kagoshima University, Japan, sponsored marine biological expeditions to Palau in the 1980s and 1990s. Ajisaka and Enomoto (1987) reported 15 species of green algae collected from Beliliou Island (Peleliu Island), and Ajisaka and Kilar (1990) discussed the characteristics of an unusual species of *Turbinaria* from Palau waters. The most recent and, by far, the most extensive algal floristic study was conducted by Ohba (1996) which cited 159 species of marine benthic algae based on collections made from 11 stations between 0 and 45 meter depth during October 1995 from the southern sector of Palau Proper, i.e., between Beliliou Island and the southern sector of Babeldaob.

Discussion on marine benthic algae also occur in three technical reports applicable to Palau, i.e., Malakal sewer outfall site by Birkeland et al. (1976), resort on Ngerekebesang Island (Arakabesan Island) by Randall et al. (1978) and Ngerukewid Island Wildlife Preserve by Wilkins (1989). Although no voucher specimens are available, the algal species reported in the technical reports have been incorporated in the listing below. The three studies provide quantitative information on the marine benthic algae within each of the three sites.

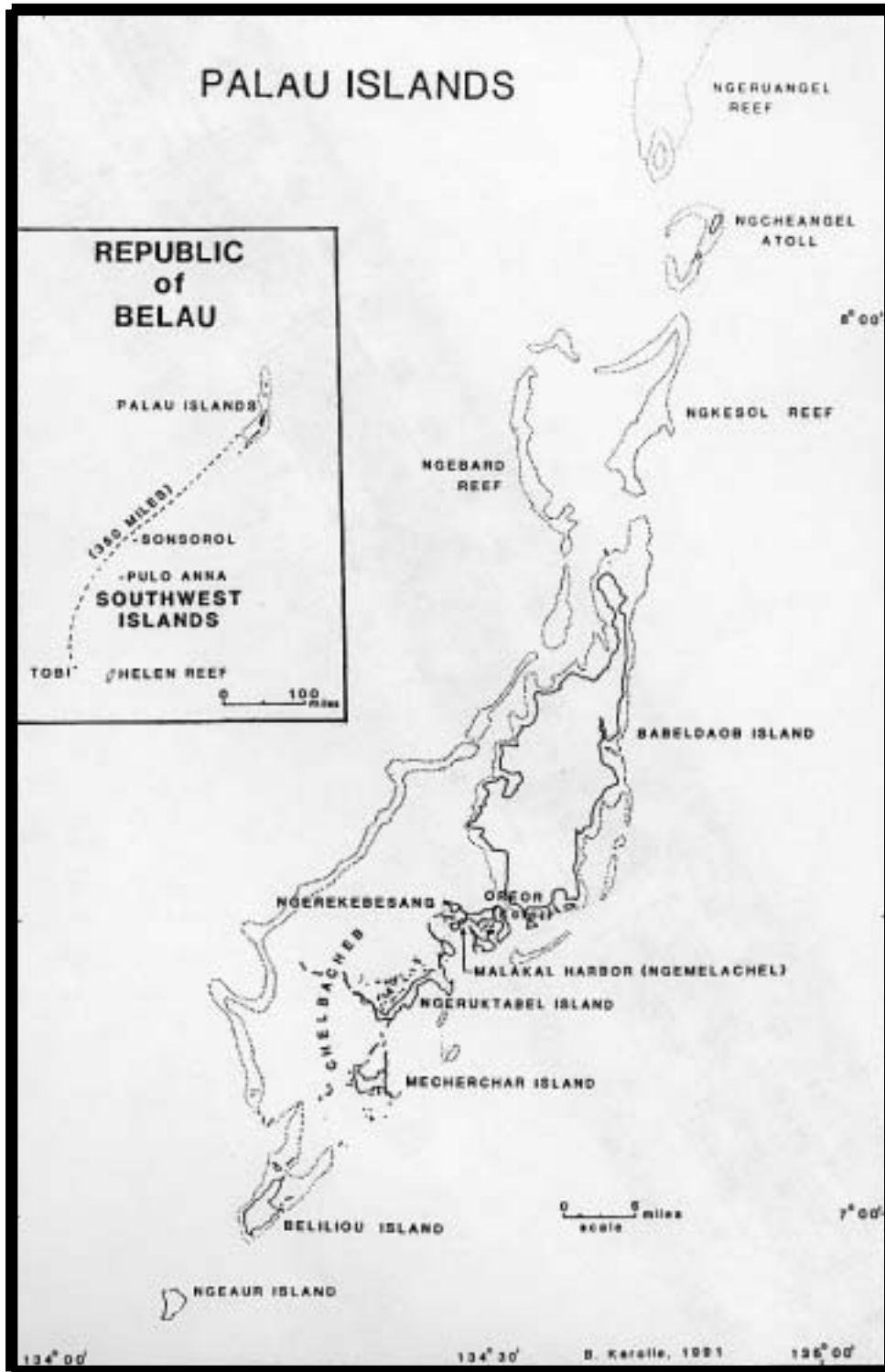


Figure 1. Map of the Palau Archipelago and Palau (Taken from Karolle, 1993).

The classification system follows Silva et al. (1996), and synonymies were according to Silva et al. (1987) and Silva et al. (1996). The 259 species of marine benthic algae (118 genera) consist of 20 species (14 genera) of blue-green algae (cyanobacteria), 94 species (30 genera) of green algae, 30 species (13 genera) of brown algae and 115 species (61 genera) of red algae. Seven species were described as new based on type specimens from Palau, i.e., *Boodleopsis carolinensis* Trono, *Cladophoropsis palauensis* Trono, *Derbesia padinae* Trono, *Udotea geppii* Yamada, *Ceramium kororensis* Trono, *Spyridia velasquezii* Trono and *Laurencia carolinensis* Saito, and are designated in boldface. Species reported by Trono (1968, 1969) which inhabit the Southwest Palau Islands, i.e., Helen Reef and Pulo Anna Island, are denoted below. The term Palau Proper refers to the marine waters between the northern tip of Ngkesol Reef (Kossol Reef) and the southern tip of Ngeaur Island (Angaur Island).

## **Division CYANOPHYTA (Blue-Green Algae/Cyanobacteria)**

### **Class Cyanophyceae**

#### **Order Chroococcales**

##### **Family Entophysalidaceae**

*Entophysalis deusta* (Meneghini) Drouet & Daily, Randall et al. (1978).

##### **Family Microcystaceae**

*Microcystis sanguinea* C. Agardh [= *Anacystis montana* (Lightfoot) Drouet & Daily], Trono (1968) as *Anacystis montana*.

#### **Order Oscillatoriales**

##### **Family Oscillatoriaceae**

*Hydrocoleum* (?) sp., Ohba (1996).

*Lyngbya aestuarii* (Mertens) Liebman, Trono (1968) from Helen Reef and Palau Proper.

*Lyngbya confervoides* C. Agardh, Trono (1968) from Helen Reef and Palau Proper, Ohba (1996).

*Lyngbya majuscula* (Dillwyn) Harvey, Tokida (1939), Kanda (1944), Trono (1968); Birkeland et al. (1976), Randall et al. (1978), Tsuda (1981b) and Wilkins (1989) as

*Microcoleus lyngbyaceus* (Kützing) P. Crouan & H. Crouan, Ohba (1996).

*Lyngbya polychroa* (Meneghini) Rabenhorst [= *Lyngbya sordida* Gomont], Ohba (1996).

### **Family Phormidiaceae**

*Phormidium* (?) sp., Ohba (1996).  
*Symploca hydroides* Gomont, Trono (1968).

### **Family Schizothrichaceae**

*Schizothrix calcicola* (C. Agardh) Gomont, Birkeland et al. (1976), Randall et al. (1978),  
Tsuda (1981b), Wilkins (1989).  
*Schizothrix mexicana* Gomont, Randall et al. (1978).

## **Order Nostocales**

### **Family Microchaetaceae**

*Tolypothrix* sp., Tokida (1939).

### **Family Nostocaceae**

*Hormothamnium enteromorphoides* Grunow, Birkeland et al. (1976), Randall et al.  
(1978).

### **Family Rivulariaceae**

*Calothrix confervicola* (Dillwyn) C. Agardh, Randall et al. (1978), Tsuda (1981b).  
*Calothrix crustacea* Thuret, Birkeland et al. (1976).  
*Calothrix pilosa* Harvey, Tsuda (1981b).  
*Dichothrix penicillata* Zarnandini, Okamura (1904), Tokida (1939).  
*Rivularia* sp., Tokida (1939).

## **Order Stigonematales**

### **Family Mastigocladaceae**

*Brachytrichia quoyii* (C. Agardh) Bornet & Flahault, Kanda (1944).  
*Kyrtuthrix maclans* (Gomont) Umezaki, Ohba (1996).

## **Division CHLOROPHYTA (Green Algae)**



## Class Chlorophyceae

### Order Ulvales

#### Family Ulvaceae

- Enteromorpha clathrata* (Roth) Greville, Randall et al. (1978).  
*Enteromorpha intestinalis* (Linnaeus) Nees, Ohba (1996).  
*Enteromorpha kylinii* Bliding, Trono (1968) from Helen Reef.  
*Enteromorpha prolifera* (O.F. Müller) J. Agardh [= *E. salina* Kützing var. *polyclados* Kützing], Trono (1968) as *E. salina* var. *polyclados* from Helen Reef.  
*Ulva lactuca* Linnaeus, Tsuda (1968, 1982).

### Order Cladophorales

#### Family Anadyomenaceae

- Anadyomene wrightii* Harvey ex Gray, Kanda (1942,1944), Ohba (1996).  
*Microdictyon okamurai* Setchell, Kanda (1944), Trono (1968), Tsuda (1981b), Wilkins (1989).

#### Family Cladophoraceae

- Chaetomorpha indica* (Kützing) Kützing, Randall et al. (1978).  
*Cladophora patentiramea* (Montague) Kützing, Ohba (1996).  
*Cladophora sibogae* Reinbold, Tokida (1939), Kanda (1942, 1944), Ohba (1996).  
*Rhizoclonium* sp., Ohba (1996).

#### Family Siphonocladaceae

- Boergesenia forbesii* (Harvey) Feldmann, Ajisaka & Enomoto (1987) as *B. forbesii* (?).  
*Boodlea coacta* (Dickie) Murray & DeToni, Tokida (1939), Ohba (1996).  
*Boodlea composita* (Harvey) Brand [= *B. siamensis* Reinbold], Okamura (1916) as *B. siamensis*, Tokida (1939) and Kanda (1944) as *B. siamensis*, Trono (1968) as *B. siamensis* and *B. composita* from Helen Reef, Ajisaka & Enomoto (1987) as *B. siamensis*, Wilkins (1989), Ohba (1996).  
*Boodlea vanbosseae* Reinbold, Trono (1968) from Palo Anna.  
***Boodleopsis carolinenses*** Trono (1971), Trono (1968) as *Boodleopsis* sp.  
*Cladophoropsis dichotoma* (Zanardini) Papenfuss [= *Spongocladia dichotoma* (Zanardini) Murray & Boodle], Tokida (1939) and Kanda (1944) as *Spongocladia dichotoma*, Ohba (1996).  
*Cladophoropsis herpestica* (Montagne) Howe, Trono (1968) from Pulo Anna.  
*Cladophoropsis javanica* (Kützing) P. Silva [= *C. zollingeri* (Kützing) Reinbold], Kanda

(1942, 1944) and Ohba (1996) as *C. zollingerii*.  
*Cladophoropsis palauensis* Trono (1971), Trono (1968) as *Cladophoropsis* sp.  
*Cladophoropsis sundanensis* Reinbold, Wilkins (1989).  
*Dictyosphaeria cavernosa* (Forsskål) Børgesen [= *D. favulosa* (C. Agardh) Decaisne ex Endlicher], Tokida (1939) and Kanda (1944) as *D. favulosa*, Trono (1968), Birkeland et al. (1976), Tsuda (1981b), Ajisaka & Enomoto (1987), Wilkins (1989), Ohba (1996).  
*Dictyosphaeria versluysii* Weber-van Bosse, Tokida (1939), Trono (1968) from Pulo Anna, Birkeland et al. (1976), Tsuda (1981b).  
*Spongocladia vaucheriaeformis* Areschong [= *Cladophoropsis vaucheriaeformis* (Areschong) Papenfuss], Tokida (1939), Kanda (1942, 1944), Ohba (1996) as *Cladophoropsis vaucheriaeformis*.  
*Struvea anastomosans* (Harvey) Piccone & Grunow ex Piccone [= *S. delicatula* Kützing], Tokida (1939) and Kanda (1944) as *S. delicatula*.  
*Ventricaria ventricosa* (J. Agardh) Olsen & West [= *Valonia ventricosa* J. Agardh], Tokida (1939), Kanda (1940b, 1944), Trono (1968), Birkeland et al. (1976), Randall et al. (1978) and Tsuda (1981b) as *Valonia ventricosa*, Ohba (1996).

### Family Valoniaceae

*Valonia aegagropila* C. Agardh, Kanda (1940b, 1944), Trono (1968) from Pulo Anna, Ohba (1996).  
*Valonia fastigiata* Harvey ex J. Agardh, Kanda (1940b, 1944), Birkeland et al. (1976), Wilkins (1989), Ohba (1996).  
*Valonia utricularis* (Roth) C. Agardh, Tokida (1939), Trono (1968) from Helen Reef and Palau Proper, Tsuda (1981b).  
*Valoniopsis pachynema* (G. Martens) Børgesen, Tsuda (1981b)

## Order Bryopsidales

### Family Bryopsidaceae

*Bryopsis plumosa* (Hudson) C. Agardh, Tokida (1939).  
*Derbesia marina* (Lyngbye) Solier [= *Halicystis ovalis* (Lyngbye) Areschoung], Ohba (1996) as *Halicystis ovalis*.  
*Derbesia padinae* Trono (1971), Trono (1968) as *Derbesia* sp.

### Family Caulerpaceae

*Caulerpa antoensis* Yamada, Tsuda (1981b).  
*Caulerpa brachypus* Harvey, Tokida (1939), Yamada (1940), Kanda (1944), Ajisaka & Enomoto (1987), Wilkins (1989), Ohba (1993).  
*Caulerpa cupressoides* (Vahl) C. Agardh, Okamura (1916), Tokida (1939), Yamada (1940),

- Kanda (1944), Taylor (1977) from Helen Reef, Ajisaka & Enomoto (1987), Ohba (1996).
- Caulerpa lentillifera* J. Agardh, Yamada (1940, 1944), Kanda (1944), Ohba (1996).
- Caulerpa nummularia* Harvey ex J. Agardh, Ohba (1996).
- Caulerpa opposita* Coppejans & Meinesz, Ohba (1996).
- Caulerpa peltata* Lamouroux [= *C. macrodiscus* Decaisne], Tokida (1939), Yamada (1940), Trono (1968), Kanda (1944), Taylor (1977), Ohba (1996) as *C. macrodiscus*.
- Caulerpa racemosa* (Forsskål) J. Agardh, Okamura (1904, 1916), Schmidt (1928), Tokida (1939), Yamada (1940), Kanda (1944), Trono (1968) from Helen Reef and Palau Proper, Birkeland et al. (1976), Taylor (1977), Tsuda (1981b), Ajisaka & Enomoto (1987), Wilkins (1989), Ohba (1996).
- Caulerpa selago* (Turner) C. Agardh, Tokida (1939).
- Caulerpa serrulata* (Forsskål) J. Agardh [= *C. boryana* J. Agardh and *C. freycinetii* C. Agardh], Okamura (1916) as *C. boryana* Harvey, Schmidt (1928) and Tokida (1939) as *C. freycinetii*, Yamada (1940), Kanda (1944), Randall et al. (1978), Tsuda (1981b), Ajisaka & Enomoto (1987), Wilkins (1989), Ohba (1996).
- Caulerpa sertularioides* (Gmelin) Howe, Tokida (1939), Yamada (1940), Kanda (1944), Trono (1968), Ohba (1996).
- Caulerpa subserrata* Okamura, Ohba (1996).
- Caulerpa taxifolia* (Vahl) C. Agardh, Okamura (1916), Schmidt (1928), Tokida (1939), Yamada (1940), Kanda (1944), Tsuda (1981b), Ohba (1996).
- Caulerpa urvilleana* Montagne, Trono (1968) from Helen Reef, Taylor (1977) from Helen Reef and Palau Proper, Tsuda (1981b), Ajisaka & Enomoto (1987), Ohba (1996).
- Caulerpa verticillata* J. Agardh, Yamada (1940), Kanda (1944), Ohba (1996).
- Caulerpa webbiana* Montagne, Tokida (1939), Yamada (1940), Kanda (1944), Ohba (1996).
- Caulerpella ambigua* (Okamura) Prud'homme van Reine & Lokhorst [= *Caulerpa ambigua* Okamura and *C. vickersiae* Børgesen], Tsuda (1981b) as *C. vickersiae*.

## Family Codiaceae

- Codium edule* P. Silva, Trono (1968).
- Codium intricatum* Okamura, Kanda (1944).
- Codium repens* P. Crouan & H. Crouan, Tokida (1939), Ohba (1996).

## Family Halimedaceae

- Halimeda copiosa* Goreau & Graham [= *Halimeda hederacea* (Barton) Colinvaux], Ohba (1996) as *H. copiosa* and *H. hederacea*.
- Halimeda cuneata* Hering, Okamura (1916), Tokida (1939), Yamada (1941), Kanda (1944).
- Halimeda cylindracea* Decaisne, Trono (1968) from Helen Reef and Palau Proper, Tsuda (1981b), Wilkins (1989), Ohba (1996).
- Halimeda discoidea* Decaisne, Trono (1968) from Helen Reef and Palau Proper, Tsuda (1981b), Ohba (1996).
- Halimeda fragilis* Taylor, Ohba (1996).

- Halimeda gigas* Taylor, Wilkins (1989), Ohba (1996).  
*Halimeda gracilis* Harvey ex J. Agardh, Yamada (1941, 1944), Kanda (1944), Trono (1968), Tsuda (1981b), Ajisaka & Enomoto (1987), Ohba (1996).  
*Halimeda incrassata* (Ellis) Lamouroux, Tokida (1939), Kanda (1940a, 1944), Yamada (1941), Trono (1968) from Helen Reef, Tsuda (1981b), Ajisaka & Enomoto (1987), Wilkins (1989).  
*Halimeda lacunalis* W.R. Taylor, Tsuda (1981b).  
*Halimeda macroloba* Decaisne, Tokida (1939), Motoda (1939), Kanda (1940a, 1942, 1944), Yamada (1941), Trono (1968) from Helen Reef and Palau Proper, Ajisaka & Enomoto (1987), Ohba (1996).  
*Halimeda macrophysa* Askenasy, Yamada (1941), Kanda (1944), Trono (1968), Birkeland et al. (1976), Ohba (1996).  
*Halimeda micronesica* Yamada, Yamada (1941), Trono (1968), Tsuda (1981b), Ohba (1996).  
*Halimeda minima* (W.R. Taylor) Colinvaux, Tsuda (1981b), Ohba (1996).  
*Halimeda opuntia* (Linnaeus) Lamouroux [= *H. cordata* J. Agardh], Okamura (1904) as *H. cordata*, Okamura (1916), Tokida (1939), Kanda (1940a, 1942, 1944), Yamada (1941), Trono (1968) from Helen Reef and Palau Proper, Birkeland et al. (1976), Randall et al. (1978), Tsuda (1981b), Ajisaka & Enomoto (1987), Wilkins (1989), Ohba (1996).  
*Halimeda simulans* Howe, Randall et al. (1978), Tsuda (1981b), Wilkins (1989), Ohba (1996).  
*Halimeda stuposa* W.R. Taylor, Tsuda (1981b).  
*Halimeda taenicola* W.R. Taylor, Tsuda (1981b), Ohba (1996).  
*Halimeda velasquezii* Taylor, Ohba (1996).

## Family Udoteaceae

- Avrainvillea amadelpa* (Montagne) A. Gepp & E. Gepp, Ohba (1996).  
*Avrainvillea erecta* (Berkeley) A. Gepp & E. Gepp, Kanda (1940a, 1944), Olsen-Stojkovich (1985), Ohba (1996).  
*Avrainvillea hollenbergii* Trono, Ajisaka & Enomoto (1987).  
*Avrainvillea lacerata* Harvey ex J. Agardh, Kanda (1944), Trono (1968), Olsen-Stojkovich (1985), Ohba (1996).  
*Avrainvillea obscura* (C. Agardh) J. Agardh, Randall et al. (1978), Tsuda (1981b), Olsen-Stojkovich (1985).  
*Chlorodesmis fastigiata* (C. Agardh) Ducker [= *C. comosa* Harvey & Bailey], Tokida (1939), Kanda (1944) and Trono (1968) as *C. comosa*, Birkeland et al. (1976), Ohba (1996).  
*Chlorodesmis hildebrandtii* A. Gepp & E. Gepp, Ohba (1996).  
*Rhipilia orientalis* A. Gepp & E. Gepp, Ohba (1996).  
*Rhipilia sinuosa* Gilbert, Gilbert (1978), Tsuda (1981b) as *Rhipilia orientalis* A. Gepp & E. Gepp, Ohba (1996).  
*Tydemanina expeditionis* Weber-van Bosse, Tokida (1939), Kanda (1944), Trono (1968), Ohba (1996).

- Udotea argentea* Zanardini, Ajisaka & Enomoto (1987), Wilkins (1989).  
*Udotea geppii* Yamada (1930), Tokida (1939), Kanda (1940a, 1942, 1944), Trono (1968) from Helen Reef and Palau Proper, Wilkins (1989), Ohba (1996).  
*Udotea javensis* A. Gepp & E. Gepp, Kanda (1944), Trono (1968), Birkeland et al. (1976), Randall et al. (1978), Ohba (1996).

## Order Dasycladales

### Family Dasycladaceae

- Acetabularia exigua* Solms-Laubach, Randall et al. (1978).  
*Acetabularia parvula* Solms-Laubach [= *A. moebii* Solms-Laubach], Wilkins (1989) as *A. moebii*, Ohba (1996).  
*Bornetella nitida* Munier-Chalmas ex Sonder, Trono (1968).  
*Bornetella oligospora* Solms-Laubach, Kanda (1944), Randall et al. (1978).  
*Bornetella ovalis* Yamada, Kanda (1944).  
*Bornetella sphaerica* (Zanardini) Solms-Laubach, Trono (1968), Birkeland et al. (1976), Randall et al. (1978), Ohba (1996).  
*Neomeris annulata* Dickie, Wilkins (1989).  
*Neomeris mucosa* Howe, Tsuda (1981b).  
*Neomeris van-bosseae* Howe, Tokida (1939), Kanda (1944), Trono (1968), Birkeland et al. (1976), Ohba (1996).

## Division PHAEOPHYTA (Brown Algae)

### Class Phaeophyceae

### Order Ectocarpales

### Family Ectocarpaceae

- Feldmannia irregularis* (Kützing) Hamel, Tsuda (1981b).

### Family Ralfsiaceae

- Ralfsia* sp., Ohba (1996).

### Order Sphacelariales

### Family Sphacelariaceae

- Sphacelaria rigidula* Kützing [= *S. furcigera* Kützing], Tokida (1939) and Kanda (1944) as

*S. furcigera*.

*Sphacelaria tribuloides* Meneghini, Tokida (1939), Kanda (1944), Birkeland et al. (1976), Randall et al. (1978), Wilkins (1989).

## Order Dictyotales

### Family Dictyotaceae

*Dictyopteris repens* (Okamura) Børgesen [*Neurocarpus repens* Okamura], Tokida (1939) as *Neurocarpus repens*, Trono (1969), Tsuda (1981b).

*Dictyota alternifida* J. Agardh, Tokida (1939).

*Dictyota bartayresiana* Lamouroux, Kanda (1942, 1944); Randall et al. (1978), Tsuda (1981b) and Wilkins (1989) as *D. bartayresii*, Ohba (1996).

*Dictyota dichotoma* (Hudson) Lamouroux [= *D. apiculata* J. Agardh], Trono (1969) and Ohba (1996) as *D. apiculata*.

*Dictyota friabilis* Setchell, Birkeland et al. (1976), Randall et al. (1978), Ohba (1996).

*Dictyota grossedentata* De Clerck & Coppejans, Kanda (1944) and Ohba (1996) as *D. patens* J. Agardh.

*Dictyota n. comb.* [= *Dilophus radicans* Okamura], Tokida (1939) and Kanda (1944) as *Dilophus radicans*. *Dictyota radicans* Harvey already exists.

*Lobophora variegata* (Lamouroux) Womersley ex Oliveira [= *Gymnosorus variegatus* (Lamouroux) J. Agardh and *Pocockiella variegata* (Lamouroux) Papenfuss], Kanda (1944) as *Gymnosorus variegatus*, Trono (1969) as *Pocockiella variegata* from Pulo Anna and Palau Proper, Birkeland et al. (1976), Randall et al. (1978), Tsuda (1981b), Wilkins (1989), Ohba (1996).

*Padina australis* Hauck, Tokida (1939), Kanda (1942, 1944), Trono (1969), Ohba (1996).

*Padina boryana* Thivy in Taylor [= *P. tenuis* (C. Agardh) Bory], Birkeland et al. (1976), Randall et al. (1978) and Tsuda (1981b) as *P. tenuis*.

*Padina japonica* Yamada, Ohba (1996).

*Padina jonesii* Tsuda, Birkeland et al. (1976), Randall et al. (1978).

*Padina minor* Yamada, Trono (1969).

*Padina pavonica* (Linnaeus) Thivy [= *P. pavonia* Linnaeus], Okamura (1916) and Tokida (1939) as *P. pavonia*, Ohba (1996).

*Styopodium zonale* (Lamouroux) Papenfuss [*S. lobatum* (C. Agardh) Kützing], Trono (1969) as *S. lobatum*.

*Zonaria* sp. [= *Homoeostrichus* sp.], Kanda (1944) as *Homoeostrichus* sp.

## Order Scytosiphonales

### Family Scytosiphonaceae

*Hydroclathrus clathratus* (C. Agardh) Howe, Kanda (1944), Trono (1969), Ohba (1996).

*Rosenvingea* sp., Kanda (1944).

## Order Fucales

### Family Sargassaceae

*Sargassum crassifolium* J. Agardh, Tsuda (1976, 1981b, 1988).

*Sargassum cristaefolium* C. Agardh, Okamura (1916), Tokida (1939), Randall et al. (1978), Tsuda (1988).

*Sargassum oligocystum* Montagne, DeWreede (1973), Randall et al. (1978).

*Sargassum polycystum* C. Agardh, Kanda (1944) as *S. microphyllum* C. Agardh, DeWreede (1973) as *S. microphyllum* and *S. granuliferum* C. Agardh, Tsuda (1988), Ohba (1996).

*Turbinaria conoides* (J. Agardh) Kützing, Trono (1969) from Pulo Anna, Ohba (1996).

*Turbinaria decurrens* Bory, Trono (1969) from Pulo Anna, Randall et al. (1978).

*Turbinaria ornata* (Turner) J. Agardh, Okamura (1916), Tokida (1939), Kanda (1944), Trono (1969), Randall et al. (1978), Tsuda (1981b), Ohba (1996).

*Turbinaria* sp., Ajisaka and Kilar (1990) consider the specimens different from the other reported species of *Turbinaria*..

## Division RHODOPHYTA (Red Algae)

### Class Rhodophyceae

#### Subclass Bangiophycidae

#### Order Erythropeltiales

### Family Erythrotrichiaceae

*Erythrotrichia carnea* (Dillwyn) J. Agardh, Trono (1969).

*Erythrotrichia parientalis* T. Tanaka, Trono (1969) from Pulo Anna.

#### Subclass Florideophycidae

#### Order Acrochaetiales

### Family Acrochaetiaceae

*Acrochaetium robustum* Børgesen, Trono (1969).

## Order Nemaliales

### Family Galaxauraceae

*Actinotrichia fragilis* (Forsskål) Børgesen, Kanda (1944), Trono (1969), Birkeland et al. (1976), Randall et al. (1978), Ohba (1996).

*Galaxaura fasciculata* Kjellman, Tanaka (1936), Kanda (1944), Randall et al. (1978), Itono (1980), Ohba (1996).

*Galaxaura rugosa* (Ellis & Solander) Lamouroux, Itono (1980) from Ngcheangel Atoll.

*Tricheocarpa cylindrica* (Ellis & Solander) Huisman & Borowitzka (= *Galaxaura fastigiata* Decaisne), Randall et al. (1978) and Ohba (1996) as *Galaxaura fastigiata*.

*Tricheocarpa fragilis* (Linnaeus) Huisman & Townsend [= *Galaxaura oblongata* (Ellis & Solander) Lamouroux], Tsuda (1981b) as *Galaxaura oblongata*.

### Family Liagoraceae

*Liagora pinnata* Harvey, Tokida (1939).

## Order Gelidiales

### Family Gelidiaceae

*Gelidium divaricatum* G. Martens, Randall et al. (1978).

*Gelidium pusillum* (Stackhouse) Le Jolis, Kanda (1942, 1944), Trono (1969) from Pulo Anna, Birkeland et al. (1976), Wilkins (1989), Ohba (1996).

### Family Gelidiellaceae

*Gelidiella acerosa* (Forsskål) Feldmann & Hamel, Kanda (1944).

## Order Gracilariales

### Family Gracilariaceae

*Gracilaria arcuata* Zanardini, Kanda (1944).

*Gracilaria bursa-pastoris* (S. Gmelin) P. Silva, Ohba (1996).

*Gracilaria coronopifolia* J. Agardh, Kanda (1944).

*Gracilaria eucheumoides* Harvey, Kanda (1944), Trono, 1969), Tsuda (1985), Meneses and



Abbott (1987), Ohba (1996).  
*Gracilaria hauckii* P. Silva [= *G. radicans* Hauck], Tokida (1939).  
*Gracilaria salicornia* (C. Agardh) Dawson [= *Corallopsis cacalia* J. Agardh and *Corallopsis minor* (Sonder) J. Agardh], Okamura (1904) as *Corallopsis cacalia* and *Corallopsis minor*, Okamura (1916) as *Corallopsis cacalia*, Tokida (1939) as *G. cacalia* and *G. minor*, Kanda (1944) as *Corallopsis minor*, Tsuda (1985), Meneses and Abbott (1987), Ohba (1996).

## Order Cryptonemiales

### Family Halymeniaceae

*Carpopeltis* (?) sp., Ohba (1996).  
*Cryptonemia* (?) sp., Ohba (1996)  
*Halymenia dilatata* Zanardini, Kanda (1942, 1944), Ohba (1996).  
*Halymenia durvillaei* Bory, Kanda (1944), Trono (1969), Ohba (1996).  
*Halymenia* (?) sp., Ohba (1996).  
*Prionitis* (?) sp., Ohba (1996).

### Family Peyssonneliaceae

*Peyssonnelia caulifera* Okamura, Ohba (1996).  
*Peyssonnelia conchicola* Piccone & Grunow, Ohba (1996).  
*Peyssonnelia obscura* Weber-van Bosse, Ohba (1996).  
*Peyssonnelia orientalis* (Weber-van Bosse) Cormaci & Furnari, Ohba (1996).  
*Peyssonnelia rubra* (Greville) J. Agardh, Trono (1969), Wilkins (1989).

## Order Corallinales

### Family Corallinaceae

*Amphiroa foliacea* Lamouroux, Birkeland et al. (1976), Randall et al. (1978), Wilkins (1989), Ohba (1996).  
*Amphiroa fragilissima* (Linnaeus) Lamouroux, Kanda (1944), Trono (1969), Birkeland et al. (1976), Randall et al. (1978), Tsuda (1981b), Ohba (1996).  
*Amphiroa zonata* Yendo, Ohba (1996).  
*Hydrolithon farinosum* (Lamouroux) Penrose & Y.M. Chamberlain [= *Fosliella farinosa* (Lamouroux) Howe], Trono (1969).  
*Hydrolithon onkodes* (Heydrich) Penrose & Woelkerling [= *Porolithon onkodes* Foslie], Birkeland et al. (1976), Wilkins (1989) and Ohba (1996) as *Porolithon onkodes*.  
*Hydrolithon reinboldii* (Weber-van Bosse & Foslie) Foslie, Wilkins (1989), Ohba (1996).  
*Jania capillacea* Harvey, Birkeland et al. (1976), Randall et al. (1978), Tsuda (1981b),

Wilkins (1989), Ohba (1996).  
*Jania decussatodichotoma* (Yendo) Yendo, Trono (1969), Randall et al. (1978)  
*Jania tenella* (Kützting) Grunow, Birkeland et al. (1976), Wilkins (1989).  
*Lithophyllum kotschyianum* Unger, Wilkins (1989), Ohba (1996).  
*Lithophyllum moluccense* Foslie, Kanda (1944), Ohba (1996).  
*Lithophyllum pallescens* (Foslie) Foslie, Ohba (1996).  
*Mastophora pacifica* (Heydrich) Foslie, Ohba (1996).  
*Neogoniolithon brassica-florida* (Harvey) Setchell & Mason [= *N. frutescens* (Foslie) Setchell & Mason], Ohba (1996) as *N. frutescens*.

## Order Gigartinales

### Family Caulacanthaceae

*Catenella caespitosa* (Withering) L. Irvine, Ohba (1996).

### Family Hypneaceae

*Hypnea charoides* Lamouroux, Ohba (1996).  
*Hypnea musciformis* (Wulfen) Lamouroux, Trono (1969) as *Hypnea esperi*.  
*Hypnea nidulans* Setchell, Tokida (1939), Kanda (1942, 1944).  
*Hypnea pannosa* J. Agardh, Tokida (1939), Kanda (1944), Trono (1969), Birkeland et al. (1976), Randall et al. (1978), Ohba (1996).  
*Hypnea valentiae* (Turner) Montagne, Trono (1969).

### Family Furcellariaceae

*Halarachnion* sp., Kanda (1944).

### Family Solieriaceae

*Kappaphycus striatum* (Schmitz) Doty ex P. Silva [= *Eucheuma striatum* Schmitz], Kanda (1944).

## Order Rhodymeniales

### Family Champiaceae

*Champia parvula* (C. Agardh) Harvey, Okamura (1904), Tokida (1939), Kanda (1944), Trono (1969) from Helen Reef, Randall et al. (1978).  
*Gastroclonium* sp. (= *Coeloseira* sp.), Ohba (1996) as *Coeloseira* (?) sp.

### Family Rhodymeniaceae

*Botryocladia microphysa* (Hauck) Kylin, Tokida (1939), Kanda (1942, 1944).  
*Ceratodictyon spongiosum* Zanardini, Kanda (1944), Trono (1969), Ohba (1996).  
*Chrysomenia* (?) sp., Ohba (1996).  
*Coelarthrum* sp., Kanda (1944).  
*Coelothrix irregularis* (Harvey) Børgesen, Trono (1969), Ohba (1996).  
*Gelidiopsis intricata* (C. Agardh) Vickers, Kanda (1944), Birkeland et al. (1976), Randall et al. (1978), Tsuda (1981b), Wilkins (1989), Ohba (1996).  
*Gelidiopsis repens* (Kützing) Weber-van Bosse, Ohba (1996).  
*Gloiocladia* new comb. [= *Gloioderma minutula* Weber-van Bosse], Tokida (1939) as *Gloioderma minutula*.  
*Rhodymenia* sp., Randall et al. (1978), Ohba (1996) as *Rhodymenia* (?) sp.

## Order Ceramiales

### Family Ceramiaceae

*Anotrichum tenue* (C. Agardh) Nägeli [= *Griffithsia tenuis* C. Agardh], Wilkins (1989).  
*Antithamnion* sp., Kanda (1944).  
*Callithamnion* sp., Kanda (1944), Ohba (1996) as *Callithamnion* (?) sp.  
*Centroceras clavulatum* (C. Agardh) Montagne [= *Ceramium clavulatum* C. Agardh], Tokida (1939) as *Ceramium clavulatum*, Trono (1969) from Pulo Anna and Palau Proper.  
*Ceramium affine* Setchell & Gardner, Trono (1969).  
*Ceramium fimbriatum* Setchell & Gardner, Trono (1969) from Pulo Anna and Palau Proper.  
*Ceramium flaccidum* (Harvey ex Kützing) Ardisone [= *C. byssoideum* Harvey, *C. gracillimum* (Kützing) Zanardini and *C. transversale* Collins & Hervey], Tokida (1939) as *C. byssoideum*, Trono (1969) as *C. gracillimum* and *C. transversale* from Helen Reef and Palau Proper, Tsuda (1981b) as *C. gracillimum* var. *byssoideum* (Harvey) Mazoyer.  
*Ceramium kororensis* Trono (1971), Trono (1969) as *Ceramium* sp..  
*Ceramium macilentum* J. Agardh [= *C. mazatlanense* Dawson], Trono (1969), Randall et al (1978) and Wilkins (1989) as *C. mazatlanense*.  
*Corallophila apiculata* (Yamada) R. Norris [= *Centroceras apiculatum* Yamada], Birkeland et al. (1976) as *Centroceras apiculatum*.  
*Corallophila huysmansii* (Weber-van Bosse) R. Norris [= *Ceramium huysmansii* Weber-van Bosse], Tokida (1939) and Kanda (1944) as *Centroceras huysmansii* (Weber-van Bosse) ?, Trono (1969) as *Ceramium huysmansii*.  
*Crouania attenuata* (C. Agardh) J. Agardh, Tokida (1939), Kanda (1944).  
*Crouania minutissima* Yamada, Trono (1969).  
*Euptilota* (?) sp., Ohba (1996).  
*Spyridia filamentosa* (Wulfen) Harvey, Okamura (1904, 1916), Tokida (1939), Kanda (1942, 1944), Trono (1969), Ohba (1996).

*Spyridia velasquezii* Trono (1971), Trono (1969) as *Spyridia* sp.  
*Wrangelia bicuspidata* Børgesen, Trono (1969).  
*Wrangelia* (?) sp., Ohba (1996).

### Family Dasyaceae

*Heterosiphonia* sp., Kanda (1944).

### Family Delesseriaceae

*Claudea multifida* Harvey, Tsuda (1981b).  
*Hypoglossum attenuatum* Gardner, Wilkins (1989).  
*Hypoglossum barbatum* Okamura, Kanda (1942, 1944).  
*Martensia elegans* Hering, Kanda (1944).  
*Vanvoorstia spectabilis* Harvey, Kanda (1944), Trono (1969).

### Family Rhodomelaceae

*Acanthophora spicifera* (Vahl) Børgesen [= *A. orientalis* J. Agardh], Okamura (1904, 1916), Tokida (1939) and Kanda (1942, 1944) as *A. orientalis*, Trono (1969), Ohba (1996).  
*Bostrychia tenella* (Lamouroux) J. Agardh [= *B. binderi* Harvey], Tokida (1939), Kanda (1942, 1944), Trono (1969) as *B. binderi*.  
*Chondria* sp., Ohba (1996).  
*Chondrophyllum papilloso* (C. Agardh) Garbary & Harper [= *Laurencia papilloso* (C. Agardh) Greville], Kanda (1944) as *Laurencia papilloso*, Trono (1969) as *Laurencia papilloso* from Helen Reef and Palau Proper, Randall et al. (1978) and Wilkins (1989) as *Laurencia papilloso*.  
*Endosiphonia spinuligera* Zanardini, Tsuda (1981b).  
*Herposiphonia herpa* Hollenberg, Trono (1969) from Helen Reef.  
*Herposiphonia pacifica* Hollenberg (1968c), Trono (1969) from Helen Reef..  
*Herposiphonia parca* Setchell, Tokida (1939), Hollenberg (1968c), Trono (1969) from Pulo Anna and Palau Proper.  
*Herposiphonia secunda* (C. Agardh) Ambronn [= *H. tenella* (C. Agardh) Nägeli], Tokida (1939) and Kanda (1942, 1944) as *H. secunda* and *H. tenella*, Hollenberg (1968c), Trono (1969) as *H. tenella*.  
*Laurencia caraibica* Silva [= *L. nana* Howe], Tokida (1939) as *L. nana*.  
***Laurencia carolinensis*** Saito (1969) from Helen Reef, Ohba (1996).  
*Laurencia cartilaginea* Yamada, Tsuda (1981b).  
*Laurencia glandulifera* (Kützing) Kützing [= *L. paniculata* (C. Agardh) J. Agardh], Birkeland et al. (1976) as *L. paniculata*.  
*Laurencia majuscula* (Harvey) Lucas, Trono (1969) from Helen Reef, Tsuda (1981b).  
*Laurencia mariannensis* Yamada, Trono (1969) from Pulo Anna.  
*Laurencia obtusa* (Hudson) Lamouroux, Kanda (1944).  
*Laurencia parvipapillata* Tseng, Ohba (1996).

*Laurencia pinnata* Yamada, Tsuda (1981b).  
*Laurencia tranoi* Ganzon-Fortes, Ohba (1996).  
*Laurencia yamadana* Howe, Trono (1969) from Helen Reef.  
*Leveillea jungermannioides* (Hering & Martens) Harvey, Trono (1969) from Pulo Anna, Ohba (1996).  
*Melanamansia glomerata* (C. Agardh) R.E. Norris [= *Amansia glomerata* C. Agardh], Tokida (1939), Kanda (1942, 1944) and Ohba (1996) as *Amansia glomerata*.  
*Neosiphonia savatieri* (Hariot) M.S. Kim & I.K. Lee [= *Polysiphonia savatieri* Hariot], Hollenberg (1968a), Trono (1969) as *P. savatieri* from Pulo Anna.  
*Polysiphonia exilis* Harvey, Hollenberg (1968b), Trono (1969).  
*Polysiphonia howei* Hollenberg, Tsuda (1981b).  
*Polysiphonia scopulorum* Harvey, Hollenberg (1968a), Trono (1969), Randall et al. (1978), Tsuda (1981b), Wilkins (1989).  
*Polysiphonia upolensis* Grunow, Hollenberg (1968a), Trono (1969).  
*Tolypocladia condensata* (Weber-van Bosse) P. Silva [= *Roschera condensata* Weber-van Bosse], Tokida (1939) and Kanda (1944) as *Roschera condensata*, Ohba (1996).  
*Tolypocladia glomerulata* (C. Agardh) Schmitz [= *Roschera glomerulata* (C. Agardh) Weber-van Bosse, Okamura (1904, 1916), Tokida (1939) and Kanda (1944) as *Roschera glomerulata*, Trono (1969) from Helen Reef and Palau Proper, Randall et al. (1978), Ohba (1996).

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