

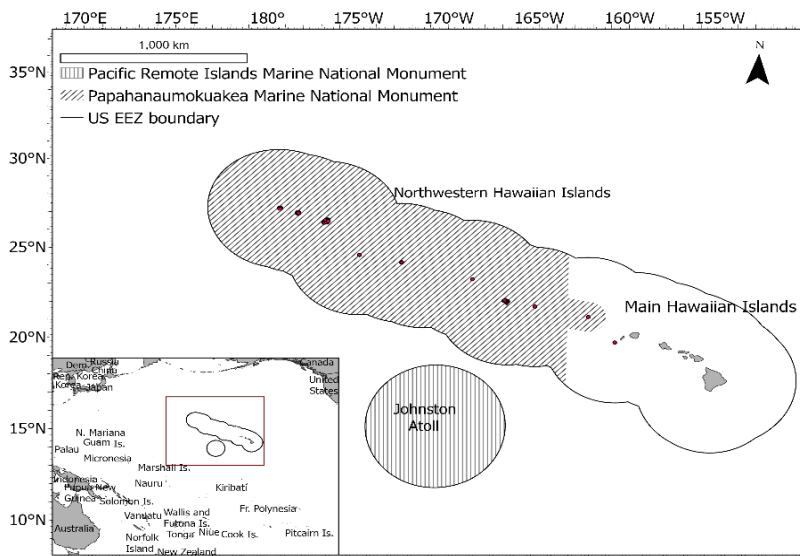
# Deep-Sea Coral Taxa in the Hawaiian Archipelago and Johnston Atoll: Depth and Geographical Distribution (v. 2020)

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This annex to the U.S. Pacific Islands chapter in “The State of Deep-Sea Coral and Sponge Ecosystems of the United States” (Parrish et al. 2017a) provides a revised and updated list of deep-sea coral taxa in the Phylum Cnidaria,

Classes Anthozoa and Hydrozoa, known to occur in U.S. waters around the Hawaiian Archipelago and Johnston Atoll (Figure 1). Deep-sea corals are defined as azooxanthellate, heterotrophic coral species occurring predominantly in waters 50 meters deep or more. Details are provided on the vertical distribution and reported occurrence in the Main Hawaiian Islands, Northwestern Hawaiian Islands, and Johnston Atoll (Table 1). Taxonomic names are generally those currently accepted in the World Register of Marine Species ([WoRMS](http://WoRMS)), and are arranged by order, and alphabetically within order by suborder (if applicable), family, genus, and species. Data sources (references) listed are those principally used to establish geographic and depth distribution.



**Figure 1.** The Hawaiian Archipelago and Johnston Atoll, showing the U.S. exclusive economic zone, and marine national monument areas around the Northwestern Hawaiian Islands (Papahānaumokuākea Marine National Monument) and the Johnston Atoll Unit of the Pacific Remote Islands Marine National Monument.

This list is an update of the peer-reviewed 2017 list (Parrish et al. 2017b) and includes taxa recognized through 2020. The 2017 list included some records from other U.S. Pacific Island jurisdictions in different biogeographic regions; separate lists are now being prepared for these jurisdictions. Taxa from the 2017 list with incomplete taxonomy reported in the older literature have been removed if we were unable to locate associated specimens. New taxa listed are primarily the result of deepwater surveys in the Hawaiian Archipelago and Johnston Atoll during

NOAA Ship *Okeanos Explorer* expeditions. Records, metadata and in some cases photos of these taxa are available from NOAA's National Database for Deep-Sea Corals and Sponges (NOAA 2020).

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<https://deepseacoraldata.noaa.gov/library/2020-regional-deep-sea-coral-species-list>.

**Table 1.** List of known deep-sea coral species in the Phylum Cnidaria, Class Anthozoa and Class Hydrozoa, and their reported distributions in U.S. waters around the Hawaiian Archipelago and Johnston Atoll. Blue shaded fields indicate newly described species since 2017. Bold text indicates changes to the list found in Parrish et al. (2017b), including additions or range extensions, denoted with an asterisk (\*), and changes in taxonomy since 2017, denoted with a cross (†) (e.g., species that were listed in 2017, but have since been given a new name or alternative spelling). 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; and JA = Johnston Atoll.

Depth ranges are further designated as follows:

a = depth range known from the full range of the species, including areas outside the Hawaii/Johnston region;

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 or Johnston Atoll, often the holotype; and

d = depth range supplemented with records from the NOAA Deep-Sea Coral and Sponge Database – principally from video annotations.

Higher Taxon	Species	Distribution	Depth Range (m)	References
<b>Class Anthozoa</b>				
<b>Subclass Hexacorallia</b>				
<b>Order Antipatharia</b>				
Family Antipathidae	<i>Antipathes</i> sp. cf. <i>A. curvata</i> van Pesch, 1914	MHI	52-55 <sup>c</sup>	1
	<i>Antipathes grandis</i> Verrill, 1928	MHI	27-127 <sup>a</sup>	2,3,4
	<i>Antipathes griggi</i> Opresko, 2009 (= <i>Antipathes</i> cf. <i>dichotoma</i> Pallas, 1766)	HI	9-110 <sup>b</sup>	3,4,5
	<b>*<i>Antipathes</i> sp. cf. <i>A. leptocrada</i> Opresko, 2015</b>	NWHI	405 <sup>c</sup>	1
	<i>Antipathes</i> sp. cf. <i>A. spiculosa</i> (Schultze, 1896)	MHI	40-50	1
	<b><i>Antipathes sylospongia</i> Opresko &amp; Wagner 2020<sup>A</sup></b>	HI, JA	1229-2065	1,6
	<i>Cirrhipathes</i> sp. cf. <i>C. anguina</i> (Dana, 1846)	HI, JA	2-158 <sup>b</sup>	1,3,4,7,8
	<i>Cirrhipathes spiralis</i> (Linnaeus, 1758)	HI, JA	91-454 <sup>b</sup>	1,8
	<b>*<i>Pseudocirrhipathes</i> sp.</b>	HI	108-457 <sup>b</sup>	1
	<i>Stichopathes echinulata</i> Brook, 1889	HI	90-565 <sup>b</sup>	3,4,7
	<b>*<i>Stichopathes spiessi</i> Opresko &amp; Genin, 1990</b>	MHI	1774-1836 <sup>d</sup>	1
	? <i>Stichopathes</i> sp.	HI, JA	9-61 <sup>b</sup>	3,4
Family Aphanipathidae	<i>Acanthopathes undulata</i> (van Pesch, 1914)	HI	30-490 <sup>b</sup>	1,4,7
	<i>Aphanipathes verticillata mauiensis</i> Opresko et al. 2012	MHI	88-130 <sup>c</sup>	3,4,9

Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Cladopathidae	<i>*Heteropathes</i> sp. cf. <i>H. americana</i> (Opresko, 2003)	NWHI, JA	1956-2573 <sup>d</sup>	1,10,11
	<i>*Heteropathes</i> sp. cf. <i>H. pacifica</i> (Opresko, 2005)	NWHI, JA	1680-2530 <sup>d</sup>	10,11
	<i>*Hexapathes</i> sp.	NWHI, JA	1667-2008 <sup>d</sup>	10,11
	<i>Trissopathes pseudotrística</i> Opresko, 2003	HI	326-2730 <sup>a</sup>	1,12
	<i>Trissopathes tetracrada</i> Opresko, 2003	HI	375-2220 <sup>a</sup>	1,12
	<i>*Trissopathes</i> sp. cf. <i>T. trística</i> (van Pesch, 1914)	NWHI, JA	1973-2128 <sup>d</sup>	1,10
Family Leiopathidae	<i>Leiopathes annosa</i> Wagner & Opresko 2015	HI, JA	295-536	13,14
	<i>Leiopathes</i> sp. nov.	MHI	966 <sup>c</sup>	13
Family Myriopathidae	<i>*Antipathella</i> sp. cf. <i>A. subpinnata</i> (Ellis & Solander, 1786)	MHI	315-410 <sup>b</sup>	1
	<i>Myriopathes</i> sp. cf. <i>M. japonica</i> (Brook, 1889)	MHI	29-126 <sup>a</sup>	1,15
	<i>Myriopathes</i> sp. cf. <i>M. ulex</i> (Ellis & Solander, 1786) (= <i>Myriopathes ulex</i> )	HI	25-364 <sup>a</sup>	3,4,16,17
Family Schizopathidae	<i>Alternatipathes alternata</i> (Brook, 1889) (= <i>Bathypathes alternata</i> Brook, 1889)	HI	417-1809 <sup>b</sup>	1,14,15
	<i>Alternatipathes venusta</i> Opresko & Wagner 2020	MHI	2638 <sup>c</sup>	1,6
	<i>Bathypathes conferta</i> (Brook, 1889)	HI, JA	306-1745 <sup>d</sup>	7,8,14
	<i>Bathypathes patula</i> Brook, 1889 <sup>b</sup> (includes <i>Bathypathes seculata</i> Opresko, 2005)	HI, JA	321-1667 <sup>d</sup>	1,10,15
	<i>Dendropathes bacotaylorae</i> Opresko, 2005	HI	408 <sup>c</sup>	1,18
	<i>Dendropathes intermedia</i> (Brook, 1889) (= <i>Antipathes intermedia</i> )	MHI	162-508 <sup>d</sup>	8,18
	<i>*Lillipathes</i> sp. <sup>c</sup>	HI, JA	359-2464 <sup>d</sup>	1,14
	<i>Parantipathes</i> sp.	HI, JA	1535-2464	1,8,10
	<i>Stauropathes stauocrada</i> Opresko, 2002	HI, JA	315-1700 <sup>a</sup>	1,19
	<i>Stauropathes</i> sp. <sup>c</sup>	HI	389-2647 <sup>b</sup>	1,14
	<i>Umbellapathes helioanthes</i> Opresko, 2005	HI	1205-1383 <sup>b</sup>	1,18
	<i>Umbellapathes litocrada</i> Opresko & Wagner 2020	NWHI, JA	1504-2413 <sup>b</sup>	1,6
Stylopathidae	<i>*Tylopathes</i> sp.	HI	340-423	1

Higher Taxon	Species	Distribution	Depth Range (m)	References
<b>Order Scleractinia</b>				
Family Anthemiphylliidae	<i>Anthemiphyllia macrolobata</i> Cairns, 1999	HI	369 <sup>c</sup>	1,20
	<i>Anthemiphyllia pacifica</i> Vaughan, 1907	HI	205-296 <sup>b</sup>	1,21,22
Family Caryophylliidae	<i>Anomocora</i> sp. cf. <i>A. fecunda</i> (Pourtalès, 1871)	HI	201-271 <sup>b</sup>	22
	<i>Bourneotrochus stellulatus</i> (Cairns, 1984) (= <i>Deltocyathus stellulatus</i> Cairns, 1984)	HI	274-336 <sup>b</sup>	1,22
	<i>Caryophyllia</i> sp. cf. <i>C. (Caryophyllia) ambrosia</i> Alcock, 1898	HI	56-206 <sup>b</sup>	22
	† <i>Caryophyllia (Caryophyllia)</i> sp. cf. <i>C. atlantica</i> (Duncan, 1873)	HI, JA	1602 <sup>b</sup>	1,21,22
	<i>Caryophyllia (Caryophyllia) hawaiiensis</i> Vaughan, 1907	HI	44-388 <sup>b</sup>	1,21,22
	<i>Caryophyllia (Caryophyllia) marmorea</i> Cairns, 1984	HI	331-337 <sup>b</sup>	1,22
	<i>Caryophyllia (Caryophyllia) octopali</i> Vaughan, 1907	HI	457-627 <sup>b</sup>	1,21,22
	<i>Caryophyllia (Caryophyllia) rugosa</i> Moseley, 1881	HI	137-439 <sup>b</sup>	1,21,22
	<i>Ceratotrochus laxus</i> Vaughan, 1907	HI	583-678 <sup>b</sup>	1,21
	<i>Coenosmilia inordinata</i> Cairns, 1984	HI	244-322 <sup>b</sup>	1,22
	<i>Conotrochus funiculumna</i> (Alcock, 1902)	HI	165-600 <sup>b</sup>	1,22
	<i>Crispatotrochus rubescens</i> (Moseley, 1881)	HI	197-634 <sup>b</sup>	1,21,22
	<i>Desmophyllum dianthus</i> (Esper, 1794)	HI, JA	310-633 <sup>b,d</sup>	1,10,23,24
	<i>Paracyathus molokensis</i> Vaughan, 1907	HI	161-260 <sup>b</sup>	1,21
	<i>Solenosmilia variabilis</i> Duncan, 1873	NWHI	650-729 <sup>b</sup>	1,25
	<i>Trochocyathus (Trochocyathus) aithoseptatus</i> Cairns, 1984	HI	371-454 <sup>b</sup>	1,22
	<i>Trochocyathus (Trochocyathus) burchae</i> (Cairns, 1984)	HI	64 <sup>c</sup>	1,22
	<i>Trochocyathus (Trochocyathus) gardineri</i> (Vaughan, 1907)	HI	274-470 <sup>b</sup>	1,21,22
	<i>Trochocyathus (Trochocyathus) mauiensis</i> (Vaughan, 1907)	HI	174-278 <sup>b</sup>	1,21
	<i>Trochocyathus (Trochocyathus) oahensis</i> Vaughan, 1907	HI	75-571 <sup>b</sup>	1,21,22
<i>Trochocyathus (Trochocyathus) patelliformis</i> Cairns, 1999	HI	1020 <sup>c</sup>	1,20,23	
<i>Trochocyathus (Trochocyathus) rhombocolumnna</i> Alcock, 1902 (= <i>Paracyathus tenuicalyx</i> Vaughan, 1907)	HI	110-530 <sup>a</sup>	1,21,23	
Family Deltocyathidae	<i>Deltocyathus</i> sp. cf. <i>D. andamanicus</i> Alcock, 1898 (sensu Cairns, 1984)	MHI	315-329 <sup>b</sup>	1,22,23,26
Family Dendrophylliidae	<i>Balanophyllia (Balanophyllia) desmophyllioides</i> Vaughan, 1907	HI	143-406 <sup>b</sup>	1,21,23
	<i>Balanophyllia (Balanophyllia) diomedeeae</i> Vaughan, 1907	HI	110-307 <sup>b</sup>	1,21,22,23
	<i>Balanophyllia (Balanophyllia) gigas</i> Moseley, 1881	HI	90-640 <sup>a</sup>	1,22,23

Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Dendrophylliidae, cont.	<i>Balanophyllia (Balanophyllia) laysanensis</i> Vaughan, 1907	HI	238-271 <sup>b</sup>	1,21,23
	<i>Cladopsammia echinata</i> Cairns, 1984	HI	295-470 <sup>b</sup>	1,22,23
	<i>Cladopsammia eguchii</i> (Wells, 1982)	HI	18-64 <sup>c</sup> ;151 <sup>d</sup>	1,23,27
	<i>Eguchipsammia fistula</i> (Alcock, 1902)	HI, JA	282-485 <sup>b</sup> 107-558 <sup>d</sup>	1,23
	<i>Eguchipsammia gaditana</i> (Duncan, 1873)	HI	244-470 <sup>b</sup>	1,22,23
	<i>Eguchipsammia serpentina</i> (Vaughan, 1907)	HI	269-362 <sup>b</sup>	1,21,23
	<i>Enallopsammia rostrata</i> (Pourtalès, 1878) [= <i>Enallopsammia amphleioides</i> (Alcock, 1902)]	HI, JA	362-583 <sup>b</sup>	1,22,23
	<i>Endopachys grayi</i> Milne Edwards & Haime, 1848	HI	37-274 <sup>b</sup>	22,23
Family Flabellidae	<i>Flabellum (Flabellum) pavoninum</i> Lesson, 1831	HI	183-517 <sup>b</sup>	1,22
	<i>Flabellum (Flabellum) vaughani</i> Cairns, 1984	HI	232-369 <sup>b</sup>	1,22
	<i>Flabellum (Ulocyathus) marcus</i> Keller, 1974	HI,	1261-1602 <sup>b</sup>	1,22,28
	<i>Javania exserta</i> Cairns, 1999	HI	400 <sup>c</sup>	1,23
	<i>Javania fusca</i> (Vaughan, 1907) (= <i>Javania fuscus</i> )	HI	13-271 <sup>b</sup>	21,23
	<i>Javania insignis</i> Duncan, 1876	HI	52-825 <sup>b</sup>	22,23
	<i>Javania lamprotichum</i> (Moseley, 1880)	HI, JA	244-322 <sup>b</sup>	1,14,22,23
	<i>Placotrochides minuta</i> Cairns, 2004	HI	119-291 <sup>c</sup>	23,29
	<i>Polymyces wellsii</i> Cairns, 1991	HI, JA	440-858 <sup>b</sup>	10,23
Family Fungiacyathidae	<i>Fungiacyathus (Bathyactis) fissilis</i> Cairns, 1984	HI	212-503 <sup>b</sup>	1,22
	<i>Fungiacyathus (Fungiacyathus) fragilis</i> Sars, 1872	HI	1762-2056 <sup>b</sup>	22
Family Gardineriidae	<i>Gardineria hawaiiensis</i> Vaughan, 1907	HI	369-541 <sup>b</sup>	1,21,22,23
Family Guyniidae	<i>Guynia annulata</i> Duncan, 1872	HI	64-384 <sup>b</sup>	22,23
Family Micrabaciidae	<i>Letepsammia formosissima</i> (Moseley, 1876)	HI	109-470 <sup>b</sup>	22,23
Family Oculinidae	<i>Madrepora oculata</i> Linnaeus, 1758 (= <i>Madrepora kauaiensis</i> Vaughan, 1907)	HI	362-538 <sup>b</sup> , 627-750 <sup>b</sup>	1,21,22
Family Pocilloporidae	<i>Madracis kauaiensis</i> Vaughan, 1907	HI,JI	44-300 (541) <sup>b</sup>	14,21,23
Family Stenocyathidae	<i>Stenocyathus vermiformis</i> (Pourtalès, 1868)	HI	439 <sup>c</sup>	22,23
Family Turbinoliidae	<i>Deltocyathoides orientalis</i> (Duncan, 1876)	MHI	439-494 <sup>b</sup>	22,23
	* <i>Peponocyathus folliculus</i> (Pourtalès, 1868)	MHI	475-494 <sup>b</sup>	1
<b>Order Zoantharia</b>				
Family Parazoanthidae	<i>Kulamanamana haumea</i> Sinniger, Ocaña & Baco, 2013 (= <i>Gerardia</i> sp.)	HI	343-577 <sup>b</sup> 165-650 <sup>d</sup>	1,8,30
	* <i>Zibrowius ammophilus</i> Sinniger, Ocaña & Baco, 2013	MHI	343-575 <sup>b</sup>	30

Higher Taxon	Species	Distribution	Depth Range (m)	References
<b>Class Anthozoa</b>				
<b>Subclass Octocorallia</b>				
<b>Order Alcyonacea</b>				
Family Acanthogorgiidae	<i>*Acanthogorgia hedlundi</i> Aurivillius, 1931	MHI	300-404 <sup>b</sup>	1,31
	<i>Acanthogorgia</i> spp. (upper bathyal) <sup>D</sup>	HI	215-800	1,14,31,32
	<i>Acanthogorgia</i> spp. (lower bathyal) <sup>D</sup>	HI	1094-1790 <sup>c</sup>	1,33
	<i>Cyclomuricea flabellata</i> Nutting, 1908	HI	71-396 <sup>b</sup>	1,32,34,35
Family Alcyoniidae <sup>E</sup>	<i>Anthomastus granulosus</i> Kükenthal, 1910	HI	20-201 <sup>b</sup>	1,36
	<i>*Anthomastus tahinodus</i> d'Hondt, 1988	HI, JA	922-2428 <sup>d</sup>	1
	<i>Bathyalcyon robustum</i> (Versluys, 1906) (= <i>Anthomastus robustum</i> )	HI	300-674 <sup>d</sup>	14
	<i>*Bellonella molokaiensis</i> Verseveldt & Bayer, 1988	MHI	183 <sup>c</sup>	37
	<i>Pseudoanthomastus fisheri</i> (Bayer, 1952) (= <i>Anthomastus fisheri</i> )	HI	356-462 <sup>b</sup>	1,8,34,36,38,39
Family Chrysogorgiidae <sup>F</sup>	<i>*Chrysogorgia cf. abludo</i> Pante & Watling, 2011	NWHI	2226-2317 <sup>d</sup>	11
	<i>Chrysogorgia arborescens</i> Nutting, 1908	HI	722-914 <sup>a</sup>	1,35
	<i>Chrysogorgia chryseis</i> Bayer & Stefani, 1988	HI, JA	732 <sup>c</sup>	1,33,40
	<i>Chrysogorgia delicata</i> Nutting, 1908	NWHI	536-1463 <sup>a</sup>	1,35
	<i>Chrysogorgia flavescens</i> Nutting, 1908	HI, JA	1688-2654 <sup>a</sup>	1,35
	<i>Chrysogorgia geniculata</i> (Wright & Studer, 1889)	HI, JA	146-616 <sup>a</sup>	1,35
	<i>Chrysogorgia lata</i> Versluys, 1902	MHI	752 to 871 <sup>c</sup>	1,34
	<i>Chrysogorgia papillosa</i> Kinoshita, 1913	MHI	704-1858 <sup>a</sup>	1,32,34
	<i>*Chrysogorgia pinnata</i> Cairns, 2007	NWHI	3957 <sup>c</sup>	1
	<i>Chrysogorgia scintillans</i> Bayer & Stefani, 1988	NWHI	580-2050 <sup>b</sup>	1,34,39,40
	<i>Chrysogorgia stellata</i> Nutting, 1908	HI, JA	649-678 <sup>a</sup>	1,34,35
	<i>Chrysogorgia</i> sp. cf. <i>C. stellata</i> Nutting, 1908	HI	646-675, 830-922 <sup>a</sup>	32,40
	<i>Iridogorgia bella</i> Nutting, 1908	HI, JA	750-2298 <sup>b</sup>	1,35,39
	† <i>Iridogorgia magnispiralis</i> Watling, 2007 (= <i>Iridogorgia</i> sp. cf. <i>I. magnispiralis</i> Watling, 2007)	HI, JA	445-2467 <sup>b</sup>	41,42
	<i>*Iridogorgia</i> sp. cf. <i>I. splendens</i> Watling, 2007	NWHI	1155-1896 <sup>b</sup>	1
	<i>Metallogorgia melanotrichos</i> (Wright & Studer, 1889)	HI, JA	(183) 585-1853 <sup>b</sup>	1,8,34,35,43
	<i>Pleurogorgia militaris</i> Nutting, 1908	HI, JA	2142-2452 <sup>b</sup>	1
	<i>*Pseudochrysogorgia</i> sp.	NWHI	745-925 <sup>b</sup>	1
	<i>Radicipes spiralis</i> (Nutting, 1908)	HI	258-1462 <sup>d</sup>	1,32,34,35,44
	<i>Rhodaniridogorgia superba</i> (Nutting, 1908) (= <i>Iridogorgia superba</i> )	HI, JA	704-914 <sup>a</sup>	1,32,34,35,45

Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Clavulariidae	<i>Carijoa</i> sp. cf. <i>C. riisei</i> (Duchassaing & Michelotti, 1860)	Invasive, HI	0-75 <sup>b</sup>	46,47
	<i>Clavularia grandiflora</i> (Nutting, 1908)	HI	367-966 <sup>b</sup>	1,34,35,36
	<i>Telestula corrugata</i> (Nutting, 1908)	HI	300-914 <sup>b</sup>	1,34,35,36
	<i>Telestula spiculicola</i> (Nutting, 1908)	HI	518-642 <sup>a</sup>	1,34,35,36
	<i>Telestula spiculicola robusta</i> Bayer, 1952	MHI	507-519 <sup>b</sup>	1,36
Family Coralliidae <sup>G</sup>	<i>Corallium tortuosum</i> Bayer, 1956 (= <i>Paracorallium tortuosum</i> (Bayer, 1956))	HI, JA	167-408 <sup>b</sup> (154-630 <sup>d</sup> )	1,8,32,34,48, 49
	<i>Hemicorallium abyssale</i> (Bayer, 1956) (= <i>Corallium abyssale</i> )	HI, JA	1829-2403 <sup>c</sup> (684-1919 <sup>d</sup> )	1,34,48,49,50
	<i>Hemicorallium ducale</i> (Bayer 1955) (= <i>Corallium ducale</i> )	HI, JA	719-1800 <sup>d</sup>	1,34,49,50,51
	<i>Hemicorallium guttatum</i> Tu, Dai & Jeng, 2016	HI	942-1509 <sup>b</sup>	1,52
	<i>Hemicorallium imperiale</i> (Bayer 1955) (= <i>Corallium imperiale</i> )	MHI, JA	446-1343 <sup>b</sup>	1,34,49,50,51, 53
	<i>Hemicorallium laauense</i> (Bayer, 1956) (= <i>Corallium laauense</i> )	HI, JA	365-580 <sup>b</sup> (297-1919 <sup>d</sup> )	1,8,32,34,48, 50
	<i>Hemicorallium regale</i> (Bayer, 1956) (= <i>Corallium regale</i> )	HI	365-719 <sup>b</sup> (226-1815 <sup>d</sup> )	1,32,34,48,50
	<i>Pleurocorallium niveum</i> (Bayer, 1956) (= <i>Corallium niveum</i> )	HI	200-546 <sup>b</sup>	1,34,48,49
	<i>Pleurocorallium porcellanum</i> (Pasternak, 1981) (= <i>P. kishinouyei</i> ; <i>Corallium kishinouyei</i> Bayer, 1996)	HI	1145 <sup>c</sup> -1807 <sup>d</sup>	1,34,50,52
	<i>Pleurocorallium secundum</i> (Dana 1846) (= <i>Corallium secundum</i> )	HI	231-576 <sup>b</sup> (162-590 <sup>d</sup> )	1,8,32,34, 48,50
	<i>Pleurocorallium</i> cf. <i>secundum</i> (= <i>Corallium</i> cf. <i>secundum</i> )	NWHI	541 <sup>c</sup>	1,54
	Family Gorgoniidae	<i>Eunicella</i> sp. (sp. nov. <i>A sensu</i> Muzik 1979)	MHI	275-495 <sup>b</sup>
Family Isididae <sup>H</sup>	<i>Acanella dispar</i> Bayer, 1990	HI	275-445 <sup>b</sup>	1,34,55
	<i>Acanella weberi</i> Nutting, 1910	HI, JA	336-1922 <sup>a</sup>	1,14
	* <i>Bathygorgia</i> sp. cf. of <i>B. tasmaniensis</i>	HI	2676 <sup>c</sup>	1
	* <i>Cladarisis</i> sp.	MHI	393-718 <sup>c,d</sup>	1
	* <i>Eknomisis</i> sp.	HI, JA	913- 2693 <sup>c,d</sup>	1,10,11
	<i>Isidella trichotoma</i> Bayer, 1990 [= <i>Acanella trichotoma</i> (Bayer, 1990)]	HI, JA	1920 <sup>c</sup>	1,34,55
	<i>Isidella</i> sp. nov. (lyrate)	HI	1808 <sup>c</sup>	14
	* <i>Jasonisis</i> sp.	HI, JA	1659-1840 <sup>d</sup>	1,10,11
	<i>Keratoisis flabellum</i> (Nutting, 1908)	HI	346-465 <sup>b</sup>	1,32,34,35
	<i>Keratoisis grandis</i> (Nutting, 1908)	HI	1344-1582 <sup>a</sup>	1,35
	<i>Keratoisis paucispinosa</i> (Wright & Studer, 1889) (= <i>Lepidisis paucispinosa</i> )	MHI	539-631 <sup>b</sup>	1,35
	<i>Lepidisis olapa</i> Muzik, 1978	HI	215-665 <sup>b</sup>	1,34,56
	<i>Lepidisis</i> sp.	HI	1425 <sup>c</sup>	33
	* <i>Orstomisis</i> sp.	JA	2255	1

Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Keroeidae	<i>Keroeides fallax</i> Bayer, 1956 <sup>1</sup>	HI	238-245 <sup>c</sup>	1,34,48
	<i>Keroeides mosaica</i> Bayer, 1956	HI	167-465 <sup>b</sup>	1,32,34,48
	<i>Keroeides pallida</i> Hiles, 1899	HI	146-278 <sup>b</sup>	1,34,48
Family Melithaeidae	<b>*<i>Melithaea bicolor</i> (Nutting, 1908)</b> [= <i>Verrucella bicolor</i> Nutting, 1908; <i>Acabaria bicolor</i> (Nutting 1908)]	MHI	18-102 <sup>b</sup>	1,35,48
Family Nephtheidae	<b>*<i>Dendronephthya alexanderi</i> (Nutting, 1908)</b> (= <i>Spongodes alexanderi</i> Nutting, 1908)	HI	201-242 <sup>b</sup>	1
Family Nidaliidae	<i>Nidalia</i> sp.	HI	193-329	14
	<i>Siphonogorgia alexanderi</i> (Nutting, 1908) (= <i>Siphonogorgia alexandri</i> (alternative spelling))	HI	223-283 <sup>a</sup>	1,34,35,36
	<i>Siphonogorgia collaris</i> Nutting, 1908	HI	144 <sup>a</sup>	1,34,35,36
Family Paragorgiidae	<i>Paragorgia coralloides</i> Bayer, 1993	HI, JA	3000 <sup>c</sup>	1,10,11
	<i>Paragorgia regalis</i> Nutting, 1912 (= <i>Paragorgia dendroides</i> Bayer, 1956)	HI	490-1910 <sup>b</sup> (299-1956 <sup>d</sup> )	1,34,39,48
Family Plexauridae	<i>Anthomuricea</i> sp. cf. <i>A. divergens</i> Kükenthal, 1919	NWHI	381-426 <sup>b</sup>	32,34
	<i>Anthomuricea tenuispina</i> Nutting, 1908 <sup>l</sup>	HI	428-688 <sup>b</sup>	1,31,32,34,35
	<i>Anthomuricea</i> sp. (sp. nov. <i>A sensu</i> Muzik 1979)	HI	344-454 <sup>c</sup>	31,32
	<i>Bebryce brunnea</i> (Nutting, 1908)	HI, JA	167-396 <sup>b</sup>	1,31,32,34,35
	<i>Muriceides tenuis</i> (Nutting, 1908)	HI	232-362 <sup>a</sup>	31,34,35
	<i>Muriceides</i> sp. (sp. nov. <i>A sensu</i> Muzik 1979)	MHI	262-421 <sup>b</sup>	1,31
	<i>Paracis horrida</i> (Thomson & Henderson, 1906) [= <i>Paracis spinifera</i> (Nutting, 1912)]	HI	201-454 <sup>b</sup>	1,8,31,32,34,57
	<i>Paracis miyajimai</i> (Kinoshita, 1909)	HI	362-531 <sup>b</sup>	1,32,34
	<i>Paramuricea hawaiiensis</i> Nutting, 1908 <sup>k</sup> (= <i>Paramuricea hawaiiensis</i> (alternative spelling))	HI	345-1839 <sup>b</sup>	1,31,34,35
	<i>Placogorgia</i> spp. <sup>l</sup>	MHI	335-375 <sup>b</sup>	1,31,32
	<i>Swiftia</i> sp. <sup>m</sup>	HI	340-500 <sup>b</sup>	1,31,32
	<i>Thesea</i> sp. cf. <i>T. ramosa</i> (Nutting 1912) (= <i>Filigella</i> sp. nov. of Muzik 1979)	NWHI	313-408 <sup>b</sup>	1,31,32,34
	<i>Villogorgia</i> spp. <sup>n</sup>	HI	305-565 <sup>b</sup>	1,31,32
Family Primnoidae	† <i>Callogorgia euthyeia</i> (Bayer & Stefani, 1989) (= <i>Fanellia euthyeia</i> Bayer & Stefani, 1989)	HI	305-419 <sup>b</sup>	1,34,58,59
	<i>Callogorgia formosa</i> Kükenthal, 1907	HI	296-750 <sup>b</sup>	1,34,58,60
	<i>Callogorgia gilberti</i> (Nutting, 1908) [= <i>Callogorgia americana</i> (Cairns & Bayer 2002)]	HI	215-960 <sup>b</sup>	1,32,34,35,58
	† <i>Callogorgia medialis</i> (Bayer & Stefani, 1989) (= <i>Fanellia medialis</i> Bayer & Stefani, 1989)	HI	395-1028 <sup>b</sup>	1,34,58,59
	<i>Callogorgia robusta</i> (Versluys, 1906)	HI	830-1050 <sup>b</sup>	1,34,58
	† <i>Callogorgia tuberculata</i> (Versluys, 1906) (= <i>Fanellia tuberculata</i> (Versluys, 1906))	HI	128-400 <sup>b</sup>	1,34,58,60



Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Primnoidae, cont.	<i>Calyptrophora alpha</i> Cairns 2009	HI	1078-1220 <sup>a</sup>	1,34,61
	<i>Calyptrophora angularis</i> (Nutting, 1908)	HI, JA	366-1839 <sup>a</sup>	1,32,34,35,61
	<i>Calyptrophora clarki</i> Bayer, 1951	HI	808-1105 <sup>a</sup>	1,34,61,62
	<i>Calyptrophora pileata</i> Cairns 2009 (includes specimens previously identified as <i>Calyptrophora japonica</i> )	HI, JA	227-520 <sup>a</sup>	1,34,61
	<i>Calyptrophora wyvillei</i> Wright, 1885 (= <i>Calyptrophora agassizii</i> Studer, 1894; <i>Calyptrophora</i> <i>versluysi</i> Nutting, 1908)	HI	764-1278 <sup>a</sup>	1,34,35,61
	<i>Candidella gigantea</i> (Wright & Studer, 1889)	HI, JA	1608-2311 <sup>a</sup>	1,34,58,61,63
	<i>Candidella helminthophora</i> (Nutting, 1908)	HI, JA	417-1801 <sup>a</sup>	1,32,34,35,61
	<b><i>Macroprimnoa ornata</i> Cairns 2018</b>	HI	3066-3676 <sup>a</sup>	1,63
	<i>Narella alata</i> Cairns & Bayer, 2007 [2008]	HI, JA	477-750 <sup>a</sup>	1,64
	<i>Narella bowersi</i> (Nutting, 1908)	HI, JA	1218-2267 <sup>a</sup>	1,32,33,34,35, 64
	<b><i>Narella calamus</i> Cairns, 2018</b>	NWHI, JA	1746-2073 <sup>a</sup>	1,63
	<i>Narella dichotoma</i> (Versluys, 1906) (Includes <i>Narella nuttingi</i> Bayer, 1997)	HI, JA	743-1448 <sup>b</sup>	1,34,64
	<i>Narella gigas</i> Cairns & Bayer, 2007 [2008]	HI	302-399 <sup>a</sup>	1,34,64
	† <i>Narella hawaiiensis</i> Cairns & Bayer, 2007 (= <i>Narella hawaiiensis</i> Cairns & Bayer, 2007)	HI, JA	1492-1944 <sup>a</sup>	1,34,64
	<i>Narella macrocalyx</i> Cairns & Bayer, 2007 [2008]	HI, JA	1206-1839 <sup>a</sup>	1,34,64
	<b><i>Narella merga</i> Cairns, 2018</b>	JA	2575-3149 <sup>a</sup>	10,63,65
	<i>Narella muzikae</i> Cairns & Bayer, 2007 [2008]	HI, JA	326-381 <sup>a</sup>	1,34,64
	<i>Narella ornata</i> Bayer, 1995	MHI	748-1006 <sup>c</sup>	1,34,64,66
	<i>Narella vermifera</i> Cairns & Bayer, 2007	HI	275-527 <sup>a</sup>	1,34,64
	<b><i>Narella virgosa</i> Cairns, 2018</b>	NWHI, JA	1901-1985	1,63
	<i>Paracalyptrophora echinata</i> Cairns, 2009	NWHI	708-1475 <sup>b</sup>	1,34,61
	† <i>Paracalyptrophora hawaiiensis</i> Cairns, 2009 (= <i>Paracalyptrophora hawaiiensis</i> Cairns, 2009)	HI	320-444 <sup>b</sup> (970)	1,34,61
	<i>Parastenella bayeri</i> Cairns, 2010	MHI	517 <sup>c</sup>	1,34,58
<i>Plumarella (Plumarella) circumoperculum</i> Cairns, 2010 (= <i>Thouarella regularis</i> (Wright & Studer, 1889) as listed by Nutting 1908)	NWHI	432-1373 <sup>b</sup>	1,34,58,63	
<i>Thouarella (Diplocalyptra) biserialis</i> (Nutting, 1908) (= <i>Amphilaphis biserialis</i> )	MHI	73-426 <sup>b</sup>	32,34,58	
<i>Thouarella (Euthouarella) hilgendorfi</i> (Studer, 1879)	HI	174-750 <sup>b</sup>	1,34,58	
Family Victorgorgiidae	<i>Victorgorgia alba</i> (Nutting, 1908) <sup>o</sup> (= <i>Anthothela nuttingi</i> Bayer, 1956)	HI, JA	340-465, 1387-1820 <sup>b</sup>	1,32,34,48,67

Higher Taxon	Species	Distribution	Depth Range (m)	References
<b>Order Pennatulacea</b>				
Family Anthoptilidae	<i>Anthoptilum murrayi</i> K�lliker, 1880	MHI	426-2286 <sup>a</sup>	1,35
	* <i>Anthoptilum</i> sp. <sup>P</sup>	NWHI,JA	1515-1826 <sup>b</sup>	1
Family Echinoptilidae	<i>Echinoptilum macintoshi</i> Hubrecht, 1885	MHI	225-232 <sup>a</sup>	1,35
Family Funiculinidae	* <i>Funiculina quadrangularis</i> (Pallas, 1766)	MHI	254-1940 <sup>b</sup>	1,39
Family Halipteridae	<i>Halipteris willemoesi</i> K�lliker, 1870	HI	1090-1808	68
Family Kophobelemnidae	<i>Kophobelemnon</i> sp. (short stemmed)	HI, JA	421-1427	1,54
Family Pennatulidae	<i>Pennatula pearceyi</i> K�lliker, 1880	MHI	1033 <sup>a</sup>	1,35
	* <i>Pennatula</i> spp. (sensu Nutting 1908) <sup>Q</sup>	HI	198-616	1,35
	† <i>Ptilella inflata</i> (K�kenthal, 1910) (= <i>Pennatula inflata</i> K�kenthal, 1910)	HI	252-1202 <sup>d</sup>	14
	* <i>Pteroeides</i> sp.	MHI	259 <sup>c</sup>	1
Family Scleroptilidae	<i>Calibelemnon symmetricum</i> Nutting, 1908	HI, JA	196-1650 <sup>b</sup>	1,35,39
Family Umbellulidae	<i>Umbellula</i> spp. <sup>R</sup>	HI, JA	514-2403	1,10,11,14,35
Family Virgulariidae	<i>Virgularia abies</i> K�lliker, 1870	MHI	223 <sup>a</sup>	1

Higher Taxon	Species	Distribution	Depth Range (m)	References
<b>Phylum Cnidaria</b>				
<b>Class Hydrozoa</b>				
<b>Order Anthoathecata</b>				
Family Stylasteridae	<i>Crypthelia kelleyi</i> Cairns 2017	NWHI, JA	2116	1,69
	<i>Distichopora anceps</i> Cairns, 1978	NWHI	360-577 <sup>b</sup>	1,70,71
	<i>Distichopora asulcata</i> Cairns, 2005	NWHI	293-377 <sup>b</sup>	1,71
	* <i>Distichopora violacea</i> (Pallas, 1766)	JA	0-152	1,8
	<i>Stylaster griggsi</i> Cairns, 2005	HI	322-583 <sup>b</sup> (237-583 <sup>d</sup> )	1,71
	<i>Stylaster infundibuliferus</i> Cairns, 2005	NWHI	521-563 <sup>b</sup>	1,71

#### Notes:

- Antipathes sylospongia* is a newly described species of black coral observed living commensally different species of sponges in the order Scepurulophora.
- Horowitz et al. (2018) provide evidence that *Bathypathes seculata* Opresko, 2005 is the juvenile stage of *Bathypathes patula* Brook, 1889, thus warranting synonymization.
- Several taxa recorded only to genus have very wide depth distributions and likely represent different species.

- D. The genus *Acanthogorgia* in Hawai'i is in need of review. Different authors have reported various putative species in the depth range of 215-800m. Nutting (1908) collected three specimens that were initially identified as *Acanthogorgia armata* Verrill, 1878 (USNM 22556, USNM 22557, USNM 25381) and referred to as *Acanthogorgia* sp. nov. by Parrish et al (2017). Grigg & Bayer (1976) reported a species as possibly *A. paramuricata* (Stiasny, 1947), although specimen information was not provided, it appears that several of these specimens may have been subsequently identified as *A. hedlundii* (Aurivillius, 1931). Grigg & Bayer listed a second species as a second species as possibly *A. striata* Nutting, 1911. An apparently deeper water species has been collected but not yet identified (e.g., USNM 94442 USNM 1411384).
- E. Two specimens of Anthomastinae from the CAPSTONE Expeditions (*Anthomastus* sp. – USNM 1467623 at 3691 m and *Pseudoanthomastus* sp. – USNM 1421500 at 1980 m) were collected at deeper depths than previously reported for these genera in the Hawaiian Archipelago.
- F. Parrish et al. (2007, 2017b) included two additional chrysogorgiids identified as *Chrysogorgia* sp. nov. (1/3R) and *Chrysogorgia* sp. nov. (2/5L). These were preliminary identifications and have been removed from the current list pending further identification. There appear to be a number of undescribed *Chrysogorgia* morphospecies from deep waters of the Hawaiian Archipelago that have not yet been described.
- G. Recent taxonomic revisions of the family Coralliidae and the increased use of genetic techniques in association with morphology have improved our understanding of many species, however further work is needed. The 2017 list included a potential hybrid, *Hemicorallium laauense* x *halmahereense*, however we have been unable to link this to a collected specimen. Therefore this taxon has been removed. Additionally, a specimen in the NMNH identified as *Corallium* cf. *secundum* (USNM 1072415) has been removed from the current list pending further identification.
- H. The Family Isididae is undergoing revision (L. Watling, pers. comm.). A number of Hawaiian specimens appear to be undescribed species (most currently in the subfamily Keratoisidinae).
- Our 2017 list included three isidid taxa that have been removed:
    - Grigg & Bayer (1976) reported a common species as “*Keratoisid* sp., probably *K. nuda* [= *Lepidisis nuda* (Wright & Studer, 1889)]. However, they did not identify voucher specimens and there have been no subsequent records. However, specimens collected by Grigg on the Sango expeditions at the same depths were subsequently described as *L. olapa*. Muzik 1978 indicated that *L. olapa* most closely resembled *L. nuda*.
    - Grigg & Bayer also reported a *Keratoisid* sp. nov., again with no reference vouchers. The National Museum of Natural History has three isidid specimens that correspond to this Sango collection, all of which were all subsequently identified as *Isidella* sp. (by K. Muzik).
    - An *Isidella* sp. “5” was reported based on notes by K. Muzik on an unpublished museum identification, but we were unable to link this to the specimen.
  - Other isidids collected during the CAPSTONE expeditions appear to be new species in genera not previously reported from the region and are included in the current 2020 list. These include specimens identified in the genera *Bathygorgia* (USNM 1411376), *Cladarisis* (USNM 1411375, USNM 1490578, USNM 1490579), *Eknomis* (USNM 1411385, USNM 1412982, USNM 1467588), *Orstomis* (USNM 1412984), and *Jasonisis* (USNM 1412975; collected from Karin Ridge, Johnston Atoll Unit of the Remote Pacific Islands Monument, but also observed elsewhere in the Monument, on Tropic of Cancer Seamount, and throughout the Northwestern Hawaiian Islands).
  - Additional isidid specimens collected and not included in the current list may also represent new species.
- I. Nutting (1908) reported a species identified as *Muricella tenera* Ridley, 1884 (USNM 25373; included in our 2017 list) that was subsequently redescribed as *Keroeides fallax* Bayer, 1956.
- J. Parrish et al. (2007, 2017b) included *Anthomuricea* cf. *reticulata* Nutting, 1910 of Grigg & Bayer (1976). These specimens from Grigg & Bayer (USNM 54552, 56863) were included in Muzik's subsequent redescription of *Anthomuricea tenuispina*.
- K. Muzik (1979) also identified a *Paramuricea* new species A. (USNM 51854) and *Paramuricea* new species B. (Bernice P. Bishop Museum 400). These species have not been described and USNM 51854 is cataloged as *P. hawaiiensis*. Grigg & Bayer (1976) also reported several unidentified specimens, likely in the genus *Paramuricea*.
- L. A number of Hawaiian specimens have been assigned to the genera *Placogorgia* or *Pseudothessa* without full

published species descriptions. WoRMS has transferred most of the *Pseudothesea* spp. to *Placogorgia* (based presumably on Bayer (1959), which synonymized the genera), however Bayer (1981) concluded that the genera were probably distinct (however noted that *Pseudothesea* may be impossible to distinguish it from *Paracis*). Grigg & Bayer (1976) included two putative species of *Placogorgia* and three *Pseudothesea* that were included in our 2017 list, however, these cannot be traced back to specific specimens. Muzik (1979) reported two new (unpublished) *Placogorgia* species that overlap with the locations and depths from Grigg & Bayer and include USNM numbers, but some of these are currently listed by the NMNH as *Villogorgia* sp. Therefore, we have included a single listing for *Placogorgia* spp. in the 2020 list pending further clarification of these species.

- M. Muzik (1979) identified a Hawaiian plexaurid as a potential new species in the genus *Swiftia* (USNM 56824). Grigg & Bayer (1976) also identified two potentially new *Swiftia* spp., but did not provide information on the specimens examined. Muzik also examined a specimen originally recorded as *Allogorgia exserta* Verrill, 1928 (USNM 49513 & Bishop Museum #101) and concluded that it was *Swiftia pacifica* (Nutting, 1912). She noted, however: "One can conclude that there was an error in the locality of the so-called Hawaiian specimen." It is entered in the Bishop Museum catalog as "Albatross" 2742 without locality. Entry 2741 is from Station 3353 off Panama. Prior to that station, the "Albatross" had been collecting in the Pacific Northwest, so it is conceivable that this *S. pacifica* was collected there and later confused." No other records of *S. pacifica* from Hawaii have been found, so this species was removed from the updated species list.
- N. A number of Hawaiian specimens have been assigned to the genus *Villogorgia* without full published species descriptions. WoRMS and Watling et al. (2011) transferred *Clematissa tenuis* Nutting 1908 to the genus *Villogorgia*, however Muzik (1979) examined the holotype of *Clematissa tenuis*, and placed it in the genus *Muriceides* – i.e., *M. tenuis*. Grigg & Bayer (1976) identified four potential species of *Villogorgia* from the Main Hawaiian Islands, including one identified as *Villogorgia arbuscula* (Gray, 1889), but without identifying the individual specimens. Muzik (1979) examined a number of specimens (including from the Grigg collections) and proposed three potentially new *Villogorgia* species. *Villogorgia* sp. nov. A of Muzik (1979) appears to be the *Villogorgia* sp. cf. *V. arbuscula* of Grigg & Bayer. We have included a single listing for *Villogorgia* spp. in the 2020 list pending further clarification of these species.
- O. Moore et al. (2017) have placed *Anthothela nuttingi* Bayer, 1956 (originally *Clematissa alba* Nutting, 1908) in the genus *Victorgorgia* based on morphological characteristics and phylogenetic reconstructions using mitochondrial gene regions. Parrish et al. (2007 and 2017b) included two undescribed species identified as *Anthothela* sp.nov. 1 & 2. These have been removed from the current list pending further identification, since the revision of Anthothelidae has resulted in the transfer of several other *Anthothela* spp. to different genera.
- P. Specimens of rock sea pens identified as *Anthoptilum* sp. or *Anthoptilum* cf. *lithophilum* Williams & Alderslade, 2011. While most sea pens occur in soft sediments, rock sea pens have specially adapted peduncles that allow them to attach to hard substrata.
- Q. Nutting (1908) described three new species in the genus *Pennatula* from the Main and Northwestern Hawaiian Islands: *Pennatula flava*, *P. pallida*, and *P. sanguinea*. Type specimens are in the Smithsonian's National Museum of Natural History. WoRMS lists the taxonomic status of all three species as uncertain.
- R. Nutting (1908) recorded three species of *Umbellula* from the Main Hawaiian Islands: *Umbellula carpenteri* Kölliker, 1880, and two new species *Umbellula gilberti* Nutting, 1908 and *U. jordani* Nutting, 1908, WoRMS identifies *U. gilberti* and *U. jordani* as *nomen dubium*, and Dolan (2008) in a revision of the Family Umbellulidae indicated that at least one specimen identified by Hickson (2016) from South Sulawesi should be classified as *U. magniflora* Kölliker, 1880. The 2017 list synonymized *Umbellula lindahli* Kölliker, 1875 and the Southern Ocean *Umbellula carpenteri* Kölliker, 1880 based on Broch (1958). Subsequent examination and genetic analysis by Dolan 2008 suggests that these are separate species.

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