

Deep-Sea Coral Taxa in the Hawaiian Archipelago and other U.S. Pacific Islands: Depth and Geographical Distribution

by Frank A. Parrish¹, Amy R. Baco-Taylor², Christopher Kelley³, Stephen D Cairns⁴, and Thomas F. Hourigan⁵

1. NOAA Fisheries, Pacific Islands Fisheries Science Center
2. Florida State University, Department of Earth, Ocean, and Atmospheric Science
3. University of Hawaii at Manoa, Hawaii Undersea Research Laboratory
4. Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C.
5. NOAA Deep Sea Coral Research & Technology Program, NOAA Fisheries, Office of Habitat Conservation

This annex to the U.S. Pacific Islands chapter in “State of Deep-Sea Coral and Sponge Ecosystems of the United States” lists deep-sea coral species in the Phylum Cnidaria, Classes Anthozoa and Hydrozoa, known to occur in the U.S. Pacific Islands region (Figure 1). The list covers azooxanthellate, heterotrophic coral species that occur predominantly deeper than 50 m in U.S. waters around the Pacific Islands. Details are provided on depth ranges and known geographic distribution within the region (Table 1). The list is adapted from Parrish and Baco (2007) with the addition of new species and range extensions reported since 2007, along with a number of species previously not included. Lists for octocorals and scleractinians in Hawaii are based primarily on an unpublished list compiled by Dr. Stephen Cairns, with additions from recent NOAA Ship *Pisces* submersible cruises led by Amy Baco-Taylor, and additions for non-Hawaiian islands species based on cited literature. The list for antipatharians from Hawaii relies heavily on the dissertation of Daniel Wagner and recent papers, as well as an unpublished list covering Hawaii and Guam compiled by Dennis Opresko. Taxonomic names are generally those currently accepted in the World Register of Marine Species (<http://www.marinespecies.org>), and are arranged by order, then alphabetically by family, genus, and species. Data sources (references) listed are those principally used to establish geographic and depth distributions.

The species listed are known to occur in the Hawaiian Archipelago, the only U.S. island region that has been extensively surveyed and sampled. The U.S. Pacific Islands encompass an enormous geographic area and several biogeographic provinces. Collections of deep-sea corals from deeper waters of the Hawaiian Archipelago, as well as from elsewhere in the U.S. Pacific, are ongoing. These collections will undoubtedly increase the known number of species and range extensions, and result in a better understanding of the biogeography of deep-sea corals in the Pacific.

Recommended citation: Parrish FA, Baco-Taylor AR, Kelley C, Cairns SD, Hourigan TF (2017) Deep-Sea Coral Taxa in the Hawaiian Archipelago and other U.S. Pacific Islands: Depth and Geographical Distribution. Online resource: <https://deepseacoraldata.noaa.gov/>.

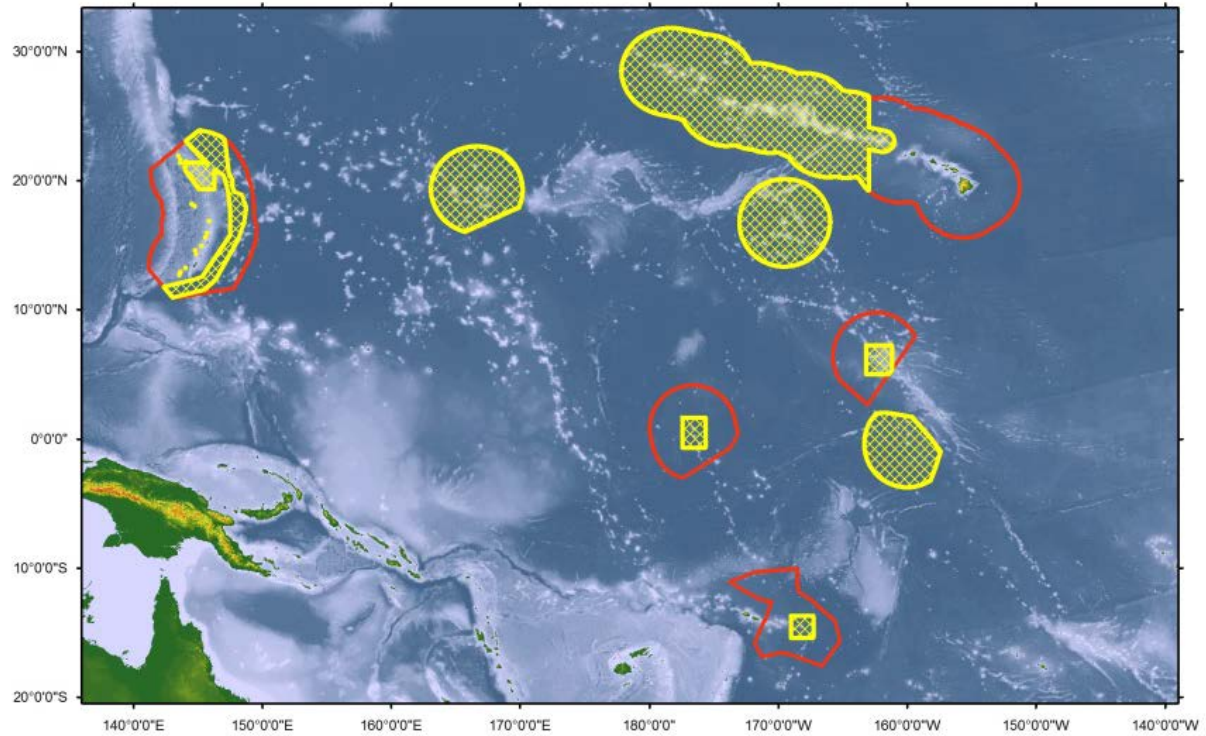


Figure 1. The U.S. Pacific Islands region showing U.S. islands, their exclusive economic zones (red polygons), and Monument boundaries (yellow polygons).

Table 1. List of known deep-sea coral species in the Phylum Cnidaria, Class Anthozoa and Class Hydrozoa, and their reported distributions across the U.S. Pacific Islands. Bold text and blue-shaded fields indicate newly described species, new list additions, or range extensions since Parrish and Baco (2007). No symbols before bold & blue-shaded species names indicate newly described species, asterisks (*) denote new list additions, crosses (†) show name changes, and bold & blue-shaded depth and/or region fields represent range changes. “NR” indicates a lack of reported distribution or depth information. References are numbered to correspond with citations following the table.

Distribution: HI = throughout Hawaiian Archipelago (including Main & Northwestern Hawaiian Islands); MHI = Main Hawaiian Islands; NWHI = Northwestern Hawaiian Islands; JA = Johnston Atoll; CNMI = Commonwealth of the Northern Marianas; Kingman = Kingman Reef; Jarvis = Jarvis Atoll; LI = Line Islands; WI = Wake Island; PA = Palmyra Atoll; AS = American Samoa.

Depth ranges are further designated as follows:

a = depth range known from the full range of the species, including areas outside the U.S. Pacific Islands;

b = depth range known from two or more specimens from the U.S. Pacific Islands (mostly from Hawaii);

c = depth from a single individual from Hawaii, usually the holotype;

d = depth range from the NOAA Deep-Sea Coral and Sponge Database - principally from HURL video observations.

Higher Taxon	Species	Distribution	Depth range (m)	References
Class Anthozoa				
Subclass Hexacorallia				
Order Antipatharia				
Family Antipathidae	<i>Antipathes</i> sp. cf. <i>A. curvata</i> van Pesch, 1914	MHI	5 ^c	1
	<i>Antipathes grandis</i> Verrill, 1928	MHI	27-127 ^a	2,3,4
	*† <i>Antipathes griggi</i> Opresko, 2009 (= cf. <i>Antipathes dichotoma</i>)	HI	9-110 ^b	3,4,5
	<i>Antipathes</i> sp. cf. <i>A. spiculosa</i> (Schultze, 1896)	MHI	40-50	1
	† <i>Cirrhopathes</i> cf. <i>anguina</i> (Dana, 1846) (= <i>Cirrhopathes anguina</i>)	HI, CNMI	2-158 ^b	1,3,4,6,7
	<i>Cirrhopathes spiralis</i> (Linnaeus, 1758)	HI, JA	91-454 ^b	1,7,8
	<i>Stichopathes echinulata</i> Brook, 1889	HI	90-565 ^b	3,4,6
	*? <i>Stichopathes</i> sp.	HI	9-58 ^b	3,4
Family Aphanipathidae	<i>Acanthopathes undulata</i> (van Pesch, 1914)	HI, CNMI	30-490 ^b	1,4,6
	<i>Aphanipathes verticillata mauiensis</i> Opresko et al. 2012	MHI	88-130 ^c	3,4,9
Family Cladopathidae	<i>Trissopathes pseudotristicha</i> Opresko, 2003	HI	326-2730 ^a	1,10
	<i>Trissopathes tetracrada</i> Opresko, 2003	HI	375-2220 ^a	1,10
Family Leiopathidae	*† <i>Leiopathes annosa</i> Wagner & Opresko 2015 (= <i>Leiopathes glaberrima</i> - does not occur in the Pacific)	HI, JA	295-536	11,12
	<i>Leiopathes</i> sp. nov.	MHI	966 ^c	11
Family Myriopathidae	<i>Myriopathes</i> sp. cf. <i>M. japonica</i> (Brook, 1889)	MHI	29-126 ^a	1,13
	<i>Myriopathes</i> cf. <i>ulex</i> (Ellis & Solander, 1786) (= <i>Myriopathes ulex</i>)	HI, Guam	25-364 ^a	3,4,8,14,15
Family Schizopathidae	*† <i>Alternatipathes alternata</i> (Brook, 1889) (= <i>Bathypathes alternata</i> Brook, 1889)	HI, Kingman	417-1809 ^b	1,13,16
	<i>Bathypathes conferta</i> (Brook, 1889)	HI, Kingman	306-1745 ^d	6,12
	<i>Bathypathes patula</i> Brook, 1889	HI	321-1667 ^d	1,13
	* <i>Bathypathes seculata</i> Opresko, 2005	MHI	1761-2056 ^c	1,17
	* <i>Dendrobathypathes</i> sp.	MHI	120 ^c	14
	<i>Dendropathes bacotaylorae</i> Opresko, 2005	HI	408 ^c	1,17
	† <i>Dendropathes intermedia</i> (Brook, 1889) (= <i>Antipathes intermedia</i>)	HI, JA	162-508 ^d	7,17
	* <i>Parantipathes</i> sp.	HI, Kingman	1535-2464	1,7,18
	<i>Stauropathes stauocrada</i> Opresko, 2002	HI, JA	315-1700 ^a	1,19
	<i>Stauropathes</i> sp.	HI	389-2647 ^b	1,16,20
	<i>Umbellapathes helioanthes</i> Opresko, 2005	HI	1205-1383 ^b	1,17
	<i>Umbellapathes</i> sp. nov.	HI, JA	742-2638	1,21,22

Higher Taxon	Species	Distribution	Depth range (m)	References
Order Scleractinia				
Family	<i>Anthemiphyllia macrolobata</i> Cairns, 1999	HI	369 ^c	1,23
Anthemiphylliidae	<i>Anthemiphyllia pacifica</i> Vaughan, 1907	HI, MI	205-296 ^b	1,24,25
Family	<i>Anomocora</i> sp. cf. <i>A. fecunda</i> (Pourtales, 1871)	HI	201-271 ^b	25
Caryophylliidae	<i>Bourneotrochus stellulatus</i> (Cairns, 1984)	HI	274-336 ^b	1,25
	<i>Caryophyllia</i> sp. cf. <i>C. (Caryophyllia) ambrosia</i> Alcock, 1898	HI	56-206 ^b	25
	<i>Caryophyllia (Caryophyllia) atlantica</i> (Duncan, 1873)	HI	1602 ^b	1,24,25
	<i>Caryophyllia (Caryophyllia) hawaiiensis</i> Vaughan, 1907	HI	44-388 ^b	1,24,25
	<i>Caryophyllia (Caryophyllia) marmorea</i> Cairns, 1984	HI	331-337 ^b	1,25
	<i>Caryophyllia (Caryophyllia) octopali</i> Vaughan, 1907	HI	457-627 ^b	1,24,25
	<i>Caryophyllia (Caryophyllia) rugosa</i> Moseley, 1881	HI	137-439 ^b	1,24,25
	<i>Ceratotrochus laxus</i> Vaughan, 1907	HI	583-678 ^b	1,24
	<i>Coenosmilia inordinata</i> Cairns, 1984	HI	244-322 ^b	1,25
	<i>Conotrochus funiculumna</i> (Alcock, 1902)	HI	165-600 ^b	1,25
	<i>Crispatotrochus rubescens</i> (Moseley, 1881)	HI, LI	197-634 ^b	1,24,25
	<i>Deltocyathus</i> sp. cf. <i>D. andamanicus</i> (Alcock, 1898)	HI	274-518 ^b	25
	<i>Desmophyllum dianthus</i> (Esper, 1794)	HI	402-633 ^b 310-505 ^d	1,26,27
	<i>Paracyathus molokensis</i> Vaughan, 1907	HI	161-260 ^b	1,24
	<i>Trochocyathus (Trochocyathus) aithoseptatus</i> Cairns, 1984	HI	371-454 ^b	1,25
	<i>Trochocyathus (Trochocyathus) burchae</i> (Cairns, 1984)	HI	64 ^c	1,25
	<i>Trochocyathus (Trochocyathus) gardineri</i> (Vaughan, 1907)	HI	274-470 ^b	1,24,25
	<i>Trochocyathus (Trochocyathus) mauiensis</i> (Vaughan, 1907)	HI	174-278 ^b	1,24
	<i>Trochocyathus (Trochocyathus) oahensis</i> Vaughan, 1907	HI	75-571 ^b	1,24,25
	<i>Trochocyathus (Trochocyathus) patelliformis</i> Cairns, 1999	HI	1020 ^c	1,23,26
	† <i>Trochocyathus (Trochocyathus) rhombocolumna</i> Alcock, 1902 (= <i>Paracyathus tenuicalyx</i> Vaughan, 1907)	HI	110-530 ^a	1,24,26
Family	<i>Deltocyathus andamanicus</i> Alcock, 1898 (sensu Cairns, 1984)	MHI	315-329 b	1,26,28
Family	<i>Balanophyllia (Balanophyllia) desmophyllioides</i> Vaughan, 1907	HI	143-406 ^b	1,24,26
Dendrophylliidae	<i>Balanophyllia (Balanophyllia) diomedae</i> Vaughan, 1907	HI	110-307 ^b	1,24,25,26
	<i>Balanophyllia (Balanophyllia) gigas</i> Moseley, 1881	HI	90-640 ^a	1,25,26
	<i>Balanophyllia (Balanophyllia) laysanensis</i> Vaughan, 1907	HI	238-271 ^b	1,24,26

Higher Taxon	Species	Distribution	Depth range (m)	References
Family Dendrophylliidae, cont.	<i>Cladopsammia echinata</i> Cairns, 1984	HI	295-470 ^b	1,25,26
	<i>Cladopsammia eguchii</i> (Wells, 1982)	HI	18-64 ^c ,151 ^d	1,26,29
	<i>Eguchipsammia fistula</i> (Alcock, 1902)	HI	282-485 ^b 107-558 ^d	1,26
	<i>Eguchipsammia gaditana</i> (Duncan, 1873)	HI	244-470 ^b	1,25,26
	<i>Eguchipsammia serpentina</i> (Vaughan, 1907)	HI	269-362 ^b	1,24,26
	<i>Enallopsammia rostrata</i> (Pourtalès, 1878)	HI	362-583 ^b	1,25,26
	<i>Endopachys grayi</i> Milne Edwards & Haime, 1848	HI	37-274 ^b	25,26
Family Flabellidae	<i>Flabellum (Flabellum) pavoninum</i> Lesson, 1831	HI	183-517 ^b	1,25
	<i>Flabellum (Flabellum) vaughani</i> Cairns, 1984	HI	232-369 ^b	1,25
	<i>Flabellum (Ulocyathus) marcus</i> Keller, 1974	HI, NW of WI	1261-1602 ^b	1,25,30
	<i>Javania exserta</i> Cairns, 1999	HI	400 ^c	1,26
	† <i>Javania fusca</i> (Vaughan, 1907) (= <i>Javania fuscus</i>)	HI	13-271 ^b	24,26
	<i>Javania insignis</i> Duncan, 1876	HI, LI	52-825 ^b	25,26
	<i>Javania lamprotichum</i> (Moseley, 1880)	HI, JA	244-322 ^b	1,25,26
	<i>Placotrochides minuta</i> Cairns, 2004	HI	119-291 ^c	26,31
	<i>Polymyces wellsii</i> Cairns, 1991	HI	440-858 ^b	26
Family Fungiacyathidae	<i>Fungiacyathus (Bathyactis) fissilis</i> Cairns, 1984	HI	212-503 ^b	1,25
	<i>Fungiacyathus (Fungiacyathus) fragilis</i> Sars, 1872	HI	1762-2056 ^b	25
Family Gardineriidae	<i>Gardineria hawaiiensis</i> Vaughan, 1907	HI	369-541 ^b	1,24,25,26
Family Guyniidae	<i>Guynia annulata</i> Duncan, 1872	HI	64-384 ^b	25,26
Family Micrabaciidae	<i>Letepsammia formosissima</i> (Moseley, 1876)	HI	109-470 ^b	25,26
Family Oculinidae	<i>Madrepora oculata</i> Linnaeus, 1758 (= <i>Madrepora kauaiensis</i> Vaughan, 1907)	HI	362-538 ^b , 627-750 ^b	1,24,25
Family Pocilloporidae	<i>Madracis kauaiensis</i> Vaughan, 1907	HI	362-538 ^b	24,26
Family Stenocyathidae	<i>Stenocyathus vermiformis</i> (Pourtalès, 1868)	HI, S. Pacific Seamounts	439 ^b	25,26
Family Turbinoliidae	<i>Deltocyathoides orientalis</i> (Duncan, 1876)	HI	439-494 ^b	25,26
Order Zoantharia				
Family Parazoanthidae	*† <i>Kulamanamana haumea</i> Sinniger, Ocaña & Baco, 2013 (= <i>Gerardia</i> sp.)	HI	343-577 ^b 165-650 ^d	1,7,32

Higher Taxon	Species	Distribution	Depth range (m)	References
Class Anthozoa				
Subclass Octocorallia				
Order Alcyonacea				
Family Acanthogorgiidae	<i>Acanthogorgia</i> sp. cf. <i>A. paramuricata</i> (Stiasny, 1947)	HI	350-396 ^b	33
	<i>Acanthogorgia</i> sp. cf. <i>A. striata</i> Nutting, 1911	HI	215-564 ^b	33
	<i>Acanthogorgia</i> sp. nov.	HI	NR	34
	<i>Acanthogorgia</i> sp.	HI	1295 ^c	35
	<i>Cyclomuricea flabellata</i> Nutting, 1908	HI	71-396 ^b	1,33,36,37
	<i>Muricella tenera</i> Ridley, 1884	HI	237-2533 ^a	37
Family Alcyoniidae	<i>Anthomastus granulosus</i> Kükenthal, 1910	HI	20-201 ^b	1,38
	† <i>Bathyalcyon robustum</i> (Versluys, 1906) (= <i>Anthomastus robustum</i>)	HI	300-674 ^d	39
	<i>Inflatocalyx</i> sp.	HI	NR	39
	† <i>Pseudoanthomastus fisheri</i> (Bayer, 1952) (= <i>Anthomastus fisheri</i>)	HI, Kingman	356-462 ^b	1,7,12,36,38,40
Family Anthothelidae	<i>Anthothela nuttingi</i> Bayer, 1956	HI, PA, Kingman	340-465, 1387-1820 ^b	1,33,36,41
	<i>Anthothela</i> sp. nov. 1	HI	1319 ^c	18,42
	<i>Anthothela</i> sp. nov. 2	HI	1804 ^c	18,42
Family Chrysogorgiidae	<i>Chrysogorgia arborescens</i> Nutting, 1908	HI	722-914 ^a	1,37
	<i>Chrysogorgia chryseis</i> Bayer & Stefani, 1988	HI	732 ^c	1,35,43
	<i>Chrysogorgia delicata</i> Nutting, 1908	HI	536-1463 ^a	1,37
	<i>Chrysogorgia flavescens</i> Nutting, 1908	HI	1688-1977 ^a	1,37
	<i>Chrysogorgia geniculata</i> (Wright & Studer, 1889)	HI	146-616 ^a	1,37
	* <i>Chrysogorgia lata</i> Versluys, 1902	HI	752 to 871 ^c	1,36
	<i>Chrysogorgia papillosa</i> Kinoshita, 1913	HI	704-1858 ^a	1,33,36
	<i>Chrysogorgia scintillans</i> Bayer & Stefani, 1988	HI	580-2050 ^b	1,36,40,43
	<i>Chrysogorgia stellata</i> Nutting, 1908	HI	649-678 ^a	1,36,37
	<i>Chrysogorgia</i> sp. cf. <i>C. stellata</i> Nutting, 1908	HI	646-675, 830-922 ^a	33,43
	<i>Chrysogorgia</i> sp. nov. (1/3R)	HI	1204 ^c	18,42
	<i>Chrysogorgia</i> sp. nov. (2/5L)	HI	691-742 ^b	24,42
	<i>Iridogorgia bella</i> Nutting, 1908	HI	750-1925 ^b	1,37,40
	* <i>Iridogorgia</i> sp. cf. <i>I. magnispiralis</i> Watling, 2007	HI	445-2467 ^b	21
	<i>Metallogorgia melanotrichos</i> (Wright & Studer, 1889)	HI	(183)-1559 ^a	1,7,36,37,44
	<i>Pleurogorgia militaris</i> Nutting, 1908	HI	2142 ^a	1,37
	<i>Radicipes spiralis</i> (Nutting, 1908)	HI	258 ^b	1,33,36,37
	† <i>Rhodaniridogorgia superba</i> (Nutting, 1908) (= <i>Iridogorgia superba</i>)	HI	704-914 ^a	1,33,36,37,45

Higher Taxon	Species	Distribution	Depth range (m)	References
Family Clavulariidae	† <i>Carijoa</i> sp. (= cf. <i>Carijoa riisei</i>)	Invasive, HI	NR	46
	<i>Clavularia grandiflora</i> (Nutting, 1908)	HI	966 ^a	1,36,37,38
	<i>Telestula corrugata</i> (Nutting, 1908)	HI	914 ^a	1,36,37,38
	<i>Telestula spiculicola</i> (Nutting, 1908)	HI	518-616 ^a	1,36,37,38
	<i>Telestula spiculicola robusta</i> Bayer, 1952	HI	507-519 ^b	1,38
Family Coralliidae	† <i>Corallium tortuosum</i> Bayer, 1956 (= <i>Paracorallium tortuosum</i> (Bayer, 1956))	HI	167-408 ^b (154-630 ^d)	1,33,36,41
	<i>Corallium</i> sp. nov.	HI	NR	18,42
	† <i>Hemicorallium abyssale</i> (Bayer, 1956) (= <i>Corallium abyssale</i>)	HI	1829-2403 ^c (684-1919 ^d)	1,36,41,47,48
	† <i>Hemicorallium ducale</i> (Bayer 1955) (= <i>Corallium ducale</i>)	HI	719-1800 ^d	1,36,47,48,49
	† <i>Hemicorallium imperiale</i> (Bayer 1955) (= <i>Corallium imperiale</i>)	HI	1096 ^c	1,18,36,48,49
	† <i>Hemicorallium laauense</i> (Bayer, 1956) (= <i>Corallium laauense</i>)	HI, Kingman	365-580 ^b (297-1919 ^d)	1,7,33,36,41,48
	† <i>Hemicorallium regale</i> (Bayer, 1956)	HI, PA	365-719 ^b (226-1815 ^d)	1,33,36,41,48
	† <i>Hemicorallium laauense x halmahera</i> (= <i>Corallium laauense x halmahera</i>)	HI	NR	18,42
	† <i>Pleurocorallium kishinouyei</i> (Bayer 1996) (= <i>Corallium kishinouyei</i>)	HI	1145 ^c (300-1807 ^d)	1,36,47,48,50
	† <i>Pleurocorallium niveum</i> (Bayer, 1956) (= <i>Corallium niveum</i>)	HI	232-282 ^c (162-502 ^d)	1,36,41,47,48
	† <i>Pleurocorallium secundum</i> (Dana 1846) (= <i>Corallium secundum</i>)	HI	231-576 ^b (162-590 ^d)	1,7,18,33,36,41,48
	† <i>Pleurocorallium</i> cf. <i>secundum</i> (= <i>Corallium</i> cf. <i>secundum</i>)	HI	NR	18,42
Family Gorgoniidae	<i>Eunicella</i> sp. nov. A	HI	275-495 ^b	33
Family Isididae	<i>Acanella dispar</i> Bayer, 1990	HI	275-445 ^b	1,36,51
	<i>Acanella weberi</i> Nutting, 1910	HI	336-1922 ^a	1,39,52
	<i>Isidella trichotoma</i> Bayer, 1990	HI	1920 ^c	1,36,51
	<i>Isidella</i> sp. "5"	HI	NR	53
	<i>Isidella</i> sp. nov. (lyrate)	HI	1808 ^c	18,42
	<i>Keratoisis flabellum</i> (Nutting, 1908)	HI	346-465 ^b	1,33,36,37
	<i>Keratoisis grandis</i> (Nutting, 1908)	HI	1344-1582 ^a	1,37
	† <i>Keratoisis paucispinosa</i> (Wright & Studer, 1889) (= <i>Lepidisis paucispinosa</i>)	HI	539-631 ^b	1,37,54
	<i>Keratoisis</i> sp. nov.	HI	305-565 ^b	33
	<i>Lepidisis nuda</i> (Wright & Studer, 1889)	HI	NR	33
	<i>Lepidisis olapa</i> Muzik, 1978	HI	215-665 ^b	1,36,54
	<i>Lepidisis</i> sp.	HI	1425 ^c	35

Higher Taxon	Species	Distribution	Depth range (m)	References
Family Keroeidae	<i>Keroeides fallax</i> Bayer, 1956	HI	238-245 ^c	1,36,41
	*<i>Keroeides koreni</i> Wright & Studer, 1889	Marshall Islands	122-168	1
	<i>Keroeides mosaica</i> Bayer, 1956	HI	167-465 ^b	1,33,36,41
	<i>Keroeides pallida</i> Hiles, 1899	HI	146 ^c	1,36,41
Family Nidaliidae	<i>Nidalia</i> sp.	HI	NR	39
	<i>Siphonogorgia alexanderi</i> (Nutting, 1908) (= <i>Siphonogorgia alexandri</i> (alternative spelling))	HI	223-283 ^a	1,36,37,38
	<i>Siphonogorgia collaris</i> Nutting, 1908	HI	144 ^a	1,36,37,38
Family Paragorgiidae	*<i>Paragorgia coralloides</i> Bayer, 1993	HI	3000 ^c	1,55
	† <i>Paragorgia regalis</i> Nutting, 1912 (= <i>Paragorgia dendroides</i>)	HI	490-1910 ^b (299-1956 ^d)	1,36,40,41
	<i>Paragorgia</i> sp. cf. <i>P. regalis</i> Nutting, 1912	HI, AS	350-396 ^b	1,33,39
	<i>Paragorgia</i> sp. nov.	HI	350-396 ^b	33
Family Plexauridae	<i>Anthomuricea</i> sp. cf. <i>A. divergens</i> Kükenthal, 1919	HI	381-426 ^b	33,36
	<i>Anthomuricea</i> sp. cf. <i>A. reticulata</i> Nutting, 1910	HI	362-421 ^b	33,36,52
	<i>Anthomuricea tenuispina</i> Nutting, 1908	HI	428-531, 581-688 ^b	1,33,36,37
	<i>Anthomuricea</i> sp. nov. A	HI	NR	34
	<i>Bebryce brunnea</i> (Nutting, 1908)	HI	167-396 ^b	1,33,36,37
	<i>Bebryce</i> sp. nov.	HI	NR	34
	<i>Muriceides tenuis</i> (Nutting, 1908)	HI	232-362 ^a	34,36,37
	New genus, sp. nov.	HI	NR	34
	<i>Paracis horrida</i> (Thomson & Henderson, 1906) (= <i>Paracis spinifera</i>)	HI	350-396 ^b	1,7,33,34,36, 56
	<i>Paracis miyajimai</i> (Kinoshita, 1909)	HI	362-531 ^b	1,33,36
	<i>Paramuricea hawaiiensis</i> Nutting, 1908 (= <i>Paramuricea hawaiiensis</i> (alternative spelling))	HI	350-396, 924-1241 ^b	36,37,52
	<i>Placogorgia</i> sp.	HI	335-375 ^b	33
	<i>Placogorgia</i> sp. cf. <i>P. dendritica</i> Nutting, 1910	HI	350-396 ^b	33,52
	† <i>Placogorgia</i> sp. cf. <i>P. orientalis</i> Thomson & Henderson, 1906 (= cf. <i>Pseudothesea orientalis</i>)	HI	147, 350- 396 ^b	33
	† <i>Placogorgia</i> sp. cf. <i>P. placoderma</i> (Nutting, 1910) (= <i>Pseudothesea placoderma</i>)	HI	73, 182 ^b	33,36,52
	<i>Swiftia</i> sp. nov. 1	HI	340-365 ^b	1,33
	<i>Swiftia</i> sp. nov. 2	HI	350-396 ^b	33
	<i>Swiftia pacifica</i> (Nutting, 1912)	HI	NR	34
	<i>Thesea</i> sp. nov. (= <i>Filigella</i> sp. nov.)	HI	NR	34
	<i>Thesea</i> sp. cf. <i>T. ramosa</i> (Nutting 1912) (= cf. <i>Elasmogorgia ramosa</i>)	HI	313-399 ^b	1,33,36,52
	<i>Villogorgia arbuscula</i> (Gray, 1889)	HI	315-412 ^b	33
	*<i>Villogorgia tenuis</i> (Nutting, 1908)	HI	NR	34,36
	<i>Villogorgia</i> sp. nov. 1	HI	350-396 ^b	33
<i>Villogorgia</i> sp. nov. 2	HI	350-396 ^b	33	

Higher Taxon	Species	Distribution	Depth range (m)	References
Family Primnoidae	<i>Callogorgia formosa</i> Kükenthal, 1907	HI	296-750	1,36,57,58
	<i>Callogorgia gilberti</i> (Nutting, 1908)	HI	215-960 ^b	1,33,36,37,57
	*<i>Callogorgia robusta</i> (Versluys, 1906)	HI	830-1050	1,36,57
	<i>Callogorgia</i> sp. nov.	HI	350-396 ^b	33
	<i>Calyptrophora agassizii</i> Studer, 1894	HI	781-1145 ^b	33
	<i>Calyptrophora alpha</i> Cairns 2009	HI	1078-1220	1,36,59
	<i>Calyptrophora angularis</i> (Nutting, 1908)	HI	366-430 (MHI), 1498-1723 (NWHI), 1207-3292 ^a	1,33,36,37,59
	<i>Calyptrophora clarki</i> Bayer, 1951	HI	808-1105	1,36,59,60
	<i>Calyptrophora pileata</i> Cairns 2009 (includes specimens previously identified as <i>Calyptrophora japonica</i>)	HI	227-244	1,36,59
	<i>Calyptrophora wyvillei</i> Wright, 1885	HI	784-823 ^a	1,36,37,59
	<i>Calyptrophora</i> sp. nov.	HI	344-454 ^b	33
	<i>Candidella gigantea</i> (Wright & Studer, 1889)	HI	1608-1802	1,36,57,59
	<i>Candidella helminthophora</i> (Nutting, 1908)	HI	417-1801	1,33,36,37,59
	<i>Fanellia euthyeia</i> Bayer & Stefani, 1989	HI	305-419	1,36,57,61
	<i>Fanellia medialis</i> Bayer & Stefani, 1989	HI	395-1028	1,36,57,61
	<i>Fanellia tuberculata</i> (Versluys, 1906)	HI	128-400	1,36,57,58
	<i>Narella alata</i> Cairns & Bayer, 2007 [2008]	HI	477-750	1,62
	<i>Narella bowersi</i> (Nutting, 1908)	HI	1218-(1758), 1937 ^a	1,33,35,36,37, 62
	<i>Narella dichotoma</i> (Versluys, 1906) (Includes <i>Narella nuttingi</i> Bayer, 1997)	HI	743-1448	1,36,62
	<i>Narella gigas</i> Cairns & Bayer, 2007 [2008]	HI	302-399	1,36,62
	<i>Narella hawaiiensis</i> Cairns & Bayer, 2007 [2008]	HI	1492-1921	1,36,62
	<i>Narella macrocalyx</i> Cairns & Bayer, 2007 [2008]	HI	1206-1807	1,36,62
	<i>Narella muzikae</i> Cairns & Bayer, 2007 [2008]	HI	326-381	1,36,62
	<i>Narella ornata</i> Bayer, 1995	HI	748-1007 ^c	1,36,62,63
	<i>Narella vermifera</i> Cairns & Bayer, 2007	HI	275-527	1,36,62
	<i>Paracalyptrophora echinata</i> Cairns, 2009	HI	708-1475 ^b	1,36,59
	<i>Paracalyptrophora hawaiiensis</i> Cairns, 2009	HI	320-444 ^b (970)	1,36,59
	<i>Parastenella bayeri</i> Cairns, 2010	HI	517 ^c	1,36,57
	†<i>Plumarella circumoperculum</i> Cairns, 2010 (= <i>Thouarella regularis</i>)	HI	432-1373 ^b	1,36,57
	<i>Thouarella (Diplocalytra) biserialis</i> (Nutting, 1908)	HI	73-426 ^b	33,36,57
*<i>Thouarella (Euthouarella) hilgendorfi</i> (Studer, 1879)	HI	174-750 ^b	1,36,57	

Higher Taxon	Species	Distribution	Depth range (m)	References
Order Pennatulacea				
Family Anthoptilidae	<i>Anthoptilum murrayi</i> K�lliker, 1880	HI	426-2286 ^a	1,37
Family Chunellidae	<i>Calibelemnon symmetricum</i> Nutting, 1908	HI	196-1650 ^b	1,37,40
Family Echinoptilidae	<i>Echinoptilum macintoshi</i> Hubrecht, 1885	HI	225-232 ^a	1,37
Family Funiculinidae	<i>Funiculina</i> sp.	HI	254-1940 ^b	40
Family Halipteridae	<i>Halipteris willemoesi</i> K�lliker, 1870	HI	NR	62
Family Kophobelemnidae	<i>Kophobelemnon</i> sp. (short stemmed)	HI	NR	18,42
Family Pennatulidae	*<i>Pennatula inflata</i> K�kenthal, 1910	HI	252-1202 ^d	39
	<i>Pennatula pearceyi</i> K�lliker, 1880	HI	1033 ^a	1,37
Family Umbellulidae	† <i>Umbellula lindahli</i> (K�lliker, 1880) (= <i>Umbellula jordani</i> Nutting, 1908)	HI	704-2403 ^a	1,37
Family Virgulariidae	<i>Virgularia abies</i> K�lliker, 1870	HI	223 ^a	1

Higher Taxon	Species	Distribution	Depth range (m)	References
Phylum Cnidaria				
Class Hydrozoa				
Order Anthoathecata				
Family Stylasteridae	<i>Crypthelia kelleyi</i> (Cairns 2017)	HI	2116	1,64
	<i>Distichopora anceps</i> Cairns, 1978	HI	360-577 ^b	1,65,66
	<i>Distichopora asulcata</i> Cairns, 2005	HI	293-377 ^b	1,66
	<i>Stylaster griggi</i> Cairns, 2005	HI	322-583 ^b (237-583 ^d)	1,66
	<i>Stylaster infundibuliferus</i> Cairns, 2005	HI	521-563 ^b	1,66

Literature Cited

Parrish FA, Baco AR (2007) State of Deep Coral Ecosystems in the U.S. Pacific Islands Region: Hawaii and the U.S. Pacific Territories. In: Lumsden SE, Hourigan TF, Bruckner AW, and G. Dorr (eds) The State of Deep Coral Ecosystems of the United States. NOAA Technical Memorandum CRCP-3. Silver Spring, MD

References

1. National Museum of Natural History (NMNH) (2016) Invertebrate Zoology Collections - Online Collection Database; Accessed 01/20/2016. US National Museum of Natural History, Smithsonian Institution, Washington D.C.
2. Wagner D, Brugler MR, Opresko DM, France SC, Montgomery AD, Toonen RJ (2010) Using morphometrics, in situ observations and genetic characters to distinguish among commercially valuable Hawaiian black coral species; a redescription of *Antipathes grandis* Verrill, 1928 (Antipatharia : Antipathidae). *Invertebrate Systematics* 24:271–290
3. Wagner D (2015) The spatial distribution of shallow-water (<150 m) black corals (Cnidaria: Antipatharia) in the Hawaiian Archipelago. *Marine Biodiversity Records* 8
4. Wagner D (2015) A taxonomic survey of the shallow-water (<150 m) black corals (Cnidaria: Antipatharia) of the Hawaiian Islands. *Frontiers in Marine Science* 2
5. Opresko DM (2009) A new name for the Hawaiian antipatharian coral formerly known as *Antipathes dichotoma* (Cnidaria: Anthozoa: Antipatharia). *Pacific Science* 63:277-291
6. Grigg RW, Opresko DM (1977) Order Antipatharia, black corals. In: Devaney DM, Eldredge LG (eds) Reef and Shore Fauna of Hawaii Section 1: Protozoa through Ctenophora. Bishop Museum Press, Honolulu
7. Bernice P. Bishop Museum Invertebrate Zoology Collection.
8. Grigg RW, Eldredge LG (1975) The commercial potential of precious corals in Micronesia. Part 1: The Mariana Islands. Sea Grant Publication Guam University Marine Laboratory 75:01
9. Opresko DM, Wagner D, Montgomery AD, Brugler MR (2012) Discovery of *Aphanipathes verticillata* (Cnidaria: Anthozoa: Antipatharia) in the Hawaiian Islands. *Zootaxa* 3348:24-39
10. Opresko DM (2003) Revision of the Antipatharia (Cnidaria: Anthozoa). Part III. Cladopathidae. *Zool Med Leiden* 77:495-536
11. Wagner D, Opresko DM (2015) Description of a new species of *Leiopathes* (Antipatharia: Leiopathidae) from the Hawaiian Islands. *Zootaxa* 3974:277-289
12. Molodtsova TN (2013) Deep-sea mushroom soft corals (Octocorallia: Alcyonacea: Alcyoniidae) of the Northern Mid-Atlantic Ridge. *Mar Biol Res* 9:488-515
13. Brook G (1889) Report on the Antipatharia. Report of the scientific results of the voyage of the H.M.S. Challenger. *Zoology* 32:1-222
14. Wagner D (2011) The Biology and Ecology of Hawaiian Black Corals (Cnidaria: Anthozoa: Hexacorallia: Antipatharia). Ph.D., University of Hawaii, Honolulu, HI
15. Wagner D, Papastamatiou YP, Kosaki RK, Gleason KA, McFall GB, Boland RC, Pyle RL, Toonen RJ (2011) New Records of Commercially Valuable Black Corals (Cnidaria: Antipatharia) from the Northwestern Hawaiian Islands at Mesophotic Depths. *Pacific Science* 65:249-255
16. Hawaii Undersea Research Laboratory (2003) Pisces Cruise 2003 HURL database.
17. Opresko DM (2005) New genera and species of antipatharian corals (Cnidaria: Anthozoa) from the North Pacific. *Zool Med Leiden* 79-2:129-165
18. Opresko D (2015) Unpublished ID of specimen from Okeanos Explorer cruise in 2015 (USNM 1404491).
19. Opresko DM (2002) Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zool Med Leiden* 76:410-442
20. Opresko D (2015) Unpublished ID of specimens from Okeanos Explorer cruise in 2015 (USNM 1404493 & 1404497).
21. Hawaii Undersea Research Laboratory (2004) Pisces Cruise 2004 HURL database.
22. Opresko D (2015) Unpublished ID of specimens from Okeanos Explorer cruise in 2015 (USNM invertebrate collection database 1404092 & 1404492).
23. Cairns SD (1999) Cnidaria Anthozoa: Deep-Water azooxanthellate Scleractinia from Vanuatu, and Wallis and Futuna Islands. *Memoires du Museum National d'histoire Naturelle* 180:31-167
24. Vaughan TW (1907) Recent Madreporaria of the Hawaiian Islands and Laysan. *Bulletin of the United States*

National Museum 59:79-80

25. Cairns SD (1984) New records of ahermatypic corals (Scleractinia) from the Hawaiian and Line Islands. Bishop Museum Occasional Papers 25:1-30
26. Cairns SD (2006) New Records of Azooxanthellate Scleractinia from the Hawaiian Islands. Bishop Museum Occasional Papers 87:45-53
27. Cairns SD (1994) Scleractinia of the Temperate North Pacific. Smithsonian Contributions to Zoology 557:1-150
28. Cairns SD, Zibrowius H (1997) Cnidaria Anthozoa: azooxanthellate Scleractinia from the Philippine and Indonesian regions. *Memoires du Museum National d'histoire Naturelle* 172:27-243
29. Wells JW (1982) Notes on Indo-Pacific scleractinian corals. Part 9. New corals from the Galapagos Islands. *Pacific Science* 36:211-220
30. Keller NB (1974) New data about some species of Madreporarian corals of the genus *Flabellum*. *Trudy Instituta Okeanologii* 98:199-212
31. Feinstein N, Cairns SD (1998) Learning from the collector: a survey of azooxanthellate corals affixed by *Xenophora* (Gastropoda; Xenophoridae), with an analysis and discussion of attachment patterns. *The Nautilus* 112:73-832
32. Sinniger F, Ocana OV, Baco AR (2013) Diversity of zoanthids (Anthozoa: Hexacorallia) on Hawaiian seamounts: description of the Hawaiian gold coral and additional zoanthids. *Plos One* 8:e52607
33. Grigg RW, Bayer FM (1976) Present Knowledge of the Systematics and Zoogeography of the Order Gorgonacea in Hawaii. *Pacific Science* 30:167-175
34. Muzik K (1979) A systematic revision of the Hawaiian Paramuriciidae and Plexauridae (Coelenterata: Octocorallia). Ph.D., University of Miami, Coral Gables, Florida
35. Berntson EA, Bayer FM, McArthur AG, France S (2001) Phylogenetic relationships within the Octocorallia (Cnidaria: Anthozoa) based on nuclear 18s rRNA sequences. *Mar Biol* 138:235-246
36. Watling L, France SC, Pante E, Simpson A (2011) Biology of deep-water octocorals. *Adv Mar Biol* 60:41-122
37. Nutting CC (1908) Descriptions of the Alcyonaria Collected by the U. S, Bureau of Fisheries Steamer Albatross in the Vicinity of the Hawaiian Islands in 1902. *Proceeding of the US National Museum Vol. 34:1624:543-601*
38. Bayer FM (1952) Descriptions and redescrptions of the Hawaiian octocorals collected by the U.S. Fish Commission Steamer "Albatross" 1. Alcyonacea, Stolonifera, and Telestacea. *Pacific Science* 6:126-136
39. Hawaii Undersea Research Laboratory HURL Database.
40. Chave EH, Malahoff A (1998) In *Deeper Waters: Photographic Studies of Hawaiian Deep-Sea Habitats and Life-Forms*. University of Hawaii Press, Honolulu, Hawaii
41. Bayer FM (1956) Descriptions and redescrptions of the Hawaiian octocorals collected by the U.S. Fish Commission Steamer "Albatross" (2. Gorgonacea: Scleraxonia). *Pacific Science* 10:67-95
42. Hawaii Undersea Research Laboratory Preliminary identification provided by Cairns, SD, National Museum of Natural History, Smithsonian Institution.
43. Bayer F, Stefani J (1988) A new species of *Chrysogorgia* (Octocorallia: Gorgonacea) from New Caledonia, with descriptions of some other species from the Western Pacific. *Proceedings of the Biological Society of Washington* 101:257-279
44. Pante E, France SC, Couloux A, Cruaud C, McFadden CS, Samadi S, Watling L (2012) Deep-sea origin and in-situ diversification of chrysogorgiid octocorals. *Plos One* 7:e38357
45. Watling L (2007) A review of the genus *Iridogorgia* (Octocorallia: Chrysogorgiidae) and its relatives, chiefly from the North Atlantic Ocean. *Journal of the Marine Biological Association of the UK* 87:393
46. Kahng SE, Grigg RW (2005) Impact of an alien octocoral, *Carijoa riisei*, on black corals in Hawaii. *Coral Reefs* 24:556-562
47. Bayer FM Unpublished notes.
48. Figueroa DF, Baco AR (2014) Complete mitochondrial genomes elucidate phylogenetic relationships of the deep-sea octocoral families Coralliidae and Paragorgiidae. *Deep Sea Research Part II: Topical Studies in Oceanography* 99:83-91
49. Bayer FM (1955) Contributions to the nomenclature, systematics, and morphology of the Octocorallia. *Proceedings of the United States National Museum* 105:207-220
50. Bayer FM (1996) Three new species of precious coral (Anthozoa: Gorgonacea, Genus *Corallium*) from Pacific waters. *Proceedings of the Biological Society of Washington* 109:205-228
51. Bayer FM (1990) A new Isidid octocoral (Anthozoa: Gorgonacea) from New Caledonia, with descriptions of other new species from elsewhere in the Pacific Ocean. *Proceedings of the Biological Society of Washington* 103:205-228
52. Nutting CC (1910) The Gorgonacea of the Siboga expedition. VI. The Gorgonellidae. *Siboga Expedition*

Monographs 13b:1-39

53. Muzik K Notes on an unpublished museum identification.
54. Muzik K (1978) A bioluminescent gorgonian, *Lepidisis olapa*, new species (Coelenterata: Octocorallia), from Hawaii. *Bulletin of Marine Science* 28:735-741
55. Bayer FM (1993) Two new species of the gorgonacean genus *Paragorgia* (Coelenterata: Octocorallia). *Precious Corals & Octocoral Research* [Tokyo] 2:1-40
56. Nutting CC (1912) Descriptions of the Alcyonaria collected by the U. S. Fisheries Steadier "Albatross," mainly in Japanese waters, during 1906. *Proceeding of the US National Museum* 43
57. Cairns SD (2010) Review of Octocorallia (Cnidaria: Anthozoa) from Hawai'i and adjacent seamounts. Part 3: genera *Thouarella*, *Plumarella*, *Callogorgia*, *Fanellia*, and *Parastenella*. *Pacific Science* 64:413-440
58. Bayer FM (1982) Some new and old species of the primnoid genus *Callorgorgia* Gray, with revalidation of the related genus *Fanelia* Gray (Coelenterata: Anthozoa). *Proceedings of the Biological Society of Washington* 95:413-448
59. Cairns SD (2009) Review of Octocorallia (Cnidaria: Anthozoa) from Hawai'i and Adjacent Seamounts. Part 2: Genera *Paracalyptrophora* Kinoshita, 1908; *Candidella* Bayer, 1954; and *Calyptrophora* Gray, 1866. *Pacific Science* 63:413-448
60. Bayer FM (1951) Two new primnoid corals of the subfamily Calyptrophorinae (Coelenterata: Octocorallia). *Journal of the Washington Academy of Sciences* 41:40-43
61. Bayer F, Stefani J (1989) Primnoidae (Gorgonacea) de Nouvelle-Caledonie. *Bulletin du Musee d'Histoire Naturelle de Paris* 10:449-518
62. Cairns SD, Bayer FM (2008) A review of the Octocorallia (Cnidaria: Anthozoa) from Hawai'i and adjacent seamounts: the genus *Narella* Gray, 1870. *Pacific Science* 62:83-115
63. Bayer FM (1955) A new species of the gorgonacean genus *Narella* (Anthozoa: Octocorallia) from Hawaiian waters. *Proceedings of the Biological Society of Washington* 108:147-152
64. Cairns SD (2017) New Species of Stylasterid (Cnidaria: Hydrozoa: Anthoathecata: Stylasteridae) from the Northwestern Hawaiian Islands. *Pacific Science* 71:77-81
65. Cairns SD (1978) *Distichopora* (Haplomerismos) *anceps*, a new Stylasterine coral (Coelenterata: Stylasterina) from deep water off the Hawaiian Islands. *Micronesica* 14:83-87
66. Cairns SD (2005) Revision of the Hawaiian Stylasteridae (Cnidaria: Hydrozoa: Athecata). *Pacific Science* 59:439-451