

Floristic Account of the Marine Benthic Algae from Jarvis Island and Kingman Reef, Line Islands, Central Pacific

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Abstract—The marine benthic algae from Jarvis Island and Kingman Reef were identified from collections obtained from the Whippoorwill Expedition in 1924, the Itasca Expedition in 1935, the U.S. Coast Guard Cutter *Taney* in 1938, the Smithsonian Institution's Pacific Ocean Biological Survey Program in 1964 and the U.S. National Oceanic and Atmospheric Administration's Reef Assessment and Monitoring Program (RAMP) in 2000, 2001, 2002, 2004 and 2006. A total of 124 species, representing 8 Cyanobacteria (blue-green algae), 82 Rhodophyta (red algae), 6 Heterokontophyta (brown algae) and 28 Chlorophyta (green algae), are reported from both islands. Seventy-nine and 95 species of marine benthic algae are recorded from Jarvis Island and Kingman Reef, respectively. Of the 124 species, 77 species or 62% (4 blue-green algae, 57 red algae, 2 brown algae and 14 green algae) have never before been reported from the 11 remote reefs, atolls and low islands comprising the Line Islands in the Central Pacific.

Introduction

The Line Islands are located approximately 1600 kilometers south of the main Hawaiian Islands and consist of 11 remote reefs, atolls and low islands that lie between 7° N and 12° S latitude, and 150° W and 164° W longitude (Fig. 1). Three of the Line Islands, i.e., Jarvis Island, Kingman Reef and Palmyra Atoll, are presently components of the seven-island Pacific Remote Islands Marine National Monument established on 6 January 2009 by Presidential Proclamation. The history, geology, oceanography and biology of the three U.S. islands are described by Maragos et al. (2008). Marine and terrestrial organisms on these remote islands are managed by the U.S. Fish and Wildlife Service and are protected by U.S. Presidential executive order.

¹JRF passed away on 4 July 2010.

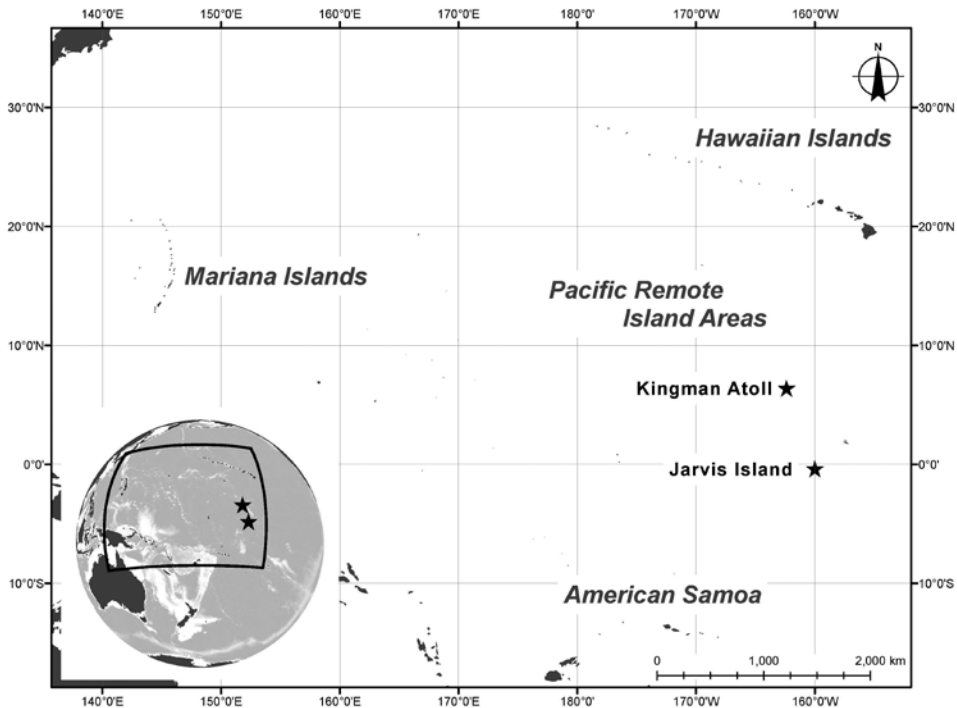


Figure 1. Location of Jarvis Island and Kingman Reef in the Central Pacific.

The only published records of marine benthic algae from Jarvis Island were included in taxonomic studies of Pacific *Polysiphonia* (Hollenberg 1968a) and Pacific *Herposiphonia* (Hollenberg 1968c). Two species of the red algal genus *Polysiphonia*, *P. poko* Hollenberg [now *Neosiphonia poko* (Hollenberg) Abbott] and *P. scopulorum* Harvey, and three species of the red algal genus *Herposiphonia*, *H. parca* Setchell, *H. secunda* (C. Agardh) Ambronn [= *H. tenella* f. *secunda* (C. Agardh) Hollenberg] and *H. variabilis* Hollenberg, were reported from Jarvis Island. There is no published record of any alga from Kingman Reef.

Our knowledge of the marine benthic algae from Palmyra Atoll, located 67 km southeast of Kingman Reef, is based on published studies by Howe & Lyon (1916), Dawson et al. (1955), Dawson (1959), and Braun et al. (2009). Howe & Lyon (1916) reported 12 species of marine benthic algae, including two species of blue-green algae, seven species of green algae of which *Cladophora sabulosa* Lyon was described as a new species, and three species of crustose coralline red algae. Dawson et al. (1955) reexamined Howe & Lyon (1916) specimens and two other collections made by Joseph E. King on 1 January 1953 and by Bruce W. Halstead and assistants on 27 April 1953. Dawson et al. (1955) provided a listing of algae from the field, as well as algae found in the alimentary tract of herbivorous fish. This study also relegated the new species *Cladophora sabulosa* under *Cladophoropsis sundanensis* Reinbold, and *Halimeda macroloba* Decaisne, reported by Howe & Lyon (1916), was identified as *H. discoidea* Decaisne.

Dawson (1959) provided a general comparative observation of the terrestrial and marine vegetation of Palmyra Atoll in 1913 and 1958, and described four new species of red algae, i.e., *Alsidium pacificum* Dawson, *Cryptonemia umbraticola* Dawson, *Antithamnion palmyrense* Dawson and *Pterocladia tropica* Dawson. The latter two species are now recognized as synonyms of *Antithamnion lherminieri* (P. Crouan & H. Crouan) Bornet ex Nasr and *Pteroclatiella caerulescens* (Kützing) Santelices & Hommersand, respectively. Hollenberg (1968a) recorded *Polysiphonia flaccidissima* Hollenberg [now *Polysiphonia sertularioides* (Grateloup) J. Agardh] and *P. upolensis* (Grunow) Hollenberg from Palmyra Atoll in his Pacific taxonomic treatment of the genus *Polysiphonia*. Skelton & South (2007) lists *Jania adhaerens* Lamouroux from Palmyra Atoll as an incidental specimen examined during the study of Samoan algae. Although Braun et al. (2009) did not provide a comprehensive list of algal species found, their examination of benthic percent cover specifically discussed five species, two of which, *Dichotomaria marginata* (J. Ellis & Solander) Lamarck and *Galaxaura filamentosa* Chou, were new records for both Palmyra Atoll and the Line Islands.

The other eight islands and atolls in the Line Islands are administered by the Republic of Kiribati. Except for Tabuaeran (Fanning Atoll), the existing knowledge of the marine benthic algae from the other non-U.S. islands in the Line Islands is almost nonexistent. The information on the marine benthic algae of Tabuaeran (DeWreede & Doty 1970, Russell 1973, Tsuda 1973 and Tsuda et al. 1973) is based on two expeditions in January 1970 and August 1972, organized by the University of Hawaii's Hawaii Institute of Geophysics and reported in two technical reports. Hollenberg (1968a, 1968c) reported *Polysiphonia herpa* Hollenberg, *P. poko* [now *Neosiphonia poko*], *P. scopulorum*, *Herposiphonia obscura* Hollenberg, *H. secunda* and *H. variabilis* from Kiritimati (Christmas Island). There are no published records of marine benthic algae from any of the other six Line Islands.

The present paper is the first floristic account of the marine benthic algae from Jarvis Island and Kingman Reef in the Line Islands. It represents the fifth publication on the diversity of marine benthic algae based on collections made by U.S. Fish and Wildlife Service personnel or during NOAA expeditions over the past decade to six of the seven U.S. islands and atolls of the Pacific Remote Islands Marine National Monument. The four recent studies reported algal species from Wake Atoll (Tsuda et al. 2006, 2010a), Howland Island and Baker Island (Tsuda et al. 2008) and Johnston Atoll (Tsuda et al. 2010b). NOAA phycologists are currently studying the algae of Palmyra Atoll (Line Islands), the seventh island or atoll within this Marine National Monument. This paper also summarizes all reported algal species (Appendix 1) from the 11 reefs, atolls and low islands within the Line Islands in the Central Pacific.

Materials and Methods

Major collections of marine benthic algae in subtidal habitats were obtained by SCUBA during four expeditions to Jarvis Island and Kingman Reef (Figs. 2 and 3) and conducted by either (1) the Honolulu Laboratory's Coral Reef Ecosys-

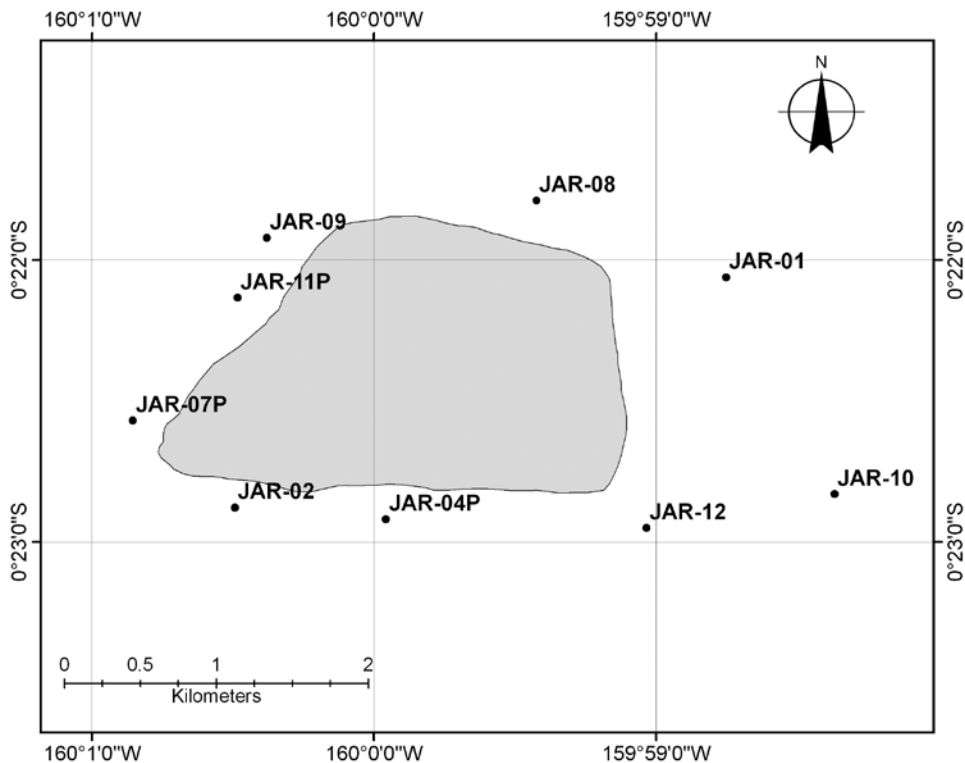


Figure 2. Jarvis Island with NOAA's rapid ecological assessment sites.

tem Investigation (CREI), Southwest Fisheries Science Center, National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA) in February 2001 and March 2002, or (2) the Pacific Islands Fisheries Science Center (PIFSC), Coral Reef Ecosystem Division (CRED), NMFS, NOAA, in March and April 2004 and 2006. CRED evolved from CREI when the Honolulu Laboratory became PIFSC in 2003. The majority of algae were placed in plastic bags, labeled and frozen immediately after each dive. Selected macroalgae were dried in plant presses aboard the research vessel. See Preskitt et al. (2004) for sampling method performed during the algal collections.

Prior to examination, the frozen algae in plastic bags from each station were thawed in tap water. Thawed seawater was poured carefully out of the bag and replaced with 4% formalin in seawater to prevent the delicate turf and epiphytes from decomposing. The collections were examined using a dissecting microscope, and all epiphytes and turf were separated. The majority of the small specimens were mounted on glass slides, i.e., specimens were decalcified with 10% hydrochloric acid, stained with aniline blue and mounted with 30% corn syrup (Karo) with phenol. Larger specimens were typically mounted on segments of herbarium paper, although some specimens were preserved in vials with 4% formalin in seawater for further sectioning. The small quantity of replicate unprocessed specimens from

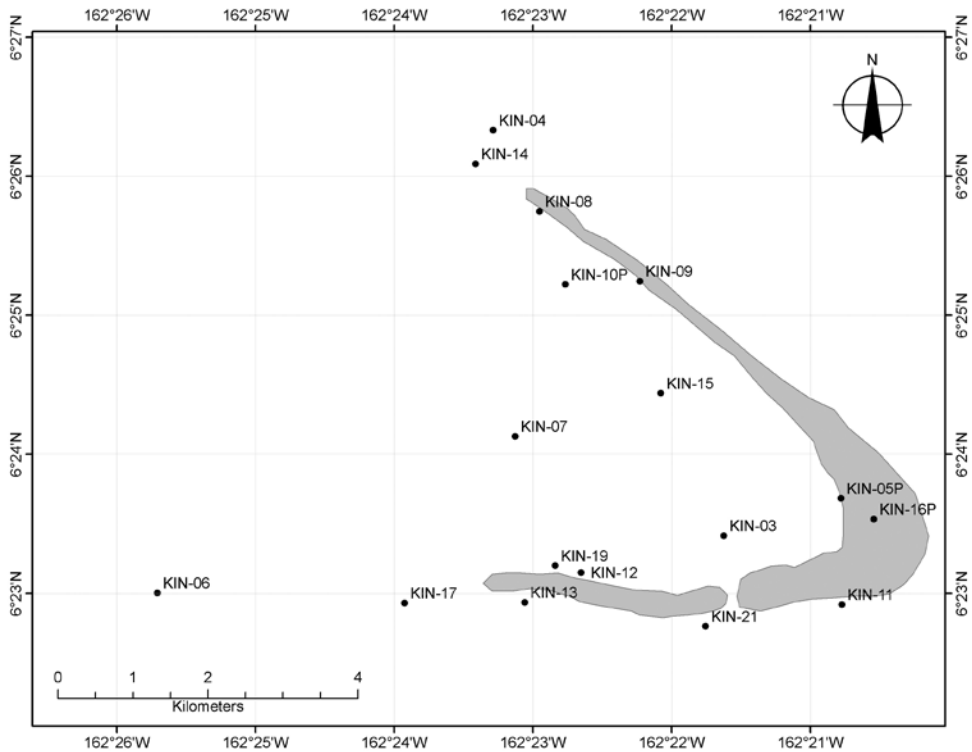


Figure 3. Kingman Reef with NOAA's rapid ecological assessment sites.

each station were consolidated into separate jars and preserved in 4% formalin in seawater. The retention of these specimens was to allow us to revisit the site collection, if needed, during our critical taxonomic reexaminations of the specimens.

NOAA stations were designated by a code system, e.g., JAR-04P-04, which signifies Jarvis Island (JAR), permanent station or site number (04P), and the year 2004 when the specimens were collected (04). A brief description of each station is presented in Appendix 2. Specimens of only three species, *Neosiphonia apiculata* (Hollenberg) Masuda & Kogame, *Polysiphonia scopulorum* Harvey and *Valonia macrophysa* Kützing, collected by Robin Newbold during the first Pacific Reef Assessment and Monitoring Program (RAMP) cruise in March 2000 were found in the Bishop Museum and included here.

Other specimens from Jarvis Island previously deposited in the *Herbarium Pacificum* of the Bishop Museum were also examined and included in this floristic study; no specimens from Kingman Reef were found in *Herbarium Pacificum*. The Jarvis collections consisted of six species collected by H. F. Bergman during the Whippoorwill Expedition in August 1924, four species collected by F. S. Collins and anonymous collectors during the Itasca Expeditions in March, April and June 1935, one specimen of *Turbinaria ornata* (Turner) J. Agardh collected by Edwin

H. Bryan Jr. on 8 August 1938 aboard the U.S. Coast Guard Cutter *Taney*, and three species collected by Charles R. Long during the Smithsonian Institution's Pacific Ocean Biological Survey Program in November 1964.

The following higher level classification systems were used: Cyanobacteria (Anagnostidis and Komárek 1988, Komárek and Anagnostidis 1989, Silva et al. 1996); Rhodophyta (Abbott 1999, Yoon et al. 2006, Choi et al. 2008); Heterokontophyta (Abbott and Huisman 2004); and Chlorophyta (Abbott and Huisman 2004, Cocquyt et al. 2010). Guiry & Guiry (2011) was consulted for current names and synonyms. Citations listed after the species represent references that provide descriptions and illustrations of the species. Brief annotations were included for the Cyanobacteria to show what characters were used in the identification. Annotations for the other algae were provided only when specimens differed from the norm or were uncommon in the central equatorial Pacific. A few species were represented by as many as 40 specimens, i.e., *Heterosiphonia crispella* (C. Agardh) Wynne; voucher specimens, however, were limited to a maximum of five specimens per island or atoll.

Genera and species are listed alphabetically under their respective families. Except for a limited number of species retained by NOAA (assigned accession numbers beginning with PSV), the majority of specimens were assigned Bishop Museum (BISH) numbers. All BISH numbered specimens listed here are deposited and are maintained in the data base of the *Herbarium Pacificum* at the Bishop Museum; PSV numbered specimens are deposited at the NOAA Fisheries' PIFSC CRED. New species records for the Line Islands are preceded by asterisks.

Floristic Account

PHYLUM CYANOBACTERIA

Class Cyanophyceae

ORDER OSCILLATORIALES

FAMILY OSCILLATORIACEAE

****Lyngbya bouillonii*** R. Hoffman & V. Demoulin 1991: 82; Lobban & Tsuda 2003: 57, fig. 2.

Trichomes, enclosed in distinct sheaths, are 20–32 μm diam. with cells 2 – 3 μm long, with distinct indentation at cross walls.

Specimen examined: Kingman. KIN-08-04, *BISH* 725664.

Lyngbya confervoides C. Agardh; Desikachary 1959: 315, pl. 49 (fig. 8), pl. 52 (fig. 1).

Trichomes are 10–16 μm diam. with cells 2–4 μm long; cross walls are not constricted. Sheaths are clear and do not appear striated contrary to a characteristic of this species.

Specimens examined: Jarvis. JAR-04P-04, *BISH* 723929; JAR-08-04, *BISH* 724012. Kingman. KIN-05P-02, *BISH* 725767; KIN-07-06, *BISH* 726325; KIN-08-06, *BISH* 724056; KIN-10P-01, *BISH* 725702; KIN-13-06, *BISH* 726449.

Lyngbya penicilliformis P. Silva; Littler & Littler 2000: 452.

Trichomes are 4–6 μm diam. and cells 5 μm long; cross walls are not constricted. Numerous empty sheaths are present.

Specimen examined: Kingman. KIN-10P-01, *BISH* 725536.

Lyngbya sordida Gomont [= *Lyngbya polychroa* (Meneghini) Rabenhorst]; Tilden 1910: 118, pl. 5 (fig. 37); Engene et al. 2010: 593, figs. 1A, 1D.

Trichomes are 16–24 μm diam. with cells 4–8 μm long; cross walls are slightly constricted. Sheaths are clear and not striated.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723788; JAR-04P-01, *BISH* 724120; JAR-07P-04, *BISH* 723828; JAR-09-01, *BISH* 724136. Kingman. KIN-03-04, *BISH* 724705; KIN-10P-06, *BISH* 724784; KIN-13-02, *BISH* 725786; KIN-18-06, *BISH* 726270; KIN-19-06, *BISH* 725505.

FAMILY PHORMIDIACEAE

**Blennothrix cf. comoides* (Gomont) Anagnostidis & Komárek [= *Hydrocoleum comoides* Gomont]; Humm & Wicks 1980: 143.

Trichomes are 10–14 μm diam. and cells 2–4 μm long, and possess distinct constricted cross walls. Apices, however, are blunt and not tapering through several cells.

Specimens examined: Kingman. KIN-10P-04, *BISH* 725730; KIN-11-04, *BISH* 726395.

**Phormidium laysanense* Lemmermann; Tilden 1910: 104, pl. 5 (figs. 7, 8).

Thalli consist of fascicles with trichomes 3–4 μm diam. and cells 4–12 μm long. Cross walls in *BISH* 725527 are very faint.

Specimens examined: Jarvis. JAR-11P-04, *BISH* 724045. Kingman. KIN-03-01, *BISH* 725519; KIN-05P-01, *BISH* 725828; KIN-08-01, *BISH* 725727; KIN-12-01, *BISH* 725724; KIN-15-06, *BISH* 725563.

FAMILY PSEUDOANABAENACEAE

**Spirocoleus cf. fragilis* (Meneghini) P. Silva; Littler & Littler 2000: 462.

Thallus consist of fascicles with trichomes 1 μm diam. and cells 1 μm long. Sheaths are obscure.

Specimen examined: Kingman. KIN-13-06, *BISH* 726442.

ORDER NOSTOCALES

FAMILY RIVULARIACEAE

Calothrix confervicola (Dillwyn) C. Agardh; Fan 1956: 169, fig. 6.

Specimens are only 50 μm long with round basal heterocysts, 6 μm diam.

Specimen examined: Kingman. KIN-05P-04, *BISH* 725815 on *Neomeris vanbosseae*.

PHYLUM RHODOPHYTA
Class Stylonematophyceae
 ORDER STYLONEMATALES
 FAMILY STYLONEMATACEAE

Stylonema alsidii (Zanardini) Drew; Skelton & South 2007: 12, figs. 9, 10.

Specimens examined: Kingman. KIN-07-04, *BISH* 726366 with *Lyngbya confervoides*; KIN-13-02, *BISH* 725782.

**Stylonema cornu-cervi* Reinsch; Abbott 1999: 44, fig. 1D.

Specimen examined: Jarvis: JAR-02-06, *BISH* 723795 on *Pterocliadiella caloglossoides*.

Class Compsopogonophyceae
 ORDER ERYTHROPELTIDALES
 FAMILY ERYTHROTRICHIACEAE

Erythrotrichia carnea (Dillwyn) J. Agardh; Abbott 1999: 45, fig. 1E.

Specimens examined: Jarvis: JAR-08-06, *BISH* 724010; JAR-09-06, *BISH* 724071.

Class Rhodophyceae
 ORDER NEMALIALES
 FAMILY ACROCHAETIACEAE

**Acrochaetium hypneae* (Børgesen) Børgesen [= *Acrochaetium seriatum* Børgesen]; Abbott 1999: 56, fig. 3J.

Specimen examined: Jarvis. JAR-04P-06, *BISH* 723907.

FAMILY LIAGORACEAE

**Liagora ceranoides* Lamouroux; Abbott 1999: 84, figs. 13I–M; N'Yeurt & Payri 2010: 24, figs. 29, 30.

Specimen examined: Kingman. KIN-19-04, *BISH* 724748 with benthic diatom *Licmorpha*.

ORDER GELIDIALES
 FAMILY GELIDIACEAE

Pterocliadiella caerulescens (Kützinger) Santelices & Hommersand [= *Pterocliadia tropica* Dawson]; Abbott 1999: 197, fig. 51E.

All dried plants were bright red and less than 3 cm tall. Prostrate axes were subcylindrical with erect axes flattened and less than 400 μm wide. As per Abbott (1999), the branchings were mostly irregular. One of four dried specimens (*BISH* 724112) possessed erect axis with two pairs of opposite subcylindrical lateral branchlets which were slightly swollen at the apices, similar to the tetrasporangial sori of *Pterocliadia bulbosa* (Loomis) Santelices. Rhizines were present in medulla only. *Pterocliadia tropica* described as a new species from Palmyra Atoll, Line Islands, by Dawson (1959) is a synonym of *P. caerulescens*.

Specimens examined: Jarvis. JAR-01-06, *BISH 724112*; JAR-11P-04, *BISH 724047*.

**Pterocладиella caloglossoides* (Howe) Santelices 1998: 243, fig. 3.

Specimens examined: Jarvis. JAR-02-06, *BISH 723792*; JAR-04P-06, *BISH 723911*; JAR-07P-04, *BISH 723838*; JAR-08-04, *BISH 724020*; JAR-09-02, *BISH 724113*.

FAMILY GELIDIELLACEAE

**Parviphycus antipai* (Celán) Santelices [= *Gelidiella antipai* Celán]; Abbott 1999: 202, figs. 53D–F as *Gelidiella antipai* Celán; N'Yeurt & Payri 2010: 36, figs. 59–61.

Specimens examined: Jarvis. JAR-07P-02, *BISH 723960*; JAR-11P-04, *BISH 724050*; JAR-12-06, *BISH 723815*. Kingman. KIN-03-04, *BISH 724721*; KIN-08-04, *BISH 725659*; KIN-10P-04, *BISH 725750*; KIN-16P-02, *BISH 724985*; KIN-16P-04, *BISH 725428*.

ORDER CORALLINALES FAMILY CORALLINACEAE

**Jania pacifica* Areschoug [= *Jania mexicana* W. R. Taylor]; Taylor 1945: 197, pl. 60; Tsuda et al. 2008: 275, fig. 2A.

Segments, 160–240 μm diam. and about 3x long as broad, are constricted and possess rounded terminal segments.

Specimens examined: Jarvis. JAR-07P-02, *BISH 723957*; JAR-07P-06, *BISH 723868*; JAR-11P-02, *BISH 724159*; JAR-11P-06, *BISH 723986*. Kingman. KIN-04-06, *BISH 726293*; KIN-06-06, *BISH 725484*; KIN-07-04, *BISH 726372*; KIN-07-06, *BISH 726329*; KIN-10P-04, *BISH 725746*.

**Jania pumila* Lamouroux; Abbott 1999: 189, fig. 48C; N'Yeurt & Payri 2010: 56, fig. 98.

Specimens examined: Jarvis. Whippoorwill Expedition, *H. J. Bergman (63.1)*, *BISH 506205*, 10.viii.1924; Smithsonian Expedition, *C. R. Long (2706.2)*, *BISH 529222*, xi.1964; JAR-04P-04, *BISH 723947*. Kingman. KIN-21-06, *BISH 726253*.

**Jania rubens* (Linnaeus) Lamouroux; Taylor 1950: 133.

Thallus of *BISH 725646* is similar to *Jania pacifica*; however, the terminal segments are acute. *BISH 725817* possesses both rounded and acute terminal segments.

Specimens examined: Kingman. KIN-05P-04, *BISH 725817*; KIN-08-04, *BISH 725646*, conceptacles.

ORDER GIGARTINALES FAMILY HALYMENIACEAE

**Carpopeltis bushiae* (Farlow) Kylin; Abbott 1999: 135, fig. 32A.

Specimen examined: Jarvis. JAR-01-04, *BISH 732994*.

Cryptonemia umbraticola Dawson 1959: 43, figs. 21F, 22A; Abbott 1999: 136, fig. 32B; N'Yeurt & Payri 2010: 42, figs. 74, 75.

Specimens examined: Jarvis. JAR-01-06, *BISH 724151 (PSV 10858)*; JAR-04P-04, *BISH 723939*. Kingman. KIN-02-06, *BISH 742963*.

**Cryptonemia yendoi* Weber-van Bosse; Abbott 1999: 138, figs. 32C–E.

Specimens examined: Jarvis. JAR-08-06, *BISH 723993*. Kingman. KIN-02-06, *BISH 724847*; KIN-07-04, *BISH 726345*; KIN-08-04, *BISH 725660*; KIN-12-01, *BISH 725721*; KIN-15-06, *BISH 725543*.

**Halymenia cf. actinophysa* Howe; Abbott 1999: 143, fig. 34A.

Specimen examined: Jarvis. JAR-02-06, *BISH 723799*; JAR-07P-01, *BISH 726467*. Kingman. KIN-10P-01, *BISH 725537*.

FAMILY HYPNEACEAE

Hypnea pannosa J. Agardh; Abbott 1999: 57, figs. 100–102.

Specimen examined: Kingman. KIN-21-06, *BISH 726240*.

Hypnea spinella (C. Agardh) Kützinger [= *H. cervicornis* J. Agardh]; Abbott 1999: 117, figs. 25B–E.

Specimens examined: Jarvis. JAR-02-06, *BISH 723786*; JAR-04P-01, *BISH 724118*; JAR-04P-04, *BISH 723938*; JAR-04P-06, *BISH 723898*.

FAMILY NEMASTOMATACEAE

**Predaea weldii* Kraft & Abbott; Abbott 1999: 153, fig. 37D–F.

Specimens examined: Kingman. KIN-07-01, *BISH 724736*; KIN-11-01, *BISH 725712*; KIN-11-02, *BISH 725450*; KIN-13-02, *BISH 725784*; KIN-17-02, *BISH 725842*.

FAMILY PEYSSONNELIACEAE

**Peyssonnelia cf. inamoena* Pilger; Skelton & South 2007: 62, figs. 108–110.

Specimens examined: Jarvis. JAR-08-04, *BISH 724024*. Kingman. KIN-05P-04, *BISH 725820*; KIN-07-01, *BISH 724738*; KIN-11-04, *BISH 726399*.

FAMILY SOLIERIACEAE

Wurdemannia miniata (Sprengel) Feldmann & Hamel; Abbott 1999: 238.

Specimens examined: Kingman. KIN-13-02, *BISH 725781*; KIN-13-04, *BISH 726425*; KIN-17-02, *BISH 725839*.

ORDER RHODYMENIALES

FAMILY CHAMPIACEAE

**Champia parvula* (C. Agardh) Harvey; Skelton & South 2007: 68, figs. 126–133.

Specimens examined: Kingman. KIN-02-06, *BISH 724836*; KIN-05P-04, *BISH 725797*; KIN-07-04, *BISH 726351*; KIN-09-01, *BISH 724691*; KIN-16P-04, *BISH 725438*.

FAMILY LOMENTARIACEAE

Lomentaria hakodatensis Yendo; Abbott 1999: 224, figs. 62A–D.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723798; JAR-04P-01, *BISH* 724116; JAR-04P-04, *BISH* 723940; JAR-04P-06, *BISH* 723921; JAR-07P-06, *BISH* 723861. Kingman. KIN-21-06, *BISH* 726248.

FAMILY RHODYMENIACEAE

**Chrysomenia kaernbachii* Grunow; Abbott 1999: 230, fig. 64B.

Specimens examined: Jarvis. JAR-01-04, *BISH* 732996; JAR-07P-04, *BISH* 723842; JAR-08-04, *BISH* 724016.

**Coelothrix irregularis* (Harvey) Børgesen; Abbott 1999: 233, figs. 65A–D.

Specimen examined: Jarvis. JAR-01-06, *BISH* 724113.

**Halichrysis coalescens* (Farlow) R. E. Norris & Millar; Abbott 1999: 235, figs. 66A–C.

Specimen examined: Jarvis. JAR-04P-06, *BISH* 723900; JAR-08-01, *BISH* 724086.

ORDER CERAMIALES

FAMILY CALLITHAMNIACEAE

**Aglaothamnion boergesenii* (Aponte & Ballantine) L'Hardy-Halos & Rueness; Abbott 1999: 244, figs. 67C–F.

Specimens examined: Jarvis. JAR-07P-04, *BISH* 723855; JAR-09-06, *BISH* 724069; JAR-12-06, *BISH* 723809.

**Aglaothamnion cordatum* (Børgesen) Feldmann-Mazoyer; Abbott 1999: 244, figs. 67G–H.

Specimen examined: Jarvis. JAR-07P-02, *BISH* 723973.

**Crouania mageshimensis* Itono; Abbott 1999: 293, figs. 82A–D.

Specimens examined: Kingman. KIN-10P-06, *BISH* 724795; KIN-12-04, *BISH* 725404; KIN-18-06, *BISH* 726272.

**Crouania minutissima* Yamada; Abbott 1999: 294, figs. 82E–G.

Specimens examined: Kingman. KIN-06-06, *BISH* 725473; KIN-07P-04, *BISH* 726349; KIN-07P-06, *BISH* 726340; KIN-12-06, *BISH* 726482.

FAMILY CERAMIACEAE

Antithamnion lherminieri (P. Crouan & H. Crouan) Bornet & Nasr [= *Antithamnion antillanum* Børgesen, *A. palmyrense* Dawson]; Abbott 1999: 248, figs. 69A, B; Skelton & South 2007: 84, figs. 177–180; N'Yeurt & Payri 2010: 106, figs. 207, 208.

As per Skelton & South (2007) and N'Yeurt & Payri (2010), *A. lherminieri* is used over *A. antillanum* despite the brief four-word original description of the basionym *Callithamnion lherminieri* P. Crouan & H. Crouan. *A. palmyrense* was one of four new species described by Dawson (1959) from Palmyra Atoll.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723789; JAR-04P-04, *BISH* 723937; JAR-07P-04, *BISH* 723853; JAR-10-04, *BISH* 723878. Kingman. KIN-16P-04, *BISH* 725431.

**Antithamnionella breviramosa* (Dawson) Wollaston; Skelton & South 2007: 86, figs. 181–185.

Axial cells are 68–120 μm long and apical cells are rounded.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723785; JAR-04P-06, *BISH* 723923; JAR-07P-04, *BISH* 723847. Kingman. KIN-12-02, *BISH* 726318; KIN-13-02, *BISH* 725780; KIN-21-06, *BISH* 726245.

**Antithamnionella graeffei* (Grunow) Athanasiadis; Skelton & South 2007: 87, figs. 186–188.

Main axis consists of short barrow-shaped cells at the apex.

Specimens examined: Kingman. KIN-05P-04, *BISH* 725796; KIN-08-04, *BISH* 725656; KIN-08-06, *BISH* 724816; KIN-13-04, *BISH* 726433; KIN-18-06, *BISH* 726261.

**Ceramium affine* Setchell & Gardner; South & Skelton 2000: 54, figs. 1–10.

Specimens examined: Kingman. KIN-07-02, *PSV* 10171; KIN-07-04, *BISH* 726374; KIN-11-04, *BISH* 726405; KIN-12-06, *BISH* 726484.

Ceramium clarionense Setchell & Gardner; Abbott 1999: 269, figs. 75A–C.

Specimens examined: Kingman. KIN-04-06, *BISH* 726296; KIN-08-04, *BISH* 725573, 725671; KIN-13-04, *BISH* 726415.

Ceramium codii (Richards) G. Mazoyer [= *Ceramium serpens* Setchell & Gardner]; Cho & Fredericq 2006: 496, figs. 24–55.

Specimens examined: Kingman. KIN-03-04, *BISH* 724723; KIN-10P-04, *BISH* 725736.

**Ceramium krameri* South & Skelton; South & Skelton 2000: 69, figs. 45–51.

Specimens examined: Kingman. KIN-03-06, *BISH* 724758; KIN-05P-04, *BISH* 725803; KIN-06-06, *BISH* 725490; KIN-07-04, *BISH* 726367; KIN-13-04, *BISH* 726428.

Ceramium macilentum J. Agardh [= *Ceramium mazatlanense* Dawson]; South & Skelton 2000: 71, figs. 52–62.

Specimens examined: Jarvis. JAR-07P-06, *BISH* 723866; JAR-08-04, *BISH* 724022; JAR-08-06, *BISH* 724006; JAR-12-06, *BISH* 723803. Kingman. KIN-03-04, *BISH* 724708; KIN-08-04, *BISH* 725645; KIN-10P-06, *BISH* 724785; KIN-12-04, *BISH* 725379; KIN-13-06, *BISH* 726445.

**Ceramium punctiforme* Setchell; South & Skelton 2000: 59, figs. 15–19.

Specimens examined: Jarvis. JAR-07P-04, *BISH* 723845; JAR-07P-06, *BISH* 723863.

Ceramium vagans P. Silva; South & Skelton 2000: 85, figs. 89–93.

Specimens examined: Jarvis. JAR-04P-06, *BISH* 723913; JAR-10-04, *BISH* 723936.

Corallophila huysmansii (Weber-van Bosse) R. E. Norris; Skelton & South 2007: 109, figs. 265–269.

Specimens examined: Kingman. KIN-03-06, *BISH* 734922; KIN-08-01, *BISH* 725685; KIN-10P-04, *BISH* 725752; KIN-11-02, *BISH* 725464; KIN-13-04, *BISH* 726431.

Corallophila kleiwegii Weber-van Bosse [= *Corallophila apiculata* (Yamada) R. E. Norris]; Skelton & South 2007: 211, figs. 270–274; N'Yeurt & Payri 2010: 114, fig. 227.

BISH 724035 possesses a prostrate axis, 240 μm diam., and narrower 140 μm diam. erect axes.

Specimens examined: Jarvis. JAR-04P-04, *BISH 723935*; JAR-04P-06, *BISH 723894*; JAR-11P-02, *BISH 724155*; JAR-11P-04, *BISH 724036*. Kingman. KIN-10P-06, *BISH 724794*; KIN-11-01, *BISH 725757*; KIN-11-04, *BISH 726383*; KIN-15-02, *BISH 725371*; KIN-16P-02, *BISH 724980*.

Gayliella transversalis (Collins & Hervey) T. O. Cho & Fredericq; Cho & Fredericq 2006: 727, figs. 5a–n, 6a–e; N'Yeurt & Payri 2010: 117, figs. 228, 229.

As per N'Yeurt & Payri (2010), most Pacific island specimens have been mistakenly reported as *Gayliella flaccida* (Kützing) T. O. Cho & L. McIvor [= *Ceramium flaccidum* (Harvey ex Kützing) Ardissonne].

Specimens examined: Jarvis. JAR-04P-06, *BISH 723893*; JAR-07P-02, *BISH 723956*; JAR-07P-04, *BISH 723848*; JAR-11P-04, *BISH 724039*. Kingman. KIN-03-04, *BISH 724713*; KIN-11-02, *BISH 725467*; KIN-19-04, *BISH 724749*.

FAMILY DASYACEAE

**Dasya anastomosans* (Weber-van Bosse) Wynne; Skelton & South 2007: 144, figs. 374–377.

Specimens examined: Kingman. KIN-04-06, *BISH 726286*; KIN-08-04, *BISH 725570*; KIN-10P-06, *BISH 724789*; KIN-11-02, *BISH 725455*; KIN-13-06, *BISH 726440*.

**Dasya iridescens* (Schlech) Millar & Abbott; Abbott 1999: 321, figs. 91A–G.

Specimens examined: Jarvis. JAR-07P-02, *BISH 723965*; JAR-08-01, *BISH 724087*; JAR-08-06, *BISH 723995*; JAR-09-06, *BISH 724072*; JAR-12-06, *BISH 723808*. Kingman. KIN-07-04, *BISH 726355*; KIN-12-02, *BISH 726322*; KIN-19-06, *BISH 725498*.

**Dasya iyengarii* Børgesen; Skelton & South 2007: 145, figs. 386–391.

Specimens examined: Kingman. KIN-03-04, *BISH 724722*; KIN-18-06, *BISH 726273*.

Heterosiphonia crispella (C. Agardh) Wynne; Skelton & South 2007: 149, figs. 398–405.

Specimens examined: Jarvis. JAR-04P-04, *BISH 723932*; JAR-07P-04, *BISH 723837*; JAR-12-06, *BISH 723821*. Kingman. KIN-02-06, *BISH 724837*; KIN-03-04, *BISH 724704*; KIN-03-06, *BISH 724770*; KIN-10P-06, *BISH 726304*; KIN-20-06, *BISH 724967*.

FAMILY DELESSERIACEAE

**Branchioglossum prostratum* Schneider; Abbott 1999: 331, figs. 95C, D.

Specimen examined: Kingman. KIN-04-06, *BISH 742956*.

**Hypoglossum caloglossoides* Wynne & Kraft 1985: 9, figs. 1–19.

Specimens examined: Kingman. KIN-04-06, *BISH 726287*; KIN-05P-04, *BISH 725816*; KIN-08-04, *BISH 725572*; KIN-08-06, *BISH 724829*.

**Hypoglossum minimum* Yamada; Wynne et al. 1989: 31, figs. 7–11.

Specimens examined: Jarvis. JAR-04P-06, *BISH* 723914; JAR-07P-02, *BISH* 723962; JAR-07P-04, *BISH* 723835; JAR-07P-06, *BISH* 723862; JAR-09-06, *BISH* 724070.

****Hypoglossum* sp.**

A single sterile specimen consists of four narrow prostrate blades, 5 mm long. One blade consists of distinctly undulating margins as depicted in *Hypoglossum wynnei* Abbott by Abbott (1996); the other three blades lack undulating margins. New bladelets appear at the distal damaged section, at the apex of the midrib and at the base. An examination of the holotype (*BISH* 634741) of *H. wynnei* shows that the second-order and third-order cells are larger and longer, 72 x 16 μm , than the cells of our Jarvis specimen.

Specimen examined: Jarvis. JAR-04P-04, *BISH* 723951.

****Taenioma perpusillum*** (J. Agardh) J. Agardh; Abbott 1999: 348, figs. 101A–E.

Specimen examined: Kingman. KIN-21-06, *BISH* 726250.

FAMILY RHODOMELACEAE

****Chondria polyrhiza*** Collins & Hervey; Abbott 1999: 360, figs. 103G–H.

Specimens examined: Jarvis. JAR-07P-04, *BISH* 723841; JAR-09-01, *BISH* 724140; JAR-09-02, *BISH* 724100; JAR-09-06, *BISH* 724065. Kingman. KIN-02-06, *BISH* 724853; KIN-12-04, *BISH* 725390; KIN-19-06, *BISH* 725504.

****Chondria simpliciuscula*** Weber-van Bosse; Abbott 1999: 361, figs. 104A–F.

Specimens examined: Jarvis. JAR-07P-02, *BISH* 723966; JAR-08-01, *BISH* 724092; JAR-08-06, *BISH* 723997; JAR-11P-04, *BISH* 724035; JAR-12-06, *BISH* 723818. Kingman. KIN-02-06, *BISH* 724851; KIN-03-04, *BISH* 724709; KIN-05P-04, *BISH* 725821; KIN-07-06, *BISH* 726333; KIN-19-06, *BISH* 725510.

****Herposiphonia arcuata*** Hollenberg; Hollenberg 1968c: 538, fig. 5.

Specimens examined: Jarvis. JAR-01-04, *BISH* 732995; JAR-07P-04, *BISH* 723846; JAR-12-06, *BISH* 723816.

Herposiphonia obscura Hollenberg; Hollenberg 1968c: 549, fig. 25.

Specimens examined: Jarvis. JAR-04P-06, *BISH* 723920; JAR-04P-04, *BISH* 723952. Kingman. KIN-17-02, *BISH* 725835.

****Herposiphonia pacifica*** Hollenberg; Hollenberg 1968c: 549, figs. 2A, 2B, 4, 19.

Specimens examined: Jarvis. JAR-04P-06, *BISH* 723922.

Herposiphonia secunda (C. Agardh) Ambronn; Abbott 1999: 376, figs. 109A–E.

Previous record: Jarvis. Hollenberg 1968c as *Herposiphonia tenella* f. *secunda* (C. Agardh) Hollenberg.

Specimens examined: Jarvis. JAR-04P-06, *BISH* 723901; JAR-07P-02, *BISH* 723958; JAR-07P-04, *BISH* 723839; JAR-08-06, *BISH* 723996; JAR-11P-04, *BISH* 724042.

Herposiphonia variabilis Hollenberg; Hollenberg 1968c: 557, figs. 1F, 2G, 17, 18, 21.

Previous record: Jarvis. Hollenberg 1968c.

Specimens examined: Jarvis. JAR-08-06, *BISH* 723990; JAR-09-02, *BISH* 724095; JAR-10-04, *BISH* 723875; JAR-10-06, *BISH* 723887; JAR-11P-06, *BISH* 723978.

**Laurencia majuscula* (Harvey) Lucas; Saito 1969: 149.

Specimens examined: Kingman. KIN-03-06, *BISH* 724771; KIN-04-06, *BISH* 726299; KIN-11-04, *BISH* 726386; KIN-13-06, *BISH* 726457.

**Neosiphonia apiculata* (Hollenberg) Masuda & Kogame [= *Polysiphonia apiculata* Hollenberg]; Hollenberg 1968a: 61, figs. 1D, 8, 9.

Specimens examined: Jarvis. South side, 9.1–15.2 m deep, *R. Newbold*, *BISH* 720248, 24.iii.2000; JAR-04P-01, *BISH* 724117.

Neosiphonia cf. *poko* (Hollenberg) Abbott [= *Polysiphonia poko* Hollenberg]; Hollenberg 1968a: 70, figs. 3A, 15, 22.

Previous record: Jarvis. Hollenberg 1968a.

Specimens examined: Kingman. KIN-05P-04, *BISH* 742959; KIN-06-06, *BISH* 725479; KIN-08-04, *BISH* 725658; KIN-10P-04, *BISH* 725748; KIN-15-02, *BISH* 724992.

**Neosiphonia polyphysa* (Kützing) Skelton & South [= *Polysiphonia polyphysa* Kützing, *P. pentamera* Hollenberg]; Hollenberg 1968b: 204, fig. 2D; Skelton & South 2007: 188, figs. 511–518.

Specimens examined: Jarvis. JAR-04P-04, *BISH* 723933; JAR-10-04, *BISH* 723881; JAR-12-06, *BISH* 723819, 723823. Kingman. KIN-07-04, *BISH* 726368; KIN-18-06, *BISH* 726259.

**Neosiphonia savatieri* (Hariot) M. S. Kim & I. K. Lee [= *Polysiphonia savatieri* Hariot]; Hollenberg 1968a: 77, figs. 37, 38.

Specimens examined: Kingman. KIN-03-04, *BISH* 724710; KIN-06-06, *BISH* 725485; KIN-07-04, *BISH* 726353; KIN-07-06, *BISH* 726338; KIN-10P-04, *BISH* 725741; KIN-12-04, *BISH* 725383.

**Neosiphonia tepida* (Hollenberg) S. M. Guimarães & M. T. Fujii [= *Polysiphonia tepida* Hollenberg]; Hollenberg 1968b: 205, figs. 3D, 3E.

Specimens examined: Jarvis. JAR-07P-01, *BISH* 724164; JAR-09-06, *BISH* 724066. Kingman. KIN-11-04, *BISH* 726401; KIN-12-04, *BISH* 726412; KIN-13-06, *BISH* 726443.

**Polysiphonia anomala* Hollenberg; Hollenberg 1968a: 59, figs. 1A, 1B, 1C.

Specimen examined: Kingman. KIN-07-06, *BISH* 726337.

**Polysiphonia homoia* Setchell & Gardner; Hollenberg 1968b: 201, fig. 2B.

Specimens examined: Jarvis. JAR-04P-06, *BISH* 742958. Kingman. KIN-05P-04, *BISH* 725804; KIN-06-06, *BISH* 725486; KIN-08-04, *BISH* 725649, 725666.

**Polysiphonia pseudovillum* Hollenberg; Hollenberg 1968a: 73, fig. 3C.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723793; JAR-11P-04, *BISH* 724037. Kingman. KIN-12-04, *BISH* 725401.

Polysiphonia scopulorum Harvey; Hollenberg 1968a: 79, figs. 6F, 30, 31, 33, 36.

Previous record: Jarvis. Hollenberg 1968a.

Specimens examined: Jarvis. South side, 9.1–15.2 m deep, *R. Newbold*, *BISH* 720249, 24.iii.2000; JAR-04P-04, *BISH* 723950. Kingman. KIN-03-04, *BISH* 724724.

Polysiphonia sertularioides (Grateloup) J. Agardh [= *Neosiphonia flaccidissima* (Hollenberg) M. S. Kim & I. K. Lee]; Kim & Lee 1999: 279.

BISH 724019 possesses short rhizoids with multicellular tips and may represent another species.

Specimens examined: Jarvis. Smithsonian Institution, *C. R. Long* (2703.1), *BISH 594680*, 16.xi.1964; JAR-02-06, *BISH 723797*; JAR-07P-02, *BISH 723963*; JAR-07P-04, *BISH 723829*; JAR-08-04, *BISH 724019*; JAR-09-06, *BISH 724063*. Kingman. KIN-03-06, *BISH 724768*; KIN-12-02, *BISH 726320*; KIN-12-04, *BISH 725400*.

Polysiphonia upolensis (Grunow) Hollenberg; Hollenberg 1968a: 94, figs. 6D, 6E, 29, 35, 42.

Specimen examined: Jarvis. JAR-04P-06, *BISH 723897*.

**Spirocladia barodensis* Børgesen; Abbott 1999: 438, figs. 131A, B.

Specimens examined: Jarvis. JAR-10-04, *BISH 723869*. Kingman. KIN-03-04, *BISH 724707*; KIN-03-06, *BISH 724767*; KIN-07-02, *PSV 10165f*; KIN-11-04, *BISH 726403*.

FAMILY SARCOMENIACEAE

**Dotyella hawaiiensis* (Doty & Wainwright) Womersley & Shepley [= *Cottoniella hawaiiensis* Doty & Wainwright]; Doty & Wainwright 1958: 229, figs. 1–9; Abbott 1999: 334, figs. 96A–C.

Erect axes, 40–64 μm diam. and up to 10 mm long, are polysiphonous with four pericentral cells and possess numerous monosiphonous filaments, 4 μm diam. and up to 800 μm long. The mature tetrasporangial stichidia are terminal on stalks; the swollen sections are 270–600 μm long with acute apices as illustrated in Doty & Wainwright (1959).

Specimens examined: Jarvis. JAR-10-04, *BISH 723869*. Kingman. KIN-06-01, *BISH 725541*; KIN-08-06, *BISH 724828*; KIN-13-04, *BISH 726413*.

**Dotyella irregularis* Abbott; Abbott 1984: 370, figs. 3–6, 8.

Specimens examined: Kingman. KIN-05P-04, *BISH 725801*; KIN-07-04, *BISH 726354*; KIN-11-04, *BISH 726397*; KIN-13-06, *BISH 726446*.

**Malaconema minimum* Hollenberg; Hollenberg 1963: 169, figs. 1–3.

Specimens examined: Jarvis. JAR-07P-01, *BISH 724168*; JAR-08-01, *BISH 724085*; JAR-09-02, *BISH 724101*; JAR-09-06, *BISH 724077*; JAR-12-06, *BISH 723817*. Kingman. KIN-07-01, *BISH 724737*; KIN-09-01, *BISH 724689*; KIN-10P-06, *BISH 724792*; KIN-12-04, *BISH 725395*; KIN-12-06, *BISH 726497*.

FAMILY WRANGELIACEAE

**Anotrichium secundum* (Harvey ex. J. Agardh) Furnari; Abbott 1999: 245, figs. 68A–C.

Erect axial filaments are 180–280 μm diam.

Specimens examined: Jarvis. JAR-01-04, *BISH 732992*; JAR-07P-04, *BISH 723849*; JAR-08-06, *BISH 723994*; JAR-10-04, *BISH 723874*; JAR-12-06, *BISH 723807*.

Anotrichium tenue (C. Agardh) Nägeli; Abbott 1999: 247, fig. 68D; N'Yeurt & Payri 2010: 104, fig. 203.

Erect axial filaments are 80–126 μm diam.

Specimens examined: Kingman. KIN-08-04, *BISH 725571*; KIN-10P-04, *BISH 725740*; KIN-12-02, *BISH 726314*; KIN-13-06, *BISH 726451*; KIN-16P-04, *BISH 725435*.

**Diplothamnion jolyi* van den Hoek; Abbott 1999: 297, fig. 83C.

Opposite determinate branches produced on 48 μm diam. prostrate axis.

Specimen examined: Kingman. KIN-07-02, *PSV 10163e*.

**Griffithsia heteromorpha* Kützing; Abbott 1999: 300, figs. 84A–C.

Specimens examined: Kingman. KIN-05P-04, *BISH 725809*; KIN-08-04, *BISH 725657, 725670*; KIN-12-04, *BISH 725389*.

**Griffithsia subcylindrica* Okamura; Abbott 1999: 302, figs. 85C–D.

Specimens examined: Jarvis. JAR-04P-01, *BISH 724129*; JAR-09-01, *BISH 724144*; JAR-09-06, *BISH 724074*. Kingman. KIN-19-06, *BISH 725507*.

**Lejolisia pacifica* Itono; Abbott 1999: 307, figs. 86F–G.

Disk-shaped rhizoid and 1-cell stalked tetrasporangia are conspicuous.

Specimen examined: Kingman. KIN-04-06, *BISH 726298*.

**Monosporus indicus* Børgesen; Abbott 1999: 308, figs. 86H–J.

Specimens examined: Kingman. KIN-07-02, *PSV 10128a*; KIN-07-04, *BISH 726373*; KIN-08-04, *BISH 725655*; KIN-13-06, *BISH 726455*; KIN-20-06, *BISH 724968*.

**Ptilothamnion cladophorae* (Yamada & Tanaka) Feldmann-Mazoyer; Abbott 1999: 313, fig. 87I.

Specimens examined: Jarvis. JAR-04P-06, *BISH 723912*; JAR-08-01, *BISH 724084*; JAR-08-06, *BISH 724002*. Kingman. KIN-03-04, *BISH 724714*; KIN-11-02, *BISH 725465*; KIN-12-04, *BISH 725411*; KIN-13-04, *BISH 726414*; KIN-20-06, *BISH 724975*.

PHYLUM HETEROKONTOPHYTA

Class Phaeophyceae

ORDER ECTOCARPALES

FAMILY ECTOCARPACEAE

Feldmannia indica (Sonder) Womersley & Bailey [= *Hincksia indica* (Sonder) J. Tanaka]; Tsuda 1972: 91, fig. 2; Skelton & South 2007: 197, figs. 535–538.

Filaments are 18–24 μm diam. Sessile plurilocular reproductive bodies (1–2 locules wide) are 80 μm long and 20 μm diam., and elongate cylindrical with rounded apices.

Specimen examined: Kingman. KIN-WRECK2-01, *BISH 724675*.

ORDER DICTYOTALES

FAMILY DICTYOTACEAE

**Dictyopteris repens* (Okamura) Børgesen; Tsuda 1972: 94, pl. 3 (fig. 1).

Specimens examined: Jarvis. JAR-04P-01, *BISH 724121*; JAR-04P-04, *BISH 723942*; JAR-04P-06, *BISH 723906*; JAR-07P-04, *BISH 723830*; JAR-08-01, *BISH 726473*. Kingman. KIN-21-06, *BISH 726239*.

Dictyota ceylanica Kützinger; Abbott & Huisman 2004: 202, fig. 77B.

Specimen examined: Jarvis. JAR-04P-01, *BISH* 724127. Kingman. KIN-21-06, *BISH* 726242.

**Dictyota humifusa* Hörnig, Schnetter & Coppejans in Hörnig et al. 1992: 57, fig. 6; Littler & Littler 2003: 170.

Specimens are light brown, up to 2 cm long and blades 3–4 mm wide and 0.1 mm thick with rounded apices. Single layer of medullary cells is ca. 64 μm tall and 56 μm wide, and is flanked by single rows of much smaller cortical cells ca. 16 μm tall and 8 μm wide.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723783; JAR-04P-04, *BISH* 723934; JAR-07P-04, *BISH* 723831; JAR-11P-04, *BISH* 724027; JAR-11P-06, *BISH* 723976.

Lobophora variegata (Lamouroux) Womersley ex Oliveira; Tsuda 1972: 97, pl. 5 (fig. 1).

Specimens examined: Jarvis. JAR-04P-06, *BISH* 723910; JAR-08-01, *BISH* 724083; JAR-08-04, *BISH* 724013; JAR-09-01, *BISH* 724134; JAR-11P-04, *BISH* 724026. Kingman. KIN-03-06, *BISH* 724760; KIN-13-04, *BISH* 726420; KIN-13-06, *BISH* 726453; KIN-15-02, *BISH* 725373; KIN-16P-04, *BISH* 725436.

ORDER FUCALES

FAMILY SARGASSACEAE

Turbinaria ornata (Turner) J. Agardh; Taylor 1964: 483, pl. 3 (figs. 1–9).

Specimens examined: Jarvis. Whippoorwill Expedition, shallow reef, *H. F. Bergman* (57), *BISH* 570589, Aug. 1924; Itasca Expedition, 80 m NE of beacon, *F. S. Collins*, *BISH* 506159, 17.iv.1935; Itasca Expedition, 14 m off-shore in surf, *F. S. Collins*, *BISH* 506189/506191, 17.iv.1935; beach drift on S beach, *E. H. Bryan Jr.* (1390), *BISH* 570569, 08.viii.1938; Smithsonian Institution, fresh drift, SW reef, *C. R. Long* (2688), *BISH* 568455, 15.xi.1964; Smithsonian Institution, *C. R. Long* (2715), *BISH* 569340, 17.xi.1964.

PHYLUM CHLOROPHYTA

Class Ulvophyceae

ORDER ULVALES

FAMILY ULVACEAE

Ulva clathrata (Roth) C. Agardh [= *Enteromorpha clathrata* (Roth) Greville]; Abbott & Huisman 2004: 46, figs. 5A–C.

Based on the molecular studies by O’Kelly et al. (2010) on Hawaii’s *Ulva*, the Line Islands specimens most likely reported here belong to an operational taxonomic unit which is unnamed. *BISH* 723918 and 723945 are less than 2 mm long with predominantly uniseriate branches. The other two specimens are 3–5 mm long with multiseriate branches. At this time, the present binomial based on morphological characters is used until further molecular studies with larger samplings are conducted (O’Kelly et al. 2010).

Specimens examined: Jarvis. Whippoorwill Expedition, *H. J. Bergman* (66), *BISH 506204*, viii.1924; JAR-04P-04, *BISH 723945*; JAR-04P-06, *BISH 723918*; JAR-11P-04, *BISH 724049*. Kingman. KIN-WRECK1-01, *BISH 724676*. *Ulva lactuca* Linnaeus; Abbott & Huisman 2004: 55, figs. 10A–D as *Ulva fasciata* Delile; O’Kelly et al. 2010: 731.

Strap-like thalli are 2-cell thick, 96–104 μm diam.; rhizoidal cells are prominent in cross-sections. Based on molecular evidence, O’Kelly et al. (2010) could only substantiate *Ulva lactuca* as one of the 12 *Ulva* species occurring in Hawaii.

Specimens examined: Jarvis. Whippoorwill Expedition, intertidal coral reef, *H. J. Bergman* (61), *BISH 506158/506188*, 10.viii.1924; Itasca Expedition, SW reef, 9 m offshore, *BISH 506163/506164*, 17.iii.1935; Itasca Expedition, *BISH 506165/506166*, 28.vi.1935. Kingman. KIN-WRECK2-01, *BISH 724674*.

ORDER CLADOPHORALES FAMILY ANADYOMENACEAE

**Microdictyon setchellianum* Howe; Egerod 1952: 366, figs. 6c–g, pl. 33.

Cells of primary branches are 176–240 μm diam. with crenulating anastomosing cells present. The single specimen looks similar to *Boodlea montagnei* (Harvey ex J.E. Gray) Egerod, but lacks the characteristic tenacular cells.

Specimens examined: Kingman. KIN-05P-02, *BISH 725770*; KIN-12-06, *BISH 726481*.

**Microdictyon umbilicatum* (Velley) Zanardini; Abbott & Huisman 2004: 62, fig. 15B.

Primary branches are 176–240 μm in diameter.

Specimens examined: Jarvis. JAR-09-01, *BISH 724135*; JAR-09-02, *BISH 724099*; JAR-12-06, *BISH 723813*. Kingman. KIN-02-06, *BISH 724842*; KIN-05P-06, *BISH 724802*; KIN-08-06, *BISH 724057*; KIN-16P-02, *BISH 724983*; KIN-19-06, *BISH 725499*.

**Phyllodictyon anastomosans* (Harvey) Kraft & Wynne; Kraft & Wynne 1996: 131, figs. 16–25.

Few siphons have developed opposite lateral knobs; net-like pattern present in few specimens.

Specimens examined: Jarvis. JAR-07P-04, *BISH 723851*; JAR-09-01, *BISH 724146*. Kingman. KIN-07-01, *BISH 724735*; KIN-10P-04, *BISH 725731*; KIN-11-02, *BISH 725470*; KIN-20-06, *BISH 724862*.

FAMILY CLADOPHORACEAE

Cladophora catenata (Linnaeus) Kützing [= *Cladophoropsis luxurians* Gilbert, *Cladophora luxurians* (Gilbert) Abbott & Huisman]; Gilbert 1962: 136, fig. 2; Abbott & Huisman 2003: 282, figs. 7, 8; Leliaert & Coppejans 2006: 672.

Filaments are 160–280 μm diam. Proximal originating digitate rhizoids are approximately 24 μm diam. and up to 4.2 mm long, and can be non-septate or 1–2 septate. Leliaert & Coppejans (2006) relegated *C. luxurians* as a synonym of *C. catenata*.

Specimens examined: Jarvis. JAR-01-04, *BISH* 732991; JAR-08-04, *BISH* 724025; JAR-08-06, *BISH* 723999. Kingman. KIN-07-01, *BISH* 724744; KIN-07-04, *BISH* 726362; KIN-09-01, *BISH* 725528; KIN-10P-04, *BISH* 725744; KIN-11-04, *BISH* 726382.

****Cladophora cf. flexuosa*** (O. F. Müller) Kützing; Abbott & Huisman 2004: 72, fig. 20C.

Filaments, up to 7 mm long, appear like fragments or young specimens of *Cladophora flexuosa* which can attain a height of 30 cm (Abbott & Huisman 2004). Basal sector, 320–360 μm diam., tapers toward the distal sector, 80–100 μm diam. Two branching sites of *BISH* 725713 show trichotomous branches, similar to those observed in *Cladophora laetevirens* (Dillwyn) Kützing, which possesses narrower main branches, 90–180 μm diam.

Specimens examined: Jarvis. JAR-11P-04, *BISH* 724033. Kingman. KIN-02-06, *BISH* 724846; KIN-03-06, *BISH* 724778; KIN-08-06, *BISH* 724831; KIN-11-01, *BISH* 725713; KIN-12-04, *BISH* 725384.

FAMILY SIPHONOCADACEAE

****Cladophoropsis cf. philippinensis*** Taylor; Leliaert & Coppejans 2006: 666, figs. 35–39.

Matted specimens are either immature or fragments, less than 2.5 cm across with apical cells 480–940 μm diam. Except for the large diameter, some specimens appear similar to *Cladophoropsis membranacea* (Hofman Bang ex C. Agardh) Børgesen as per fig. 33 in Leliaert & Coppejans (2006); a few specimens morphologically resemble the genus *Valoniopsis*.

Specimens examined: Kingman. KIN-02-06, *BISH* 724849; KIN-05P-02, *BISH* 725772; KIN-06-06, *BISH* 725488; KIN-11-06, *BISH* 724805; KIN-15-06, *BISH* 725558.

Dictyosphaeria cavernosa (Forsskål) Børgesen; Egerod 1952: 350, figs. 1b–f, 2f, 2g.

Specimens examined: Jarvis. JAR-04P-01, *BISH* 724124; JAR-04P-04, *BISH* 723931; JAR-04P-06, *BISH* 723892; JAR-07P-01, *BISH* 724161; JAR-11P-02, *BISH* 724152. Kingman. KIN-06-01, *BISH* 725689; KIN-07-01, *BISH* 724729; KIN-11-01, *BISH* 725759; KIN-11-02, *BISH* 725446.

Dictyosphaeria versluysii Weber-van Bosse; Egerod 1952: 351, figs. 1a, 2h–k.

Specimens examined: Jarvis. Itasca Expedition, *BISH* 506161, 28.vi.1935; JAR-01-06, *BISH* 724114; JAR-02-06, *BISH* 723780; JAR-04P-01, *BISH* 724132; JAR-08-01, *BISH* 724079. Kingman. KIN-08-01, *BISH* 725683; KIN-09-01, *BISH* 724693; KIN-13-02, *BISH* 725777; KIN-15-02, *BISH* 724990; KIN-19-06, *BISH* 725501.

FAMILY VALONIACEAE

****Valonia macrophysa*** Kützing; Littler & Littler 2003: 206.

Specimen examined: Jarvis. South, 9.1–15.2 m deep, *R. Newbold*, *BISH* 720247, 24.iii.2000, identified by I. A. Abbott.

Valonia utricularis (Roth) C. Agardh; Skelton & South 2007: 260, fig. 689.

Specimens are characterized by irregular sized vesicles.

Specimens examined: Jarvis. JAR-02-06, *BISH* 723801; JAR-04P-04, *BISH* 723949; JAR-04P-06, *BISH* 723890; JAR-07P-06, *BISH* 723858; JAR-11P-06, *BISH* 723979. Kingman. KIN-10P-01, *BISH* 725699; KIN-10P-06, *BISH* 726303; KIN-12-04, *BISH* 725409; KIN-13-04, *BISH* 726418; KIN-14-02, *BISH* 725676.

****Valonia ventricosa*** J. Agardh; Kraft 2007: 121, figs. 51A–D.

Specimens examined: Kingman. KIN-03-06, *BISH* 724766; KIN-04-06, *BISH* 726302; KIN-05P-01, *BISH* 725717; KIN-11-01, *BISH* 725711.

ORDER BRYOPSIDALES
FAMILY BRYOPSIDACEAE

Bryopsis hypnoides Lamouroux; Skelton & South 2007: 262.

Specimens examined: Jarvis. JAR-07P-02, *BISH* 723971. Kingman. KIN-21-06, *BISH* 726243.

Bryopsis pennata Lamouroux; Egerod 1952: 370, fig. 7.

Specimens examined: Jarvis. Whippoorwill Expedition, south end, coral reef, *H. J. Bergman* (60), *BISH* 544167, 10.viii.1924; JAR-02-06, *BISH* 723796; JAR-04P-01, *BISH* 724115; JAR-04P-06, *BISH* 723919 (drift); JAR-11P-04, *BISH* 724041. Kingman. KIN-06-06, *BISH* 725472; KIN-12-04, *BISH* 725375.

FAMILY CAULERPACEAE

****Caulerpa nummularia*** Harvey ex J. Agardh; Abbott & Huisman 2004: 121, fig. 44A.

Specimen examined: Kingman. KIN-21-06, *BISH* 726252.

****Caulerpa serrulata*** (Forsskål) J. Agardh; Meñez & Calumpong 1982: 9, pl. 2E.

Specimens examined: Jarvis. JAR-04P-04, *BISH* 723941; JAR-11P-04, *BISH* 724030. Kingman. KIN-06-06, *BISH* 725471; KIN-07-04, *BISH* 726344; KIN-08-06, *BISH* 724830; KIN-09-01, *BISH* 724696; KIN-15-06, *BISH* 725552.

Caulerpella ambigua (Okamura) Prud'homme van Reine & Lokhorst [= *Caulerpa ambigua* Okamura]; Eubank 1946: 410, figs. 2a, 2b, pl. 22 as *Caulerpa ambigua*.

Specimens examined: Jarvis. JAR-04P-01, *BISH* 726465; JAR-08-01, *BISH* 726475.

FAMILY CODIACEAE

Codium edule Silva; Egerod 1952: 392, fig. 18, pl. 35b.

Utricles are 120–160 μm diam. and 240–560 μm long which are thinner than utricles of Samoan *Codium geppiorum* O. Schmidt, 180–410 μm diam. as reported by Skelton & South (2007).

Specimens examined: Jarvis. JAR-04P-01, *BISH* 724122; JAR-04P-04, *BISH* 723927; JAR-08-01, *BISH* 726477.

FAMILY DERBESACEAE

****Pedobesia* cf. *simplex*** (Meneghini ex Kützing) M. J. Wynne & Leliaert [= *Pedobesia lamourouxii* (J. Agardh) Feldmann, Lorease, Codomier & Coute]; Kobara & Chihara 1984: 152, figs. 1–3; Wynne & Leliaert 2001: 6, figs. 1–11.

All siphons are sterile and less than 1 cm long and 160–265 μm diam. (central part), i.e., narrower than *Pedobesia claviformis* (J. Agardh) Macrailld & Womersley (see Macrailld & Womersley 1974) which is up to 1,100 μm diam. but wider than *P. ryukyuensis* (Yamada & T. Tanaka) Kobara & Chihara (see Kobara & Chihara 1984) which is 35–50 μm diam. Fertile *Derbesia ryukyuensis* Yamada & Tanaka, now *Pedobesia ryukyuensis*, was reported from Palmyra Atoll, located 67 km southeast of Kingman Reef, by Dawson (1959). The absence of sporangia on all of the Jarvis Island and Kingman Reef specimens makes this identification tentative. The shape of the spheroidal sporangia of *P. simplex* differs considerably from the obovoid sporangia of *P. ryukyuensis*. *Pedobesia simplex* has previously been reported in the Pacific from Japan (Kobara & Chihara 1984) and Korea (Lee & Kang 1986).

Specimens examined. Jarvis. JAR-04P-04, *BISH* 723954; JAR-04P-06, *BISH* 723908; JAR-07P-04, *BISH* 723850; JAR-09-01, *BISH* 724139; JAR-11P-04, *BISH* 724038. Kingman. KIN-06-01, *BISH* 725694; KIN-13-02, *BISH* 725791.

FAMILY HALIMEDACEAE

Halimeda fragilis Taylor; Taylor 1950: 88, pl. 48 (fig. 2).

Specimens examined: Jarvis. Whippoorwill Expedition, reef, 0.3–0.6 m deep, *H. J. Bergman* (62), *BISH* 506179, 10.viii.1924; Itasca Expedition, *BISH* 506160, 28.vi.1935; JAR-01-04, *BISH* 732988; JAR-04P-06, *BISH* 723902; JAR-07P-04, *BISH* 723844; JAR-10-06, *BISH* 723884. Kingman. KIN-07-01, *BISH* 724733; KIN-14-02, *BISH* 725674; KIN-16P-04, *BISH* 725415; KIN-19-04, *BISH* 724746. ***Halimeda opuntia*** (Linnaeus) Lamouroux; Hillis-Colinvaux 1980: 110, figs. 19, 51, 92.

Specimens examined: Jarvis. JAR-09-01, *BISH* 724148. Kingman. KIN-02-06, *BISH* 724838; KIN-03-01, *BISH* 724679; KIN-13-02, *BISH* 725775.

****Halimeda taenicola*** W.R. Taylor 1950: 86, pl. 46 (fig. 1).

Specimens examined: Kingman. KIN-08-06, *BISH* 724818; KIN-09-01, *BISH* 724700; KIN-11-04, *BISH* 726396; KIN-12-02, *BISH* 726306; KIN-16P-04, *BISH* 725445.

FAMILY UDOTEACEAE

****Avrainvillea amadelpa*** (Montagne) A. Gepp & E. Gepp; Olsen-Stojkovich 1985: 36, fig. 19, pl. 7a.

Siphons, 16–20 μm diam., have more rounded than pointed apices; pseudo-cortex is present.

Specimen examined: Kingman. KIN-11-04, *BISH* 726381.

Avrainvillea lacerata Harvey ex J. Agardh; Olsen-Stojkovich 1985: 33, fig. 18, pl. 6b.

Fronds are thin and lack pseudocortex.

Specimens examined: Kingman. KIN-06-06, *BISH* 725475; KIN-08-01, *BISH* 725682; KIN-12-04, *BISH* 725393; KIN-16P-04, *BISH* 725413; KIN-20-06, *BISH* 724855.

**Pseudochlorodesmis furcellata* (Zanardini) Børgesen; Kraft 2007: 259, fig. 94; Verbruggen et al. 2009: 726–731.

Siphons are less than 4 mm long with dichotomous branches (28–40 μm diam.) not constricted at base of dichotomy. The genus *Pseudochlorodesmis* is retained since it has not been clearly shown that *P. furcellata* represents a life phase of *Halimeda tuna* (J. Ellis & Solander) Lamouroux or any other species of *Halimeda* (see Kraft 2007).

Specimens examined. Jarvis. JAR-04P-01, *BISH* 726464; JAR-04P-06, *BISH* 723915.

**Pseudochlorodesmis parva* Gilbert [= *Siphonogramen parva* (Gilbert) Abbott & Huisman]; Gilbert 1962: 141, fig. 7; Abbott & Huisman 2004: 142, figs. 53B, 53C; Verbruggen et al. 2009: 726–731.

Siphons are less than 2 mm long, terminally branched and 20–40 μm diam. As per Verbruggen et al. (2009), the form genus *Pseudochlorodesmis* is retained at this time.

Specimens examined. Kingman. KIN-07-02, *PSV* 10172; KIN-07-04, *BISH* 726375.

ORDER DASYCLADALES FAMILY DASYCLADACEAE

Neomeris vanbosseae Howe; Egerod 1952: 405, fig. 22b, pl. 41.

Two sterile juvenile specimens of *Neomeris*, *BISH* 725396 (KIN-12-04) and *BISH* 725500 (KIN-19-06), were also present in the Kingman Reef collections. Since the external calcification patterns were non-descriptive, no species designation could be assigned to the two specimens.

Specimens examined: Kingman. KIN-03-04, *BISH* 724715; KIN-07-06, *BISH* 726342; KIN-08-04, *BISH* 725661; KIN-10P-06, *BISH* 724790; KIN-16P-06, *BISH* 724811.

Discussion

A total of 124 species of marine benthic algae was identified from Jarvis Island and Kingman Reef, i.e., 8 Cyanobacteria, 82 Rhodophyta, 6 Heterokontophyta and 28 Chlorophyta. The 95 species recorded from Kingman Reef (Table 1) as opposed to the 79 species recorded from Jarvis Island may reflect differences in collecting effort (47 collections occurred at Kingman Reef versus 22 collections at Jarvis Island during the 2001, 2002, 2004 and 2006 cruises), or may be the result of habitat differences between the two islands, or the amount of available reef area. Whereas Jarvis Island contains only fore-reef habitat and one shallow-reef shelf, Kingman Reef is a classic atoll system with fore reef, back reef, and lagoonal habitats. Additionally, Kingman Reef possesses 11 times more reef area that is

shallower than 30 m than Jarvis Island (47.63 km² vs. 4.32 km² for Kingman Reef and Jarvis Island, respectively).

Table 1. Number of species of Cyanobacteria, Rhodophyta, Heterokontophyta and Chlorophyta reported from Jarvis Island and Kingman Reef, and number of new species records for the Line Islands.

Phylum	Number of Species			
	Jarvis Island (22 stations)	Kingman Reef (47 stations)	Total	New Line Islands Records
Cyanobacteria	3	8	8	4
Rhodophyta	52	59	82	57
Heterokontophyta	5	4	6	2
Chlorophyta	19	24	28	14
Total	79	95	124	77 (62%)

Of the 124 species reported here, 77 (62%) represent new species records for the Line Islands, i.e., 4 blue-green algae, 57 red algae, 2 brown algae and 14 green algae. Forty-one percent of the species encountered occurred at both Kingman Reef and Jarvis Island, while 23% were reported only for Jarvis Island and 36% were reported only for Kingman Reef. Only *Herposiphonia parca* reported by Hollenberg (1968c) from Jarvis Island was not among the present collections.

The presence of the green alga *Pedobesia* cf. *simplex* and the red alga *Dotyella hawaiiensis* collected from both Jarvis Island and Kingman Reef is noteworthy. The first record of the genus *Pedobesia* in the central and western Pacific islands, i.e., *Pedobesia clavaeformis* (J. Agardh) MacRaidl & Womersley, was reported from Swains Island, American Samoa (Tsuda et al. 2011). *Pedobesia* cf. *simplex* represents the second record of the genus from central and western Pacific islands. Specimens of *Dotyella hawaiiensis* from Jarvis Island and Kingman Reef represent the first record of this species from central Pacific islands outside the Hawaiian Archipelago.

Understanding baseline diversity and abundance of marine algae and other organisms on near-pristine reefs surrounding isolated and unpopulated islands such as Jarvis Island and Kingman Reef is imperative for successful reef conservation efforts on a global scale. Macroalgal overgrowth of coral in degraded ecosystems has erroneously led to the belief that the presence of algae in tropical marine ecosystems is indicative of decreased reef health (Vroom et al. 2006, Vroom 2011), and documenting the high algal species diversity and abundance on protected and healthy reefs in U.S. Marine National Monuments is fundamentally altering perceived negative stereotypes of the algal communities that naturally occur alongside coral and other benthic invertebrates (Tsuda et al. 2006, 2008, 2010a, 2010b; Vroom et al. 2005, 2010; Vroom & Timmers 2009; Vroom & Braun 2010). Understanding that algal populations typically cover a majority of hard-bottomed substrate in healthy tropical marine environments is forcing management agencies to reevaluate metrics useful for gauging ecosystem health (Vroom 2011).

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Appendix 1. Previous records of marine benthic algae from the Line Islands, Central Pacific. The synonyms cited below represent species reported by authors for specimens collected from the Line Islands. Type specimens from the Line Islands are presented in boldface.

Cyanobacteria

- Blennothrix lyngbyacea* (Kützing ex Gomont) Anagnostidis & Komárek. Tabuaeran. Tsuda et al. 1973 as *Microcoleus lyngbyaceus* (Kützing) P. Crouan & H. Crouan sensu Drouet 1968.
- Calothrix confervicola* (Dillwyn) C. Agardh. Tabuaeran. Tsuda et al. 1973.
- Chroococcus turgidus* (Kützing) Nägeli [= *Anacystis dimidiata* Drouet & Daily]. Palmyra. Dawson et al. 1955. Tabuaeran. Tsuda et al. 1973.
- Entophysalis conferta* (Kützing) Drouet & Daily. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Entophysalis deusta* (Meneghini) Drouet & Daily. Tabuaeran. Tsuda et al. 1973.
- Hormothamnion solutum* Bornet & Grunow. Palmyra. Dawson et al. 1955. Tabuaeran. Tsuda et al. 1973.
- Leptolyngbya rivulariarum* (Gomont) Anagnostidis & Komárek [= *Lyngbya rivulariarum* Gomont]. Palmyra. Dawson et al. 1955.
- Lyngbya confervoides* C. Agardh. Palmyra. Howe & Lyon 1916, Dawson et al. 1955.
- Lyngbya majuscula* (Dillwyn) Harvey. Palmyra. Dawson et al. 1955, Dawson 1959.
- Lyngbya penicilliformis* P. Silva [= *Phormidium penicillatum* Gomont]. Palmyra. Dawson et al. 1955, Dawson 1959.
- Lyngbya semiplena* (C. Agardh) J. Agardh. Palmyra. Dawson et al. 1955.
- Lyngbya sordida* (Zanardini) Gomont. Palmyra. Dawson 1959.
- Merismopedia thermalis* Kützing [= *Agmenellum thermale* (Kützing) Drouet & Daily]. Tabuaeran. Tsuda et al. 1973.
- Oscillatoria bonnemaisonii* (P. Crouan & H. Crouan) P. Crouan & H. Crouan. Palmyra. Dawson et al. 1955, Dawson 1959.
- Phormidium corium* (C. Agardh) Kützing ex Gomont. Palmyra. Dawson et al. 1955.
- Phormidium gracile* (Meneghini ex Gomont) Anagnostidis [= *Lyngbya gracilis* (Meneghini) Rabenhorst]. Palmyra. Howe & Lyon 1916, Dawson 1959.
- Schizothrix calcicola* (C. Agardh) Gomont ex Gomont sensu Drouet 1968. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Schizothrix mexicana* Gomont sensu Drouet 1968. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Scytonematopsis pilosa* (Harvey ex Bornet & Flahault) I. Umezaki & M. Watanabe [= *Calothrix pilosa* Harvey]. Tabuaeran. Tsuda et al. 1973.
- Spirulina major* Kützing. Palmyra. Dawson et al. 1955.
- Symploca hydnoides* (Harvey) Kützing. Palmyra. Dawson et al. 1955.

Rhodophyta

- Acrochaetium gracile* Børgesen. Palmyra. Dawson 1959.
- Acrochaetium robustum* Børgesen. Palmyra. Dawson et al. 1955.
- Acrochaetium* sp. Tabuaeran. Tsuda et al. 1973.
- Alsidium pacificum* Dawson** 1959 (Type from Palmyra).
- Anotrichium tenue* (C. Agardh) Nägeli [= *Griffithsia tenuis* C. Agardh]. Tabuaeran. Tsuda et al. 1973.
- Antithamnion lherminieri* (P. Crouan & H. Crouan) Bornet ex Nasr [= ***Antithamnion palmyrense* Dawson** 1959, Palmyra]
- Bangia atropurpurea* (Roth) C. Agardh [= *B. fuscopurpurea* (Dillwyn) Lyngbye]. Tabuaeran. Tsuda et al. 1973.
- Callithamnion* sp. 1. Tabuaeran. Tsuda et al. 1973.
- Callithamnion* sp. 2. Tabuaeran. Tsuda et al. 1973.
- Caloglossa lepriurii* (Montagne) G. Martens. Palmyra. Dawson 1959. Likely a misapplied name for *Hypoglossum caloglossoides* Wynne & Kraft (see Wynne & Kraft 1985).

- Centroceras clavulatum* (C. Agardh) Montagne. Palmyra. Dawson et al. 1955, Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Centroceras minutum* Yamada. Palmyra. Dawson 1959.
- Ceramium clarionense* Setchell & Gardner [= *C. marshallense* Dawson]. Palmyra. Dawson 1959.
- Ceramium codii* (Richards) G. Mazoyer [= *C. serpens* Setchell & Gardner]. Palmyra. Dawson 1959.
- Ceramium macilentum* J. Agardh [= *C. mazatlanense* Dawson]. Tabuaeran. Tsuda et al. 1973.
- Ceramium vagans* P. Silva [= *C. vagabunde* Dawson]. Palmyra. Dawson 1959.
- Ceramium* sp. Palmyra. Dawson 1959.
- Chondria repens* Børgesen. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Chondria* sp. Tabuaeran. Tsuda et al. 1973.
- Chroodactylon ornatum* (C. Agardh) Basson [= *Asterocystis ornata* (C. Agardh) G. Hamel]. Palmyra. Dawson et al. 1955.
- Corallophila huysmansii* (Weber-van Bosse) R. Norris [= *Ceramium huysmansii* Weber-van Bosse]. Tabuaeran. Tsuda et al. 1973.
- Corallophila kleiwegii* Weber-van Bosse [= *Corallophila apiculata* (Yamada) R. Norris, *Centroceras apiculatum* Yamada]. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Cruoriella mexicana* (Dawson) Denizot [= *Cruoriopsis mexicana* Dawson]. Palmyra. Dawson et al. 1955.
- Cryptonemia umbraticola* Dawson 1959** (Type from Palmyra).
- Dichotomaria marginata* (J. Ellis & Solander) Lamarck. Palmyra. Braun et al. 2009.
- Erythrotrichia carnea* (Dillwyn) J. Agardh. Palmyra. Dawson 1959.
- Erythrotrichia parietalis* T. Tanaka. Palmyra. Dawson 1959.
- Galaxaura filamentosa* Chou. Palmyra. Braun et al. 2009.
- Gayliella flaccida* (Kützinger) T.O. Cho & L. McIvor [= *Ceramium flaccidum* (Harvey ex Kützinger) Ardisone, *C. gracillimum* (Kützinger) Zanardini, *C. masonii* Dawson, *C. taylorii* Dawson]. Palmyra. Dawson et al. 1955, Dawson 1959. Tabuaeran. Tsuda et al. 1973. Most likely a misapplied name for *Gayliella transversalis* (Collins & Hervey) T.O. Cho & Fredericq as per N'Yeurt & Payri (2010).
- Gelidiella bornetii* (Weber-van Bosse) Feldmann & Hamel. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Gelidiella myrioclada* (Børgesen) Feldmann & G. Hamel. Tabuaeran. Tsuda et al. 1973.
- Gelidiopsis intricata* (C. Agardh) Vickers. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Gelidium muscifforme* (W. R. Taylor) Santelices [= *Pterocladia musciformis* W. R. Taylor]. Palmyra. Dawson 1959.
- Gelidium pulchellum* (Turner) Kützinger. Tabuaeran. Tsuda et al. 1973.
- Gelidium pusillum* (Stackhouse) LeJolis. Tabuaeran. DeWreede & Doty 1970, Tsuda et al. 1973. Most likely a misapplied name for *Gelidium isabelae* W. R. Taylor as per Millar & Freshwater (2005).
- Gracilaria* sp. Tabuaeran. DeWreede & Doty 1970.
- Griffithsia ovalis* Harvey. Tabuaeran. Tsuda et al. 1973.
- Herposiphonia obscura* Hollenberg. Kiritimati. Hollenberg 1968c.
- Herposiphonia parca* Setchell. Tabuaeran. Tsuda et al. 1973; Jarvis. Hollenberg 1968c.
- Herposiphonia secunda* (C. Agardh) Ambronn. Palmyra. Dawson 1959. Kiritimati. Hollenberg 1968c. Jarvis. Hollenberg 1968c.
- Herposiphonia variabilis* Hollenberg. Kiritimati. Hollenberg 1968c. Jarvis. Hollenberg 1968c.
- Heteroderma subtilissima* (Foslie) Foslie]. Palmyra. Dawson 1959.
- Heterosiphonia crispella* (C. Agardh) Wynne [= *H. wurdemannii* (J. Bailey ex Harvey) Falkenberg]. Palmyra. Dawson 1959.
- Hydrolithon craspedium* (Foslie) Silva [= *Porolithon craspedium* (Foslie) Foslie]. Palmyra. Howe & Lyon 1916, Dawson 1959.
- Hydrolithon farinosum* (Lamouroux) Penrose & Y. M. Chamberlain [= *Fosliella farinosa* (Lamouroux) Howe]. Tabuaeran. Tsuda et al. 1973.
- Hydrolithon gardineri* (Foslie) Verheij & Prud'homme van Reine [= *Porolithon gardineri* Foslie, *Porolithon marshallense* Taylor]. Palmyra. Howe & Lyon 1916 as *Lithophyllum craspedium*

- Foslie and *Lithophyllum kaiseri* (Heydrich) Heydrich (see Dawson et al. 1955), Dawson et al. 1955. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Hydrolithon onkododes* (Heydrich) Penrose & Woelkerling [= *Porolithon onkododes* Foslie]. Tabuaeran. Tsuda et al. 1973.
- Hydropuntia edulis* (S. G. Gmelin) Gurgel & Fredericq [= *Gracilaria edulis* (S. G. Gmelin) P. C. Silva, *Gracilaria lichenoides* (Lamouroux) Greville]. Tabuaeran. Tsuda et al. 1973.
- Hypnea japonica* Tanaka. Tabuaeran. Tsuda et al. 1973.
- Hypnea pannosa* J. Agardh [= *Hypnea nidulans* Setchell]. Tabuaeran. Tsuda et al. 1973.
- Hypnea spinella* (C. Agardh) Kützing [= *H. cervicornis* J. Agardh]. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Hypnea* sp. Tabuaeran. DeWreede & Doty 1970.
- Jania adhaerens* Lamouroux. Palmyra. Skelton & South 2007.
- Jania capillacea* Harvey. Palmyra. Dawson et al. 1955, Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Jania decussatodichotoma* (Yendo) Yendo. Palmyra. Dawson et al. 1955.
- Jania natalensis* Harvey. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Jania tenella* (Kützing) Grunow. Palmyra. Dawson et al. 1955, Dawson 1959.
- Lejolisia colombiana* W. R. Taylor. Palmyra. Dawson 1959.
- Lithothamnion* spp. Palmyra. Dawson 1959.
- Lomentaria hakodatensis* Yendo. Palmyra. Dawson 1959.
- Lophosiphonia bermudensis* Collins & Hervey. Palmyra. Dawson 1959.
- Neogoniolithon brassica-florida* (Harvey) Setchell & L. R. Mason [= *Goniolithon frutescens* Foslie]. Palmyra. Howe & Lyon 1916, Dawson et al. 1955, Dawson 1959.
- Neosiphonia howei* (Hollenberg) Skelton & South [= *Polysiphonia howei* Hollenberg]. Tabuaeran. Tsuda et al. 1973.
- Neosiphonia poko* (Hollenberg) Abbott [= *Polysiphonia poko* Hollenberg]. Kiritimati. Hollenberg 1968a. Jarvis. Hollenberg 1968a.
- Neosiphonia sphaerocarpa* (Børgeesen) M.S. Kim & I.K. Lee [= *Polysiphonia sphaerocarpa* Børgeesen]. Tabuaeran. Tsuda et al. 1973.
- Palisada surculigera* (C. K. Tseng) K. W. Nam [= *Laurencia surculigera* C. K. Tseng]. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Parviphycus pannosus* (Feldmann) G. Furnari [= *Gelidiella pannosa* (Feldmann) Feldmann & Hamel, *G. tenuissima* Feldmann & G. Hamel]. Tabuaeran. Tsuda et al. 1973.
- Peyssonnelia dubyi* P. Crouan & H. Crouan [= *Cruoriella dubyi* (P. Crouan & H. Crouan) Schmitz]. Palmyra. Dawson 1959.
- Peyssonnelia rubra* (Greville) J. Agardh. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Polysiphonia herpa* Hollenberg. Kiritimati. Hollenberg 1968a
- Polysiphonia scopulorum* Harvey [= *Lophosiphonia scopulorum* (Harvey) Womersley]. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973. Kiritimati. Hollenberg 1968a. Jarvis. Hollenberg 1968a.
- Polysiphonia sertularioides* (Grateloup) J. Agardh [= *Neosiphonia flaccidissima* (Hollenberg) M.S. Kim & I.K. Lee; *Polysiphonia flaccidissima* Hollenberg]. Palmyra. Hollenberg 1968a.
- Polysiphonia upolensis* (Grunow) Hollenberg. Palmyra. Hollenberg 1968a.
- Polysiphonia* spp. Palmyra. Dawson 1959 (3 species). Tabuaeran. DeWreede & Doty 1970 (1 species).
- Pterocladia caeruleascens* (Kützing) Santelices & Hommersand [= *Pterocladia tropica* Dawson 1959, Palmyra].
- Rhodymenia* sp. Tabuaeran. Tsuda et al. 1973.
- Spermothamnion* sp. Palmyra. Dawson 1959.
- Stylonema alsidii* (Zanardini) K. Drew [= *Goniotrichum elegans* (Chauvin) Zanardini]. Tabuaeran. Tsuda et al. 1973.
- Wrangelia argus* (Montagne) Montague. Tabuaeran. Tsuda et al. 1973.
- Wurdemannia miniata* (Sprengel) F. Feldmann & G. Hamel. Palmyra. Dawson 1959.
- Wurdemannia* sp. Tabuaeran. Tsuda et al. 1973.

Heterokontophyta

- Asteronema breviarticulatum* (J. Agardh) Ouriques & Bouzon [= *Ectocarpus breviarticulatus* J. Agardh]. Tabuaeran. Tsuda et al. 1973.
- Dictyota ceylanica* Kützinger. Palmyra. Dawson 1959 as *D. divaricata* Lamouroux.
- Dictyota friabilis* Setchell. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Feldmannia indica* (Sonder) Womersley & Bailey [= *Hincksia indica* (Sonder) J. Tanaka, *Ectocarpus indicus* Sonder]. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Feldmannia irregularis* (Kützinger) Hamel [= *Ectocarpus irregularis* Kützinger]. Palmyra. Dawson 1959.
- Lobophora papenfussii* (W. R. Taylor) Farghaly [= *Pocockiella papenfussii* W. R. Taylor]. Palmyra. Dawson 1959.
- Lobophora variegata* (Lamouroux) Womersley ex Oliveira [= *Pocockiella variegata* (Lamouroux) Papenfuss]. Palmyra. Dawson 1959, Braun et al. 2009. Tabuaeran. DeWreede & Doty 1970, Tsuda et al. 1973.
- Sphacelaria rigidula* Kützinger [= *S. furcigera* Kützinger, *S. carolinensis* Trono]. Palmyra. Dawson et al. 1955, Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Sphacelaria tribuloides* Meneghini. Tabuaeran. Tsuda et al. 1973.
- Turbinaria ornata* (Turner) J. Agardh [= *T. trialata* (J. Agardh) Kützinger]. Palmyra. Dawson et al. 1955, Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Russell 1973; Tsuda et al. 1973.

Chlorophyta

- Anadyomene wrightii* Harvey ex Gray. Palmyra. Dawson 1959.
- Avrainvillea lacerata* Harvey ex J. Agardh. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970, Tsuda et al. 1973.
- Boodlea composita* (Harvey) Brand. Palmyra. Dawson et al. 1955. Tabuaeran. DeWreede & Doty 1970.
- Boodlea vanbosseae* Reinbold. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Bryopsis hypnoides* Lamouroux. Tabuaeran. Tsuda et al. 1973.
- Bryopsis pennata* Lamouroux. Palmyra. Dawson et al. 1955, Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Caulerpa fastigiata* Montagne. Tabuaeran. Tsuda et al. 1973.
- Caulerpa racemosa* (Forsskål) J. Agardh. Tabuaeran. DeWreede & Doty 1970 as *C. peltata* Lamouroux and *C. racemosa*; Tsuda et al. 1973.
- Caulerpa serrulata* (Forsskål) J. Agardh [= *C. freycinetii* C. Agardh]. Palmyra. Howe & Lyon 1916, Dawson et al. 1955, Dawson 1959.
- Caulerpa urvilleana* Montagne. Palmyra. Howe & Lyon 1916 as *C. cupressoides* (Vahl) C. Agardh (see Dawson et al. 1955), Dawson et al. 1955, Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Caulerpa webbiana* Montagne. Tabuaeran. Tsuda et al. 1973.
- Caulerpella ambigua* (Okamura) Prud'homme van Reine & Lokhorst [= *Caulerpa ambigua* Okamura, *C. vickersiae* Børgesen]. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Chaetomorpha indica* (Kützinger) Kützinger. Tabuaeran. Tsuda et al. 1973.
- Cladophora catenata* (Linnaeus) Kützinger [= *Cladophoropsis luxurians* Gilbert]. Tabuaeran. Tsuda et al. 1973.
- Cladophora patentiramea* (Montagne) Kützinger. Palmyra. Dawson 1959.
- Cladophora* cf. *perpusilla* Skottsberg & Levring. Palmyra. Dawson et al. 1955.
- Cladophora sericea* (Hudson) Kützinger [= *C. crystallina* (Roth) Kützinger]. Palmyra. Dawson 1959.
- Cladophora socialis* Kützinger. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Cladophora vagabunda* (Linnaeus) Hoek [= *C. inserta* Dickie]. Palmyra. Dawson 1959.
- Cladophora* spp. Tabuaeran. Tsuda et al. 1973 (4 species).
- Cladophoropsis bacillima* Dawson. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Cladophoropsis sundanensis* Reinbold [= *Cladophora sabulosa* Lyon in Howe & Lyon 1916, Palmyra, see Dawson et al. 1955]. Palmyra. Dawson et al. 1955. Tabuaeran. Tsuda et al. 1973.

- Chaetophoraceae. Tabuaeran. Tsuda et al. 1973.
- Codium edule* P. Silva. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Codium geppiorum* O. Schmidt [= *C. geppii* O. Schmidt]. Palmyra. Dawson 1959.
- Derbesia attenuata* Dawson. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Derbesia marina* (Lyngbye) Solier. Palmyra. Dawson 1959.
- Dictyosphaeria cavernosa* (Forsskål) Børgesen [= *D. favulosa* (C. Agardh) Decaisne ex Endlicher]. Palmyra. Howe & Lyon 1916, Dawson et al. 1955, Dawson 1959, Braun et al. 2009. Tabuaeran. DeWreede & Doty 1970, Tsuda et al. 1973.
- Dictyosphaeria versluisii* Weber-van Bosse. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Halimeda bikiensis* Taylor. Tabuaeran. Tsuda et al. 1973.
- Halimeda discoidea* Decaisne. Palmyra. Howe & Lyon 1916 as *H. macroloba* Decaisne (see Dawson et al. 1955); Dawson et al. 1955, Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Halimeda fragilis* Taylor. Palmyra. Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Halimeda gracilis* Harvey ex J. Agardh. Palmyra. Dawson 1959. Tabuaeran. Tsuda et al. 1973.
- Halimeda heteromorpha* N'Yeurt. Tabuaeran. Tsuda et al. 1973 as *Halimeda incrassata* (Ellis) Lamouroux.
- Halimeda lacunalis* W. R. Taylor. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Halimeda opuntia* (Linnaeus) Lamouroux. Palmyra. Howe & Lyon 1916, Dawson et al. 1955, Dawson 1959, Braun et al. 2009.
- Halimeda* sp. Tabuaeran. Tsuda et al. 1973.
- Microdictyon pseudohapteron* A. Gepp & E. Gepp. Palmyra. Dawson et al. 1955, Dawson 1959.
- Neomeris bilimbata* Koster. Palmyra. Dawson 1959.
- Neomeris vanbosseae* Howe. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Ostreobium queketti* Bornet & Flahault [= *O. reineckeii* Bornet in Reinbold]. Tabuaeran. Tsuda et al. 1973.
- Parvocaulis clavatus* (Yamada) S. Berger et al. [= *Acetabularia clavata* Yamada]. Tabuaeran. Tsuda et al. 1973.
- Parvocaulis parvulus* (Solms-Laubach) S. Berger et al. [= *Acetabularia moebii* Solms-Laubach]. Tabuaeran. Tsuda et al. 1973.
- Pedobesia ryukyuensis* (Yamada & T. Tanaka) Kobara & Chihara [= *Derbesia ryukyuensis* Yamada & Tanaka]. Palmyra. Dawson 1959.
- Phaeophila dendroides* (P. Crouan & H. Crouan) Batters [= *Phaeophila engleri* Reinke]. Palmyra. Dawson et al. 1955.
- Rhipidiphyllon reticulatum* (Askenasy) Heydrich. Tabuaeran. Tsuda et al. 1973.
- Rhipilia geppii* Taylor. Palmyra. Dawson et al. 1955.
- Rhizoclonium riparium* (Roth) Harvey [= *R. implexum* (Dillwyn) Kützing]. Palmyra. Dawson et al. 1955.
- Ulva clathrata* (Roth) C. Agardh [= *Enteromorpha clathrata* (Roth) Greville]. Palmyra. Dawson et al. 1955.
- Ulva flexuosa* Wulfen [= *Enteromorpha lingulata* J. Agardh, *E. plumosa* Kützing, *E. tubulosa* (Kützing) Kützing]. Palmyra. Howe & Lyon 1916, Dawson 1959. Tabuaeran. DeWreede & Doty 1970; Tsuda et al. 1973.
- Ulva intestinalis* Linnaeus [= *Enteromorpha intestinalis* (Linnaeus) Nees]. Palmyra. Dawson 1959.
- Ulva kyllinii* Hayden, Blomster, Maggs, P. Silva, M. Stanhope & J. Waaland [= *Enteromorpha kyllinii* Bliding]. Palmyra. Dawson et al. 1955.
- Ulva lactuca* Linnaeus. Tabuaeran. DeWreede & Doty 1970, and Tsuda et al. 1973 as *Ulva fasciata* Delile.
- Valonia aegagropila* C. Agardh. Tabuaeran. Tsuda et al. 1973.
- Valonia utricularis* (Roth) C. Agardh. Palmyra. Dawson 1959.

Appendix 2. Collection stations at Jarvis Island and Kingman Reef. Specimens were collected by Karen J. Geisler (2001), Peter S. Vroom (2002), Kimberly N. Page (2004), and Aline D. Tribollet (2006).

Jarvis Island

- JAR-01-04 (00° 22.062' S, 159° 58.751' W). Gradual declining reef slope at northeast side, limestone and coral rubble, 14 m deep, 26.iii.2004.
- JAR-01-06. See JAR-01-04 for coordinates and habitat, 20.iii.2006.
- JAR-02-06 (00° 22.878' S, 160° 00.494' W). Reef slope at southwest side, high coral cover, 14.3 m deep, 21.iii.2006.
- JAR-04P-01 (00° 22.920' S, 159° 59.958' W). Reef wall at south side, 15.2 m deep, 17.ii.2001.
- JAR-04P-04 (00° 22.900' S, 159° 59.895' W). Reef slope at south side, high coral cover, 15.2 m deep, 27.iii.2004.
- JAR-04P-06. See JAR-04P-04 for coordinates and habitat, 21.iii.2006.
- JAR-07P-01 (00° 22.570' S, 160° 00.856' W). Steep reef slope at west side, soft corals abundant, 23.8 m deep, 16.ii.2001.
- JAR-07P-02. See JAR-07P-01 for coordinates and habitat, 9.iii.2002.
- JAR-07P-04 (00° 22.592' S, 160° 00.863' W). Steep reef slope at west side, 14.6 m deep, 27.iii.2004.
- JAR-07P-06. See JAR-07P-04 for coordinates and habitat, 22.iii.06.
- JAR-08-01 (00° 21.790' S, 159° 59.424' W). Rubble slope, north side, 14.9 m deep, 17.ii.2001.
- JAR-08-04 (00° 21.800' S, 159° 59.451' W). Gradual declining reef slope at north side, limestone and coral rubble, 17.1 m deep, 26.iii.04.
- JAR-08-06. See JAR-08-4 for coordinates and habitat, 20.iii.06.
- JAR-09-01 (00° 21.922' S, 160° 00.380' W). Spur and groove formation, northwest side, 15.2 m deep, 17.ii.2001.
- JAR-09-02. See JAR-09-01 for coordinates and habitat, 10.iii.2002.
- JAR-09-06. (00° 21.925' S, 160° 00.385' W). Reef slope at northwest side, 14.6 m deep, 20.iii.2006.
- JAR-10-04 (00° 22.831' S, 159° 58.367' W). Reef slope off southeast corner, limestone and coral rubble, 12.2 m deep, 26.iii.2004.
- JAR-10-06. See JAR-10-04 for coordinates and habitat, 21.iii.2006.
- JAR-11P-02 (00° 22.135' S, 160° 00.484' W). Steep reef slope at mid-west side, 15.5 m deep, 10.iii.2002.
- JAR-11P-04 (00° 22.159' S, 160° 00.507' W). Steep reef slope at mid-west side, 15.5 m deep, 27.iii.2004.
- JAR-11P-06. See JAR-11P-04 for coordinates and habitat, 22.iii.2006.
- JAR-12-06 (00° 22.950' S, 159° 59.033' W). Reef slope at southeast corner, coral cover moderate, 15.2 m deep, 22.iii.2006.

Kingman Reef

- KIN-02-06 (no coordinates), 01.iv.2006.
- KIN-03-01 (06° 23.419' N, 162° 21.627' W). Back reef in southeast end of lagoon, 15.9 m deep, 23.ii.2001.
- KIN-03-04 (06° 23.413' N, 162° 21.619' W). Back reef in southeast end of lagoon, 15.9 m deep, 02.iv.2004.
- KIN-03-06 (06° 23.413' N, 162° 21.625' W). Back reef in southeast end of lagoon, 15.9 m deep, 02.iv.2006.
- KIN-04-06 (06° 26.332' N, 162° 23.285' W). North patch reef in lagoon, 16.2 m deep, 30.iii.2006.
- KIN-05P-01 (06° 23.707' N, 162° 20.934' W). Back reef in southeast lagoon, 10.4 m deep, 23.ii.2001.
- KIN-05P-02 (06° 23.700' N, 162° 20.770' W). Back reef in southeast lagoon, 9.8 m deep, 17.iii.2002.
- KIN-05P-04 (06° 23.665' N, 162° 20.771' W). Back reef in southeast lagoon, 9.8 m deep, 03.iv.2004.
- KIN-05P-06 (06° 23.683' N, 162° 20.779' W). Back reef in southeast lagoon, 9.8 m deep, 02.iv.2006.

- KIN-06-01 (06° 23.002' N, 162° 25.698' W). Reef slope in southwest lagoon, 15.8 m deep, 21.ii.2001.
- KIN-06-06. See KIN-06-01 for coordinates and habitat, March 2006.
- KIN-07-01 (06° 24.142' N, 162° 23.097' W). Middle lagoon patch reef, 16.2 m deep, 21.ii.2001.
- KIN-07-02 (06° 22.930' N, 162° 23.978' W). Middle lagoon patch reef, 11.9 m deep, 19.iii.2002.
- KIN-07-04 (06° 24.123' N, 162° 23.131' W). Middle lagoon patch reef, 11.9 m deep, 04.iv.2004.
- KIN-07-06 (06° 24.128' N, 162° 23.127' W). Middle lagoon patch reef, 11.9 m deep, 31.iii.2006.
- KIN-08-01 (06° 25.743' N, 162° 22.927' W). Reef slope in north lagoon, 14.9 m deep, 21.ii.2001.
- KIN-08-04 (06° 25.752' N, 162° 22.936' W). Reef slope in north lagoon, 10.1 m deep, 04.iv.2004.
- KIN-08-06 (06° 25.746' N, 162° 22.946' W). Reef slope in north lagoon, 10.1 m deep, 30.iii.2006.
- KIN-09-01 (06° 25.256' N, 162° 22.246' W). Reef slope in northeast lagoon, 15.2 m deep, 22.ii.2001.
- KIN-10P-01 (06° 25.216' N, 162° 22.760' W). Northeast lagoon pinnacle and patch reef, 15.2 m deep, 22.ii.2001.
- KIN-10P-04 (06° 25.223' N, 162° 22.765' W). Northeast lagoon pinnacle and patch reef, 14.3 m deep, 04.iv.2004.
- KIN-10P-06 (06° 25.217' N, 162° 22.772' W). Reef slope in northeast lagoon, 14.3 m deep, 30.iii.2006.
- KIN-11-01 (06° 22.927' N, 162° 20.749' W). Southeast ocean reef slope, East Paloma Pass, 14.3 m deep, 22.ii.2001.
- KIN-11-02 (06° 22.925' N, 162° 20.765' W). Southeast ocean reef slope, East Paloma Pass, 14.9 m deep, 19.iii.2002.
- KIN-11-04 (06° 22.909' N, 162° 20.791' W). Southeast ocean reef slope, East Paloma Pass, 14.9 m deep, 02.iv.2004.
- KIN-11-06 (06° 22.921' N, 162° 20.772' W). Southeast ocean reef slope, East Paloma Pass, 14.9 m deep, 29.iii.2006.
- KIN-12-01 (06° 23.143' N, 162° 22.640' W). East lagoon pinnacle, north of Paloma Pass, 16.8 m deep, 23.ii.2001.
- KIN-12-02 (06° 23.149' N, 162° 22.652' W). East lagoon pinnacle, north of Paloma Pass, 14.9 m deep, 17.iii.2002.
- KIN-12-04 (06° 23.138' N, 162° 22.641' W). East lagoon pinnacle, north of Paloma Pass, 14.9 m deep, 03.iv.2004.
- KIN-12-06. See KIN-12-04 for coordinates and habitat, 31.iii.2006.
- KIN-13-02 (06° 22.947' N, 162° 23.063' W). South fore-reef slope, 14.6 m deep, 17.iii.2002.
- KIN-13-04. See KIN-13-02 for coordinates and habitat, 02.iv.2004.
- KIN-13-06 (06° 22.931' N, 162° 23.054' W). South fore-reef slope, 14.6 m deep, 29.iii.2006.
- KIN-14-02 (06° 26.090' N, 162° 23.413' W). North back-reef slope, 14.6 m deep, 18.iii.2002.
- KIN-15-02 (06° 24.429' N, 162° 22.054' W). Northeast lagoon patch reef, 14.9 m deep, 18.iii.2002.
- KIN-15-06 (06° 24.438' N, 162° 22.077' W). Northeast lagoon patch reef, 14.9 m deep, 01.iv.2006.
- KIN-16P-02 (06° 23.533' N, 162° 20.542' W). Southeast lagoon back reef, 7.3 m deep, 18.iii.2002.
- KIN-16P-04 (06° 23.315' N, 162° 20.553' W). Southeast lagoon back reef, 7.3 m deep, 03.iv.2004.
- KIN-16P-06 (06° 23.542' N, 162° 20.523' W). Southeast lagoon back reef, 7.3 m deep, 02.iv.2006.
- KIN-17-02 (06° 22.930' N, 162° 23.978' W). South fore-reef slope, 15.2 m deep, 19.iii.2002.
- KIN-18-06 (no coordinates). 30.iii.2006.
- KIN-19-04 (06° 23.118' N, 162° 22.864' W). South lagoon patch reef, 14.9 m deep, *K. N. Page* and *L. B. Preskitt*, 03.iv.2004.
- KIN-19-06 (06° 23.199' N, 162° 22.889' W). South lagoon patch reef, 14.9 m deep, 31.iii.2006.
- KIN-20-06 (no coordinates). 30.iii.2006.
- KIN-21-06 (06° 22.763' N, 162° 21.755' W). South fore-reef slope, west of Paloma Pass, 15.2 m deep, 03.iv.2006.
- KIN-WRECK1-01 (no coordinates). 22.ii.2001.
- KIN-WRECK2-01 (06° 23.419' N, 162° 21.627' W). Same coordinates as KIN-03, 23.ii.2001.