Zootaxa 4487 (1): 001–083
http://www.mapress.com/j/zt/

Monograph

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.4487.1.1
http://zoobank.org/urn:lsid:zoobank.org:pub:524B23B9-8EAA-4BD6-8937-A1B8F1C057B9

ZOOTAXA

4487

Names of hydroids (Cnidaria, Hydrozoa) established by Charles McLean Fraser (1872–1946), excluding those from Allan Hancock Expeditions

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Magnolia Press
Auckland, New Zealand

Accepted by A. Collins: 6 Jun. 2018; published: 2 Oct. 2018

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(*Zootaxa* 4487)

83 pp.; 30 cm.

2 Oct. 2018

ISBN 978-1-77670-478-1 (paperback)

ISBN 978-1-77670-479-8 (Online edition)

FIRST PUBLISHED IN 2018 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: magnolia@mapress.com

http://www.mapress.com/j/zt

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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Abstract

An account is given of the names of families, genera, and species of hydroids established by C.M. Fraser of Canada, excluding those from Allan Hancock Pacific Expeditions and the Allan Hancock Caribbean Sea Expedition. The names of four families, 11 genera, and 101 species are attributed to him in this work, complementing those of another two genera and 164 species described by Fraser in various Allan Hancock publications. Information is provided on type localities of his new species, on locations and kinds of type material in existence, where known, and on the current taxonomic status of families, genera, and species described by him in works reviewed herein. Two replacement names (*Thuiaria geniculata* Fraser, 1918a and *Salacia fraseri* Calder, 1991) exist for *Thuiaria distans* Fraser, 1914a (not *Thuiaria distans* Allman, 1877). The widely overlooked senior synonym, *T. geniculata*, is recognized as the valid name of the species. *Diphasia alta* nom. nov. is proposed as a new replacement name for the permanently invalid junior primary homonym *Diphasia robusta* Fraser, 1943a (not *D. attenuata robusta* Billard, 1924). In addition, *Cryptolaria crassa* nom. nov. is proposed as a new replacement name for the junior secondary homonym *Cryptolaria rigida* (Fraser, 1948) [not *C. rigida* (Fraser, 1940a)]. Lectotypes have been designated for 47 of the species to establish objective standards for application of their names. *Corymorpha adventitia* Fraser, 1941b, from the Pacific coast of Panama, is assigned to *Ralpharia* Watson, 1980, as *R. adventitia*. No type specimens are known to exist for seven of the species considered, including one holotype (of *Hebella eximia* Fraser, 1944a) missing from its bottle. Particular attention has been paid to dating and chronology of the 51 publications of Fraser covered in this work. Earlier bibliographic errors are corrected, most notably establishing that the book *Distribution and relationship in American hydroids* was published in early 1947 rather than 1946 as per the title page.

Key words: bibliography, Hydroidolina, invertebrate zoology, marine biology, Medusozoa, museum collections, natural history, taxonomy, zoological nomenclature

Introduction

Charles McLean Fraser (1 June 1872–26 December 1946) was a Canadian marine and fisheries biologist, a curator at the Pacific Biological Station, Departure Bay, British Columbia (1912–1924), a professor of zoology at the University of British Columbia (1920–1940), and an associate of the Allan Hancock Foundation in California, USA (Clemens 1947, 1948; Schmitt 1948; Arai 1992, 2004; Calder *et al*. 2009). In addition to broad academic service and accomplishments, his primary research specialty was the taxonomic study of hydroids. Fraser's interest in the group began at the outset of the 20th century while a student at the University of Toronto, and continued until his death in 1946. His Ph.D. thesis, *The systematic study of the hydroids of the North Pacific coasts of America*, was finished in 1911 at the University of Iowa under prominent hydroid specialist Charles Cleveland Nutting

(1858–1927). Its completion was reported in both the journal *Science* (Anonymous 1911a) and the calendar of the University of Iowa (Anonymous 1911b). No copies of the thesis are now known to exist. Searches for it by us in libraries and archives at the University of Iowa, the University of Toronto, and the University of British Columbia were unsuccessful. A bibliography of Fraser's published works on hydroids, and on other subjects in science, is included in Schmitt (1948). Papers on Hydrozoa by Fraser are also listed in the bibliography of Vervoort (1995). Fraser was the sole author of some 56 publications (Fraser 1911–1948) dealing in whole or in part with Hydrozoa (see References section), with three of them being books (Fraser 1937a, 1944a, 1947a).

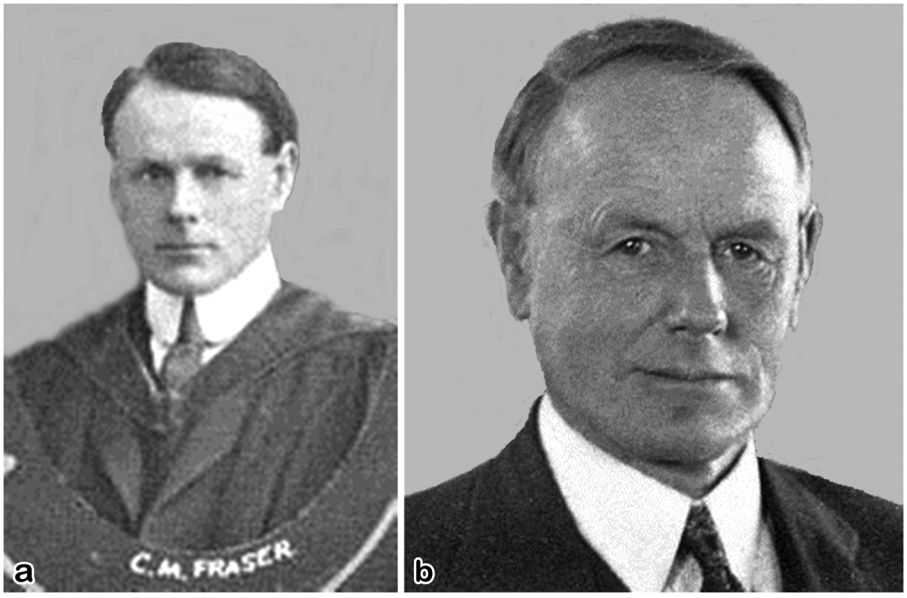

FIGURE 1. Charles McLean Fraser (1872–1946), B.A. (Toronto, 1898), M.A. (Toronto, 1903), Ph.D. (Iowa, 1911), LL.D. (British Columbia, 1942). a. Photograph from the *Fifth Annual of the University of British Columbia, 1920*, courtesy of the Alma Mater Society, University of British Columbia. b. Photograph from the University of British Columbia yearbook *Totem 1938*, courtesy of the Alma Mater Society, University of British Columbia.

Professor C. McLean Fraser (Figs. 1a, b) is credited here with the establishment of some 265 nominal species of hydroids. That number includes 101 species listed in this work, together with 164 others from Allan Hancock expeditions dealt with earlier (Calder *et al*. 2009). It seems likely that he is second in that accomplishment after George James Allman (1812–1898), a noted hydroid specialist from the British Isles, who described some 283 species of hydrozoans (Calder 2015). Fraser's taxonomic studies on the group over the first half of the 20th century were extensive, and his publications are still widely used and cited. Nevertheless, his work on hydroids has often been criticized, and its shortcomings have been detrimental to his otherwise distinguished academic reputation (Calder *et al*. 2009). Besides noteworthy accomplishments in marine science and fisheries of the Northeast Pacific, Fraser has been described as dedicated, helpful, modest, and kind, and "one of the University of British Columbia's most beloved professors" (Foerster 1948). One of his students, copepodologist Mildred Helena Campbell (1907–2004), wrote the following about him (Damkaer 2011):

> My first interest in zoology was really aroused by Dr. C. McLean Fraser, who was head of that department at the University of British Columbia when I was a student there—he, of course, was a "hydroid" specialist, an excellent teacher, and thorough researcher…. Dr. Fraser and his wife became close personal friends—they had no children and treated me almost like a daughter—in fact, he proposed a toast to the bride at my wedding.

In his hydroid research, Fraser appears to have taken on too much work with the limited time available to him for such studies. Moreover, for a taxonomist of his stature and experience, it is puzzling that he generally disregarded major principles of zoological nomenclature. In particular, the *Règles Internationales de la Nomenclature Zoologique* (precursor of the current *International Code of Zoological Nomenclature*) were not consistently followed in the proper designation of types, and many of his named species lack an objective standard of reference for application of the names they bear. Designation of lectotypes, followed by re-descriptions and new

illustrations, are needed for them. Name-bearing types were designated in only four of his papers, all in accounts of species held in collections at the National Museum of Natural History, Smithsonian Institution (Fraser 1937b, 1940a, 1941b, 1945a). In other works over the last half of his career, specimens intended as types of new species were often labelled as such (e.g., "type" or "cotype"), but no indication of their status was given in published accounts. Other facets of Fraser's hydroid work have been disparaged as well, but such criticisms are well known and need not be restated here. Against all this, commendation is warranted in particular for taxonomic accounts and detailed distribution records of hundreds of species provided in his books on hydroids of the Atlantic and Pacific coasts of North America (Fraser 1937a, 1944a, 1947a).

Fraser amassed a substantial personal collection of hydroids during his career. Diverse, scientifically important, and including many type specimens, it remained largely ignored for nearly three decades after his death in the Department of Zoology at the University of British Columbia. Some of the materials preserved in fluid became dry over the years. Nevertheless, much of the collection remains in satisfactory condition. In particular, specimens on nearly 1000 microscope slides, stained and mounted in Canada balsam, tend to be relatively good. The C. McLean Fraser Hydroid Collection was finally turned over to the late Dr. Mary Needler Arai of the University of Calgary, who catalogued it and deposited it for safekeeping in the British Columbia Provincial Museum (now the Royal British Columbia Museum, or RBCM), Victoria, British Columbia, Canada. Records at the RBCM indicate that it was accessioned there during 1976. In addition to a published list of the collection by Arai (1977), information about it exists in three catalogues of the C. McLean Fraser Hydroid Collection at the RBCM and in the online invertebrate zoology collection database of the museum (http://search-collections.royalbcmuseum.bc.ca/InvertebrateZoology). Other type materials of species described by Fraser have been located at the National Museum of Natural History, Smithsonian Institution (USA), the Museum of Comparative Zoology, Harvard University (USA), the California Academy of Sciences (USA) and the American Museum of Natural History (USA). As noted earlier (Calder *et al*. 2009), a large collection of hydroids identified by Fraser from Allan Hancock Expeditions exists at the Santa Barbara Museum of Natural History (USA).

This project was undertaken to provide a synopsis of hydroid taxa named by Fraser in works other than those published in reports of the Allan Hancock Pacific Expeditions and the Allan Hancock Caribbean Sea Expedition (see Calder *et al*. 2009). Information is provided on type localities of species, on kinds and locations of type specimens, and on the current status of each family, genus, and species described and named by him. Lectotypes have been designated for 47 of the species. Bibliographic work included verification of reference citations through examination of original works by Fraser, as well as documenting, where possible, the dates of issue of those publications covered in this work.

Materials and methods

Some 56 publications dealing in whole or in part with Hydrozoa, included in the References section below, were published by Charles McLean Fraser between 1911 and 1948. All but two of those reports were on hydroids, with the exceptions (Fraser 1916, 1947c) being notes on hydromedusae. An inventory of new nominal taxa in 51 of the 56 publications by Fraser was undertaken as part of this study. Excluded were those described in five papers on hydroids of the Allan Hancock Pacific Expeditions and the Allan Hancock Caribbean Sea Expedition (Fraser 1938a, c, d, 1947b, 1948), already reviewed elsewhere (Calder *et al*. 2009). For each nominal species established by Fraser, the type status of specimens assigned to it has been assessed based on evidence provided in the original description and on relevant provisions of the *International Code of Zoological Nomenclature* (ICZN, Chapter 16). References to the ICZN (International Commission on Zoological Nomenclature 1999) and to articles from it mentioned herein are based on the 1999 edition in use as this synopsis was written. Searches for type material of each species were undertaken initially by scanning online databases of museum collections where Fraser's hydroids were most likely to have been deposited, including the Royal British Columbia Museum, the National Museum of Natural History, Smithsonian Institution, the Museum of Comparative Zoology, the California Academy of Sciences, the American Museum of Natural History, and the Yale Peabody Museum of Natural History. In the case of species described from Japan, records of the Hirohito Hydroid Collection at the National Museum of Nature and Science were also checked.

Following online searches of museum collection databases, type specimens located in collections at the National Museum of Natural History, Smithsonian Institution, the Museum of Comparative Zoology, the California

Academy of Sciences, the American Museum of Natural History, and the Fraser Hydroid Collection at the Royal British Columbia Museum were examined by us. We found no Fraser types in collections at the Canadian Museum of Nature or the Royal Ontario Museum. When satisfactory syntype specimens of a given nominal species were discovered in a collection, a lectotype (ICZN Art. 74) was designated in the interests of nomenclatural stability by establishing an objective standard for application of the name. ICZN Declaration 44, an amendment of ICZN Art. 74.7.3, has been followed in each case by adopting the statement "lectotype, by present designation." When necessary, the type locality of a given species has been restricted to a single location upon designation of a lectotype.

To avoid confusion, taxon names listed herein are as originally established by Fraser, and their systematic arrangement essentially follows that adopted in his three comprehensive works (1937a, 1944a, 1947a). Important changes in nomenclature and classification for them are noted in Remarks sections. Included with each of Fraser's new species listed herein is an abbreviated synonymy list and a Remarks section, as well as information on type locality, location or locations and kinds of type material known to exist, and a brief statement on current taxonomic status. Synonymy lists include the original names of taxa assigned by Fraser, together with major synonyms of those names. With a few exceptions, current names of species follow those accepted as valid in the World Register of Marine Species (WoRMS) (http://www.marinespecies.org). Many of the species listed herein remain poorly known. Redescriptions, new illustrations, and taxonomic reappraisals of them are needed, but were beyond the scope of this study.

Efforts were also made during this study to establish the chronology of all of Fraser's publications on Hydrozoa (Fraser 1911–1948). The month or day of publication of a given work, where stated, has been noted. Approximate publication dates of two books by Fraser (1944a, 1947a), published by the University of Toronto Press, were determined by examining correspondence in files held by the University of Toronto Archives and Record Management Services. Publication dates of papers appearing in the *Transactions of the Royal Society of Canada* remain imprecisely known. Annual meetings of the society during much of Fraser's career were held in May, with a complete volume from a given meeting appearing early the following year. However, individual papers were reportedly prepared for publication as they were received (see *Proceedings and Transactions of the Royal Society of Canada*, series 3, 26, xv: "Papers for Volume XXVI have been received at intervals since the beginning of the year and reprints issued; in this way there is continuous publication and authors can obtain their reprints without delay"). Thus, manuscripts from oral presentations and other submissions to the society by Fraser were likely published the same year that they were received. In the absence of evidence to the contrary, the date adopted here is taken to be the last day of the particular year, following ICZN Art. 21.3.2.

Abbreviations in the text are as follows:

AM	Australian Museum, Sydney, New South Wales, Australia.
AMNH	American Museum of Natural History, New York, New York, USA.
BCPM	British Columbia Provincial Museum (now Royal British Columbia Museum), Victoria, BC, Canada.
BHL	Biodiversity Heritage Library.
CAS	California Academy of Sciences, San Francisco, California, USA.
CAS-IZ	California Academy of Sciences, Invertebrate Zoology Collection Database.
CMN	Canadian Museum of Nature, Gatineau, Quebec, Canada.
ICZN	International Commission on Zoological Nomenclature; *International Code of Zoological Nomenclature*, Fourth Edition.
IPA	isopropyl alcohol.
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA.
MCZ-IZ	Museum of Comparative Zoology, Invertebrate Zoology Collection Database, Harvard University, Cambridge, Massachusetts, USA.
NMNH	National Museum of Natural History, Smithsonian Institution, Washington, DC, USA.
NMV	Museums Victoria, Melbourne Museum, Carlton, Victoria, Australia.
NMNS	National Museum of Nature and Science, Tsukuba City, Japan.
NSMT	National Science Museum Tokyo (now National Museum of Nature and Science, Tsukuba City, Japan; including the Showa Memorial Institute, Emperor Shōwa (Hirohito) Hydroid Collection).

RBCM	Royal British Columbia Museum, Victoria, British Columbia, Canada.
ROM	Royal Ontario Museum, Toronto, Ontario, Canada.
SBMNH	Santa Barbara Museum of Natural History, Santa Barbara, California, USA.
USNM	United States National Museum (now National Museum of Natural History, Smithsonian Institution), Washington, DC, USA.
WoRMS	World Register of Marine Species (http://www.marinespecies.org, last consulted 18 April 2018), with content on Hydrozoa from the World Hydrozoa Database by Peter Schuchert (http://www.marinespecies.org/hydrozoa).
YPM	Yale Peabody Museum of Natural History, New Haven, Connecticut, USA.

Systematic Account

Phylum Cnidaria Verrill, 1865

Order Anthoathecata Cornelius, 1992

Family Oceaniidae Eschscholtz, 1829

Corydendrium fruticosum Fraser, 1914a

? *Corydendrium fruticosum* Fraser, 1914a: 112, pl. 2, figs. 2A, B.

Syntypes. BCPM 976-00163-001: USA, Washington, Friday Harbor, July 1912; 60% IPA.
BCPM 976-00163-002: USA, Washington, Friday Harbor, July 1912; 60% IPA.
BCPM 976-00164-001: Canada, British Columbia, Dodd Narrows, 1901; 60% IPA.
BCPM 976-00165-001: Strait of Georgia; slide.
BCPM 976-00165-002: Strait of Georgia; slide.

Lectotype, by present designation. RBCM 976-00163-003: USA, Washington, Friday Harbor, outside Brown Island, 73–110 m, July 1912, one colony, 2.7 cm high, in fair condition, without gonophores; 70% ethanol.

Paralectotypes. BCPM 976-00163-001: USA, Washington, Friday Harbor, July 1912; 60% IPA.
BCPM 976-00163-002: USA, Washington, Friday Harbor, July 1912; 60% IPA.
BCPM 976-00164-001: Canada, British Columbia, Dodd Narrows, 1901; 60% IPA.
BCPM 976-00165-001: Strait of Georgia; slide (missing from slide box).
BCPM 976-00165-002: Strait of Georgia; slide.

Type locality. USA, Washington: Friday Harbor, outside Brown Island, 73–110 m (Fraser 1914a).

Current status. Valid.

Remarks. No name-bearing types were designated by Fraser (1914a) in establishing *Corydendrium fruticosum*. However, syntypes of the species exist in the Fraser Hydroid Collection at the RBCM (BCPM 976-00163-001, BCPM 976-00163-002, BCPM 976-00164-001, BCPM 976-00165-001, BCPM 976-00165-002). The lectotype designated here (RBCM 976-00163-003) is a single colony selected from specimens in BCPM 976-00163-002. One of the syntype slides (BCPM 976-00165-002) also bears a specimen in reasonably good condition, but its collection locale, whether from British Columbia (Canada) or Washington state (USA), could not be determined (and see ICZN Recommendation 74E). Another syntype slide (BCPM 976-00165-001) is currently missing from its slide box.

The only certain records of *Corydendrium fruticosum* appear to be those of Fraser (1914a) from Friday Harbor, Washington, and from Snake Island and the Northumberland Channel near Dodd Narrows, British Columbia. Both of the latter locations are in the Strait of Georgia area near Nanaimo, BC. Later accounts of the species in his books on hydroids (Fraser 1937a, 1947a) were almost certainly based on the original description. Hydroids identified with question as *C. fruticosum* were reported from waters off southern California and Baja California, Mexico, by Fraser (1948: 192).

The species is currently taken to be valid (Cairns *et al*. 2002; WoRMS).

Turritopsis fascicularis Fraser, 1943a

Oceania armata Kölliker, 1853: 323.
Turritopsis fascicularis Fraser, 1943a: 76, pl. 15, figs. 1a, b.

Holotype. MCZ-IZ 9005: USA, Florida, off Alligator Reef, Steamer *Bibb* Sta. 192, 24°41'45"N, 80°27'45"W, 216 m, 08 May 1867, one fragmentary colony, in poor condition, with hydranths and medusa buds deteriorated, coll. L.F. de Pourtalès, labelled "type"; formalin, about to be transferred to ethanol.

Type locality. USA, Florida: off Alligator Reef, 24°41'45"N, 80°27'45"W, 118 fm (216 m) (Fraser 1943a).

Current status. Invalid.

Remarks. Fraser (1943a) failed to designate a name-bearing type in describing *Turritopsis fascicularis*. The species was described from a hydroid collection sent to him for identification from the MCZ, and a fragmentary specimen labelled "type" exists in collections at the museum (MCZ-IZ 9005). No other type material of *T. fascicularis* is known to exist. Fraser's original description implies that the species was described from a single colony ("Colony consisting of a massive, fascicled stem, 6 cm…."), taken here to be the holotype by monotypy. The type specimen appears to have been in relatively good condition at the time it was described, comprising an intact hydrocaulus with well-preserved hydranths and medusa buds (Fraser 1943a, pl. 15, figs. 1a, b). It is now in multiple fragments and in poor condition, with no clearly distinguishable hydranths or gonophores. Conflicting collection data exist on labels with the hydroid, with one indicating "May 8, 1867" and another "May 8 1869". The earlier date, as given in the online catalogue of the MCZ, has been followed here.

Miglietta (2016) redescribed this species and provided 16S sequence data based on putative conspecifics from the Gulf of Mexico. From her analyses, Schuchert (2016) determined that *T. fascicularis* was indistinguishable from *Oceania armata* Kölliker, 1853 based on DNA sequence data, and he placed the two names in synonymy.

Family Bougainvilliidae Lütken, 1850

Bimeria brevis Fraser, 1918c

Bimeria brevis Fraser, 1918c: 338, pl. 1, figs. 2a–c.
Garveia brevis.—Cairns *et al*., 1991: 14.

Syntypes. BCPM 976-00172-001: Canada, Bay of Fundy.

BCPM 976-00172-002: Canada, Bay of Fundy.

Lectotype, by present designation. BCPM 976-00172-001: Canada, New Brunswick, St. Andrews, Katy Cove, on a tubulariid stem, one colony, up to 3 mm high, without gonophores; slide.

Paralectotype. BCPM 976-00172-002: Canada, Bay of Fundy; slide.

Type locality. Canada, New Brunswick: St. Andrews, Katy Cove, on a tubulariid (Fraser 1918c).

Current status. *Species inquirenda* (WoRMS).

Remarks. Name-bearing types were not designated in the original description of *Bimeria brevis* Fraser, 1918c. Specimens on two slides in the Fraser Hydroid Collection at the RBCM (BCPM 976-00172-001, BCPM 976-00172-002) are regarded here as syntypes. These collections are recorded in the RBCM database as being from the Bay of Fundy. Notably, the type locality of the species in the original description (Katy Cove, located at St. Andrews, New Brunswick) is within the Bay of Fundy region. The only other records of the species given by Fraser (1944a) are from Cape Breton Island (Nova Scotia), Portland (Maine), and Casco Bay (Maine), all outside the stated type locality. As lectotype of the species, we designate a colony or part of a colony on one of the syntype slides (BCPM 976-00172-001). Two colony fragments are present on that slide, with the lectotype specimen occurring on the longer of two tubulariid stems.

Fraser's (1918c) account of *Bimeria brevis* was based on sterile and possibly juvenile material. His hydroids appear to have been bougainvilliids, but they are not referable to *Bimeria* Wright, 1859 because no perisarcal covering exists over the bases of the tentacles. Cairns *et al*. (1991, 2002) assigned the species to *Garveia* Wright, 1859, but that seems open to question. In WoRMS, *G. brevis* is justifiably listed as a *taxon inquirenda*.

Bimeria pusilla Fraser, 1925

? *Bimeria pusilla* Fraser, 1925: 168, fig. 2.
Garveia pusilla.—Cairns *et al*., 1991: 14.

Type material. CAS-IZ 21799.00: USA, California, San Francisco Estuary, San Francisco Bay, Marin County, Lime Point, 10 August 1896, specimen count 1, coll. University of California; 10% formalin.

Type locality. USA, California: San Francisco Bay, Lime Point (Fraser 1925).

Current status. *Species inquirenda* (WoRMS).

Remarks. The only known type material of *Bimeria pusilla*, in collections at the CAS (CAS-IZ 21799.00), is listed as a syntype. The online database indicates a specimen count of "1", and Fraser's (1925) description of the species appears to have been based on a single colony. No other type material of *B. pusilla* was located, and the CAS specimen may be the holotype by monotypy.

The brief account of *Bimeria pusilla* by Fraser (1925) was based on sterile material. Although the hydroid appears to have been a bougainvilliid, it is not referable to *Bimeria* Wright, 1859 because the tentacles are not covered by a sheath of perisarc basally. Cairns *et al*. (1991, 2002) included the species in *Garveia* Wright, 1859, but verification is warranted. *Garveia pusilla* is listed in WoRMS as a *taxon inquirenda*, and we agree.

Bimeria tenella Fraser, 1925

? *Bimeria tenella* Fraser, 1925: 168, figs. 3A, B.
Garveia tenella.—Cairns *et al*., 1991: 14.

Type material. CAS-IZ 21800.00: USA, California, San Francisco Estuary, San Francisco Bay, Southampton Lt. N 10° E, Blunt Point N 65° W, Alcatraz Light S 28° W, 12 August 1912, 22.5 fm (41 m), specimen count 1, coll. USFCS *Albatross*; 10% formalin.

Type locality. USA, California: San Francisco Bay, several locations near the entrance (close to Southampton Light, Angel Island, and Alcatraz Island), 16–40 m (Fraser 1925).

Current status. *Species inquirenda* (WoRMS).

Remarks. Type material of *Bimeria tenella* exists at CAS (CAS-IZ 21800.00). Listed there as a syntype, the specimen count is given as "1". No other type material is known to exist, and the CAS collection may prove to be a holotype by monotypy. The single lot of *B. tenella* in the Fraser Hydroid Collection at the RBCM (BCPM 976-00177-001: Cartago Bay) is non-type material. That sample was collected from Isla Isabela, Galápagos Islands, Ecuador, during the 1934 Allan Hancock Pacific Expedition (Fraser 1938a).

Only infertile material of *Bimeria tenella* was available to Fraser (1925) in describing the species. His hydroid, likely a bougainvilliid, lacked a perisarcal sheath around the bases of the tentacles and is not referable to *Bimeria* Wright, 1859. The species was included in *Garveia* Wright, 1859 by Cairns *et al*. (1991, 2002). *Garveia tenella* is listed in WoRMS as a *taxon inquirenda*.

Bimeria tunicata Fraser, 1943a

? *Calyptospadix cerulea* Clarke, 1882: 136, pl. 7, figs. 1–9.
Bimeria franciscana Torrey, 1902: 28, pl. 1, fig. 4.
Bimeria tunicata Fraser, 1943a: 76, pl. 15, figs. 2a, b.
Garveia franciscana.—Vervoort, 1964: 127, figs. 1–4.

Syntypes. MCZ-IZ 9006: USA, Louisiana, Louisiana coast, 1918, winter, several colonies, up to 13 cm high, in fair to fairly good condition, with male and female gonophores, coll. Percy Viosca, labelled "type"; formalin, about to be transferred to ethanol.

Lectotype, by present designation. MCZ-IZ 9006: USA, Louisiana, Louisiana coast, 1918, winter, hydrocaulus of one colony, 7 cm high, in fairly good condition, with female gonophores, coll. Percy Viosca, labelled "type"; ethanol.

Paralectotypes. MCZ-IZ 146028: USA, Louisiana, Louisiana coast, 1918, winter, several colonies, up to 13 cm high, in fair to fairly good condition, some colonies with male and others with female gonophores, coll. Percy Viosca, labelled "type"; formalin, about to be transferred to ethanol.

Type locality. USA, Louisiana coast (Fraser 1943a).

Current status. Invalid.

Remarks. In establishing *Bimeria tunicata*, no name-bearing type was fixed by Fraser (1943a). Several colonies examined by him in preparing the original description, labelled "Type" and constituting syntypes, are at the MCZ (MCZ-IZ 9006). A hydrocaulus having the best-preserved female gonophores was selected from among the syntypes as the lectotype (MCZ-IZ 9006). All others are paralectotypes (MCZ-IZ 146028).

Bimeria tunicata was assigned to the synonymy of *Bimeria franciscana* Torrey, 1902 by Deevey (1950), following a study of abundant material from both Louisiana, type locality of the former, and San Francisco Bay, type locality of the latter. Vervoort (1964) referred the species to *Garveia* Wright, 1859, as *G. franciscana*. More likely this species will prove to be identical with, or at least congeneric with, the seldom-reported estuarine bougainvilliid *Calyptospadix cerulea* Clarke, 1882 (type locality: Fort Wool in Hampton Roads, Virginia, USA).

Labels with the syntypes credit the collector of this species as "Percy Viaseo", believed by us to be the noted Louisiana naturalist Percy Viosca, Jr. (see Penn 1962).

Bougainvillia inaequalis Fraser, 1944a

Bougainvillia inaequalis Fraser, 1944a: 51, pl. 5, figs. 20a–c.

Syntypes. AMNH 3247: USA, Louisiana, off "Passa Loutre" (Pass a Loutre), 5 miles (8 km) NNE, 15 fm (27 m), 23 January 1931, four monosiphonic colonies or colony fragments, in fair condition, up to 8 mm high, with tattered hydranths, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

AMNH 3248: USA, Louisiana, East Bay, May 1930, one polysiphonic colony, in fair condition but much fragmented and tangled, with hydranths, with gonophores, coll. M. Burkenroad; formalin, now in ethanol.

AMNH 3251: USA, Louisiana, off "Passa Loutre" (Pass a Loutre), 15 fm (27 m), 1930, numerous (>100) fragments of a colony or colonies, in poor condition, up to 1.8 cm high, with very few hydranths, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

Lectotype, by present designation. AMNH 3248: USA, Louisiana, East Bay, May 1930, one polysiphonic colony, in fair condition but much fragmented and tangled, with hydranths, with gonophores, coll. M. Burkenroad; formalin, now in ethanol.

Paralectotypes. AMNH 3247: USA, Louisiana, off "Passa Loutre" (Pass a Loutre), 5 miles (8 km) NNE, 15 fm (27 m), 23 January 1931, four monosiphonic colonies or colony fragments, in fair condition, up to 8 mm high, with tattered hydranths, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

AMNH 3251: USA, Louisiana, off "Passa Loutre" (Pass a Loutre), 15 fm (27 m), 1930, numerous (>100) fragments of a colony or colonies, in poor condition, up to 1.8 cm high, with very few hydranths, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

Type locality. USA, Louisiana: East Bay (Fraser 1944a).

Current status. Valid.

Remarks. Fraser (1944a) described *Bougainvillia inaequalis* without designating name-bearing types. Nevertheless, type material of the species exists at the AMNH. One sample (AMNH 3248) is listed in the online database of the museum as the holotype, while another (AMNH 3247) is listed as a paratype. A third (AMNH 3251), not listed in the online database, is recorded on a card file as a paratype. The latter sample contains a label in Fraser's handwriting, now much faded, supporting the type status of the material. As we interpret the Code (ICZN Art. 72.4.7), these three are syntypes. Hydroids of the species at the RBCM (BCPM 976-00181-001), collected 14 March 1946 from Aransas Bay, Texas (Arai 1977), are not part of the type series. Neither is a collection at the NMNH (USNM 51999) from Grand Isle, Louisiana, a location not included in the type locality. No type material of *B. inaequalis* was located in online databases of other museums.

Of the syntypes listed above, the lectotype selected here (AMNH 3248) clearly corresponds best with the species as described by Fraser (1944a). As noted above, it has been listed in the past, incorrectly, as the holotype.

Although the specimen is fragmentary and in only fair condition, hydranths and gonophores are present on parts of the colony. The lectotype collection also contains stems of a tubulariid. Our lectotype designation restricts the type locality of *B. inaequalis* to East Bay, Louisiana, USA. Hydroids in the other two vials (AMNH 3247, AMNH 3251) are paralectotypes.

Notes on card files at the AMNH indicate that the syntypes were examined decades ago by William J. Rees (1913–1967), who concluded that materials in two of the samples (AMNH 3247, AMNH 3251) probably belong to a different species from that in the third (AMNH 3248). In our opinion, however, all are conspecific. Although we are somewhat less certain about the identity of hydroids in AMNH 3247, we believe they are simply younger specimens.

Bougainvillia inaequalis is listed as valid in works such as Vannucci & Rees (1961), Cairns *et al*. (2002), Calder & Cairns (2009), and WoRMS. Deevey (1950) questioned its validity, noting that it seemed to intergrade with *B. carolinensis* McCrady, 1859. Defenbaugh & Hopkins (1973), following Fraser (1944a), distinguished *B. inaequalis* from *B. carolinensis* and *B. rugosa* Clarke, 1882 in having much wrinkled perisarc on stem and branches. That character is indeed striking, as apparent in the lectotype colony examined here and as illustrated in Fraser (1944a: pl. 5, figs. 20b, c). The nominal species is maintained in this work as valid, although further taxonomic studies of its trophosome and gonosome are warranted. In being an insufficiently described species, with its medusa stage unknown, records of *B. inaequalis* from New Zealand are doubtful (Schuchert 1996).

Family Bythotiaridae Maas, 1905

Genus *Crypta* Fraser, 1911

Bythotiara Günther, 1903: 425.
Crypta Fraser, 1911: 19 [invalid junior homonym of *Crypta* Stephens, 1830 and *Crypta* Gray, 1850].
Endocrypta Fraser, 1912a: 216 [new replacement name for *Crypta* Fraser, 1911].

Type species. *Crypta huntsmani* Fraser, 1911, by monotypy.

Current status. Invalid.

Remarks. The generic name *Crypta* Fraser, 1911 is an invalid junior homonym of *Crypta* Stephens, 1830: 103 (Coleoptera), and *Crypta* Gray, 1850: 83 (Mollusca), and was replaced by *Endocrypta* Fraser, 1912a. *Endocrypta* was then shown to be a junior subjective synonym of *Bythotiara* Günther, 1903 by Brinckmann-Voss (1979). Although *Crypta* Humphrey, 1797: 4 (Mollusca) appeared even earlier than the homonymous names above, it was published in a work rejected for nomenclatural purposes by the ICZN in not having been published as prescribed by the Code (Opinion 51), and is not available.

Genus *Endocrypta* Fraser, 1912a

Bythotiara Günther, 1903: 425.
Crypta Fraser, 1911: 19 [invalid junior homonym of *Crypta* Stephens, 1830 and *Crypta* Gray, 1850].
Endocrypta Fraser, 1912a: 216 [replacement name for *Crypta* Fraser, 1911].

Type species. *Crypta huntsmani* Fraser, 1911, by monotypy.

Current status. Invalid.

Remarks. As noted above, *Endocrypta* Fraser, 1912a is a junior subjective synonym of *Bythotiara* Günther, 1903 (Brinckmann-Voss 1979).

Crypta huntsmani Fraser, 1911

Crypta huntsmani Fraser, 1911: 19, pl. 1, figs. 1–5.

Endocrypta huntsmani.—Fraser, 1912a: 216.
Bythotiara huntsmani.—Brinckmann-Voss, 1979: 1226, figs. 1–6.

Type material. None known to exist.

Type locality. Canada, British Columbia: Departure Bay, Nanaimo (Fraser 1911).

Current status. Valid, as *Bythotiara huntsmani* (Fraser, 1911).

Remarks. Only non-type material of *Crypta huntsmani* exists in the Fraser Hydroid Collection at the RBCM (BCPM 976-00166-001: Departure Bay, 04 April 1933, trawl, from transparent tunicate; BCPM 976-00166-002: Departure Bay, 04 April 1933; BCPM 976-00166-003: Departure Bay, 04 April 1933) (Arai 1977).

Fraser (1911) found hydranths with medusa buds, but no free medusae were observed by him. Brinckmann-Voss (1979) raised medusae from hydroids identified as *Endocrypta huntsmani*, and referred them to the genus *Bythotiara* Günther, 1903, as *B. huntsmani*. That binomen is currently recognized as valid (Arai & Brinckmann-Voss 1980; Cairns *et al*. 2002; WoRMS).

The specific name honours Archibald Gowanlock Huntsman (1883–1973), a noted Canadian marine biologist who first discovered the hydroid stage of this species in stomodea of ascidians and brought it to the attention of Fraser.

Family Hydractiniidae L. Agassiz, 1862

Hydractinia aggregata Fraser, 1911

Hydractinia aggregata Fraser, 1911: 25, pl. 2, figs. 1–4.

Syntypes. USNM 71134: USA, Washington, San Juan Islands, 1904, three colonies on empty gastropod shells, coll. H. Moon; ethanol.

Lectotype, by present designation. USNM 71134: USA, Washington, San Juan Islands, 1904, one colony on an empty gastropod shell, in good condition, with gonozooids and gonophores, coll. H. Moon; ethanol.

Paralectotypes. USNM 1458915: USA, Washington, San Juan Islands, 1904, two colonies on empty gastropod shells, one colony, in fair condition, with gonophores, one colony, in poor condition, without gonophores, coll. H. Moon; ethanol.

Type locality. USA: Washington, San Juan Archipelago (Fraser 1911).

Current status. Valid.

Remarks. Fraser (1911) described *Hydractinia aggregata* based on collections from two localities on the west coast of North America (Canada: Departure Bay; USA: San Juan Archipelago). One of these, made available to him by C.C. Nutting at the University of Iowa, had been collected in the San Juan Archipelago by H. Moon. The Nutting collections at Iowa were eventually deposited in the NMNH (Calder 2004), and material of *H. aggregata* from one of the original localities at that museum (USNM 71134), listed above, is taken here to be a syntype. The three specimens ("specimen count: 1 ca.") are not recorded as type material in the current online database of that museum but are considered so here. Material of *H. aggregata* from another of the two original type localities (Departure Bay, British Columbia), likely collected by Fraser himself, exists on a slide in the Fraser Hydroid Collection at the RBCM (BCPM 976-00206-001). However, we were unable to determine the date of its collection and could not confirm that it was a syntype. Other collections of the species in the Fraser Collection are non-types (BCPM 976-00203-001: Departure Bay, channel N of Inskip Rock and Jesse Island, 18 April 1912, 9–22 m; BCPM 976-00204-001: N of Jesse Island, 10 July 1912, 27 m; BCPM 976-00205-001 and BCPM 976-00205-002: Departure Bay, S of Jesse and Brandon Islands, 17 September 1912, 18–37 m; BCPM 976-00207-001: Horswell Channel, near Clarke Rock, 02 November 1912, 15–37 m; BCPM 976-00208-001: Horswell Channel, between Horswell Rock and Clarke Rock, 25 July 1913, 27–55 fm; BCPM 976-00209-001: S of Mudge Island, 21 August 1912, 22–37 m; BCPM 976-00210-001: Friday Harbor, 25 July 1912; BCPM 976-00211-001: SW arm Tasoo Harbour, 07 June 1935, 18-46 m; BCPM 976-00212-001: Rose Spit, 06 September 1935).

The best colony of the syntype series, covering most of a relatively small gastropod shell, is designated here as the lectotype (USNM 71134). The remaining two colonies are paralectotypes (USNM 1458915).

Hydractinia aggregata was found on gastropod shells occupied by hermit crabs (Fraser 1911). Gastrozooids

and gonozooids, but not dactylozooids, were observed. The species is apparently common in the Strait of Georgia (Fraser 1914a, 1937a, 1947a).

Hydractinia armata Fraser, 1940b

Hydractinia armata Fraser, 1940b: 39, figs. 1a–f.

Syntypes. BCPM 976-00213-001: USA, California, San Mateo County, Montara, 8 June 1939, coll. T. Bullock and R. Fernald; 60% IPA.

BCPM 976-00214-001: USA, California, San Mateo County, Pillar Point, 15 June 1939, under ledge, coll. T. Bullock; 60% IPA.

Lectotype, by present designation. RBCM 976-00213-002: USA, California, San Mateo County, Montara, in tidepools, on coralline algae, 8 June 1939, one colony, with gonophores, in fairly good condition, coll. T. Bullock and R. Fernald; 70% ethanol.

Paralectotypes. BCPM 976-00213-001: USA, California, San Mateo County, Montara, in tidepools, 8 June 1939, coll. T. Bullock & R. Fernald, two fragments, with gonophores, in fair condition; 60% IPA.

BCPM 976-00214-001: USA, California, San Mateo County, Pillar Point, 15 June 1939, intertidal ledge (Fraser 1940b), in poor condition, coll. T. Bullock; 60% IPA.

Type locality. USA, California: San Mateo County, Montara (misspelled as Mantara), encrusting corallines in tidepools (Fraser 1940b).

Current status. Valid.

Remarks. In establishing *Hydractinia armata*, Fraser (1940b) failed to designate name-bearing types. Specimens located at the RBCM (BCPM 976-00213-001; BCPM 976-00214-001) during this study, from the two original type localities near Moss Beach, California, are considered syntypes here. We designate the best of the available syntype colonies as the lectotype herewith (RBCM 976-00213-002).

Hydractinia armata, taken to be valid (Cairns *et al*. 2002; Mills *et al*. 2007; WoRMS), has been reported southwards to San Nicolas Island, California (Fraser 1948), and northwards to a tidepool at Race Rocks, British Columbia, in the Strait of Juan de Fuca (Brinckmann-Voss 1996). Its spines, very numerous, are noteworthy in being long, smooth, and nearly cylindrical up to a tapered point, with a series of internal annular thickenings (Fraser 1940b).

Hydractinia carolinae Fraser, 1912c

Hydractinia carolinae Fraser, 1912c: 351, figs. 9A–C.

Syntypes. BCPM 976-00215-001: USA, North Carolina, off Beaufort, 14–15 May 1911, dredged by R/V *Fish Hawk*, on legs of crab; 60% IPA.

BCPM 976-00215-002: USA, North Carolina, Beaufort; slide.

Lectotype, by present designation. RBCM 976-00215-003: USA, North Carolina, about 37 km SW of Beaufort, depth 24–26 m, 14–15 May 1911, on leg of crab, dredge, R/V *Fish Hawk*, one colony, in fair condition, with gonophores; 70% ethanol.

Paralectotypes. BCPM 976-00215-001: USA, North Carolina, off Beaufort, 14–15 May 1911, dredge, R/V *Fish Hawk*, several colonies or colony parts on legs of crab, some with gonophores; 60% IPA.

BCPM 976-00215-002: USA, North Carolina, one colony or colony part, Beaufort; slide.

Type locality. USA, North Carolina: about 37 km SW of Beaufort, depth 24–26 m, on a crab (Fraser 1912c).

Current status. Valid.

Remarks. According to Fraser (1912c), *Hydractinia carolinae* was described from hydroids occurring on the legs of a single crab, and all were female. Materials at the RBCM listed above (BCPM 976-00215-001; BCPM 976-00215-002) represent the original collection and constitute syntypes because the species was found in the type locality only once (Fraser 1944a). Indeed, all specimens may have originated from a single colony and represent parts of a holotype by monotypy (ICZN Art. 73.1.2). However, we have considered the fragments, on different

legs, as syntypes and have designated a lectotype from one of them (ICZN Recommendation 73F). The best colony, or colony fragment, from BCPM 976-00215-001, has been selected as the lectotype (RBCM 976-00215-003). Other material assigned to the species in the Fraser Hydroid Collection at the RBCM (BCPM 976-00216-001, Puerto Rico, Culebra, 25 February 1934, 8-10 fm) (Arai 1977) is not part of the type series.

Hydractinia carolinae is held to be valid (Cairns *et al*. 2002; WoRMS).

Hydractinia laevispina Fraser, 1922a

Hydractinia laevispina Fraser, 1922a: 97, pl. 1, figs. 1–6.

Syntypes. BCPM 976-00220-001: Canada, British Columbia, Gabriola Passage, 29 June 1921, 18 m; dry.

Type locality. Canada, British Columbia: Gabriola Pass, western end (Fraser 1922a).

Current status. Valid.

Remarks. Collection data accompanying material in the Fraser Hydroid Collection at the RBCM (BCPM 976-00220-001) accord with those given in the original description of *Hydractinia laevispina* by Fraser (1922a). In the absence of a type designation of the species by Fraser (1922a), those specimens are syntypes. We have not designated a lectotype from the available material because it is now dry and in very poor condition.

Both male and female colonies of the species, found growing on shells of a barnacle ("*Balanus aquilla*" = *Menesiniella aquila*), were observed and described in Fraser's (1922a) original account. *Hydractinia laevispina* is considered a valid species (Brinckmann-Voss 1996; Cairns *et al*. 2002; Mills *et al*. 2007; Miglietta *et al*. 2009).

Hydractinia valens Fraser, 1941b

Hydractinia valens Fraser, 1941b: 79, pl. 13, figs. 2a–e.

Holotype. USNM 43451: USA, Massachusetts, R/V *Speedwell* Sta. 284, SW of Stellwagen Bank, 42°10'N, 70°22'W, 57 m, 04 August 1879, trawl, one colony on shell of a live gastropod, in rather poor condition, with a few gonophores, labelled "type"; ethanol.

Type locality. USA, Massachusetts: SW of Stellwagen Bank, 42°10'N, 70°22'W, 31 fm (57 m) (Fraser 1941b).

Current status. Valid.

Remarks. A specimen of *Hydractinia valens* Fraser, 1941b at the NMNH (USNM 43451) is currently listed in the online database as a syntype, although the specimen count in the online database is recorded as "1". Fraser had designated it as the "type." No other specimens of the species, type or otherwise, are reported in collections at the AMNH, CAS, MCZ, RBCM, or YPM. From his original description ("Colony growing from ..."), Fraser (1941b) seems to have examined a single specimen in describing the species. We therefore take the only colony of the species at the NMNH (USNM 43451), examined here, to be the holotype by monotypy (ICZN Art. 73.1.2).

Hydractinia valens, known to date solely from the brief account of Fraser (1941b), is regarded as valid (Cairns *et al*. 2002; WoRMS). It apparently differs from the sympatric *H. polyclina* L. Agassiz, 1860 and *H. symbiolongicarpus* Buss & Yund, 1989 in having spines that are short and smooth rather than tall and jagged. Fraser described its gastrozooids as "large and lusty" (to 4.5 mm high), with 10 tentacles (according to Fraser 1947a, the number of tentacles is 12). Gonozooids lacked tentacles, and bore fixed sporosacs each having about six ova. Fraser did not record the substrate of the species, but the holotype is on the shell of a gastropod with the snail still inside.

Family Corymorphidae Allman, 1872

Corymorpha adventitia Fraser, 1941b

Corymorpha adventitia Fraser, 1941b: 79, pl. 13, figs. 3a, b.

Syntypes. USNM 43452: Panama, Gulf of Panama, Panama Bay, Perico Island, 8°55'N, 79°31'W, 12 March 1891, three colony fragments, with hydranths or fragments of hydranths, labelled "type"; ethanol.

Lectotype, by present designation. USNM 43452: Panama, Gulf of Panama, Panama Bay, Perico Island, 8°55'N, 79°31'W, 12 March 1891, one colony fragment with a hydranth, in only fair condition, with gonophores, labelled "type"; ethanol.

Paralectotypes. USNM 1458875: Panama, Gulf of Panama, Panama Bay, Perico Island, 8°55'N, 79°31'W, 12 March 1891, two colony fragments with hydranths or fragments of hydranths, in only fair condition, with gonophores; ethanol.

Type locality. Panama: Gulf of Panama, off Perico Island, 8°55'N, 79°31'W (see Remarks section below).

Current status. Valid.

Remarks. Fraser (1941b) indicated examining more than one specimen ("Zooids 20 mm.…") in describing *Corymorpha adventitia*, and his "type" of the species at the NMNH (USNM 43452) indeed comprises fragments of what appear to be at least two polyps (syntypes). The best specimen, with a hydrocaulus and a hydranth with gonophores, is designated here as the lectotype (USNM 43452). The other fragments have been isolated and assigned paralectotype status (USNM 1458875). The paralectotype polyp appears to match the hydroid illustrated by Fraser (1941b, pl. 13, figs. 3a, b) in describing the species, but it is not in as good condition now as the lectotype. No specimens of the species are reported in collections at the AMNH, CAS, MCZ, RBCM, or YPM.

Two different collection localities have been given for *Corymorpha adventitia*. According to Fraser (1941b), the hydroid was present in a vial labelled "U.S.F.C. Str. *Albatross*, Panama, Mar. 12, 1891" but no station was listed on that day from the cruise. Fraser thereupon recorded as its locality the last haul made the previous day (off Darién, 7°33' N, 78°34'20" W, 155 m). A different locality in the Gulf of Panama (Perico Island, near Panama City), recorded in the NMNH database as *Albatross* Station 234, is taken here to be correct. Labels with the holotype specimen mark 12 March 1891 as the date of collection, but one of them confirms that the collection was from *Albatross* Station 234.

Vervoort (2009) restated the morphological characters of *C. adventitia*, a species he regarded as insufficiently described. It is not currently listed in WoRMS. Examination of type material shows that this hydroid is a species of *Ralpharia* Watson, 1980, and it is here assigned the binomen *R. adventitia*. Its relationship to other known species of the genus needs to be explored. To the north, *Ralpharia multitentaculata* (Fraser, 1938a) is known from the coast of Baja California, Mexico (Calder *et al*. 2009). Across the Isthmus of Panama, *Ralpharia gorgoniae* Petersen, 1990 occurs on the Atlantic coast of Panama (Calder & Kirkendale 2005) and is widely distributed elsewhere in the Caribbean region (e.g., Galea 2013, Galea & Ferry 2015). Representatives of the genus occur essentially worldwide in warm seas.

Lampra uvularis Fraser, 1941b

Lampra uvularis Fraser, 1941b: 80, pl. 14, fig. 4.
Corymorpha uvularis.—Vervoort, 2009: 772.

Syntypes. USNM 43453: USA, Alaska, Alexander Archipelago, Admiralty Island, Stephens Passage, Thistle Ledge, R/V *Albatross* Sta. 4253, 14 July 1903, Tanner beam trawl, 240–344 m, two polyps with fragments of gonophores, labelled "type"; ethanol.

Lectotype, by present designation. USNM 43453: USA, Alaska, Alexander Archipelago, Admiralty Island, Stephens Passage, Thistle Ledge, R/V *Albatross* Sta. 4253, 14 July 1903, Tanner beam trawl, 240–344 m, one polyp, in fair condition, with gonophores and detached fragments of gonophores, labelled "type"; ethanol.

Paralectotype. USNM 1458921: USA, Alaska, Alexander Archipelago, Admiralty Island, Stephens Passage, Thistle Ledge, R/V *Albatross* Sta. 4253, 14 July 1903, Tanner beam trawl, 240–344 m, one small polyp with a hydranth and detached fragments of it, in poor condition, with gonophores and fragments of gonophores; ethanol.

Type locality. USA, Alaska: Stephens Passage, Thistle Ledge, 131 fm (240 m) (Fraser 1941b).

Current status. Valid, as *Corymorpha uvularis* (Fraser, 1941b).

Remarks. The "type" of *Lampra uvularis*, as designated by Fraser (1941b), comprises two syntypes at the NMNH (USNM 43453). There have been no subsequent records of the species. The larger and better of the two type specimens is designated here as the lectotype (USNM 43453). The other, now a paralectotype, is removed herewith to a different collection (USNM 1458921).

Vervoort (2009) provided a summary of Fraser's (1941b) brief original description of the species, and assigned it to *Corymorpha* M. Sars, 1835, as *C. uvularis*. He suggested that it might be identical to either *C. glacialis* M. Sars, 1860 or *C. carnea* (Clark, 1877). The species is currently listed as valid in WoRMS. The specific name, derived from the diminutive of the Latin *uva* (grape, or cluster of grapes) and the suffix *-aris* (pertaining to), refers to the gonophores of this hydroid. Fraser described them as "…looking like compact bunches of grapes or like the cluster of flowers in the grape hyacinth…".

Family Hypolytidae Fraser, 1943b

Euphysidae Haeckel, 1879: 29.
Hypolytidae Fraser, 1943b: 32.

Current status. Invalid.

Remarks. The family name Hypolytidae as first used by Fraser (1943b) was not accompanied by a statement of characters that differentiate the taxon (ICZN Art. 13.1.1) or by a bibliographic reference to such a statement (ICZN Art. 13.1.2). Hypolytidae is nevertheless available from its original publication in having been used as valid (e.g., Fraser 1944a, 1945b, 1947a) before 2000 (ICZN 13.2.1). A diagnosis of the trophosome and gonosome of the taxon was provided the following year by Fraser (1944a). Hypolytidae Fraser, 1943b (Hydrozoa) and Hippolytidae Bate, 1888 (Crustacea) are not homonyms because of the spelling difference that exists between them (ICZN Art. 55.4).

Rees (1946) reviewed characters of the two species included within Hypolytidae by Fraser (1944a), *Hypolytus peregrinus* Murbach, 1899 (misspelled by Rees as *Hipolytus peregrinus*) and *Dahlgrenella farcta* Miles, 1937. Both were assigned by him to *Corymorpha* M. Sars, 1835, with Hypolytidae (misspelled by Rees as Hipolytidae) being relegated to the synonymy of Corymorphidae Allman, 1872. Later, Rees (1957a) included *Hypolytus* Murbach, 1899 and *Euphysa* Forbes, 1848 (including its junior subjective synonym *Dahlgrenella* Miles, 1937) in the subfamily Euphysinae Haeckel, 1879 within Corymorphidae, while noting that a "wide gulf" existed between those so-called "lower corymorphines" and "higher corymorphines" such as *Corymorpha*. Relationships within corymorphioids are still unsettled, with some authors recognizing Euphysidae as a distinct family (Bouillon *et al*. 2006; Xu *et al*. 2014) and others including it as a group within Corymorphidae (Petersen 1990; Schuchert 2010, 2012; WoRMS). With *Hypolytus* now included as a synonym of *Euphysa* (Petersen 1990; Cairns *et al*. 2002; Bouillon *et al*. 2006; Schuchert 2010; WoRMS), Hypolytidae is certainly a synonym of Euphysidae, and it is sometimes subsumed within Corymorphidae as well (e.g., WoRMS).

Family Tubulariidae Fleming, 1828

Ectopleura grandis Fraser, 1944a

Ectopleura grandis Fraser, 1944a: 92, pl. 15, figs. 66a, b.

Syntypes: AMNH 3253: USA, Louisiana, East Bay, May 1930, several colonies and colony fragments, some with and some without hydranths, up to 5 cm high, in marginally fair to poor condition, a few hydranths with developing gonophores, coll. M. Burkenroad; formalin, now in ethanol.

AMNH 3258: USA, Louisiana, Imbale Bay, 15 April 1930, several (>10) stem fragments without hydranths, up to 12 mm high, with some stolons on seagrass, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

Lectotype, by present designation. AMNH 3253: USA, Louisiana, East Bay, May 1930, one colony, branched eight times, about 5 cm high when straightened, in marginally fair condition, with 4 hydranths, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

Paralectotypes. AMNH 3258: USA, Louisiana, Imbale Bay, 15 April 1930, several (>10) stem fragments without hydranths, up to 12 mm high, with some stolons on seagrass, without gonophores, coll. M. Burkenroad; formalin, now in ethanol.

AMNH_IZC 250227: USA, Louisiana, East Bay, May 1930, several colonies and colony fragments, some with

and some without hydranths, up to 3.5 cm high, in marginally fair to poor condition, a few hydranths with developing gonophores, coll. M. Burkenroad; formalin, now in ethanol.

Type locality. USA, Louisiana: East Bay (Fraser 1944a).

Current status. Valid.

Remarks. *Ectopleura grandis* was founded by Fraser (1944a) for hydroids from Barataria Bay, Imbale Bay, and East Bay, Louisiana. Although no types of the species were designated in the original account, specimens of the type series exist at the AMNH, with one sample (AMNH 3253: East Bay) listed in the online database of the museum as the holotype and another (AMNH 3258: Imbale Bay) as a paratype. We regard both as syntypes here, under provisions of the Code (ICZN Art. 72.4.7). Arai (1977) also listed the species as part of the Fraser Hydroid Collection at the RBCM (BCPM 976-00144-001: Barataria Bay, 25 May 1931). However, it is not currently listed in the online catalogue of the museum, and is now missing from the collection. No other types of the species were located in online databases of the NMNH, CAS, RBCM, MCZ and YPM.

After examining the syntypes listed above, a single colony was selected as the lectotype and returned to its vial (AMNH 3253). Other colonies and colony fragments from the same vial were removed to a separate vial, assigned a new collection number (AMNH_IZC 250227), and included in the paralectotype series. The lectotype colony is the best preserved of all the type specimens, although its four hydranths lack gonophores. A few hydranths in one of the paralectotype collections (AMNH_IZC 250227) have developing gonophores, but their trophosomes show fewer characters of the species overall. None of the examined hydranths were as large as indicated by Fraser (1944a: pl. 15, fig. 66a). The type locality of *Ectopleura grandis* is restricted here to East Bay, Louisiana, USA, following designation of a lectotype.

Ectopleura grandis has been considered a valid species in works such as Deevey (1950), Defenbaugh & Hopkins (1973), Petersen (1990), Cairns *et al*. (2002), Bouillon *et al*. (2006), Calder & Cairns (2009), and WoRMS. According to Deevey (1950), the hydroid is decidedly more robust than that of *E. dumortierii* (Van Beneden, 1844), yet it possesses fewer tentacles (proximal and distal tentacles each ca. 14–16) when nearly mature (Fraser 1944a). Of note, however, type specimens examined here were less robust than typical hydroids of *E. dumortierii* from Chesapeake Bay (Calder 1971). Meanwhile, stems of *E. grandis* in AMNH collections were much more branched than indicated in the original description by Fraser (1944a). The species is still inadequately known, and knowledge of its life cycle is incomplete.

Tubularia aurea Fraser, 1936a

Tubularia aurea Fraser, 1936a: 504, fig. 1.

Syntypes. BCPM 976-00145-001: Canada, British Columbia, Houston Stewart Channel, Danger Rocks, on shore, east end of channel, 17 June 1935, labelled "type"; 60% IPA.

BCPM 976-00145-002: Canada, British Columbia, Houston Stewart Channel, Danger Rocks, on shore, east end of channel, 17 June 1935; slide (missing from slide box).

Lectotype, by present designation. RBCM 976-00145-003: Canada, British Columbia, Houston Stewart Channel, Danger Rocks, east end of channel, on shore, 17 June 1935, one specimen, 1.3 cm high, in fairly good condition, with gonophores; 70% ethanol.

Paralectotypes. BCPM 976-00145-001: Canada, British Columbia, Houston Stewart Channel, Danger Rocks, east end of channel, on shore, 17 June 1935, several specimens, in varied condition, some with gonophores, labelled "type"; 60% IPA.

BCPM 976-00145-002: Canada, British Columbia, Houston Stewart Channel, Danger Rocks, on shore, east end of channel, 17 June 1935; slide (missing from slide box).

Type locality. Canada, British Columbia: Queen Charlotte Islands (=Haida Gwaii), Houston Stewart Channel, eastern end at Danger Rocks, on shore (Fraser 1936a).

Current status. Valid.

Remarks. Records of *Tubularia aurea* in the Fraser Hydroid Collection at the RBCM refer to material in IPA labelled “type” (BCPM 976-00145-001) and on a slide (BCPM 976-00145-002), both from the eastern end of Houston Stewart Channel, Queen Charlotte Islands (=Haida Gwaii), British Columbia, Canada. Although hydroids

in the two collections are regarded here as syntypes, the slide is now missing at the RBCM. The lectotype designated here (RBCM 976-00145-003) is the best of the available syntype specimens from the wet (IPA) collection (BCPM 976-00145-001). The remaining specimens in that collection become paralectotypes.

The species, known only from a perfunctory original description, is treated as valid in WoRMS. Fraser (1936a) described *Tubularia aurea* from specimens collected at low tide in Houston Stewart Channel, and from Flamingo Harbour (Flamingo Inlet, Moresby Island, British Columbia). No original specimens from the latter location are known to exist.

Tubularia crassa Fraser, 1941b

Tubularia crassa Fraser, 1941b: 81, pl. 14, figs. 5a, b.

Syntypes. USNM 22746: USA, Massachusetts, off Martha's Vineyard, 40°49'30"N, 70°47'W, R/V *Fish Hawk* Sta. 988, 07 September 1881, 55 m, rake dredge, two polyps, labelled "type"; ethanol.

Lectotype, by present designation. USNM 22746: USA, Massachusetts, off Martha's Vineyard, 40°49'30"N, 70°47'W, R/V *Fish Hawk* Sta. 988, 07 September 1881, 55 m, rake dredge, one polyp, in fairly good condition, with gonophores, labelled "type"; ethanol.

Paralectotype. USNM 1458912: USA, Massachusetts, off Martha's Vineyard, 40°49'30"N, 70°47'W, R/V *Fish Hawk* Sta. 988, 07 September 1881, 55 m, rake dredge, one polyp, in poor condition, with gonophores; ethanol.

Type locality. USA, Massachusetts: off Martha's Vineyard, 40°49'30"N, 70°47'W, 30 fm (55 m) (Fraser 1941b).

Current status. Invalid.

Remarks. Fraser (1941b) designated material at the NMNH as the "type" of *Tubularia crassa* (USNM 22746). The collection contains two specimens. One had been proposed as the lectotype and the other as a paralectotype of the species by K.W. Petersen in inter-museum correspondence, but the designations were never published and cannot be upheld as valid. The same designations are repeated here, with the lectotype having the original collection number (USNM 22746) and the paralectotype being assigned a new number (USNM 1458912).

The two original syntypes were also examined by Calder (1975), who concluded that they were identical with *Corymorpha pendula* L. Agassiz, 1862. As with that species, the hydroids appear to be solitary inhabitants of soft substrates, hydrocauli are thick and parenchymatic, hydranths have smaller oral and larger aboral whorls of tentacles, and gonosomes are fixed sporosacs rather than free medusae (L. Agassiz 1862; Fraser 1944a). WoRMS currently lists *T. crassa* as a *taxon inquirenda*.

Family Corynidae Johnston, 1837

Coryne corrugata Fraser, 1925

Coryne corrugata Fraser, 1925: 167, fig. 1.
Coryne corrigata.—Berrill, 1953: 297, figs. 12B, C [incorrect subsequent spelling].

Syntypes. CAS-IZ 21798.00: USA, California, San Diego County, San Diego, near jetty, 03 May 1902; 10% formalin.

BCPM 976-00128-001: USA, California, San Diego, near jetty, 03 May 1902, labelled "co-type"; 60% IPA.

Lectotype, by present designation. CAS-IZ 227311: USA, California, San Diego County, San Diego, near jetty, 03 May 1902, fragment of a colony, ca. 3.5 cm high, in good condition, without gonophores; 10% formalin.

Paralectotypes. CAS-IZ 21798.00: USA, California, San Diego County, San Diego, near jetty, 03 May 1902, several colony fragments, in good condition, without gonophores; 10% formalin.

BCPM 976-00128-001: USA, California, San Diego, near jetty, 03 May 1902, several colony fragments, up to ca. 3 cm high, in fair condition, without gonophores, labelled "co-type"; 60% IPA.

Type locality. USA, California: San Diego, near a jetty (Fraser 1925).

Current status. *Species inquirenda*.

Remarks. In describing *Coryne corrugata*, Fraser (1925) did not designate name-bearing types of the species. Specimens considered parts of the type series exist at CAS (CAS-IZ 21798.00) and in the Fraser Hydroid Collection at the RBCM (BCPM 976-00128-001). The CAS material is in good condition, and the best specimen available from this syntype series is designated here as the lectotype (CAS-IZ 227311). The material at the RBCM may have been dry sometime in the past (Schuchert 2001b), but is in fair condition, with some of the hydranths still being reasonably well preserved; the fragments constitute paralectotypes.

Fraser (1925) described *C. corrugata* on the basis of infertile material. For that reason, Schuchert (2001b) included it in a group of "problematic or indeterminable species." Nevertheless, he maintained that material identified as *Coryne corrigata* (sic) by Berrill (1953: figs. 12B, C) was likely identified correctly. Berrill provided no information about the source of his hydroid other than referring to it as "…*Coryne corrigata* Fraser of the Pacific coast….". *Coryne corrugata* is a species needing further study.

Coryne crassa Fraser, 1914a

Coryne crassa Fraser, 1914a: 113, pl. 2, figs. 3A–C.

Syntypes. BCPM 976-00129-001: USA, Washington, Friday Harbor; slide.

BCPM 976-00129-002: USA, Washington, Friday Harbor; slide.

Lectotype, by present designation. RBCM 976-00129-003: USA, Washington, Friday Harbor, one colony (middle colony on slide BCPM 976-00129-002), 1.5 cm high, in fairly good condition, with gonophores; slide.

Paralectotypes. BCPM 976-00129-001: USA, Washington, Friday Harbor, several fragments, some with gonophores; slide.

BCPM 976-00129-002: USA, Washington, Friday Harbor, two colony fragments, one to the left and one to the right of the lectotype specimen in the middle, some with gonophores; slide.

Type locality. USA, Washington: Friday Harbor (Fraser 1914a).

Current status. Valid.

Remarks. Although Fraser (1914a) did not designate a name-bearing type in first describing *Coryne crassa*, syntypes of it exist, on slides, in the Fraser Hydroid Collection at the RBCM (BCPM 976-00129-001; BCPM 976-00129-002). The best available specimen, on the second of these slides (BCPM 976-00129-002), is selected here as the lectotype and is assigned a new catalogue number (RBCM 976-00129-003). Three fragments of colonies exist on the slide, with the lectotype being in the middle.

Earlier, Schuchert (2001b) examined the slide bearing the lectotype and provided a re-description of the species. It was included by him in a group that included *C. hincksii* Bonnevie, 1898 and *C. sagamiensis* Hirohito, 1988. The species has subsequently been reported from China (Gao 1956; Xu *et al*. 2014) and from Race Rocks, British Columbia (Brinckmann-Voss 1996).

Family Acaulidae Fraser, 1924b

Acaulidae Fraser, 1924b: 173.

Current status. Valid.

Remarks. Stimpson (1853) described and illustrated *Acaulis primarius*, a remarkable new genus and species of solitary hydroid from Grand Manan Island, New Brunswick, Atlantic Canada. His polyp was unusual in having a very short, spike-shaped hydrocaulus beneath a large hydranth having scattered capitate tentacles and an irregular whorl of filiform tentacles at the base. Some early authors (e.g., Allman 1872) believed Stimpson's hydroid constituted a hydranth that had detached from its stalk. Even though G.O. Sars (1874) subsequently described and accurately illustrated *A. primarius* from Lofoten, Norway, uncertainty persisted over the morphological structure of the species (e.g., Fewkes 1890; Dendy 1902; Fraser 1918c). Fraser (1924b) confirmed the morphology of its hydrocaulus, and established the family Acaulidae to accommodate the species.

The taxonomy of *A. primarius* has recently been reviewed by Schuchert (2006). As noted therein, two species

were mistakenly included under that binomen by Stimpson (1853). However, Schuchert concluded that Allman (1872), in effect, had designated a lectotype (ICZN 74.5) by fixing its identity in conformity with that matching the longstanding concept of the species. That concept accords with the only illustration of *A. primarius* provided by Stimpson (1853, pl. 1, fig. 4). Type material of the species exists at the MCZ (Invertebrate Zoology Coel-162).

Family Symplectaneidae Fraser, 1941b

Myriothelidae Hincks, 1868: 75.
Candelabridae Stechow, 1921a: 248.
Symplectaneidae Fraser, 1941b: 78.

Current status. Invalid.

Remarks. Fraser (1941b) founded Symplectaneidae for *Symplectanea bracteata*, a presumed new genus and species of hydroid described by him from Stephens Passage, Alaska. *Symplectanea* Fraser, 1941b was referred to the synonymy of *Monocoryne* Broch, 1910 by Rees (1957b), a genus included by him in Myriothelidae Hincks, 1868. Symplectaneidae thereupon became a junior synonym of Myriothelidae.

Although the family name Myriothelidae predates Candelabridae Stechow, 1921a, the latter name has come into prevailing usage for the taxon because its type genus, *Candelabrum* de Blainville, 1830, predates its subjective synonym, *Myriothela* M. Sars, 1850, type genus of Myriothelidae. In the interests of nomenclatural stability, Schuchert (2006) urged adoption of Candelabridae over its senior synonym Myriothelidae, a nomenclatural act permissible under Art. 40.2 of the ICZN provided certain circumstances are met. Under Recommendation 40A of the Code, the currently accepted name, with its author and date, may be cited as Candelabridae Stechow, 1921a (1868), indicating precedence over Myriothelidae Hincks, 1868 and subsequently published synonyms. In turn, Symplectaneidae is a junior synonym of both Candelabridae and Myriothelidae. When elevated to the rank of family, the subfamily name Monocoryninae Rees, 1956 is also a junior synonym of Candelabridae.

Genus *Symplectanea* Fraser, 1941b

Monocoryne Broch, 1910: 138.
Symplectanea Fraser, 1941b: 78.

Type species. *Symplectanea bracteata* Fraser, 1941b, by monotypy.

Status. Invalid.

Remarks. As noted above, Rees (1957b) assigned *Symplectanea* Fraser, 1941b to the synonymy of *Monocoryne* Broch, 1910 after comparing type specimens of the type species of the two. All subsequent authors, in considering the genus, have adopted his proposal.

Symplectanea bracteata Fraser, 1941b

Symplectanea bracteata Fraser, 1941b: 78, pl. 13, figs. 1a, b.
Monocoryne bracteata.—Rees, 1957b: 19, unnumbered figures.

Syntypes. USNM 43450: USA, Alaska, Alexander Archipelago, Admiralty Island, Stephens Passage, Thistle Ledge, R/V *Albatross* Sta. 4253, 14 July 1903, Tanner beam trawl, 240–344 m, fragments of two polyps, labelled "type"; ethanol.

Lectotype, by present designation. USNM 43450: USA, Alaska, Alexander Archipelago, Admiralty Island, Stephens Passage, Thistle Ledge, R/V *Albatross* Sta. 4253, 14 July 1903, Tanner beam trawl, 240–344 m, three fragments of one polyp, in fair condition, with gonophores, labelled "type"; ethanol.

Paralectotype. USNM 1458906: USA, Alaska, Alexander Archipelago, Admiralty Island, Stephens Passage, Thistle Ledge, R/V *Albatross* Sta. 4253, 14 July 1903, Tanner beam trawl, 240–344 m, fragments of one polyp, in poor condition, with gonophores; ethanol.

Type locality. USA, Alaska: Stephens Passage, Thistle Ledge, 131 fm (240 m) (Fraser 1941b).

Current status. Valid, as *Monocoryne bracteata* (Fraser, 1941b).

Remarks. Fraser's (1941b) "type" of *Symplectanea bracteata* (USNM 43450) is currently recorded in the online NMNH database as syntype material with a specimen count of "1". No other types of the species are known to exist. Fraser (1941b) clearly examined more than one polyp because his description of the species begins with the words "Solitary zooids grow from a broad base…" According to Rees (1957b), who examined the sample from the NMNH, "torn fragments of two solitary capitate hydroids" were present. Although the same material has been referred to as the holotype by both Stepanjants *et al*. (2003) and Brinckmann-Voss & Lindner (2008), these two polyps are indeed syntypes. Our examination revealed that both specimens are fragmented. Three parts of the larger polyp were matched and constitute what we designate here as the lectotype (USNM 43450). This polyp corresponds with the specimen illustrated in Fraser's original description of the species (pl. 13, fig. 1a). The second specimen, and all miscellaneous remaining fragments, are included as paralectotype material (USNM 1458906).

Rees (1957b) compared Fraser's specimens with those of *Monocoryne gigantea* (Bonnevie, 1898). Specimens of *M. bracteata* differed in being larger and in having a greater number of capitula on the compound tentacles. Rees provisionally retained *M. bracteata* as valid because the condition of the specimens was too poor to determine if they were conspecific with *M. gigantea*. Stepanjants *et al*. (2003) also retained *M. bracteata* as valid after examining new material identified as the species from the Kuril Islands, Russia. However, the identity of that material as *M. bracteata* was questioned by Brinckmann-Voss & Lindner (2008), who believed it was likely identical instead with the newly-described *M. colonialis* Brinckmann-Voss & Lindner, 2008 from the Aleutian Islands, Alaska.

Beautiful illustrations of living specimens identified as *Monocoryne bracteata* appear in a paper by Schuchert *et al.* (2016).

Family Eudendriidae L. Agassiz, 1862

Eudendrium biseriale Fraser, 1935b

Eudendrium biseriale Fraser, 1935b: 105, pl. 1, figs. 1a, b.

Syntypes. BCPM 976-00228-001: Japan, Sagami Bay, Eboshi-iwa, low tide, 19 April 1931, several colony fragments, up to ca. 2 cm high, in rather poor condition, some with female gonophores, labelled "type"; reconstituted from dry, 60% IPA.

BCPM 976-00228-002: Japan, Sagami Bay, Eboshi-iwa, 19 April 1931, several colony fragments, in rather poor condition, some with female gonophores; reconstituted from dry, 60% IPA.

Type locality. Japan: "Eboshi-iwa, near Enoshima, at tide mark" (Fraser 1935b).

Current status. Valid.

Remarks. Specimens listed above as syntypes, from collections made by Emperor Hirohito in Sagami Bay, Japan, were sent to Fraser (1935b) for identification. No name-bearing type designation was made by him in the original account of the species. Notwithstanding the label marked "type" in one of the samples (BCPM 976-00228-001), both collections are taken here to contain syntype material (see ICZN Art. 72.4.7). Hydroids in the two bottles have been dry at some time in the past, and we consider all of them to be unsatisfactory for lectotype designation.

A sample of *Eudendrium biseriale* in the Emperor Shōwa Hydroid Collection at NMNS (NSMT-HyR 971, Japan, Sagami Bay, Eboshiiwa, off Chigasaki, 19 April 1931) seems to correspond with collection data accompanying specimens in the RBCM, but we do not know if Fraser examined it in describing the species. It has not been included here as a syntype.

Hydroids of *E. biseriale* were subsequently re-described by Yamada (1954) and Hirohito (1988). Both authors noted that male gonophores are usually scattered rather than being arranged in two whorls, as emphasized by Fraser (1935b) and as implied by the specific name he applied to it.

Eudendrium irregulare Fraser, 1922a

Eudendrium irregulare Fraser, 1922a: 97, pl. 1, fig. 7.

Syntypes. BCPM 976-00235-001: Canada, British Columbia, Northumberland Channel, 14 July 1921, 27 m; 60% IPA.

Lectotype, by present designation. RBCM 976-00235-002: Canada, British Columbia, Northumberland Channel, 27 m, 14 July 1921, one straggling colony, overgrowing a lafoeid, in poor condition, pedicels up to about 3 mm high, hydranths mostly absent or very badly deteriorated, gonophores absent; 70% ethanol.

Paralectotypes. BCPM 976-00235-001: Canada, British Columbia, Northumberland Channel, 14 July 1921, 27 m; several small colonies on lafoeids, in poor condition, gonophores absent; 60% IPA.

Type locality. Canada, British Columbia: Northumberland Channel, 27 m (Fraser 1922a).

Current status. Valid.

Remarks. Collection data accompanying the RBCM specimens (BCPM 976-00235-001) accord with those given in the original description of *Eudendrium irregulare* by Fraser (1922a). Hydroids in the Fraser Collection are therefore taken to be syntypes. The lectotype colony selected here (RBCM 976-00235-002) was chosen as the best representative of the species amongst the syntypes in the collection. All remaining specimens of the original syntype series are paralectotypes. Another collection of the species recorded in the RBCM database (BCPM 976-00166-001-Z) could not be located. A bottle with a similar collection number (BCPM 976-00166-001-Y) contains material attributed to *Endocrypta huntsmani* (Fraser, 1911).

Material of *E. irregulare* examined and described by Fraser (1922a) was sterile. Although he reported having seen colonies of this small, straggly hydroid many times and at different locations, hydranths satisfactory for description had not previously been observed. Fertile specimens of the species have yet to be described, and its cnidome remains unknown (Calder 2017). The species has been accepted as valid (Cairns *et al*. 2002; WoRMS).

Eudendrium rugosum Fraser, 1940a

Eudendrium rugosum Fraser, 1940a: 575, pl. 32, fig. 1.

Holotype. USNM 43433: North Atlantic Ocean, Flemish Cap, R/V *Albatross* Sta. 2693, 46°53'N, 44°39'30"W, 11 August 1886, large beam trawl, 143 m, two larger and a few smaller fragments of a colony, with hydrocauli up to 1.3 cm high, without hydranths but with a few male gonophores, labelled "type"; ethanol.

Paratype. BCPM 976-00250-001: North Atlantic Ocean, 46°53'N, 44°39'30"W, 11 August 1886, 139 m, several colony fragments, up to 5 mm high, in very poor condition, gonophores not seen, labelled "co-type"; 60% IPA.

Type locality. International waters: North Atlantic Ocean, Flemish Cap, 46°53'N, 44°39'30"W (Fraser 1940a).

Current status. Valid.

Remarks. Fraser (1940a) designated USNM 43433 as the "type" of *Eudendrium rugosum*. That name-bearing type material is recorded, correctly, as a holotype in the NMNH online database. Other specimens at the RBCM (BCPM 976-00250-001), labelled "co-type", constitute paratype material.

The hydroid of *Eudendrium rugosum* is small (ca. 15 mm high) and poorly characterized. Fraser (1940a) did not describe or illustrate its hydranths, and only male gonophores were present in his material. Examination of the holotype confirm this account. The cnidome has yet to be described. It is listed as valid in Cairns *et al*. (2002) and WoRMS, but discovery and examination of new material, particularly from the general type locality, is needed to better define and distinguish the species.

Eudendrium speciosum Fraser, 1945a

Eudendrium speciosum Fraser, 1945a: 22, figs. 1a, b.

Holotype. USNM 43464: USA, Gulf of Mexico, Florida, Pensacola, Santa Rosa Sound, 07 August 1942, one

colony, 3.5 cm high, in poor condition, without hydranths, without gonophores, coll. E.H. Behre, labelled “type”; ethanol.

Paratype. BCPM 976-00251-001: USA, Florida, Santa Rosa Sound, shore, several colony fragments, up to 3.1 cm high, in fair to fairly good condition, with male gonophores; 60% IPA.

Type locality. USA, Florida: Pensacola, Santa Rosa Sound (Fraser 1945a).

Current status. Valid.

Remarks. Fraser (1945a) established *Eudendrium speciosum* for a species found in a small collection of hydroids received for identification from staff at the NMNH. The “type” designated by him (USNM 43464) is listed in the current online database of that museum as syntype material, but a single colony is present. It is therefore the holotype of the species. The specimen is in poor condition and may have been dry some time in the past. Additional material of the species exists in the Fraser Hydroid Collection at the RBCM (BCPM 976-00251-001), but in not having been fixed as a name-bearing type it is taken here to be a paratype (ICZN Art. 72.1.3). By mistake, Arai (1977) reported the type locality of *E. speciosum*, Santa Rosa Sound, to be in Louisiana rather than Florida.

Eudendrium speciosum is known only from the original description. It is listed as valid in Calder & Cairns (2009) and WoRMS, but its taxonomic status needs to be clarified.

Order Leptothecata Cornelius, 1992

Family Incertae Sedis

Egmundella fasciculata Fraser, 1940a

Egmundella fasciculata Fraser, 1940a: 577, pl. 32, figs. 4a, b.

Syntypes. USNM 43436: USA, North Atlantic Ocean off Martha’s Vineyard, R/V *Fish Hawk* Sta. 949, 40°03’N, 70°31’W, 23 August 1881, rake dredge, 183 m, several colonies or colony fragments, without gonophores, labelled “type”; ethanol.

Lectotype, by present designation. USNM 43436: USA, North Atlantic Ocean off Martha’s Vineyard, R/V *Fish Hawk* Sta. 949, 40°03’N, 70°31’W, 23 August 1881, rake dredge, 183 m, one colony, 2.5 cm high, in fairly good condition, without gonophores, labelled “type”; ethanol.

Paralectotypes. USNM 1458911: USA, North Atlantic Ocean off Martha’s Vineyard, R/V *Fish Hawk* Sta. 949, 40°03’N, 70°31’W, 23 August 1881, rake dredge, 183 m, several colonies or colony fragments, up to 2.0 cm high, in from good to poor condition, without gonophores; ethanol.

BCPM 976-00289-001: USA, south of Martha's Vineyard, 40°03'N, 70°31'W, 23 August 1881, 183 m, several colony fragments, in poor condition, without gonophores, labelled “co-type”; 60% IPA.

Type locality. USA, Massachusetts: edge of continental shelf south of Martha’s Vineyard, 40°03’N, 70°31’W, 183 m (Fraser 1940a).

Current status. Valid.

Remarks. Fraser’s (1940a) “type” of *Egmundella fasciculata* is currently listed as a holotype in the online database of the NMNH (USNM 43436). However, several colonies or colony fragments were present in the collection. The best of these specimens has been designated as the lectotype (USNM 43436). All others in the series are paralectotypes (USNM 1458911). Also present in this collection, together with the paralectotypes, are specimens of a species of campanularioid. Other material from the same collection, held in the Fraser Hydroid Collection at the RBCM (BCPM 976-00289-001), is labelled a “co-type” of *E. fasciculata*. Now in poor condition, it likewise constitutes a paralectotype.

Egmundella fasciculata is listed as valid by Cairns *et al*. (2002) and WoRMS. The species is known only from the original description, and only from its trophosome.

Egmundella grandis Fraser, 1941b

Egmundella grandis Fraser, 1941b: 82, pl. 16, figs. 8a, b.

Syntypes. USNM 43455: USA, Virginia, Chesapeake Bay, off mouth, R/V *Fish Hawk* Sta. 897, 37°25'N, 74°18'W, 16 November 1880, 288 m, trawl, several small colonies or colony fragments, labelled "type"; ethanol + four slides.

Lectotype, by present designation. USNM 43455: USA, Virginia, Chesapeake Bay, off mouth, R/V *Fish Hawk* Sta. 897, 37°25'N, 74°18'W, 16 November 1880, 288 m, trawl, one sparse colony or colony fragment on a bivalve shell, in mediocre condition, without gonophores, labelled "type"; ethanol.

Paralectotypes. USNM 1458863: USA, Virginia, Chesapeake Bay, off mouth, R/V *Fish Hawk* Sta. 897, 37°25'N, 74°18'W, 16 November 1880, 288 m, trawl, several tiny colony fragments, in mediocre condition, without gonophores; ethanol + four slides.

Type locality. USA, Virginia: slope waters east of Chesapeake Bay, 37°25'N, 74°18'W (north of Washington Canyon), 157.5 fm (288 m) (Fraser 1941b).

Current status. Valid.

Remarks. Material designated as the "type" of *Egmundella grandis* by Fraser (1941b) is at the NMNH (USNM 43455). That collection comprised syntypes, with material in ethanol and on four slides. The best of these specimens, growing on a bivalve shell and returned to the original vial (USNM 43455), is designated here as the lectotype. All others in the type series are paralectotypes (USNM 1458863). The four slides forming part of this series are relatively recent preparations and were not made by Fraser.

While the location of this collection was given by Fraser (1941b) as the state of Maryland, coordinates reveal instead that the specimens were from the continental slope off the eastern shore of Virginia.

On the basis of morphology, biogeography, and habitat, a report of *E. grandis* from shallow waters of Belize (Spracklin 1982), in the Caribbean Sea, is considered by us to be a misidentification. No other records exist of this obscure and briefly described species, known only from its trophosome. Regarded as valid here, it is not listed in WoRMS. The species was excluded from the lists of Cairns *et al*. (1991, 2002) earlier because its depth (288 m) was below the 200 m bathymetric limit set in those two works.

Egmundella humilis Fraser, 1936c

Egmundella humilis Fraser, 1936c: 50, pl. 1, figs. 2a–d.

Syntypes. BCPM 976-00291-001: Japan, Sagami Bay, 03 August 1934, 91 m, on a bryozoan, in poor condition; 60% IPA.

BCPM 976-00292-001: Japan, Sagami Bay, 18 January 1935, 91 m, on a bryozoan, in poor condition; 60% IPA.

BCPM 976-00293-001: Japan, Sagami Bay, one colony, in fairly good condition, without gonothecae (?); slide.

BCPM 976-00293-002: Japan, Sagami Bay, three colonies or colony fragments, in fair condition, without gonothecae; slide (damaged).

Lectotype, by present designation. BCPM 976-00293-001: Japan, Sagami Bay, on a bryozoan, in fairly good condition, without gonothecae (?); slide.

Paralectotypes. BCPM 976-00291-001: Japan, Sagami Bay, 03 August 1934, 91 m, on a bryozoan, in poor condition; 60% IPA.

BCPM 976-00292-001: Japan, Sagami Bay, 18 January 1935, 91 m, on a bryozoan, in poor condition; 60% IPA.

BCPM 976-00293-002: Japan, Sagami Bay, three colonies or colony fragments, in fair condition, without gonothecae; slide (damaged).

Type locality. Japan: Sagami Bay, on a bryozoan (Fraser 1936c).

Current status. Valid.

Remarks. This species was described by Fraser (1936c) based on material sent to him on behalf of Emperor Hirohito. No name-bearing types were originally designated but the type series includes material in the Fraser Hydroid Collection at the RBCM (BCPM 976-00291-001; BCPM 976-00292-001; BCPM 976-00293-001; BCPM 976-00293-002). Specimens in IPA (BCPM 976-00291-001; BCPM 976-00292-001) appear to have been dry sometime in the past and are now in poor condition. The best specimen in the syntype series, on a slide (BCPM

976-00293-001), is designated here as the lectotype. Although collection data accompanying the slide are incomplete, the specimen is known to have been collected in Sagami Bay and is almost certainly a fragment taken from one of the fluid collections as the species was being described.

Twelve lots of hydroids identified as *Egmundella humilis*, also collected from the type locality in advance of Fraser's description of the species, exist in the Emperor Shōwa Hydroid Collection at the NMNS (NSMT-HyR 940–NSMT-HyR 951). We do not know whether Fraser examined any of these specimens, and we excluded them from the syntype series.

Specimens examined by Fraser (1936c) were said to be infertile. Although gonothecae are present on the two slides, it is uncertain that they are those of *E. humilis* because a clytiid is also present on the slide. In any case, the gonosome of the species was observed and described later by Hirohito (1995). Gonothecae described by him appeared to contain developing medusae.

Egmundella humilis is listed as valid in WoRMS. Galea (2013) included *E. modesta* Millard & Bouillon, 1975 from the Seychelles as a questionable synonym of this species.

Genus *Eucuspidella* Fraser, 1944a

Eucuspidella Fraser, 1944a: 172.

Type species. *Cuspidella pedunculata* Allman, 1877, by monotypy.

Current status. Valid.

Remarks. Fraser (1944a) concluded that *Cuspidella pedunculata* Allman, 1877 exceeded the bounds of the genus *Cuspidella* Hincks, 1866 in having a pedicellate rather than a sessile hydrotheca. He therefore established *Eucuspidella* for the species. Other characters distinguishing the genus were a tubular or fusiform hydrotheca that merged imperceptibly with the pedicel, opercular valves with no demarcation from the hydrothecal wall, and the absence of a diaphragm and nematophores. Gonophores of *E. pedunculata*, a minute species reported from bathyal waters (475 m) off the Dry Tortugas, Florida (Allman 1877), and with some uncertainty from 4798 m in the Windward Passage north of Haiti (Vervoort 1972), remain unknown.

Eucuspidella has been provisionally upheld as valid in some works (Vervoort 1972; Calder 1996; Bouillon *et al*. 2006). In others, it has been assigned to the synonymy of *Campanulina* Van Beneden, 1847 and to the family Campanulinidae Hincks, 1868 (e.g., WoRMS). That assignment is untenable given that *Campanulina tenuis* Van Beneden, 1847, a widely misconceived hydrozoan having decidedly different morphological characters (see Rees 1939: 435–437; Calder 1991:5, 6), is the type species of that genus. Meanwhile, the family Campanulinidae Hincks, 1868, as originally defined, is based on a misidentified type genus (*Campanulina* sensu Allman, 1864, not *Campanulina* Van Beneden, 1847). Widespread taxonomic confusion thus persists at present over the concepts of both *Campanulina* and Campanulinidae. As for its phylogenetic affinities, *Eucuspidella* cannot be assigned at present with confidence to any known family.

Genus *Meganema* Fraser, 1939b

Keratosum Hargitt, 1909: 379.
Meganema Fraser, 1939b: 60 [invalid junior homonym of *Meganema* Conrad, 1868 (Mollusca)].

Type species. *Meganema claviformis* Fraser, 1939b, by monotypy.

Current status. Invalid.

Remarks. *Meganema* Fraser, 1939b: 60 is an invalid junior homonym of *Meganema* Conrad, 1868: 267 (Mollusca). It has been regarded as a junior synonym of *Lafoeina* M. Sars, in G.O. Sars, 1874 by some authors (e.g., Fraser 1947a: 239) and of *Keratosum* Hargitt, 1909 by others (e.g., Calder 1991: 10). *Keratosum* has been included as a junior synonym of *Lafoeina* in some works (e.g., Schuchert 2001a: 59; WoRMS), but the two genera are considered distinct here based on differences in gonophore type and colony form. Actual junior synonyms of

Keratosum include *Levinsenia* Hadži, 1917 [not *Levinsenia* Mésnil, 1897 (Polychaeta) or *Levinsenia* Stossich, 1899 (Trematoda) or *Levinsenia* Bale, 1915 (Hydrozoa)] and *Eupoma* Stechow, 1920. With synonyms available, it seems unnecessary to provide a replacement name for the junior homonym of Fraser.

Meganema claviformis Fraser, 1939b

Lafoeina maxima Levinsen, 1893: 182, pl. 6, figs. 9–12.
Keratosum complexum Hargitt, 1909: 379, figs. 8–10.
Levinsenia maxima.—Hadži, 1917: 55.
Eupoma maximum.—Stechow, 1920: 45.
Meganema claviformis Fraser, 1939b: 60, figs. 2a–c.
Lafoeina claviformis.—Fraser, 1947a: 240.
Keratosum maximum.—Calder, 1991: 10.

Syntypes. BCPM 976-00302-001: Canada, Nunavut, Dolphin and Union Strait, off Cape Bexley, 68°59'N, 115°40'W, 16 m, summer 1936 or 1937, RCMP Vessel *St. Roch*, dredge, two colony fragments, coll. Sgt. H.A. Larsen; slide.

Lectotype, by present designation. RBCM 976-00302-001: Canada, Nunavut, Dolphin and Union Strait, off Cape Bexley, 68°59'N, 115°40'W, 16 m, summer 1936 or 1937, RCMP Vessel *St. Roch*, dredge, one colony fragment (specimen on the left side of the slide BCPM 976-00302-001), 8 mm high, in only fair condition, without gonophores, coll. Sgt. H.A. Larsen; slide.

Paralectotype. BCPM 976-00302-001: Canada, Nunavut, Dolphin and Union Strait, off Cape Bexley, 68°59'N, 115°40'W, 16 m, summer 1936 or 1937, RCMP Vessel *St. Roch*, dredge, one colony fragment, 8 mm high, in only fair condition, without gonophores, coll. Sgt. H.A. Larsen; slide.

Type locality. Canada, Nunavut: Dolphin and Union Strait, off Cape Bexley, 68°59'N, 115°40'W, 16 m (Fraser 1939b).

Current status. Invalid.

Remarks. In describing *Meganema claviformis*, Fraser (1939b) reported that the hydroid was "attached to sponges, barnacle shells, etc." No name-bearing type was designated by him. The only type material of the species in existence is mounted on a slide (BCPM 976-00302-001) in the Fraser Hydroid Collection at the RBCM. Two specimens occur on the slide, both of them fragmentary. While the fragments may be part of a single colony, we have not assumed so for nomenclatural purposes (ICZN Recommendation 73F). The specimen on the left side of the slide has been designated here as the lectotype (RBCM 976-00302-002) to objectively define the species and ensure stability of nomenclature. The specimen on the right is the paralectotype.

Fraser (1947a) abandoned *Meganema* Fraser, 1939b as valid, acknowledging that *M. claviformis* was referable to the same genus as *Lafoeina maxima* Levinsen, 1893. He nevertheless persisted in recognizing *Lafoeina claviformis* as a distinct species. The two were later regarded as synonyms (Calder 1970, 1991). The species is listed in Cairns *et al*. (2002) as *Keratosum maximum* and in WoRMS as *Lafoeina maxima*. The former is maintained here for reasons given above in Remarks on the genus *Meganema*.

Family Haleciidae Hincks, 1868

Genus *Endothecium* Fraser, 1935b

Endothecium Fraser, 1935b: 107 [invalid junior homonym of *Endothecium* Koker, 1924 (Anthozoa)].
Sagamihydra Hirohito, 1995: 41 [correct original spelling].
Sagamihyra Hirohito, 1995: 42 [incorrect original spelling].

Type species. *Endothecium reduplicatum* Fraser, 1935b, by monotypy.

Current status. Invalid.

Remarks. *Endothecium* Fraser, 1935b is an invalid junior homonym of *Endothecium* Koker, 1924: 22

(Anthozoa). Hirohito (1995) proposed *Sagamihydra* as a replacement name for the junior homonym, although he misspelled it as *Sagamihyra* on page 42 in the same publication. For the record, *Sagamihydra* is taken here to be the correct original spelling under the First Reviser Principle (ICZN 24.2.3). In the WoRMS list, *Sagamihydra* is currently included in the synonymy of *Halecium* Oken, 1815, but the genus is considered valid here in having hydranths with an intertentacular web, a cnidome comprising large haplonemes in addition to microbasic mastigophores, and gonophores that arise from within the hydrothecal cavity (Calder 1991; Hirohito 1995).

Endothecium reduplicatum Fraser, 1935b

Endothecium reduplicatum Fraser, 1935b: 107, pl. 1, figs. 3a–c.
Sagamihyra reduplicata.—Hirohito, 1995: 42 [incorrect original spelling].
Sagamihydra reduplicata.—Hirohito, 1995: 43, figs. 12 a–d, pl. 3, fig. D.
Halecium reduplicatum.—Bouillon *et al*., 2006: 313.

Syntypes. BCPM 976-00457-001: Japan, Sagami Bay, several colony fragments, some detached and others on small rocks, in poor condition, with gonothecae, labelled "type"; 60% IPA.

BCPM 976-00457-002: Japan, Sagami Bay, three fragments, up to 1.3 cm high, in fairly good condition, with gonothecae; slide.

BCPM 976-00457-003, Japan, Sagami Bay, one colony fragment, 7 mm high, in only fair condition, with gonothecae; slide.

Lectotype, by present designation. RBCM 976-00457-004: Japan, Sagami Bay, one colony fragment (longest colony fragment on slide BCPM 976-00457-002), 1.3 cm high, in fairly good condition, with gonothecae; slide.

Paralectotypes. BCPM 976-00457-001: Japan, Sagami Bay, several colony fragments, some detached and others on small rocks, in poor condition, with gonothecae, labelled "type"; 60% IPA.

BCPM 976-00457-002: Japan, Sagami Bay, two colony fragments, up to 1.1 cm high, in fairly good condition, without gonothecae; slide.

BCPM 976-00457-003: Japan, Sagami Bay, one colony fragment, 7 mm high, in only fair condition, with gonothecae; slide.

Type locality. Japan: Sagami Bay, Hayama, at low tide (Fraser 1935b).

Current status. Valid, as *Sagamihydra reduplicata* (Fraser, 1935b).

Remarks. *Endothecium reduplicatum* is based on hydroids from the collection of Emperor Hirohito of Japan, sent for identification to Fraser by Dr. Hirotaro Hattori. No name-bearing type of the species has previously been designated. The first of the syntype samples listed above from the Fraser Hydroid Collection at the RBCM, in fluid (BCPM 976-00457-001) and containing a label marked “type”, has been dry in the past and is now in poor condition. Syntype specimens on the two slides, likely taken from the same material in fluid preservative, are much better preserved. The best specimen, designated here as the lectotype (RBCM 976-00457-004), is the longest colony fragment on the first of these slides (BCPM 976-00457-002). It can also be identified as the fragment on the right and the only fragment having gonothecae. Detailed collection data are lacking for all three collections of the species at the RBCM.

Other specimens of this hydroid, collected from the type locality prior to its original description by Fraser (1935b), exist in the Emperor Shōwa Hydroid Collection at NMNS (NSMT-HyR 954; NSMT-HyR 956). We do not know if any of these were examined by Fraser in describing the species. They have not been included here in the syntype series.

As noted above, *Endothecium* Fraser, 1935b is a junior homonym and has been replaced by *Sagamihydra* Hirohito, 1995. The species upon which it was based on is considered valid (Hirohito 1995, as *Sagamihydra reduplicata*; WoRMS, as *Halecium reduplicatum*). *Sagamihydra reduplicata* was subsequently reported, but not described or illustrated, from Panama and Mexico in the tropical eastern Pacific by Fraser (1938a, 1948).

Halecium balei Fraser, 1911

Halecium gracile Bale, 1888: 759, pl. 14, figs. 1–3 [invalid junior primary homonym of *Halecium gracile* Verrill, 1874].

Halecium balei Fraser, 1911: 46 [new replacement name for *Halecium gracile* Bale, 1888, not *Halecium gracile* Verrill, 1874].

Syntypes. NMV F58760: Australia, New South Wales, Port Stephens, on *Aglaophenia* sp., labelled as "co-types"; two microslides (Stranks 1993: 6).

Type locality. Australia: Port Stephens and Port Jackson (Bale 1888).

Current status. ? Invalid.

Remarks. *Halecium balei* was proposed by Fraser (1911) as a replacement name for *H. gracile* Bale, 1888, recognized as an invalid junior primary homonym of *H. gracile* Verrill, 1874. In turn, *H. balei* has been held to be a junior subjective synonym of *H. delicatulum* Coughtrey, 1876 (Vervoort & Watson 2003), although the status of the species is still open to question (Galea *et al*. 2014: 15).

As an objective synonym of *H. gracile* Bale, 1888, *Halecium balei* Fraser, 1911 has the same name-bearing type material (ICZN Art. 72.7), namely that at the NMV (NMV F58760). A search for type material of *H. gracile* in collections at the Australian Museum, Sydney, was unsuccessful (Stephen Keable, personal communication, 24 January 2017).

Halecium crassicaule Fraser, 1947a

Halecium robustum Nutting, 1901a: 182, pl. 23, figs.3–5 [invalid junior primary homonym of *Halecium robustum* Verrill, 1873, and *Halecium robustum* Pieper, 1884, and *Halecium robustum* Allman, 1888].

Halecium harrimani Nutting, 1901b: 789 [new replacement name for *Halecium robustum* Nutting, 1901a, not *Halecium robustum* Verrill, 1873].

Halecium crassicaule Fraser, 1947a: 273 [new replacement name for *Halecium robustum* Nutting, 1901a, not *Halecium robustum* Verrill, 1873].

Syntypes. USNM 71169: USA, Alaska, Harriman Alaska Expedition, Alexander Archipelago, Glacier Bay, Berg Inlet; ethanol.

USNM 70881: USA, Alaska, Alaska, Alexander Archipelago, Glacier Bay; ethanol.

Type locality. USA, Alaska: Glacier Bay, Berg Inlet (Nutting 1901a).

Current status. Invalid.

Remarks. Fraser (1944a: 201) recognized that the name *Halecium robustum* Nutting, 1901a was preoccupied by several other binomena, including *H. robustum* Verrill, 1873. Unaware that Nutting (1901b) had already discovered the homonymy and provided *H. harrimani* as a new replacement name for his *H. robustum*, Fraser (1947a: 273) proposed *H. crassicaule* as a *nomen novum* for the same taxon. As a junior objective synonym of Nutting's *H. robustum* and *H. harrimani*, Fraser's *H. crassicaule* has the same name-bearing types (ICZN Art. 72.7). The name *H. harrimani* is now taken to be the valid name of the species (Calder 2004; WoRMS).

Two collections of *Halecium robustum* Nutting, 1901a (= *H. harrimani*) from Glacier Bay, Alaska, are listed in the online database of the NMNH. Only one of them is listed as syntype material (USNM 71169). The second (USNM 70881), having similar collection data, has not been included as a name-bearing type. It, too, is regarded here as part of the syntype series. No other type material of the species is known to exist. From published records, *H. harrimani* is presently known only from the type locality (Fraser 1947a).

Halecium cymosum Fraser, 1935b

Halecium cymosum Fraser, 1935b: 107, pl. 2, figs. 4a–d.

Syntypes. BCPM 976-00471-001: Japan, Sagami Bay, Eboshi-iwa, "on tidal marks", 19 April 1931, in poor condition; dry.

BCPM 976-00471-002: Japan, Sagami Bay, Eboshi-iwa, "on tidal marks", 19 April 1931, several colony fragments, up to 3 mm high, in fairly good condition, with gonophores; slide.

Lectotype, by present designation. RBCM 976-00471-003: Japan, Sagami Bay, Eboshi-iwa, "on tidal marks", 19 April 1931, one colony fragment (middle colony on the slide BCPM 976-00471-002), 3 mm high, in fairly good condition, with gonophores; slide.

Paralectotypes. BCPM 976-00471-001: Japan, Sagami Bay, Eboshi-iwa, "on tidal marks", 19 April 1931, in poor condition; dry.

BCPM 976-00471-002: Japan, Sagami Bay, Eboshi-iwa, "on tidal marks", 19 April 1931, several colony fragments, up to 3 mm high, in fairly good condition, with gonophores; slide.

Type locality. Japan: Sagami Bay, Eboshi-iwa (as "Yeboshi-iwa"), at low tide (Fraser 1935b).

Current status. Valid.

Remarks. Fraser (1935b) received specimens of *Halecium cymosum*, collected at Eboshiiwa in Sagami Bay by Emperor Hirohito, from Dr. Hirotaro Hattori. No name-bearing type was designated by him. Hydroids in the Fraser Hydroid Collection at the RBCM (BCPM 976-00471-001; BCPM 976-00471-002), listed above, are syntypes. The first of these, now dry, is in poor condition. However, specimens on the slide, having the same collection data, are in reasonably good condition. As a lectotype of the species, we designate the large colony fragment (RBCM 976-00471-003), located in the middle of the slide (BCPM 976-00471-002). Gonophores are present on this specimen. All others on the slide, along with the dry collection (BCPM 976-00471-001), are paralectotypes.

Several records of *H. cymosum* were also documented by Hirohito (1995) in his collection. Data accompanying one sample (No. 1242, Sagami Bay, Eboshiiwa, 19 April 1931) correspond with those at the RBCM. The specimens are now at the NMNS in Japan (NSMT-HyR 1242). We do not know whether Fraser examined the material in the process of describing the species, and excluded it from the syntype series.

While colonies described by Fraser (1935b) reached a maximum height of 3 mm, others examined by Hirohito (1995) attained 10 mm high or more. Hirohito provided illustrations of the trophosome of *H. cymosum*, and of the male and female gonophores, complementing those of Fraser. The species is taken to be valid (Hirohito 1995; WoRMS).

Halecium diminutivum Fraser, 1940a

Halecium diminutivum Fraser, 1940a: 578, pl. 33, figs. 6a, b.

Holotype. USNM 43438: USA, Massachusetts, Nantucket Shoals, on *Sertularella* sp., one colony, 1.2 mm high, in fair condition, without gonothecae, labelled "type"; ethanol.

Schizoholotype. BCPM 976-00474-001: USA, Nantucket, on *Sertularella* sp., one colony fragment, in fair condition, without gonothecae; slide.

Type locality. USA, Massachusetts: on Nantucket Shoals, epizoic on *Sertularella* (Fraser 1940a).

Current status. Valid.

Remarks. The "type" of *Halecium diminutivum*, as designated by Fraser (1940a), is justifiably listed as a holotype in the online database of the NMNH (USNM 43438). Several other species of hydroids occur with the holotype, including sertulariids, sertularellids, symplectoscyphids, and campanulariids. A slide of the species, from the same sample and on the same substrate (a species of *Sertularella*), exists in the Fraser Hydroid Collection at the RBCM (BCPM 976-00474-001). With the species having been based on a single specimen (Fraser 1940a) from Nantucket Shoals, and with no subsequent records of the species having been reported from the type locality (Fraser 1944a, 1947a), we consider the RBCM material to be a fragment of the holotype (i.e., a schizoholotype).

This is a miniscule (to 1.2 mm high), easily overlooked, and poorly known species, reported only from two locations (the type locality of Nantucket Shoals, and also off Chatham Light) on the coast of Massachusetts, USA (Fraser 1944a). The gonosome has yet to be described. *Halecium diminutivum* is held to be valid in Cairns *et al*. (2002) and WoRMS.

Halecium dubium Fraser, 1941b

Halecium dubium Fraser, 1941b: 83, pl. 16, fig. 10a, pl. 17, fig. 10b.

Holotype. USNM 22922: USA, Massachusetts, south of Georges Bank, R/V *Albatross* Sta. 2572, 40°29'N, 66°04'W, 3235 m, 02 September 1885, large beam trawl, one colony, ca. 3 cm high, in fair condition, with gonophores, labelled "type"; ethanol.

Type locality. USA, Massachusetts: in abyssal waters seaward of George's Bank, 40°29'N, 66°04'W, 1769 fm (3235 m) (Fraser 1941b).

Current status. Valid.

Remarks. Fraser (1941b) designated material at the NMNH (USNM 22922) as the "type" of *Halecium dubium*. Although currently listed in the online database of that museum as a syntype, the specimen count is correctly indicated as "1". Moreover, Fraser's (1941b: 83, 84) original description of the species reveals that it was based on a single male colony, stating "…the specimen from which this species is described…" The single NMNH specimen is therefore the holotype (ICZN Art. 73.1.2).

Fraser (1941b) considered *Halecium dubium* to be much like *H. telescopicum* Allman, 1888 from Australia (off Port Jackson). He distinguished it as new because it lacked repeated reduplication of the hydrophores. Also considered unusual by him was the existence of a small semicircular notch at the distal end of the male gonotheca. *Halecium dubium* is recognized as a valid species in WoRMS.

Halecium flabellatum Fraser, 1935b

Halecium flabellatum Fraser, 1935b: 108, pl. 2, figs. 5a–c.

Syntypes. BCPM 976-00476-001: Japan, Shio-no-misaki, Kii, Wakayama Prefecture, 23 May 1933, 33 m, female, labelled "type"; dry.

BCPM 976-00476-002: Japan, Shio-no-misaki, Kii, Wakayama Prefecture, 23 May 1933, 33 m, male, labelled "type"; dry.

Lectotype, by present designation. BCPM 976-00476-001: Japan, Shio-no-misaki, Kii, Wakayama Prefecture, 33 m, 23 May 1933, one desiccated colony, with female gonophores, labelled "type"; dry.

Paralectotype. BCPM 976-00476-002: Japan, Shio-no-misaki, Kii, Wakayama Prefecture, 23 May 1933, 33 m, one desiccated colony, with male gonophores, labelled "type"; dry.

Type locality. Japan: Shio-no-misaki, Kii, Wakayama Prefecture, 30–35 m (Fraser 1935b).

Current status. Valid.

Remarks. The specimens upon which *Halecium flabellatum* is based were sent to Fraser (1935b) for identification from the collection of Emperor Hirohito of Japan. No name-bearing type of the species was designated by him. Four samples of *H. flabellatum* are recorded in the Fraser Hydroid Collection at the RBCM. Two of them, listed above and both labelled "type" in what appears to be Fraser's handwriting, are syntypes. Both are now dry. The specimens, with a single colony in each sample, were examined without being removed from their vials by us during this study. Although desiccated, major characters of the species as illustrated by Fraser (1935b) and Hirohito (1995) are still recognizable. In being the only syntypes, and in the expectation that at least partial re-hydration might be possible, we have selected the female colony (BCPM 976-00476-001) as the lectotype. The male colony (BCPM 976-00476-002) is a paralectotype. The other two (976-00477-001: Sagami Bay, female; BCPM 976-00477-002: Sagami Bay, male) were not from the type locality and are not part of the syntype series. Specimens of *H. flabellatum* in NSMT collections (NSMT-HyR 1389: Japan, off Jôgashima, 108 m, 19 August 1936), recorded by Hirohito (1995), are also not syntypes.

Halecium flabellatum was regarded as valid by Hirohito (1995), a conclusion upheld in WoRMS.

Halecium fruticosum Fraser, 1943a

Halecium fruticosum Fraser, 1943a: 77, pl. 16, figs. 4a, b.

Holotype. MCZ-IZ 9012: USA, North Carolina, Cape Fear, Cape Fear River, NNE 14 miles (23 km) off Bald Head Light, 9 fm (16 m), 1868-1869, one badly fragmented colony, in rather poor condition, without gonophores, coll. L.F. de Pourtalès, labelled "type"; formalin.

Type locality. USA, North Carolina: Bald Head Lighthouse, NNE 14 miles (23 km) off Cape Fear (Fraser 1943a).

Current status. Valid, but see Remarks below.

Remarks. Fraser (1943a) described and illustrated *Halecium fruticosum*, but provided no information as to its name-bearing type. The species was described in a collection sent to him for identification from the MCZ. A specimen at that museum (MCZ-IZ 9012), labelled "type", is listed as a holotype in the MCZ online database. No other type material of the species was discovered during this study. In describing the species, Fraser reported that "…no complete colony [was] obtained…", and no gonosomes were observed. On examination, the type of the species indeed comprises several fragments. However, all are considered parts of a single colony that we take to be the holotype by monotypy.

Although the holotype specimen is in rather poor condition, its trophosomal characters are still recognizable. The identity and affinities of the species will likely be apparent after more collecting is undertaken in the vicinity of the type locality, and after fertile specimens are discovered. Somewhat similar to *Halecium fruticosum* is a hydroid from the Beaufort area of North Carolina, identified with question by Fraser (1912c) as *H. bermudense* Congdon, 1907. His specimen was sterile, but an account was given of both female and male gonosomes from the original description of Congdon (1907). Calder & Hester (1978) also reported *H. bermudense* from inshore waters of South Carolina, based largely on the account of Fraser (1912c). The occurrence of *H. bermudense* on the coast of the Carolinas needs to be confirmed.

Included as a valid species in Cairns *et al*. (2002), *Halecium fruticosum* is currently listed as a *species inquirenda* in WoRMS. To date, the only published record of the species is the original account by Fraser (1943a).

Halecium minor Fraser, 1935b

Halecium minor Fraser, 1935b: 108, pl. 2, figs. 6a–e [invalid junior primary homonym of *Halecium halecinum* var. *minor* Pictet, 1893].

Halecium permodicum Calder, 2017: 54 [replacement name for *Halecium minor* Fraser, 1935b, not *Halecium halecinum* var. *minor* Pictet, 1893].

Syntypes. BCPM 976-00485-001: Japan, Sagami Bay, Hayama, 25 August 1933, on an anthozoan, labelled "type"; dry.

BCPM 976-00485-002: Japan, Sagami Bay, Hayama, 25 August 1933; slide.

Lectotype, by present designation. RBCM 976-00485-003: Japan, Sagami Bay, Hayama, 25 August 1933, one detached colony (largest and best trophosome of the species on the slide), in good condition, 5 mm high, without gonothecae; slide.

Paralectotypes. BCPM 976-00485-001: Japan, Sagami Bay, Hayama, 25 August 1933, on an anthozoan, colony desiccated, labelled "type"; dry.

BCPM 976-00485-002: Japan, Sagami Bay, Hayama, 25 August 1933, several colonies or colony fragments, in fair to good condition, one with a female gonotheca; slide.

Type locality. Japan: Sagami Bay, Hayama, 2–3 m, on an anthozoan (Fraser 1935b).

Current status. Invalid.

Remarks. Fraser (1935b) described *Halecium minor* from material sent to him by Dr. Hirotaro Hattori on behalf of Emperor Hirohito of Japan. He did not designate a name-bearing type of the species in that account. Two samples of the species exist in the Fraser Hydroid Collection at the RBCM, one of them dry in a vial (BCPM 976-00485-001) and the other on a microslide (BCPM 976-00485-002). Both are listed above as syntypes, with the first one containing a label marked "type". The species is not represented in the Hirohito Hydroid Collection at the NMNS (Hirohito 1995: 16). The lectotype of *H. minor* designated here (RBCM 976-00485-003) is a specimen, in good condition, on a slide (BCPM 976-00485-002). It is distinguished in having the largest and best trophosome (5 mm high) of the species on the slide. Paralectotypes include other specimens of the same species on the slide, as well as the desiccated material labelled "type" (BCPM 976-00485-001). Notably, one tiny paralectotype colony or colony fragment near the lectotype on the slide bears a female gonotheca with two gonothecal hydranths. That specimen was otherwise too inadequate to be assigned name-bearing status. The hydranth of a tubulariid and bryozoan fragments are also present on the mount.

Halecium minor Fraser, 1935b is an invalid junior primary homonym of *Halecium halecinum* var. *minor* Pictet, 1893, currently recognized at the rank of species, as *H. minor* Pictet, 1893. The binomen of Fraser has been replaced by *Halecium permodicum* Calder, 2017.

Halecium nullinodum Fraser, 1935b

Halecium nullinodum Fraser, 1935b: 109, pl. 2, fig. 7.

Type. BCPM 976-00489-001: Japan, Okino-se, shoal outside of Sagami Bay, 22 September 1933, 91–110 m, labelled "type"; dry.

Type locality. Japan: Okino-se, outside of Sagami Bay, 100–150 m (Fraser 1935b).

Current status. Valid.

Remarks. Material of this species, from the collection of Emperor Hirohito, was sent to Fraser for identification by Dr. Hirotaro Hattori. While no specimens of *Halecium nullinodum* are listed in collections at the NMNS, Arai (1977) listed two collections of the species in the Fraser Hydroid Collection at the RBCM (BCPM 976-00489-001; BCPM 976-00489-002). However, one of these (BCPM 976-00489-002), on a slide, bears only a campanulariid colony. Specimens referable to *Halecium* are lacking on it, and the slide may have been mislabelled originally. The only known type material of *Halecium nullinodum* is therefore that in a vial at the RBCM (BCPM 976-00489-001), now dry and in very poor condition. It is unclear whether that material comprises one or more than one specimen, and whether it constitutes a holotype by monotypy or syntypes. We are therefore unable to resolve the type status of the collection. In our opinion, a neotype is needed given its unsatisfactory condition.

The trophosome and female gonophores of *Halecium nullinodum* were described by Fraser (1935b). He did not observe males. Hirohito (1995: 16) regarded *H. nullinodum* as "a problematic species", including it with question as a synonym of *H. sessile* Norman, 1867. Fraser's species is listed as valid in WoRMS.

Halecium pygmaeum Fraser, 1911

Halecium mirabile Schydlowsky, 1902: 233, pl. 3, figs. 25, 26.
Halecium pygmaeum Fraser, 1911: 48, pl. 4, figs. 1, 2.

Type material. None known to exist.

Type locality. USA, Washington: San Juan Archipelago (Fraser 1911).

Current status. Invalid.

Remarks. Fraser (1911: 48) based his description of this small species on hydroids in the collection of Prof. Trevor Kincaid (1872–1970) of the University of Washington. No types are known to exist. Specimens of the species from the San Juan Archipelago at the NMNH (USNM 70852: USA, Washington, Strait of Juan de Fuca, Admiralty Inlet, Port Townsend, coll. H. Moon; ethanol) are from a different collection (that of H. Moon; Fraser 1911: 4) and are not believed by us to constitute type material. Another collection of the species exists at the NMNH (USNM 43655), but there is no evidence that T. Kincaid was the collector. Non-type specimens also exist in the Fraser collection at the RBCM (BCPM 976-00491-001: China Hat, 21 August 1912; BCPM 976-00491-002 and BCPM 976-00491-003: China Hat; BCPM 976-00492-001: Hayama, Sagami Bay, September 17, 1933) (Arai 1977). Only female gonothecae were observed originally. Those of the male were described later (Fraser 1914a; 1937a).

Halecium pygmaeum Fraser, 1911 is listed in WoRMS as a junior subjective synonym of *Halecium mirabile* Schydlowsky, 1902. Hirohito (1995) recognized it as a valid species, but noted its similarity to *H. repens* Jäderholm, 1907. In some works (Dons 1912; Broch 1918; Schuchert 2001a), *H. mirabile* and *H. repens* have been regarded as synonyms or questionable synonyms of *H. curvicaule* Lorenz, 1886.

Halecium tensum Fraser, 1941b

Halecium tensum Fraser, 1941b: 84, pl. 17, figs. 11a–c.

Holotype. USNM 22926: USA, Massachusetts, off Martha's Vineyard, R/V *Fish Hawk* Sta. 940, 39°54'N, 69°51'30"W, 245 m, 04 August 1881, trawl, one polysiphonic colony, ca. 5 cm high, in fair condition, without gonophores, labelled "type"; ethanol.

Type locality. USA, Massachusetts: off Martha's Vineyard, 39°54'N, 69°51'30"W, 134 fm (245 m) (Fraser 1941b).

Current status. Valid.

Remarks. From the original description, Fraser (1941b) appears to have established *Halecium tensum* on the basis of a single colony. After examination and description, his "type" of the species was returned to collections at the NMNH (USNM 22926). The specimen count is correctly given as "1" in the online database of that museum, and no other type material is known to exist. While currently listed therein as a syntype, it is taken here to be the holotype by monotypy (ICZN Art. 73.1.2).

According to Fraser (1941b), this species somewhat resembles *Halecium kuekenthali* Marktanner-Turneretscher, 1895, it but differs in having a more rigid and less branched colony as well as longer internodes that lack annulations. Gonophores were lacking in the holotype, and the species has not been reported again. It is listed as valid in WoRMS.

Halecium vasiforme Fraser, 1935b

Halecium vasiforme Fraser, 1935b: 109, pl. 2, figs. 8a, b.

Syntypes. BCPM 976-00503-001: Japan, Sagami Bay, Hayama, "on tidal marks", 25 August 1933, on barnacle fragments, in poor condition, labelled "type"; dry.

BCPM 976-00503-002: Japan, Sagami Bay, Hayama, "on tidal marks", 25 August 1933, on barnacle shell, several colony fragments, in fair to fairly good condition, some with gonothecae; slide.

Lectotype, by present designation. RBCM 976-00503-003: Japan, Sagami Bay, Hayama, "on tidal marks", 25 August 1933, on barnacle shell, one colony fragment (upper left corner of the mount), in fairly good condition, with gonothecae; slide.

Paralectotypes. BCPM 976-00503-001: Japan, Sagami Bay, Hayama, "on tidal marks", 25 August 1933, on barnacle fragments, in poor condition, labelled "type"; dry.

BCPM 976-00503-002: Japan, Sagami Bay, Hayama, "on tidal marks", 25 August 1933, on barnacle fragments, several colony fragments, in fair to fairly good condition, some with gonothecae; slide.

Type locality. Japan: Sagami Bay, Hayama, low tide, on barnacle shells (Fraser 1935b).

Current status. Valid.

Remarks. No name-bearing type has been designated before for *Halecium vasiforme*. Specimens in the Fraser Hydroid Collection at the RBCM (BCPM 976-00503-001; BCPM 976-00503-002), taken here to be syntypes, were originally from the collection of Emperor Hirohito. Material labelled as the "type" by Fraser (BCPM 976-00503-001) is now dry and in poor condition. However, several specimens, varying from fair to fairly good, exist on a slide (BCPM 976-00503-002). While these may all be part of a single colony from one barnacle, we chose to select a single fragment on this slide as the lectotype. The best specimen, having gonothecae and located in the upper left corner of the mount, is designated by us as the lectotype (RBCM 976-00503-003). All other specimens on the slide, and any in the dry collection, are paralectotypes.

Five collections of the species at the NMNS (NSMT-HyR 1370–NSMT-HyR 1374) are from the type locality, and were collected before Fraser's (1935b) description of the species. It is uncertain that they were examined by him during his description of this stolonal species, and they have not been included here as syntypes.

The original description of *H. vasiforme* by Fraser (1935b) provided accounts of the trophosome and female gonophores. Male gonophores were described later by Hirohito (1995). The hydroids examined by Fraser were epizoic on barnacles, but Hirohito also found specimens on algae, sponges, and gorgonians in Sagami Bay. The species is taken to be valid in WoRMS.

Family Phylactothecidae Stechow, 1921a

Ophiodes carchesium Fraser, 1914b

Ophiodes carchesium Fraser, 1914b: 220, figs. 1a, b.

Ophiodissa carchesium.—Fraser, 1937a: 113, pl. 23, figs. 127a, b.
Hydrodendron carchesium.—Rees & Vervoort, 1987: 21.

Holotype. BCPM 976-00508-001: USA, Alaska, Gulf of Alaska, SE of Trinity Islands, halibut grounds, 50 fm (91 m), 20 August 1914, on a bryozoan, one colony, in poor condition, without gonophores, coll. Dr. A. Willey; slide.

Type locality. USA, Alaska: Gulf of Alaska, SE of Trinity Islands, halibut grounds, 50 fm (91 m) (Fraser 1914b).

Current status. Valid, as *Hydrodendron carchesium* (Fraser, 1914b).

Remarks. The hydroid briefly described as *Ophiodes carchesium* by Fraser (1914b) was found in a small collection from halibut grounds in the Gulf of Alaska, provided by Dr. Arthur Willey of McGill University, Montreal, Canada. The specimen, sterile and simple in morphology, was growing as an epizoite on a bryozoan colony. Material in the Fraser Hydroid Collection at the RBCM (BCPM 976-00508-001), comprising a single colony consistent with both the descriptive account and illustration in Fraser (1914b: figs. 1a, b), is considered by us to be the holotype by monotypy (ICZN Art. 73.1.2). The specimen and its bryozoan substrate have now slipped beyond the coverslip of the slide, but are still embedded in Canada balsam.

Known only from the original account, the species is listed as *Hydrodendron carchesium* in Rees & Vervoort (1987), Cairns *et al*. (2002), and WoRMS. The specific name *carchesium* is a noun in apposition (Latin: a kind of drinking cup) and need not agree in gender with any generic name with which it is combined (ICZN Art. 31.2.1).

The family Phylactothecidae Stechow, 1921a is recognized here as valid following Choong *et al*. (2018). Included within it are *H. carchesium* and other species of the genus *Hydrodendron* Hincks, 1874.

Ophiodes corrugata Fraser, 1936a

Ophiodes corrugata Fraser, 1936a: 504, figs. 2A, B.
Ophiodissa corrugata.—Fraser, 1937a: 113, pl. 23, figs. 128a–c.
Hydrodendron corrugatum.—Rees & Vervoort, 1987: 22.

Syntypes. BCPM 976-00509-001: Canada, British Columbia, Houston Stewart Channel; slide.

Lectotype, by present designation. RBCM 976-00509-002: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Houston Stewart Channel, off Rose Harbour, 30 fm (55 m), June-early September 1935, one colony fragment (on the left side of the slide), 1.8 mm long, in good condition, without gonophores; slide.

Paralectotypes. BCPM 976-00509-001: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Houston Stewart Channel, off Rose Harbour, 30 fm (55 m), June-early September 1935, several fragments mounted with lectotype, in good condition, without gonophores; slide.

Type locality. Canada, British Columbia: Queen Charlotte Islands (=Haida Gwaii), Houston Stewart Channel, off Rose Harbour, 30 fm (55 m) (Fraser 1936a).

Current status. Valid, as *Hydrodendron corrugatum* (Fraser, 1936a).

Remarks. (Fraser 1936a) established *Ophiodes corrugata* based on sterile material. Several colonies appear to have been available to him in describing the species (see Fraser 1936a, 504; 1947a: 281). Specimens, taken to be syntypes, exist on a slide at the RBCM (BCPM 976-00509-001). No other types are known to exist. As lectotype, we have selected a 1.8 mm-long specimen with several hydrothecae and nematothecae. That colony (RBCM 976-00509-002) is on the left side of the slide, with all others mounted with it constituting paralectotypes (BCPM 976-00509-001).

The species was reported again, but not described, from San Miguel Island, California (Fraser 1948). Rees & Vervoort (1987), Cairns *et al.* (2002), and WoRMS refer to this hydroid under the binomen *Hydrodendron corrugatum*.

Ophiodes gracilis Fraser, 1914a

Ophiodes gracilis Fraser, 1914a: 171, pl. 22, figs. 82A–D.
Diplocyathus gracilis.—Leloup, 1930: 6.
Ophiodissa gracilis.—Fraser, 1937a: 114, pl. 23, figs. 129a–d.

Plumularia magellanica moneroni Naumov, 1960: 462, fig. 351.
Not *Hydrodendron gracilis*.—Millard, 1973: 973: 33, figs. 6F, G; 1975: 164, figs. 53E–J.
Hydrodendron gracile.—Rees & Vervoort, 1987: 20.

Type material. None known to exist.

Type locality. Canada, British Columbia: Clarke Rock; Pylades Channel; Rose Spit (Graham Island, Haida Gwaii) (Fraser 1914a).

Current status. Valid, as *Hydrodendron gracile* (Fraser, 1914a), although the species needs reassessment.

Remarks. The only material of *Ophiodes gracilis* Fraser, 1914a in the Fraser Hydroid Collection at the RBCM (BCPM 976-00510-001: Canada, British Columbia, Houston Stewart Channel) is not from any of the type localities listed by Fraser (1914a) and is not part of the type series. Instead, it is from later collections made in Houston Stewart Channel, a passage separating Moresby and Kunghit islands in the Queen Charlotte Islands (=Haida Gwaii) (Fraser 1936b).

Fraser's (1914a) account of this hydroid, assigned by Rees & Vervoort (1987) to *Hydrodendron* Hincks, 1874 as *H. gracile*, was based on sterile material. Specimens examined by Antsulevich (1987, 2015) from the Pacific coast of the Russian Federation lacked gonophores as well. Meanwhile, fertile hydroids assigned to the species by Millard (1973, 1975, as *H. gracilis*) are unlikely to have been conspecific. Indeed, records of *H. gracile* outside the boreal North Pacific, and especially from tropical waters, need to be re-considered. Hydroids of this species, identified as *Plumularia magellanica moneroni* by Naumov (1960) from Tatar Strait (Gulf of Tatary), Russian Federation, are almost certain to be distinct from *Plumularia magellanica* Hartlaub, 1905 (=*Kirchenpaueria magellanica*) (Horia R. Galea, personal communication, 22 March 2018). Naumov's specimens were also sterile.

The species was included as *H. gracile* in Cairns *et al.* (2002), following Rees & Vervoort (1987), and as *H. gracilis* in the current WoRMS list. When combined with the genus *Hydrodendron* (gender: neuter), the specific name must agree in gender and becomes *gracile* instead of *gracilis* (Rees & Vervoort 1987).

Family Zygophylacidae Quelch, 1885

Lictorella carolina Fraser, 1911

Lictorella carolina Fraser, 1911: 53, pl. 4, figs. 3–5.
Zygophylax carolina.—Rees & Vervoort, 1987: 71.
Zygophylax carolinus Cairns *et al*., 1991: 24.

Holotype. See Remarks below.

Type locality. USA, Washington: San Juan Archipelago (Fraser 1911).

Current status. Valid, as *Zygophylax carolina* (Fraser, 1911).

Remarks. Fraser (1911) described *Lictorella carolina* from a single detached specimen that may not have constituted a complete colony. Rees & Vervoort (1987) considered an "imperfectly preserved specimen labelled: '*Lictorella carolina* Fraser. San Juan. T. Kincaid'" in the NMNH to be type material and probably the holotype of the species (No. 70625, with No. 34084 on a separate label). The collection could not be located in the online database of the NMNH under either number during this study. Neither could the specimen be found during a visit by one of us (DRC) to the NMNH in September 2017. Hydroids of *L. carolina* in the Fraser Hydroid Collection at the RBCM (BCPM 976-00334-001: Trinity Islands, 20 August 1914, 91 m, dry; BCPM 976-00335-001: Gulf of Alaska) (Arai 1977) are not types.

Additional information on morphology of this species, beyond the original description, exists in Fraser (1914b). Rees & Vervoort (1987) remarked that the hydroid, as *Zygophylax carolina*, was "insufficiently described" and founded on sterile material. Nevertheless, *Z. carolina* has been listed as valid in Cairns *et al*. (2002, as *Z. carolinus*), Antsulevich (2015), and WoRMS.

Lictorella crassicaulis Fraser, 1943a

Lictorella crassicaulis Fraser, 1943a: 80, pl. 18, fig. 9.

Zygophylax crassicaulis.—Rees & Vervoort, 1987: 82.

Holotype: MCZ-IZ 9010-a: Barbados, USCSS *Blake*, 13°11'54"N, 59°38'45"W, 73 fm (134 m), 09 March 1879, several fragments of a single colony, in fairly good condition, without gonophores, coll. A. Agassiz, labelled "type"; 70% ethanol + fragment on SEM stub.

Type locality. Barbados: *Blake* Expedition Sta. 290, 13°11'54"N, 59°38'45"W, 73 fm (134 m) (Fraser 1943a).

Current status. Valid, as *Zygophylax crassicaulis* (Fraser, 1943a).

Remarks. Fraser (1943a) described *Lictorella crassicaulis* from a collection sent to him from the MCZ. No type for it was designated by him in that paper, but material of the species exists at the MCZ in both ethanol and on a SEM stub. That collection (MCZ-IZ 9010-a) is from the type locality, and it contains labels marked "type" and "*Lictorella crassicaulis* Fraser" (in Fraser's handwriting). Rees & Vervoort (1987) referred to the collection as the "type series", but we consider it to consist of fragments of a single colony. A specimen count of "1" is given in the MCZ online database, and it seems certain that the fragment on the SEM stub was taken from it. No other type material is known to exist. We therefore regard the MCZ specimen as the holotype by monotypy (ICZN Art. 73.1.2). The colony described by Fraser was said to be 6 cm in height. Although its polysiphonic hydrocaulus is now broken into several pieces, and some of the hydrocladia are detached, the specimen is otherwise in reasonably good condition. The specific name of this hydroid is currently misspelled *crassicaulus* on most of the labels accompanying the specimen, and also in the MCZ online database.

Zygophylax crassicaulis is known only from its type locality off the west coast of Barbados. Fraser (1943a) did not observe the gonosome in describing this hydroid. The species has been taken to be valid by Rees & Vervoort (1987) and WoRMS.

Lictorella crassitheca Fraser, 1941b

Lictorella crassitheca Fraser, 1941b: 85, pl. 18, figs. 12a, b.
Zygophylax crassitheca.—Rees & Vervoort, 1987: 78.

Holotype. USNM 43456: USA, Maine, 31 m, five fragments and some detached hydrothecae of a single colony, in fair condition, without gonophores, labelled "type"; ethanol.

Type locality. USA: Gulf of Maine, 17 fm (31 m) (Fraser 1941b).

Current status. Valid, as *Zygophylax crassitheca* (Fraser, 1941b).

Remarks. Material designated by Fraser (1941b) as the "type" of *Lictorella crassitheca* at the NMNH (USNM 43456) presently comprises five fragments of what we regard as parts of a single colony. No indication of specimen number was provided in the original description. Rees & Vervoort (1987) referred to the collection as the "type series," but the specimen count in the online database of the NMNH is stated to be "1." Recorded therein as a syntype, the specimen is taken here to be the holotype by monotypy (ICZN Art. 73.1.2). No other type material of the species is known to exist. Minimal collection data accompany the holotype.

In addition to the record from the Gulf of Maine, Fraser (1941b) recorded this species from R/V *Albatross* Sta. 2430, 42°58'30"N, 50°50'W, SE of Sable Island (Nova Scotia, Canada), 179 fm (327 m), 23 June 1885. In being listed separately from the "type", however, the material is not considered part of the type series (ICZN Art. 72.4.6). That collection, from the upper slope near the southern tip of the Grand Banks of Newfoundland, was not found in the current online database of the NMNH.

In describing *Lictorella crassitheca*, no gonophores were observed by Fraser (1941b). Nematophores were said to be scarce and restricted to the polysiphonic hydrocaulus (Fraser 1941b, 1944a, b). Now assigned the binomen *Zygophylax crassitheca*, this species is currently recognized as valid (Rees & Vervoort 1987; Cairns *et al*. 2002; WoRMS).

Genus *Euperisiphonia* Fraser, 1940a

Cryptolaria Busk, 1857: 173.
Euperisiphonia Fraser, 1940a: 578.

Type species. *Euperisiphonia rigida* Fraser, 1940a, by original designation.

Current status. Invalid.

Remarks. Fraser (1944a: 232) referred *Euperisiphonia* Fraser, 1940a to the synonymy of *Zygophylax* Quelch, 1885 by assigning its type species, *E. rigida* Fraser, 1940a, to that genus. However, Rees & Vervoort (1987) transferred *Euperisiphonia* to *Cryptolaria* Busk, 1857, and that synonymy has been adopted in the WoRMS list and in other works such as that of Vervoort & Watson (2003).

Euperisiphonia rigida Fraser, 1940a

Euperisiphonia rigida Fraser, 1940a: 579, pl. 33, figs.7a–c.
Zygophylax rigida.—Fraser 1944a: 232, pl. 44, figs. 197a–d.
Cryptolaria rigida.—Rees & Vervoort, 1987: 51 [not *Cryptolaria rigida* (Fraser, 1948)].

Holotype. USNM 43439: Mexico, Quintana Roo, Yucatan Channel, R/V *Albatross* Sta. 2354, 20°59'30"N, 86°23'45"W, 238 m, 22 January 1885, small beam trawl; ethanol.

Type locality. Mexico: Yucatan Channel, 20°59'30"N, 86°23'45"W, 238 m (Fraser 1940a).

Current status. Valid, as *Cryptolaria rigida* (Fraser, 1940a).

Remarks. The only known type material of *Euperisiphonia rigida* is in collections at the NMNH (USNM 43439). Designated as the "type" by Fraser (1940a), it is recorded as a holotype in the NMNH online database. The collection was referred to as the "type series" by Rees & Vervoort (1987). However, Fraser (1940a) remarked in describing the species that the "largest fragment", presumably of a single damaged colony, was 3.5 cm high. The gonosome of the species has yet to be described. This specimen could not be located at the NMNH during a visit by one of us (DRC) in September 2017.

Euperisiphonia rigida Fraser, 1940a has been referred to *Zygophylax* Quelch, 1885 in some works (e.g., Fraser 1944a, b; Vervoort 1968) and to *Cryptolaria* Busk, 1857 in others (e.g., Rees & Vervoort 1987; Vervoort & Watson 2003). Its correct generic assignment is still somewhat debatable (Vervoort & Watson 2003: 53), although the species is currently assigned to *Cryptolaria* in WoRMS. Also thought referable to *Cryptolaria* is *Lictorella rigida* Fraser, 1948 (Calder *et al*. 2009). Secondary homonymy arises when the two species are assigned to the same genus, whether *Cryptolaria*, as *C. rigida* (Fraser, 1940a) and *C. rigida* (Fraser, 1948), or *Zygophylax*, as *Z. rigida* (Fraser, 1940a) and *Z. rigida* (Fraser, 1948). To minimize potential nomenclatural confusion over the two, and see Schuchert (2015: 331), a replacement name is proposed here for the junior secondary homonym *C. rigida* (Fraser, 1948). That name, *Cryptolaria crassa*, nom. nov. (Latin *crassus*, thick, strong), refers to the thick and rigid hydrocaulus of the species.

Family Hebellidae Fraser, 1912c

Hebellidae Fraser, 1912c: 370.

Current status. Valid.

Remarks. Fraser (1912c) introduced the family Hebellidae for two genera, *Hebella* Allman, 1888 and *Scandia* Fraser, 1912c, the latter a new genus established by him in the same paper. The name Hebellidae had been used in a manuscript being prepared by Charles Cleveland Nutting (1858–1927), who granted Fraser permission to use it in his paper. Fraser (1912c) made the name nomenclaturally available and is therefore credited as its author (ICZN Art. 50.1). Nutting's manuscript, intended as a volume on Lafoeidae A. Agassiz, 1865 and Hebellidae in his series on American hydroids (Nutting, 1900, 1904, 1915), disappeared after his death and was never published (Calder 2004).

Marques *et al*. (2006) presented evidence from a cladistic analysis supporting recognition of Hebellidae as a distinct family. That conclusion is now widely accepted, although it seems to be polyphyletic as presently classified (Moura *et al*. 2011).

Hebella eximia Fraser, 1944a

Hebella (?) *eximia* Fraser, 1944a: 207, pl. 39, figs. 185a, b.

Holotype. MCZ-IZ 9067: Dominica, USCSS *Blake* Sta. 185, 15°24'55"N, 61°27'10"W, 333 fm (609 m), 27 January 1879, coll. A. Agassiz; ethanol (specimen now missing from its vial).

Type locality. Dominique (Dominica): 15°24'55"N, 61°27'10"W, 333 fm (609 m) (Fraser 1944a).

Current status. *Species inquirenda*.

Remarks. While no name-bearing types of *Hebella* (?) *eximia* were designated by Fraser (1944a), the online catalogue at MCZ records type material of the species in the collection (MCZ-IZ 9067). That record does not specify the number of colonies, but Fraser's (1944a) description was of a single colony. No types or other specimens were located elsewhere, including the Fraser Hydroid Collection at the RBCM. The MCZ specimen, apparently the holotype by monotypy (ICZN Art. 73.1.2), is now missing from its bottle. The vial originally containing it was carefully checked twice during this study, but no hydroids of *H. eximia* were found.

Fraser (1944a) founded *Hebella eximia* in his book on hydroids of the western North Atlantic. No gonosome was present, and he was uncertain of its generic affinities. Boero *et al*. (1997) referred it to the synonymy of *H. scandens* (Bale, 1888), given the resemblance of its trophosome to that species. Their conclusion has been upheld in the current WoRMS list. Based on Fraser's account of the morphology of its hydrothecae, however, and the considerable depth from which it was collected, it may well be distinct. It is held here to be a *species inquirenda*. With the holotype now missing, designation of a neotype, following provisions of the ICZN, seems desirable if the species is re-discovered.

Genus *Scandia* Fraser, 1912c

Scandia Fraser, 1912c: 371.

Type species. *Campanularia mutabilis* Ritchie, 1907, by monotypy.

Current status. Valid.

Remarks. *Scandia* Fraser, 1912c is recognized as valid in contemporary works such as Calder (1991), Bouillon *et al*. (2006), Marques *et al*. (2006), and WoRMS.

Family Lafoeidae A. Agassiz, 1865

Cryptolaria triserialis Fraser, 1913b

Cryptolaria (?) *borealis* Levinsen, 1893: 173, pl. 5, fig. 21.
Cryptolaria triserialis Fraser, 1913b: 170, pl. 13, figs. 1, 2.
Grammaria borealis.—Stechow, 1923: 147.
Acryptolaria triserialis.—Fraser, 1944a: 213, pl. 42, figs. 194a–c.

Type material. None known to exist.

Type locality. Canada, Nova Scotia: Chedabucto Bay, Canso, off Durells Island, 37 m (Fraser 1913b).

Current status. Invalid.

Remarks. No collections of *Cryptolaria triserialis* Fraser, 1913b, type or otherwise, could be located during this study. The species was not mentioned as part of the Fraser Hydroid Collection by Arai (1977), and it was not found by us during this study in either the online database, or the collections, or a museum catalogue of the collection.

Cairns *et al*. (2002) followed Fraser (1944a) in assigning the species to *Acryptolaria* Norman, 1875, as *A. triserialis*. However, Kramp (1932) included *C. triserialis* in the synonymy of *Grammaria borealis* (Levinsen, 1893), a conclusion adopted by Vervoort (1972), Schuchert (2001a), Antsulevich (2015), and WoRMS.

Grammaria elegans Fraser, 1943a

Grammaria elegans Fraser, 1943a: 79, pl. 18, fig. 7.

Holotype. MCZ-IZ 9007: U.S. Virgin Islands: off St. Croix, *Blake* Expedition, 17°37'55"N, 64°54'20"W, 115 fm (210 m), 05 January 1878, one colony, 8 cm high, with a detached fragment, in fairly good condition, without gonophores, labelled "type"; formalin, about to be transferred to ethanol.

Type locality. U.S. Virgin Islands: off St. Croix, 17°37'55"N, 64°54'20"W, 115 fm (210 m) (Fraser 1943a).

Current status. Valid.

Remarks. Fraser (1943a) described *Grammaria elegans* from a hydroid colony in collections at the MCZ, but designated no name-bearing type for it. A single specimen of the species from the type locality ("off Santa Cruz Island"), labelled "type", was located in the MCZ Type Collection (MCZ-IZ 9007). That specimen is the holotype by monotypy. No types were located elsewhere (NMNH, CAS, RBCM, YPM), and it was not mentioned as part of the Fraser Hydroid Collection at the RBCM by Arai (1977).

Grammaria elegans is listed as valid in WoRMS. With the exception of one questionable record from slope waters off the Carolinas (Hilbig 1994, as *G.* cf. *elegans*), the species is known only from the original description. Its gonosome is unknown.

Grammaria rigida Fraser, 1943a

Grammaria rigida Fraser, 1943a: 79, pl. 18, fig. 8.

Holotype. MCZ-IZ 9011: Barbados, off Sandy Bay, *Hassler* Expedition 1871–1872, 13°03'00"N, 59°35'00"W, 29–30 December 1871, one colony fragment, 1 cm high, in fair condition, without gonophores, labelled "type" and "holotype"; 80% ethanol.

Type locality. Barbados: off Sandy Bay, 13°03'00"N, 59°35'00"W, 100 fm (183 m) (Fraser 1943a).

Current status. Valid.

Remarks. *Grammaria rigida* was described by Fraser (1943a) from a colony fragment in a collection at the MCZ. Although no types of it were originally designated in that paper, material of the species exists at the museum (MCZ-IZ 9011) from the type locality, and with labels marked "type" and "holotype". No other types are known to exist, and the single specimen, a fragment of a hydrocaulus with 13 hydrocladia or parts thereof, is the holotype by monotypy. It is in satisfactory condition, although hydranths are mostly deteriorated or absent.

This is another poorly known hydroid species, described by Fraser (1943a) from the trophosome only. No records of it have been published since the original description, although non-type material from North Carolina, identified as *G. rigida*, exists at the NMNH (USNM 61370, USNM 61371, USNM 72875). The species is listed as valid in WoRMS.

Lafoea adnata Fraser, 1925

Lafoea adnata Fraser, 1925: 170, figs. 5A, B.
Filellum adnatum.—Marques *et al*., 2006: 46.

Lectotype. BCPM 976-00324-001: USA, California, Farallon Islands, 60–64 m, on algae, without gonophores, labelled "cotype"; 60% IPA (Arai 1977; Marques *et al*. 2011).

Paralectotypes. BCPM 976-00324-002: USA, California, Farallon Islands, 60–64 m, one colony, on algae; slide.

CAS-IZ 21802.00: USA, California, Farallon Islands, 33–35 fm (60–64 m), on algae, bryozoans and other hydroids, labelled "syntype"; 10% formalin.

Type locality. USA, California: near Farallon Islands, 60–64 m (Fraser 1925).

Current status. *Species inquirenda*.

Remarks. Marques *et al*. (2006) re-examined part of the syntype material of *Lafoea adnata* (BCPM 976-

00324-001), and transferred it to *Filellum* Hincks, 1868, as *F. adnatum*. Later, Marques *et al*. (2011) designated the same hydroid as the lectotype and provided a re-description and illustrations of it. The remaining syntypes (BCPM 976-00324-002, CAS-IZ 21802.00) thereby became paralectotypes.

Fraser's (1925) specimens of this species, from the Farallon Islands, California, were sterile. In the absence of coppiniae, Marques *et al*. (2011) considered *F. adnatum* to be a *species inquirenda*. The hydroid was included by Cairns *et al*. (2002) under the binomen *L. adnata*, and it is currently listed under the same name in WoRMS.

Family Sertulariidae Lamouroux, 1812

Abietinaria rigida Fraser, 1911

Abietinaria rigida Fraser, 1911: 61, pl. 5, figs. 1–3.

Syntypes. USNM 68653: USA, Washington, San Juan Islands, numerous colonies and colony fragments, condition varying from poor to fairly good, gonothecae very scarce, with multiple other hydroid species, coll. Trevor Kincaid; ethanol.

BCPM 976-00531-001: USA, Washington, San Juan Archipelago, one colony fragment, 1.4 cm high, in fairly good condition, without gonothecae; slide.

BCPM 976-00531-002: USA, Washington, San Juan Archipelago, one colony fragment, 0.8 cm high, in rather poor condition, without gonothecae; slide.

Lectotype, by present designation. USNM 68653: USA, Washington, San Juan Islands, one colony, 6.4 cm high, in fairly good condition, without gonothecae, coll. Trevor Kincaid; ethanol.

Paralectotypes. USNM 1458918: USA, Washington, San Juan Islands, numerous colonies and colony fragments, condition varying from poor to fairly good, gonothecae very scarce, with multiple other hydroid species, coll. Trevor Kincaid; ethanol.

BCPM 976-00531-001: USA, Washington, San Juan Archipelago, one colony fragment, 1.4 cm high, in fairly good condition, without gonothecae; slide.

BCPM 976-00531-002: USA, Washington, San Juan Archipelago, one colony fragment, 0.8 cm high, in rather poor condition, without gonothecae; slide.

Type locality. USA, Washington: San Juan Archipelago (Fraser 1911).

Current status. Valid.

Remarks. In describing *Abietinaria rigida*, Fraser (1911: 62) recorded its distribution from two locations: "Albatross Station 2865, N. 48°12', W. 122°51', 48 fathoms (in collection of the State University of Iowa); San Juan Archipelago". While preparing his account of it as a graduate student at Iowa, he examined two collections of hydroids from the San Juan Archipelago in the possession of Prof. C.C. Nutting, one of them acquired from Mr. H. Moon and another from Prof. Trevor Kincaid. As noted earlier (Calder 2004), collections in Nutting's possession were subsequently transferred to the NMNH. Although not indicated as a type in the online database of that museum, material of *A. rigida* at the NMNH (USNM 68653) matching both the type locality (San Juan Islands) and the collector (T. Kincaid) is considered part of the syntype series of the species here. So too are specimens on two slides from the same locality in the Fraser Hydroid Collection at the RBCM (BCPM 976-00531-001, BCPM 976-00531-002). Others at the RBCM (BCPM 976-00532-001: Houston Stewart Channel, off Rose Harbour, 23 August 1935; BCPM 976-00533-001: W of Goose Island, 26 July 1936, 64 m; BCPM 976-00534-001: Haida Gwaii, Graham Island, 4.8 km off Sadler Point, 29 July 1936, 55 m; BCPM 976-00535-001: off Masset Inlet, 30 July 1936, 82 m) are certainly not part of the type series. Likewise, a collection of *A. rigida* at CAS (CAS-IZ 15183.00) from the San Juan Islands is not type material in having been collected during 1918.

After examining all of the syntypes listed above, we designate a colony at the NMNH (USNM 68653) as the lectotype of *Abietinaria rigida*. In our opinion, it best reflects the distinctive characters of the species. Although the colony lacks gonothecae, few gonothecae were observed in the entire syntype series and all were on single detached branches. Such specimens were considered unsatisfactory for lectotype designation. The designation restricts the type locality of the species to the San Juan Archipelago, USA. The remaining specimens in the original syntype collection at the NMNH are paralectotypes (USNM 1458918), as are those at the RBCM (BCPM 976-00531-001, BCPM 976-00531-002).

Hydroids of *Abietinaria rigida* were reportedly "…plentiful in the San Juan Archipelago" (Fraser 1911). The species is regarded as valid (Cairns *et al*. 2002; WoRMS).

Diphasia clarae Fraser, 1911

Hydrallmania distans Nutting, 1899: 746, pl. 63, figs. 3A–D.
Diphasia clarae Fraser, 1911: 64, pl. 5, fig. 1.

Syntype. USNM 70860: USA, Washington, San Juan Islands, one colony on *Lafoea* sp., coll. T. Kincaid; ethanol.

Lectotype, by present designation. USNM 70860: USA, Washington, San Juan Islands, one colony, ca. 8 mm high, on *Lafoea* sp., in fairly good condition, without gonophores, coll. T. Kincaid; ethanol.

Type locality. USA, Washington: San Juan Archipelago (Fraser 1911).

Current status. Invalid.

Remarks. *Diphasia clarae* was originally described by Fraser (1911) from specimens collected in both Washington state, USA (San Juan Archipelago) and British Columbia, Canada (Queen Charlotte Islands, now called Haida Gwaii). No name-bearing types were designated by him for the species. A hydroid colony at the NMNH (USNM 70860) from one of the two original type localities, and in a collection (by Trevor Kincaid) that Fraser examined during his study (Fraser 1911: 4), would have been part of the type series of *D. clarae*. Although no other specimens from the type series are known to exist, we designate it as the lectotype rather than the holotype by monotypy (ICZN Recommendation 73F). A single sample of specimens identified as *D. clarae* exists in the Fraser Hydroid Collection at the RBCM (BCPM 976-00544-001: Horswell Channel, 17 October 1912, 15-18 m) (Arai 1977), but it was collected subsequent to the original description of the species and does not constitute type material. Our lectotype designation restricts the type locality of *D. clarae* to the San Juan Archipelago, Washington, USA.

Subsequently assigned to the synonymy of *Hydrallmania distans* Nutting, 1899 by Fraser (1914a: 108, 185), the binomen *Diphasia clarae* was abandoned in later comprehensive works on hydroids by him (Fraser 1937a, 1947a).

The figures and captions of plates 5 and 6 in Fraser's (1911) paper, in which *Diphasia clarae* was described, were reversed. The figure of the species is on plate 5 and not plate 6, as indicated in the text.

Diphasia crassa Fraser, 1940a

Synthecium protectum Jäderholm, 1903: 290, pl. 13, figs. 5, 6.
Diphasia crassa Fraser, 1940a: 579, pl. 33, figs. 8a, b.
Synthecium crassum.—Vervoort & Watson, 2003: 246.

Holotype. USNM 43440: Chile, Reina Adelaida Archipelago, Strait of Magellan, west mouth of straits, R/V *Albatross* Sta. 2782, 51°12'S, 74°13'30"W, 472 m, 06 February 1888, small beam trawl, one colony, 2.5 cm high, in rather poor condition, without gonophores, labelled "type"; ethanol.

Type locality. Chile: southwest coast, 51°12'S, 74°13'30"W, 472 m (Fraser 1940a).

Current status. Invalid.

Remarks. The only known name-bearing type material of *Diphasia crassa*, fixed originally by Fraser (1940a) as the "type" and constituting a single colony, is justifiably listed as a holotype in collections at the NMNH (USNM 43440). No specimens assigned to the species exist in the Fraser Hydroid Collection at the RBCM. The coordinates of the station are imprecise as they reflect a location on an island.

Fraser (1940a) referred this species, with question, to *Diphasia* L. Agassiz, 1862. Poorly known and described from infertile material, it was listed under *Synthecium* Allman, 1872 by Vervoort & Watson (2003). Following the suggestion of Horia R. Galea (personal communication, 31 March 2016), *D. crassa* is regarded here as a synonym of *Synthecium protectum* Jäderholm, 1903 (type locality: Cape Valentine, Elephant Island). Of particular note, a distinctive unpaired hydrotheca may occur at the proximal end of each hydrocladium in both *D. crassa* and *S. protectum*. Jäderholm (1903) also reported that hydrothecae of *S. protectum* are partially covered by a flange of the adjoining internode.

Diphasia robusta Fraser, 1943a

Diphasia robusta Fraser, 1943a: 80, pl. 19, figs. 11a, b [invalid junior primary homonym of *Diphasia attenuata robusta* Billard, 1924].

Type material. None known to exist.

Type locality. USA, Massachusetts: off George's Bank, Canyon D (Lydonia Canyon), 40°23'N, 67°39'W, 640–283 m (Fraser 1943a).

Current status. Invalid.

Remarks. Although Fraser (1943a) described *Diphasia robusta* from specimens in collections at the MCZ, no record of the species currently exists in the online database of that museum. A search for the hydroid in collections at MCZ during a visit by one of us (DRC) in November 2017 was unsuccessful. No type material of it is recorded in online records of the RBCM, AMNH, NMNH, CAS, or YPM.

Specimens of *Diphasia robusta* described by Fraser were collected in Lydonia Canyon, at the edge of the continental shelf off Nantucket Island, Massachusetts, on 24 July 1936 during a cruise of R/V *Atlantis*. Except for the robust nature of its colony (Fraser 1947a), the morphology of the species generally resembles that *of D. fallax* (Johnston, 1847). Its female gonophores have yet to be described.

Although currently listed as valid in WoRMS, *Diphasia robusta* Fraser, 1943a is a permanently invalid junior primary homonym of *Diphasia attenuata robusta* Billard, 1924 (ICZN Art. 57.2). A new replacement name, *D. alta* (derived from the Latin adjective *altus* and used in the meaning of "deep", in reference to occurrence of this hydroid in bathyal waters), is proposed here for the species.

Selaginopsis trilateralis Fraser, 1936a

Selaginopsis trilateralis Fraser, 1936a: 504, fig. 3.
Pericladium trilateralis.—Cairns *et al*., 2002: 25.

Syntype. BCPM 976-00574-001: Canada, British Columbia, Houston Stewart Channel, 22 July 1935, 27–33 m, labelled "type"; 60% IPA.

Lectotype, by present designation. BCPM 976-00574-001: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Houston Stewart Channel, near Rose Harbour, 30 fm (55 m), 22 July 1935, one colony, 16 mm high, in fairly good condition, without gonothecae, labelled "type"; 60% IPA.

Type locality. Canada, British Columbia: Queen Charlotte Islands (=Haida Gwaii), Houston Stewart Channel near Rose Harbour, 55 m (Fraser 1936a).

Current status. Valid, as *Pericladium trilaterale* (Fraser, 1936a).

Remarks. Fraser (1936a) did not designate a name-bearing type of his *Selaginopsis trilateralis*. It was originally described by him as "A rigid colony, 18 mm high…", suggesting an account of one specimen. A single colony of the species from one of the two original type localities (western end of Houston Stewart Channel, Haida Gwaii, British Columbia), labelled as the "type", exists in the Fraser Hydroid Collection at the RBCM (BCPM 976-00574-001). That specimen is approximately the same size recorded by Fraser (16 mm vs. 18 mm high). However, as noted above, the species was reported by Fraser (1936a) to have been found at a second location, "…in the western portion of the channel (Houston Stewart Channel), 15-18 f. (25-30 m.)." No type material is known to exist from that location, but we have avoided assuming that none exists (ICZN Recommendation 73F). Instead of concluding that the existing type specimen is the holotype by monotypy, we have designated it as the lectotype. Other specimens in the Fraser collection (BCPM 976-00575-001: off Frederick Island, 29 July 1936, 25 m, dry; BCPM 976-00575-002: Frederick Island, slide) are not part of the type series. Those hydroids were collected after the original description of the species was published by Fraser (1936a), and at a different location (Frederick Island, Haida Gwaii) than the type locality. Fraser's original figure of the species is somewhat misleading in that the proximal branch is illustrated with only two instead of three rows of hydrothecae. All branches in the lectotype colony have three hydrothecal rows.

This species is listed as *Thuiaria trilateralis* in WoRMS. Unlike in the genus *Thuiaria* Fleming, 1828, the hydrothecal rim of the species is marked by two low, rounded cusps (Fraser 1936a) rather than being circular or

sinuous. It is assigned here to *Pericladium* Allman, 1876 in having hydrothecae arranged in more than two longitudinal rows, and in having hydrothecal margins with two marginal cusps. The spelling of the specific name, as *Pericladium trilateralis* in Cairns *et al*. (2002), is corrected here to *P. trilaterale*.

Sertularia brevis Fraser, 1935b

Sertularia minuta Hargitt, 1924: 494, pl. 5, fig. 18 [invalid junior primary homonym of *Sertularia minuta* Bale, 1882].
Sertularia brevis Fraser, 1935b: 110, pl. 2, fig. 9 [replacement name for *Sertularia minuta* Hargitt, 1924; not *Sertularia minuta* Bale, 1882]
Dynamena brevis.—Yamada, 1959: 58.

Syntypes. USNM 42652: Philippines, Bataan, Luzon Island, Mariveles, 14°25'48"N, 120°28'48"E, 06 June 1912, several colony fragments (as *Sertularia minuta* Hargitt, 1924); slide.

Lectotype, by present designation. USNM 42652: Philippines, Bataan, Luzon Island, Mariveles, 14°25'48"N, 120°28'48"E, 06 June 1912, one colony fragment, in good condition, with a gonotheca (as *Sertularia minuta* Hargitt, 1924); slide; see Remarks below.

Paralectotypes. USNM 42652: Philippines, Bataan, Luzon Island, Mariveles, 14°25'48"N, 120°28'48"E, 06 June 1912, several colony fragments, in good condition, two with gonothecae (as *Sertularia minuta* Hargitt, 1924); same slide as lectotype.

Type locality. Philippines, Bataan: Luzon Island, Mariveles.

Current status. Valid, as *Dynamena brevis* (Fraser, 1935b).

Remarks. Hargitt (1924) provided a station number (697) in his account of *Sertularia minuta* from the Philippines, but gave no other collection data to accompany it. Information on the type locality above is taken from the NMNH record of Hargitt's syntype specimens (USNM 42652). The coordinates of the site point to a location on dry land.

Several colony fragments exist on the syntype slide (USNM 42652) of Hargitt's (1924) *Sertularia minuta*. These may or may not have been part of the same colony. Therefore, one in the NW quadrant, having a gonotheca containing a gonophore, is designated here as the lectotype. Others on the slide are paralectotypes.

Nutting (1927: 213) noted the homonymy between *Sertularia minuta* Hargitt, 1924 and *S. minuta* Bale, 1882, but did not provide a replacement name for the junior name. Fraser (1935b) proposed *S. brevis* as a *nomen novum* for Hargitt's species, now assigned to *Dynamena* Lamouroux, 1812, as *D. brevis* (e.g., Yamada 1959; Hirohito 1995; Tseng *et al*. 2014; WoRMS). Meanwhile, *Sertularia minuta* Bale, 1882 has been referred to *Amphisbetia* L. Agassiz, 1862, as *A. minuta.*

Sertularia pyriformis Fraser, 1936c

Sertularia pyriformis Fraser, 1936c: 51, pl. 2, figs. 5a–c.
Salacia pyriformis.—Yamada, 1959: 72.

Syntypes. BCPM 976-00674-001: Japan, Sagami Bay, Hayama, 7 m, 20 May 1935, on a sponge, one colony, 1.5 cm high, in fairly good condition, with gonothecae; 60% IPA.

BCPM 976-00674-002: Japan, Sagami Bay, Hayama, 7 m, 20 May 1935, on a sponge, four colony fragments, up to 1.1 cm high, in fairly good condition, one fragment with gonothecae; slide.

Lectotype, by present designation. BCPM 976-00674-001: Japan, Sagami Bay, Hayama, 7 m, 20 May 1935, on a sponge, one colony, 1.5 cm high, in fairly good condition, with gonothecae; 60% IPA.

Paralectotypes. BCPM 976-00674-002: Japan, Sagami Bay, Hayama, 7 m, 20 May 1935, on a sponge, four colony fragments, up to 1.1 cm high, in fairly good condition, one fragment with gonothecae; slide.

Type locality. Japan: Sagami Bay, Hayama, 7 m (Fraser 1936c).

Current status. Valid, as *Salacia pyriformis* (Fraser, 1936c).

Remarks. Specimens described and named *Sertularia pyriformis* by Fraser (1936c), from the collection of Emperor Hirohito, were collected in Sagami Bay, Japan. While no name-bearing types were designated by Fraser,

syntype material exists in the Fraser Hydroid Collection at the RBCM (BCPM 976-00674-001; BCPM 976-00674-002). The fluid-preserved specimen (BCPM 976-00674-001), a fairly large colony in quite good condition and with multiple gonothecae, is designated here as the lectotype. Other colony fragments on a slide (BCPM 976-00674-002) are paralectotypes.

Five samples of hydroids identified as *S. pyriformis* in the Emperor Shōwa Hydroid Collection at the NMNS (NSMT-HyR 2680–NSMT-HyR 2684, and especially NSMT-HyR 2683) correspond in terms of general collection data with the material of Fraser (1936c).

This species is listed as valid in both Hirohito (1995) and WoRMS under the binomen *Salacia pyriformis*.

Sertularia subtilis Fraser, 1937b

Sertularia rugosissima Thornely, 1904: 118, pl. 2, fig. 4.
Sertularia hupferi Broch, 1914: 34, figs. 9a–c.
Tridentata rugosissima Stechow, 1923: 205.
Sertularia subtilis Fraser, 1937b: 3, pl. 1, fig. 4.
Geminella subtilis.—Vannucci Mendes, 1946: 572, pl. 4, figs. 42, 43.

Holotype. USNM 43288: Puerto Rico, off NE coast, Johnson-Smithsonian Deep-Sea Expedition Sta. 68, 18°23'35"N, 65°37'10"W, 24 February 1933, 18 m, R/V *Caroline*, one colony, 3 mm high, in fairly good condition, without gonothecae, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Schizoholotype. BCPM 976-00681-001: Puerto Rico, two colony fragments (distal part of hydrocaulus with four pairs of hydrothecae, 1.9 mm high; basal part of hydrocaulus and stolon, 2.8 mm high), in good condition, without gonothecae; slide.

Type locality. Puerto Rico: northeast coast, 18°23'35"N, 65°37'10"W, 10 fm (18 m) (Bartsch 1933; Fraser 1937b).

Current status. Invalid.

Remarks. *Sertularia subtilis* was described from a single, sterile, 3-mm-high colony collected during the Johnson-Smithsonian Deep-Sea Expedition to Puerto Rico and vicinity (Fraser 1937b). The small specimen at the NMNH (USNM 43288), designated by Fraser as the holotype, is currently listed as a syntype in the online database of that museum. Material on a slide in the Fraser Hydroid Collection at the RBCM (BCPM 976-00681-001), from Puerto Rico, is regarded here as a fragment of the holotype (schizoholotype), because no other records of this species were known to Fraser (1944a, 1947a). No expedition station number is currently recorded under *S. subtilis* in either the NMNH or the RBCM databases, or in the records of Fraser (1937b) and Arai (1977), but the coordinates and depth of collection given by Fraser correspond with Station 68 in Bartsch (1933). A label confirming that station number exists in the vial containing the holotype. A colony of *Tridentata turbinata* (Lamouroux, 1816), a much larger species of hydroid, occurs in close proximity to the holotype of *S. subtilis*.

This species has been assigned in WoRMS, and in several papers on hydroids of the warm western Atlantic (e.g., Migotto 1996; Galea 2008), to the synonymy of *Sertularia rugosissima* Thornely, 1904. Inclusion of that species in *Sertularia* Linnaeus, 1758 is patently incorrect in differing greatly from *Sertularia argentea*, type species of the genus. It is referred here to *Tridentata* Stechow, 1920, as *T. rugosissima*, based on the known morphology of its trophosome and gonotheca. Also considered a synonym of *T. rugosissima* is *Sertularia hupferi* Broch, 1914.

Thuiaria alba Fraser, 1911

Thuiaria alba Fraser, 1911: 74, pl. 7, figs. 1, 2.
Salacia alba.—Cairns *et al*., 1991: 26.

Syntypes. USNM 70821: USA, Washington, San Juan Archipelago, 1904, Sta. 32, one colony with distal end detached and some detached hydrocladia, total length 5.6 cm high, in fair condition, without gonophores, coll. H. Moon; ethanol.

USNM 70876: USA, Washington, San Juan Archipelago, 1904, Sta. 38, one colony with distal end detached and some detached hydrocladia, total length ca. 3.9 cm, in fairly poor condition, without gonophores; ethanol.

USNM 70903: USA, Washington, San Juan Archipelago, Sta. 83, four colonies or colony fragments with some detached hydrocladia, up to 5.8 cm high, in fair condition, without gonophores, with other species of sertulariids, coll. H. Moon; ethanol.

USNM 71143: USA, Washington, San Juan Archipelago, San Juan Island, >10 colonies or colony fragments and many detached hydrocladia, up to 3.2 cm high, in from fairly good to poor condition, without gonophores, with other species of hydroids, coll. T. Kincaid; ethanol.

BCPM 976-00688-001: USA, Washington, San Juan Archipelago, several colony fragments, up to 2.3 cm high, without gonophores; 60% IPA (not seen in collection).

BCPM 976-00688-002: USA, Washington, San Juan Archipelago, several colony fragments, 2.9 cm high, in fairly good condition, without gonophores; 60% IPA.

BCPM 976-00688-003: USA, Washington, San Juan Archipelago, one colony fragment, 1.1 cm high, in good condition, with developing gonothecae; slide.

BCPM 976-00688-004: USA, Washington, San Juan Archipelago; slide (missing from slide box).

Lectotype, by present designation. USNM 70903: USA, Washington, San Juan Archipelago, Sta. 83, one colony, 4.6 cm high, in fairly good condition, without gonophores, coll. H. Moon; ethanol.

Paralectotypes. USNM 1458895: USA, Washington, San Juan Archipelago, Sta. 83, three colonies or colony fragments with some detached hydrocladia, up to 5.8 cm high, in fair to fairly good condition, without gonophores, with other species of sertulariids, coll. H. Moon; ethanol.

USNM 70821: USA, Washington, San Juan Archipelago, 1904, Sta. 32, one colony with distal tip detached and with some detached hydrocladia, total length 5.6 cm high, in fair condition, without gonophores, coll. H. Moon; ethanol.

USNM 70876: USA, Washington, San Juan Archipelago, 1904, Sta. 38, one colony with distal tip detached and with some detached hydrocladia, total length ca. 3.9 cm, in fairly poor condition, without gonophores; ethanol.

USNM 71143: USA, Washington, San Juan Archipelago, San Juan Island, >10 colonies or colony fragments and many detached hydrocladia, up to 3.2 cm high, varying from fairly good to poor condition, without gonophores, with other species of hydroids, coll. T. Kincaid; ethanol.

BCPM 976-00688-001: USA, Washington, San Juan Archipelago, several colony fragments, up to 2.3 cm high, in fairly good condition, without gonophores; 60% IPA.

BCPM 976-00688-002: USA, Washington, San Juan Archipelago, several colony fragments, up to 2.9 cm high, in fairly good condition, without gonophores; 60% IPA.

BCPM 976-00688-003: USA, Washington, San Juan Archipelago, one colony fragment, 1.1 cm high, in good condition, with developing gonothecae; slide.

BCPM 976-00688-004: USA, Washington, San Juan Archipelago; slide (missing from slide box).

Type locality. USA, Washington: San Juan Archipelago (Fraser 1911).

Current status. Valid.

Remarks. Fraser (1911) described *Thuiaria alba* based on hydroids from the San Juan Archipelago in collections of both Mr. H. Moon and Prof. T. Kincaid. At the time, both collections were in the possession of C.C. Nutting at the University of Iowa. As noted previously, Nutting's collections were later transferred to the NMNH in Washington. While no types were designated by Fraser, data accompanying the four collections at the NMNH noted above (USNM 70821, USNM 70876, USNM 70903, USNM 71143) correspond with information on *T. alba* in his paper. All are regarded here as syntypes. A single colony from one of the collections (USNM 70903) has been selected as the lectotype of the species. The remaining specimens in that collection (now assigned the number USNM 1458895), and all the others (USNM 70821, USNM 70876, USNM 71143), are paralectotypes.

Also considered part of the original type series of *T. alba* by us, and designated herein as paralectotypes, are four samples of the species from the same region in the Fraser Hydroid Collection at the RBCM (BCPM 976-00688-001, BCPM 976-00688-002, BCPM 976-00688-003, BCPM 976-00688-004). These were almost certainly prepared by Fraser from the same San Juan Archipelago collections. Others at the RBCM are from outside the type locality, or were collected after the species was established, and are not types (BCPM 976-00689-001: Friday Harbor, July 1912; BCPM 976-00691-001: Alert Bay, 20 August 1912, 22 m; BCPM 976-00692-001 and BCPM 976-00692-002: Houston Stewart Channel off Rose Harbour, 23 August 1935). Also not part of the type series is a sample from Port Townsend, Washington (BCPM 976-00690-001). Gonothecae were present on those hydroids (Arai 1977), and Fraser did not observe the gonosome in originally describing the species. However, a developing gonotheca was observed during our study on one of the paralectotypes (BCPM 976-00688-003).

This species is currently taken to be valid, as *Thuiaria alba*, by Cairns *et al*. (2002). While listed as *Salacia alba* in Bouillon *et al*. (2006) and WoRMS, an abcauline diverticulum is present in the species (observed here in BCPM 976-00688-004), consistent with the current diagnosis of *Thuiaria* Fleming, 1828.

Thuiaria distans Fraser, 1914a

Thuiaria distans Fraser, 1914a: 197, pl. 32, figs. 123A, B [invalid junior primary homonym of *Thuiaria distans* Allman, 1877].
Thuiaria geniculata Fraser, 1918a: 136 [replacement name for *Thuiaria distans* Fraser, 1914a, not *Thuiaria distans* Allman, 1877].
Salacia fraseri Calder, 1991: 102 [replacement name for *Thuiaria distans* Fraser, 1914a, not *Thuiaria distans* Allman, 1877].
Thuiaria fraseri Cairns *et al*., 2002: 26.

Type. BCPM 976-00708-001: Canada, British Columbia, Fairway Channel, N of Gabriola Island, 46–55 m, 13 May 1912, one colony, 2.3 cm high, in fair condition, without gonophores.

Lectotype, by present designation. BCPM 976-00708-001: Canada, British Columbia, Fairway Channel, N of Gabriola Island, 46–55 m, 13 May 1912, one colony, 2.3 cm high, in fair condition, without gonophores; 60% IPA.

Type locality. Canada, British Columbia: Fairway Channel, N of Gabriola Island (Fraser 1914a).

Current status. Invalid.

Remarks. Fraser (1914a) described *Thuiaria distans* without designating a type. Nevertheless, a hydroid colony from the type locality in the Fraser Hydroid Collection at the RBCM (BCPM 976-00708-001), listed above, is certain to be a type specimen. Given that Fraser was not explicit in stating the number of colonies in hand as the species was being described, however, we avoid assuming that the specimen is the holotype by monotypy and designate it as the lectotype (ICZN Recommendation 73F). The printed catalogue of the Fraser Collection indicates that the specimen was dry at some point but was rehydrated in January 1984. For all that, it is still in fair condition. Other specimens of the species occur in the Fraser Hydroid Collection at the RBCM (BCPM 976-00709-001: Northwest Bay, 19 June 1914; BCPM 976-00709-002 and BCPM 976-00709-003: Northwest Bay; BCPM 976-00710-001: 14 km S of Marble Island, 26 June 1935, 347 m), but they are not part of the type series.

Thuiaria distans Fraser, 1914a is an invalid junior primary homonym of *Thuiaria distans* Allman, 1877. Fraser (1918a) discovered the homonymy and proposed *Thuiaria geniculata* as a *nomen novum* for it. However, that replacement name has been widely if not universally overlooked, even by Fraser (1937a, 1947a) himself. Unaware of the correction in nomenclature, Calder (1991) replaced the original name of Fraser's species with another, *Salacia fraseri*. The two *nomena nova* are objective synonyms, with *T. geniculata* Fraser, 1918a having priority. Held to be valid by Cairns *et al*. (2002) as *Thuiaria fraseri*, and in WoRMS as *Salacia fraseri*, the species is assigned here to *Thuiaria* Fleming, 1828 under the binomen *T. geniculata* Fraser, 1918a.

Originally described from the trophosome only, gonothecae of *T. geniculata* were described and illustrated later by Fraser (1937a, as *T. distans*).

Family Sertularellidae Maronna, Miranda, Peña Cantero, Barbeitos & Marques, 2016

Sertularella humilis Fraser, 1943a

Sertularella humilis Fraser, 1943a: 81, pl. 19, fig. 12.

Holotype. MCZ-IZ 9008: USA, Florida, off Sand Key, 27 March 1872, *Bache* Expedition 1872–1874, 75–128 fm (137–234 m), one hydrocaulus, 0.9 mm high, in poor condition, with eight hydrothecae (two of them broken off), without gonophores, coll. W. Stimpson, labelled "type"; dry.

Type locality. USA, Florida: off Sand Key Light, 125 fm (229 m) (Fraser 1943a).

Current status. Valid.

Remarks. The original description of *Sertularella humilis* by Fraser (1943a), in a collection from the MCZ, was based on a single colony said to reach 1 cm in height. A specimen of the species from the type locality at that

museum (MCZ-IZ 9008), containing a label marked "type", is the holotype by monotypy (ICZN Art. 73.1.2) because no other type material is known to exist. The specimen is now dry, accompanied by a note stating "found dry (prior to 1983)". Although desiccated and in quite poor condition, the base of the colony nevertheless matches the illustration provided by Fraser (1943a, pl. 19, fig. 12).

Gonophores were lacking in the hydroid described by Fraser (1943a), and the small, unbranched colony appears to have been a juvenile. *Sertularella humilis*, taken to be valid in WoRMS, is known only from the original description. Fraser (1947a) speculated that its affinities were with *S. tenella* (Alder, 1856) and *S. rugosa* (Linnaeus, 1758), both boreal species.

Sertularella ornata Fraser, 1937b

Sertularella ornata Fraser, 1937b: 2, pl. 1, fig. 3 [invalid junior primary homonym of *Sertularella fusiformis* forma *ornata* Broch, 1933].
Sertularella fraseri Galea, 2010: 18, figs. 5a–g [replacement name for *Sertularella ornata* Fraser, 1937b].

Holotype. USNM 43287: Puerto Rico, Johnson-Smithsonian Deep-Sea Expedition Sta. 37, Mona Passage, NE of Mona Island, 18°11'55"N, 67°42'50"W, 160–200 fm (293–366 m), 10 February 1933, R/V *Caroline*, beam trawl, one colony with about three detached fragments, 5 mm high, in good to excellent condition, with a few gonothecae, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Paratypes. BCPM 976-00612-001: Puerto Rico, Johnson Hydro Sta. 37, ca. 329 m, 10 February 1933, one colony, up to 4 mm high, without gonothecae, labelled "cotype"; 60% IPA.

BCPM 976-00612-002: Puerto Rico, N of Puerto Rico, Johnson Hydro Sta. 37, 10 February 1933, parts of one colony, 5 mm high, without gonothecae; slide.

Type locality. Puerto Rico: 18°11'55"N, 67°42'50"W, 160–200 fm (293–366 m) (Bartsch 1933; Fraser 1937b).

Current status. Invalid.

Remarks. *Sertularella ornata* was one of nine new species of hydroids described by Fraser (1937b) in material collected by the Johnson-Smithsonian Deep-Sea Expedition to Puerto Rico and vicinity. A single colony of *S. ornata* at the NMNH (USNM 43287), designated the holotype by Fraser (1937b: 3), is currently listed as a syntype in the online database. Accompanied by labels marked "type" and "holotype", we consider it to be the holotype here. Another label with the specimen indicates that it was taken at Station 37 of the expedition, not Station 38 as reported in some accounts. Other specimens of the species, examined in the Fraser Hydroid Collection at the RBCM (BCPM 976-00962-001; BCPM 976-00612-002), are from the same location. We followed Bartsch (1933) in recording collection data for that station. Specimens at the RBCM were not specifically mentioned as types by Fraser in the original description, but they are considered paratypes based on the fact that one is labelled "cotype" (ICZN Art. 72.4.1.1) and the second, on a slide from the same station, was likely prepared from it.

As noted in WoRMS, *Sertularella ornata* Fraser, 1937b is an invalid junior homonym of *S. fusiformis* forma *ornata* Broch, 1933. Galea (2010) provided a replacement name, *S. fraseri*, for Fraser's species. As for *S. ornata* Broch, 1933, it is included as a synonym of *S. ellisii* (Deshayes & Milne Edwards, 1836) in WoRMS.

In having hydrothecae ornamented with strong transverse ridges, *Sertularella fraseri* is a particularly striking species of hydroid.

Family Syntheciidae Marktanner-Turneretscher, 1890

Synthecium gracile Fraser, 1937b

?*Sertularella cylindrica* var. *pusilla* Ritchie, 1910: 817, pl. 77, fig. 9.
Cyclonia gracilis Stechow, 1921b: 230.
? *Hincksella cylindrica* Blackburn, 1937: 173, fig. 2.
Synthecium gracile Fraser, 1937b: 2, pl. 1, fig. 2 [invalid junior primary homonym of *Synthecium gracile* Coughtrey, 1875].
Hincksella gracilis.—Vervoort & Watson, 2003: 245.
?*Hincksella pusilla*.—Vervoort & Watson, 2003: 245.

Holotype. USNM 43286: Puerto Rico, N of Salinas Point, Johnson-Smithsonian Deep-Sea Expedition Sta. 26, 18°30'30"N, 66°23'05"W, 07 February 1933, 60–73 m, R/V *Caroline*, one colony on a hydroid stem, ca. 6 mm high, in fair condition, without gonophores, coll. Paul Bartsch, labelled "type"; ethanol.

Paratype. BCPM 976-00962-001: Puerto Rico, north coast, Johnson Hydro Sta. 26 (Johnson-Smithsonian Deep-Sea Expedition Sta. 26), 07 February 1933, one colony overgrowing another hydroid, in poor condition, without gonothecae, labelled "co-type"; dry sometime in the past, 60% IPA.

Type locality. Puerto Rico: 18°30'30"N, 66°23'05"W, 33–40 fm (60–73 m) (Bartsch 1933, Sta. 26; Fraser 1937b).

Current status. Invalid.

Remarks. *Synthecium gracile* was described by Fraser (1937b) from a specimen collected during the Johnson-Smithsonian Deep-Sea Expedition. The single colony at the NMNH (USNM 43286) was designated by him as the holotype, although it is currently listed as a syntype in the NMNH online database. Material in the Fraser Hydroid Collection at the RBCM (BCPM 976-00962-001), from the same location and labelled "co-type", constitutes a paratype. Another specimen of *S. gracile* at the RBCM (BCPM 976-00963-001: slide), collected from "Cerros Island" (Cedros Island, Mexico) during the Allan Hancock Pacific Expeditions (Fraser 1938a), is not type material.

The nomenclature of *S. gracile* Fraser, 1937b is fraught with homonymy. The name is a junior primary homonym of *S. gracile* Coughtrey, 1875 (established as *S. gracilis*, but corrected to *S. gracile* by Thompson 1879). Homonymy no longer exists between the two names because *S. gracile* Fraser is now assigned to *Hincksella* Billard, 1918, while *S. gracile* Coughtrey is referred to *Amphisbetia* L. Agassiz, 1862. However, the name of Fraser's species then becomes a junior secondary homonym of *Hincksella gracilis* (Stechow, 1921b) (originally *Cyclonia gracilis*).

Vervoort & Watson (2003: 245) considered Fraser's hydroid to be a briefly described and poorly illustrated species of doubtful identity, likely conspecific with *Hincksella pusilla* (Ritchie, 1910) from the Mergui Archipelago, Indian Ocean. It is listed by WoRMS as a synonym of *H. cylindrica* (Bale, 1888), in common with Vervoort (1968), Calder (1991), and others. However, Galea & Ferry (2015) presented evidence that *H. cylindrica* is a species restricted to Australia, and concluded that the species of warm waters in the western Atlantic (including *Cyclonia gracilis* Stechow, 1921b) is identical with *H. pusilla*. With Fraser's species currently held to be a probable synonym (for a recent synonymy list, see Galea 2010), it seems unnecessary to provide a replacement name for it here.

Synthecium nanum Fraser, 1943a

Sertularia tubitheca Allman, 1877: 24, pl. 16, figs. 5, 6.
Synthecium tubithecum.—Jäderholm, 1903: 291, pl. 13, fig. 7.
Synthecium nanum Fraser, 1943a: 80, pl. 18, fig. 10.

Holotype. MCZ-IZ 9003: USA, Florida, W of the Dry Tortugas, 24°36'40"N, 83°02'20"W, 22 January 1868, 16 fm (29 m), Pourtalès Gulf Stream Exploration, Steamer *Bibb*, one colony, 3 mm high, with three hydrothecal pairs, in only fair condition, on stem of *Thyroscyphus marginatus* (Allman, 1877), without gonophores, coll. L.F. de Pourtalès, labelled "type"; ethanol.

Type locality. USA, Florida: off Dry Tortugas, 24°36'40"N, 83°02'20"W, 16 fm (29 m), Pourtalès Gulf Stream Exploration (Fraser 1943a).

Current status. Invalid.

Remarks. Fraser (1943a) described *Synthecium nanum* from a collection of hydroids at the MCZ. No types of it were designated therein by him, but the species is based on known material (MCZ-IZ 9003). Little data are included with this hydroid in the current online database of the MCZ, and the number of specimens is unstated. However, in a very brief account, Fraser (1943a) described the hydroid as "…consisting of a single, unbranched, erect stem…" No other type material of the species is known to exist. The type, examined during this study, is indeed a single small colony. It is therefore the holotype by monotypy.

Synthecium nanum is, as noted earlier (Calder 1991), a junior subjective synonym of *S. tubithecum* (Allman, 1877). Fraser's (1943a) hydroid was originally found in the same sample as Allman's (1877) type of *S. tubithecum*. The specimen is considered a juvenile colony of that well-known species.

Family Kirchenpaueriidae Stechow, 1921a

***Plumularia paucinema* Fraser, 1940b**

Plumularia paucinema Fraser, 1940b: 42, fig. 3.
Kirchenpaueria paucinema.—Cairns *et al*., 2002: 20.

Syntype material. None known to exist.

Type locality. USA, California: Santa Cruz Island, Scorpion Harbor (Fraser 1940b).

Current status. Valid, as *Kirchenpaueria paucinema* (Fraser, 1940b).

Remarks. Fraser (1940b) failed to designate name-bearing types of *Plumularia paucinema*, and the species was not listed as part of the Fraser Hydroid Collection by Arai (1977). No material, type or otherwise, could be located at the AMNH, CAS, CMN, MCZ, NMNH, RBCM, ROM, SBMNH, or YPM. Based on characters noted in the original description, the species was assigned to *Kirchenpaueria* Jickeli, 1883 by Cairns *et al*. (2002), as *K. paucinema*.

The hydroids examined by Fraser (1940b) were collected at Scorpion Harbor, Santa Cruz Island, California, by Willis G. Hewatt (1904–1980) of Texas Christian University. The species, found in kelp beds on 25 June 1939, was rare (Hewatt 1946).

Family Plumulariidae McCrady, 1859

***Antennularia dissimilis* Fraser, 1943a**

Antennularia dissimilis Fraser, 1943a: 83, pl. 19, figs. 15a, b.
Nemertesia dissimilis.—Ramil & Vervoort, 2006: 121.

Holotype. MCZ-IZ 9009: USA, Georgia, E of St. Andrew Sound, 30°58'N, 79°34'W, Harvard-Havana Expedition, R/V *Atlantis* Sta. 3781, 265-290 fm (485–530 m), 24 February 1940, one colony fragment, 4.4 cm high, in poor condition and with nearly all hydrocladia missing, without gonophores, labelled "type"; 70% ethanol.

Type locality. USA, Georgia: continental slope, 30°58'N, 79°34'W, 265-290 fm (485–530 m), R/V *Atlantis* Sta. 3781 (Fraser 1943a).

Current status. Valid, as *Nemertesia dissimilis* (Fraser, 1943a).

Remarks. No type designation was provided by Fraser (1943a) in his original account of *Antennularia dissimilis*. Nevertheless, material of the species, labelled "type", exists at the MCZ (MCZ-IZ 9009). Fraser's description of *A. dissimilis* was based on a fragment of a single sterile colony. That specimen, the holotype by monotypy, is in poor condition. Few hydrocladia remain, and even then only the most proximal parts are present.

Subsequently referred to *Nemertesia* Lamouroux, 1812 by Ramil & Vervoort (2006), *N. dissimilis* is listed as valid in WoRMS. The species, from bathyal waters at the western edge of the Blake Plateau off southern Georgia, is known only from the type locality.

***Antennularia verticillata* Fraser, 1925**

Antennularia verticillata Fraser, 1925: 171, fig. 6.
Nemertesia verticillata.—Cairns *et al*. 1991: 28.

Holotype. CAS-IZ 21803.00: USA, Oregon, 31.7 miles (51 km) N 75° E of Heceta Head Light, U.S.F.C. Str. *Albatross*, 84 fm (154 m), 29 April 1914; 10% formalin.

Type locality. USA, Oregon: 31.7 miles (51 km) N 75° E of Heceta Head Light, 154 m (Fraser 1925).

Current status. Valid, as *Nemertesia verticillata* (Fraser, 1925).

Remarks. Although material at the CAS (CAS-IZ 21803.00) is listed as a syntype, Fraser (1925) described *Antennularia verticillata* from a "…fragment of a stem...". No other type material is known to exist, and the specimen is taken to be the holotype by monotypy. Arai (1977) did not include any record of this species in the Fraser Hydroid Collection at the RBCM.

Antennularia verticillata was described from a colony fragment, reaching 25 mm high, with a strongly canaliculated hydrocaulus. Gonophores were lacking. Ramil & Vervoort (2006) reviewed the characters of this and other species currently included in *Nemertesia* Lamouroux, 1812. The species is currently listed as valid, under the binomen *N. verticillata*, in both Cairns *et al*. (2002) and WoRMS.

Hippurella elegans Fraser, 1937b

Hippurella elegans Fraser, 1937b: 5, pl. 2, figs. 9a–c.

Holotype. USNM 43292: Puerto Rico, north coast off Playa de Loiza, Johnson-Smithsonian Deep-Sea Expedition Sta. 9, 18°33'15"N, 65°56'45"W, 240 fm (439 m), 01 February 1933, R/V *Caroline*, one colony, ca. 35 cm high, in excellent condition, with gonophores, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Paratypes. USNM 43343: Puerto Rico, north coast, Johnson-Smithsonian Deep-Sea Expedition Sta. 106, 18°31'30"N, 66°18'20"W, 08 March 1933, 150-195 fm (274–357 m), R/V *Caroline*, coll. Paul Bartsch; ethanol.

USNM 43344: Puerto Rico, northwest coast, Johnson-Smithsonian Deep-Sea Expedition Sta. 35, 18°24'45"N, 67°14'15"W, 09 February 1933, 80-180 fm (146–329 m), R/V *Caroline*, coll. Paul Bartsch; ethanol.

BCPM 976-00864-001: Puerto Rico, northwest coast, 09 February 1933, 146-329 m, one large colony (>20 cm high), in fair condition, with phylactocarps and gonophores; 60% IPA.

BCPM 976-00865-001: Puerto Rico, Johnson-Smithsonian Deep-Sea Expedition Sta. 9, N of Puerto Rico, 01 February 1933, 439 m, two colony fragments, in fair condition, with phylactocarps and gonophores, labelled "co-type"; 60% IPA.

BCPM 976-00866-001: Puerto Rico, one colony fragment, 1.1 cm high, in fairly good condition, without phylactocarps and gonophores; slide.

Type locality. Puerto Rico: off north coast, Johnson-Smithsonian Deep-Sea Expedition Sta. 9, 18°33'15"N, 65°56'45"W, 240 fm (439 m) (Fraser 1937b).

Current status. Valid.

Remarks. The colony of *Hippurella elegans* designated by Fraser (1937b) as the holotype is currently listed as a syntype at the NMNH (USNM 43292). Location data on a label with this hydroid do not accord with coordinates for Johnson-Smithsonian Deep-Sea Expedition Station 9 recorded in Bartsch (1933). Our record above is taken from data on the collection label.

Remaining samples of *Hippurella elegans* in both the NMNH (USNM 43343, USNM 43344) and the RBCM (BCPM 986-00864-001, BCPM 976-00865-001, BCPM 976-00866-001), all from Puerto Rico, comprise paratypes. Data for the two paratype collections at the NMNH (USNM 43343, USNM 43344), from Fraser's (1937b) original account, generally agree with station records in Bartsch (1933).

Hippurella elegans is currently known only from Puerto Rico, and from Fraser's (1937b) original description. Differences said to exist in the three species currently assigned to *Hippurella* Allman, 1877 (*H. annulata* Allman, 1877; *H. longicarpa* Nutting, 1900; *H. elegans* Fraser, 1937b) need to be re-evaluated. *Hippurella elegans* is listed as valid in WoRMS.

Plumularia polynema Fraser, 1941b

Plumularia polynema Fraser, 1941b: 87, pl. 18, figs. 15a, b.

Holotype. USNM 43459: USA, Massachusetts, off Martha's Vineyard, R/V *Fish Hawk* Sta. 1092, 39°58'N, 69°42'W, 369 m, 11 August 1882, trawl, several fragments of a colony, the largest ones 7 mm, 5 mm, and 5 mm long, in rather poor condition, without gonophores, labelled "type"; ethanol.

Paratypes. USNM 24360: USA, Massachusetts, off Martha's Vineyard; ethanol.

BCPM 976-00928-001: USA, Massachusetts, off Martha's Vineyard, "near USFC Stn. 1038", in poor condition, without gonothecae; 60% IPA.

Type locality. USA, Massachusetts: off Martha's Vineyard, 39°58'N, 69°42'W, 202 fm (369 m) (Fraser 1941b).

Current status. Valid.

Remarks. In describing *Plumularia polynema*, Fraser (1941b) designated material at the NMNH (USNM 43459) as its "type". That collection, thereby fixed as the name-bearing type of the species, is currently listed as syntype material in the NMNH online database. Regarded here as the holotype, the specimen is in three main fragments, two of them corresponding with original illustrations of the species (Fraser 1941b, pl. 18, figs. 15a, b). Fraser's description mentions a fragment of the hydroid reaching 83 mm in length, but nothing approaching that size exists in the holotype collection.

Another collection of *Plumularia polynema* mentioned in Fraser's account (USA, Massachusetts, off Martha's Vineyard, R/V *Fish Hawk* Sta. 1038, 39°58'N, 70°06'W; 238 m, 21 September 1881; thought to be material in USNM 24360) was not nominated by him as a type and is excluded from the type series (ICZN Art. 72.4.6). So too is a collection of the species from off Martha's Vineyard in the Fraser Hydroid Collection at the RBCM (BCPM 976-00928-001). Both of these collections are listed instead as paratypes (ICZN Art. 72.1.3).

This little-known hydroid, from the upper continental slope off Martha's Vineyard, is currently considered a *species inquirenda* in WoRMS. Although poorly characterized, we prefer to recognize it as valid based on its bathyal type locality. The gonosome of the species remains unknown.

Genus *Sphaerocystis* Fraser, 1943a

Dentitheca Stechow, 1920: 41.
Sphaerocystis Fraser, 1943a: 85 [invalid junior homonym of *Sphaerocystis* Léger, 1892 (Protozoa)].

Type species. *Sphaerocystis heteronema* Fraser, 1943a, by monotypy.

Current status. Invalid.

Remarks. As noted earlier (Calder 1997: 8), *Sphaerocystis* Fraser, 1943a is an invalid junior homonym of *Sphaerocystis* Léger, 1892 (Protozoa). It is also a junior subjective synonym of *Dentitheca* Stechow, 1920, with its type species (*Sphaerocystis heteronema* Fraser, 1943a) being regarded as identical with *Dentitheca dendritica* (Nutting, 1900) (see Calder 1997, 2013; Galea 2010).

A replacement name for the junior homonym *Sphaerocystis* Fraser, 1943a is unnecessary because an available valid subjective synonym (*Dentitheca* Stechow, 1920) exists for it (ICZN Art. 60). Nevertheless, the validity of *Dentitheca* has been challenged in some works (e.g., Ansín Agís *et al*. 2014), considered therein as a synonym of *Plumularia* Lamarck, 1816.

Sphaerocystis heteronema Fraser, 1943a

Plumularia dendritica Nutting, 1900: 67, pl. 8, figs. 4–6.
Sphaerocystis heteronema Fraser, 1943a: 85, pl. 20, figs. 17a, b.

Holotype. MCZ-IZ 9002: Bahamas, Pourtalès Gulf Stream Exploration, USCSS *Bibb* Sta. 162, Orange Key (Orange Cay), 9 fm (16 m), one small and fragmentary colony, about 1.2 cm high, without gonophores, labelled "type"; dry.

Type locality. Bahamas: off Orange Key (Orange Cay), 9 fm (16 m) (Fraser 1943a).

Current status. Invalid.

Remarks. Type material of *Sphaerocystis heteronema* Fraser, 1943a is known to exist only at the MCZ (MCZ-IZ 9002). No type of the species was designated by Fraser (1943a), but his description was based on a single colony, constituting the holotype by monotypy. That specimen is now dry, accompanied by a note stating "found dry (prior to 1983)". Nevertheless, three fragments of a single hydrocaulus, and several detached hydrocladia, were found in the vial. Although desiccated, and constituting a very small colony of a particularly large species, its morphology is still apparent and its identity quite certain. As noted above in remarks on the genus *Sphaerocystis* Fraser, 1943a, *S. heteronema* Fraser, 1943a is a junior subjective synonym of *Plumularia dendritica* Nutting, 1900, a species now frequently assigned to the genus *Dentitheca* Stechow, 1920. In common with *S. heteronema*, the type locality of *D. dendritica* is the Bahamas (near Little Cat Island).

Family Halopteridídae Millard, 1962

Antennella curvitheca Fraser, 1937b

Antennella curvitheca Fraser, 1937b: 4, pl. 2, figs. 7a, b.

Holotype. USNM 43291: Puerto Rico, northeast coast near Las Cucarachas light, Johnson-Smithsonian Deep-Sea Expedition Sta. 69, 18°24'30"N, 65°38'30"W, 9 fm (16 m), 24 February 1933, R/V *Caroline*, one colony on an alga, ca. 5 mm high, in good condition, without gonophores, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Paratypes. BCPM 976-00816-001: Puerto Rico, north coast, Johnson Hydro Sta. 69, 9 fm (16 m), 24 February 1933, on algae, in fair condition, without gonothecae, labelled "co-type"; 60% IPA.

BCPM 976-00816-002: Puerto Rico, north coast, Johnson Hydro Sta. 69, 9 fm (16 m), 24 February 1933, on an alga, one colony, up to 6 mm high, in fair to fairly good condition, without gonothecae; slide.

Type locality. Puerto Rico: 18°24'30"N, 65°38'30"W, 9 fm (16 m) (Bartsch 1933, Sta. 69; Fraser 1937b).

Current status. Valid.

Remarks. The hydroid described as *Antennella curvitheca* by Fraser (1937b) was collected off the northeast coast of Puerto Rico during the Johnson-Smithsonian Deep-Sea Expedition. Material designated as the holotype by Fraser (USNM 43291), currently listed as a syntype in the NMNH online database, is taken to be a single colony after its examination here. Paratype material exists at the RBCM (BCPM 976-00816-001; BCPM 976-00816-002). No gonophores were present in Fraser's material, but the species is distinctive in the curvature of the adcauline wall of the hydrotheca (Schuchert 1997). Gonothecae have subsequently been described by Van Gemerden-Hoogeveen (1965) and Schuchert (1997).

Antennella curvitheca is considered valid (Schuchert 1997; Cairns *et al*. 2002; WoRMS). Outside several locations in the Caribbean region (Galea 2010), the species is now known to range from Plantagenet (=Argus) Bank, near Bermuda (Calder 2000), to waters of the continental shelf off Brazil (Grohmann *et al*. 2003).

Antennella paucinoda Fraser, 1935b

Antennella paucinoda Fraser, 1935b: 110, pl. 2, figs. 10a, b.

Syntypes. BCPM 976-00818-001: Japan, Sagami Bay, Arasaki, 70-80 m, 04 August 1931, one or more colonies, up to 3.5 cm high, in good condition, labelled "type"; 60% IPA.

BCPM 976-00818-002: Japan, Sagami Bay, Arasaki, 70-80 m, 04 August 1931, one part of a colony, 1.7 cm high, in excellent condition, with gonothecae; slide.

Lectotype, by present designation. BCPM 976-00818-002: Japan, Sagami Bay, Arasaki, 70-80 m, 04 August 1931, one part of a colony, 1.7 cm high, in excellent condition, with gonothecae; slide.

Paralectotypes. BCPM 976-00818-001: Japan, Sagami Bay, Arasaki, 70-80 m, 04 August 1931, one or more colonies, up to 3.5 cm high, in good condition, labelled "type"; 60% IPA.

Type locality. Japan: Sagami Bay, near Hayama, 70-80 m (Fraser 1935b).

Current status. Valid, but see Remarks below.

Remarks. These hydroids, sent to Fraser (1935b) for identification from the collection of Emperor Hirohito, are from Sagami Bay, Japan. Although only one of the samples listed above at the RBCM is marked "type" (BCPM 976-00818-001), both are taken here to represent syntype material (see ICZN Art. 72.4.7) and are likely from the same collection. No name-bearing type was designated by Fraser in the original account of the species, and none has subsequently been made to our knowledge. While Fraser labelled a fluid specimen (BCPM 976-00818-001) as the "type", it comprises fragments of one or more colonies, and is included here as a paralectotype. A single colony fragment apparently from the same sample on a microscope slide (BCPM 976-00818-002), in excellent condition and with gonothecae, is designated here as the lectotype.

Several dozen records of *Antennella paucinoda*, from Sagami Bay, Japan, also exist in the Emperor Shōwa Hydroid Collection at the NMNS. Three of them are from the same locality as those at the RBCM (NSMT-HyR 147, NSMT-HyR 148, NSMT-HyR 149).

Hirohito (1995) noted the resemblance of *A. paucinoda* to several other species of *Antennella* Allman, 1877, but treated it as distinct. The validity of the species has been questioned in several subsequent works. Authors including Schuchert (1997) and Vervoort & Watson (2003) included it in the synonymy of *A. secundaria* (Gmelin, 1791). In more recent accounts (Schuchert 2015; WoRMS), *A. paucinoda* is listed as a synonym of *A. quadriaurita* Ritchie, 1909, a species it more closely resembles in having two lateral nematothecae of unequal size on either side of each hydrotheca. Given the present irresolution of its relationships, together with its Japanese type locality and the remote South Atlantic type locality of *A. quadriaurita* (Gough Island), we follow Hirohito in recognizing it as valid. The species is common in Sagami Bay (Hirohito 1995).

Antennella variabilis Fraser, 1936c

Antennella variabilis Fraser, 1936c: 52, pl. 2, figs. 6 a–d.

Syntypes. BCPM 976-00821-001: Japan, Sagami Bay, Amadaiba, 26 September 1933, 91 m, on a hydrozoan; 60% IPA.

BCPM 976-00822-001: Japan, Sagami Bay, Kameki rocks, 02 August 1933, 46 m; 60% IPA.

BCPM 976-00823-001: Japan, Sagami Bay, Amadaiba, 07 September 1933, 73 m; 60% IPA.

BCPM 976-00824-001: Japan, Sagami Bay, Okinose, 22 September 1933, 91-110 m, on a sponge; 60% IPA.

BCPM 976-00825-001: Japan, Sagami Bay; slide.

Lectotype, by present designation. RBCM 976-00823-002: Japan, Sagami Bay, Amadaiba, 07 September 1933, 73 m, one colony, to ca. 1.5 cm high, in good condition, with numerous gonophores; 70% ethanol.

Paralectotypes. BCPM 976-00823-001: Japan, Sagami Bay, Amadaiba, 07 September 1933, 73 m, on bryozoans and other hydroid species, several colonies or colony fragments, to ca. 1.5 cm high, in good condition, some with gonophores; 60% IPA.

Type locality. Japan: "Various localities in Sagami Bay" (Fraser 1936c); restricted here to Sagami Bay, Amadaiba, 73 m.

Current status. *Species inquirenda*.

Remarks. *Antennella variabilis* was described by Fraser (1936c), based on specimens in the collection of Emperor Hirohito, from several locations in Sagami Bay, Japan. He designated no name-bearing types, but syntypes of material identified as the species exist in the Fraser Hydroid Collection at the RBCM (BCPM 976-00821-001, BCPM 976-00822-001, BCPM 976-00823-001, BCPM 976-00824-001, BCPM 976-00825-001). After examining each of these collections, we selected a colony from one of them (BCPM 976-00823-001) as the lectotype (RBCM 976-00823-002). Of the material available it is in the best condition, with numerous gonothecae being present. The lectotype designation fixes the identity of *A. variabilis* as a species somewhat resembling the better known *A. quadriaurata* Ritchie, 1909, but one that appears to be significantly smaller and more gracile in colony form.

In his account on the hydroids of Sagami Bay, Hirohito (1995) assigned *A. variabilis* to the synonymy of *A. secundaria* (Gmelin, 1791). However, he noted that some of the colonies referred to the species by Fraser resembled *A. paucinoda* Fraser, 1935b in having two pairs of lateral nematothecae beside each hydrotheca, as in *A. quadriaurita*. Indeed, our examination of the original syntypes confirms that Fraser's (1936c) *A. variabilis* was based on more than a single species. Specimens in the series resembling *A. secundaria*, lacking two pairs of lateral nematothecae and having a single axillar one instead (BCPM 976-00824-001; BCPM 976-00825-001), are excluded here from the paralectotype series of *A. variabilis* above. So too is material close to or identical with more robust species such as *A. paucinoda* and *A. quadriaurata* (BCPM 976-00821-001, BCPM 976-00822-001). Schuchert (1997, 2015) included *A. variabilis* in the synonymy of *A. quadriaurita*, but it appears to be a distinct morphotype and is considered a *species inquirenda* here.

No hydroids identified as *A. variabilis* are currently listed in the online database of collections at the NMNS. Notably, however, Hirohito (1995) had referred *A. variabilis* to the synonymy of *A. secundaria*, and any specimens earlier identified as the former may be listed there under the latter name.

Genus *Tetranema* Fraser, 1937a

Tetranema Fraser, 1937a: 193 [invalid junior homonym of *Tetranema* Haeckel, 1879 (Hydrozoa)].
Astrolabia Naumov, 1955: 22.

Type species. *Tetranema furcata* Fraser, 1937a, by monotypy.

Current status. Invalid.

Remarks. The name *Tetranema* Fraser, 1937a is an invalid junior homonym of *Tetranema* Haeckel, 1879: 125 (Hydrozoa). It has been replaced by a synonym, *Astrolabia* Naumov, 1955 (Calder 1997; Schuchert 1997; Antsulevich 2015; WoRMS).

Tetranema furcata Fraser, 1937a

Tetranema furcata Fraser, 1937a: 193, pl. 44, figs. 233a–e.
Astrolabia furcata.—Schuchert, 1997: 151.

Syntypes. BCPM 976-00948-001: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Moresby Island, Kaison Bank, 28 July 1936, 201 m, two colonies, labelled "type"; 60% IPA.

BCPM 976-00948-002: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Moresby Island, Kaison Bank, 28 July 1936, one colony; slide.

Lectotype, by present designation. RBCM 976-00948-003: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Moresby Island, Kaison Bank, 201 m, 28 July 1936, one colony, 3.3 cm high, with one gonotheca, in good condition; 70% ethanol.

Paralectotypes. BCPM 976-00948-001: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Moresby Island, Kaison Bank, 201 m, 28 July 1936, one colony, 2.1 cm high, without gonothecae, in fair condition; labelled "type"; 60% IPA.

BCPM 976-00948-002: Canada, British Columbia, Queen Charlotte Islands (=Haida Gwaii), Moresby Island, Kaison Bank, 28 July 1936, one colony, 1.3 cm high, with one gonotheca, in good condition; slide.

Type locality. Canada, British Columbia: Queen Charlotte Islands (=Haida Gwaii), west coast of Moresby Island, Kaison Bank (Fraser 1937a).

Current status. Valid, as *Astrolabia furcata* (Fraser, 1937a).

Remarks. Although Fraser (1937a) designated no name-bearing type for *Tetranema furcata*, syntype material of the species exists at the RBCM. Two colonies were represented in fluid (BCPM 976-00948-001), with the larger one, in better condition and with a gonotheca, being designated here as the lectotype of the species. It was removed to a new bottle and assigned a new catalogue number (RBCM 976-00948-003). The smaller colony, sterile and in poorer condition, was returned to the original bottle as a paralectotype (BCPM 976-00948-001). A second paralectotype specimen occurs on a microscope slide (BCPM 976-00948-002). Although the slide is broken lateral to the mount, the hydroid colony is in good condition and bears a gonotheca.

The original description of *Tetranema furcata* by Fraser (1937a) included accounts of both its trophosome and gonosome. With *Tetranema* Fraser, 1937a being an invalid junior homonym of *Tetranema* Haeckel, 1879, the specific name is now combined with a subjective synonym, *Astrolabia* Naumov, 1955, as *A. furcata*. The hydroid is reportedly amphi-Pacific in distribution, with *A. heterotheca* Naumov, 1955 from a depth of 576 m near Astrolabe Strait, Kuril Islands, Russia, being a subjective junior synonym (Antsulevich 2015).

Family Aglaopheniidae Marktanner-Turneretscher, 1890

Aglaophenia curvidens Fraser, 1937b

Aglaophenia curvidens Fraser, 1937b: 3, pl. 1, figs. 5a–c.

Holotype. USNM 43289: Puerto Rico, northeast coast off Cabo San Juan, Johnson-Smithsonian Deep-Sea

Expedition Sta. 75, 18°27'35"N, 65°33'35"W, 25 February 1933, 48 m, R/V *Caroline*, one colony, 2.6 cm high, in fairly good condition, without gonophores, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Paratypes. BCPM 976-00770-001: Puerto Rico, north coast, Johnson Hydro Sta. 75, 25 February 1933, two colony fragments, in only fair condition, without gonothecae, labelled "co-type"; 60% IPA.

Type locality. Puerto Rico: 18°27'35"N, 65°33'35"W, 26 fm (48 m) (Bartsch 1933, Sta. 75; Fraser 1937b).

Current status. Valid.

Remarks. *Aglaophenia curvidens* was taken by tangle off Cabo San Juan, northeastern Puerto Rico, during the Johnson-Smithsonian Deep-Sea Expedition (Station 75). Fraser's holotype of the species is currently listed as a syntype in the NMNH online database (USNM 43289), although the specimen count is given as "1". That specimen, examined here, indeed comprises a single colony. Other material, labelled "co-type", exists at the RBCM (BCPM 976-00770-001). It is included above as a paratype.

The hydroid described by Fraser (1937b) was sterile. Its specific name refers to the striking inward curve of the marginal cusps on the hydrothecal rim. *Aglaophenia curvidens* is currently listed as valid in WoRMS, although Bogle (1975) regarded it as probably identical with *Macrorhynchia robusta* (Fewkes, 1881). Fraser (1944a) distinguished the two species based on purported differences in the morphology of their marginal cusps, which were said to be straight in *M. robusta* (=*Aglaophenia robusta*) and strongly recurved in *A. curvidens*. We have followed his concept that the two are distinct. The species is known only from the original description, although non-type specimens identified as *Aglaophenia* cf. *curvidens* from northern Florida, USA, exist in the NMNH (USNM 59441).

Aglaophenia inconstans Fraser, 1941b

Aglaophenia inconstans Fraser, 1941b: 86, pl. 18, figs. 13a, b.

Syntypes. USNM 43457: USA, Alaska, Bering Sea, Pribilof Islands, S of St. George Island, R/V *Albatross* Sta. 3497, 56°18'N, 169°38'W, 157 m, 17 July 1893, large beam trawl, about 11 colonies or colony fragments along with several detached hydrocladia, to ca. 15 cm high when straightened, in only fair to poor condition, without gonophores, labelled "type", ethanol.

Lectotype, by present designation. USNM 43457: USA, Alaska, Bering Sea, Pribilof Islands, S of St. George Island, R/V *Albatross* Sta. 3497, 56°18'N, 169°38'W, 157 m, 17 July 1893, large beam trawl, one colony, ca. 14 cm high when straightened, in only fair condition, without gonophores; ethanol.

Paralectotypes. USNM 1458872: USA, Alaska, Bering Sea, Pribilof Islands, S of St. George Island, R/V *Albatross* Sta. 3497, 56°18'N, 169°38'W, 157 m, 17 July 1893, large beam trawl, about 10 colonies or colony fragments along with several detached hydrocladia, to ca. 15 cm high when straightened, in poor to only fair condition, without gonophores, ethanol.

BCPM 976-00784-001: USA, Alaska, Bering Sea, Pribilof Islands, S of St. George Island, U.S.F.C. Sta. 3497, 17 July 1893, several colony fragments, in poor condition, without corbulae, labelled "co-type"; 60% IPA.

Type locality. USA, Alaska: Bering Sea, 56°18'N, 169°38'W, 86 fm (157 m) (Fraser 1941b).

Current status. Valid.

Remarks. Fraser (1941b) designated material at the NMNH (USNM 43457) as the "type" of *Aglaophenia inconstans*. The NMNH collection was thereby fixed as the name-bearing type (ICZN Art. 72.1.2). Fraser's original description ("Colonies varying in appearance…"), and a later account ("In some cases there were no branches, but in others the stem is definitely branched…"; Fraser 1947a: 435), indicate that more than one colony was examined in describing the species. We found that the original "type" collection included multiple colonies or colony fragments. Accordingly, a lectotype specimen was selected from the collection to objectively define the species. It was returned to a vial together with the original labels and collection number (USNM 43457). The remaining specimens in the series, constituting paralectotypes, were removed to a separate vial and assigned a new collection number (USNM 1458872).

Material of the species from the same collection (R/V *Albatross* Sta. 3497) as the lectotype, in the Fraser Hydroid Collection at the RBCM (BCPM 976-00784-001), bears the label "co-type". However, it does not have a name-bearing function (i.e., it was not part of the original syntype series) because it was not fixed originally as a

name-bearing type along with the NMNH collection (see ICZN Arts. 72.1.2 and 72.4.7). It therefore comprises paralectotype material.

Only the trophosome of *Aglaophenia inconstans* was found and described by Fraser (1941b). The species is not currently listed in WoRMS.

Aglaophenia insolens Fraser, 1943a

Aglaophenia rhynchocarpa Allman, 1877: 40, pl. 23, figs. 5–8.
Aglaophenia insolens Fraser, 1943a: 81, pl. 19, figs. 13a–c.

Syntypes. MCZ-IZ 9001: Trinidad and Tobago, Trinidad, "Maguaripe Bay" (=Macqueripe Bay), 24 July 1937, several colonies or colony fragments, up to 23 mm high, in good condition, without gonophores, together with several other hydroid species, coll. E. Deichmann, labelled "type" and "holotype"; 70% ethanol.

MCZ-IZ 9128: Trinidad and Tobago, Trinidad, "Maguarepe Bay" (=Macqueripe Bay), 24 July 1937, several colonies or colony fragments, up to 13 mm high, in fair to good condition, without gonophores, together with at least 14 other hydroid species, coll. E. Deichmann; formalin to 80% ethanol (currently shelved under *Diphasia tropica*).

Lectotype, by present designation. (MCZ-IZ 9001): Trinidad and Tobago, Trinidad, "Maguaripe Bay" (=Macqueripe Bay), 24 July 1937, one colony, 23 mm high, in good condition, without gonophores, coll. E. Deichmann, labelled "type" and "holotype"; 70% ethanol.

Paralectotypes. MCZ-IZ 146029: Trinidad and Tobago, Trinidad, "Maguaripe Bay" (=Macqueripe Bay), 24 July 1937, several colonies or colony fragments, up to 15 mm high, in good condition, without gonophores, together with several other hydroid species, coll. E. Deichmann; 70% ethanol.

MCZ-IZ 9128: Trinidad and Tobago, Trinidad, "Maguarepe Bay" (=Macqueripe Bay), 24 July 1937, several colonies or colony fragments, up to 13 mm high, in fair to good condition, without gonophores, together with at least 14 hydroid species, coll. E. Deichmann; formalin to 80% ethanol.

Type locality. Trinidad and Tobago: Trinidad, "Maguaripe Bay" (=Macqueripe Bay) (Fraser 1943a).

Current status. Invalid.

Remarks. Fraser (1943a: 81) described *Aglaophenia insolens* from "numerous colonies" in a collection sent to him from the MCZ, but no types were designated for it in the original account. Two lots assigned to the species exist at the MCZ, with one of them (MCZ-IZ 9001) indicated as type material in the current online database. That collection includes several colonies or colony fragments. The second (MCZ-IZ 9128) is part of the same collection from Trinidad, and is regarded here as syntype material as well (ICZN Art. 72.1.1; 72.4.7). No other type material is known to exist.

Of the available syntypes, the largest colony from the collection labelled "type" (MCZ-IZ 9001) is selected as the lectotype (MCZ-IZ 9001). Measuring 23 mm high, and in good condition, it is likely the specimen referred to by Fraser in the original description ("…the largest colony observed was 24 mm"). The remaining colonies of the species from that collection (MCZ-IZ 146029), as well as those in the other (MCZ-IZ 9128), are paralectotypes.

Aglaophenia insolens, reported only from the type locality, has been regarded as conspecific with *A. rhynchocarpa* Allman, 1877 (Calder 1997; Galea 2013). Synonymy of the two is currently upheld in WoRMS. Bogle (1975: 67) had earlier assigned *A. insolens* to the synonymy of *A. rathbuni* Nutting, 1900, a species she suspected was "…merely a variant of *A. rhynchocarpa*".

Aglaophenia longiramosa Fraser, 1945a

Aglaophenia allmani Nutting, 1900: 100, pl. 22, figs. 2, 3 [replacement name for *Aglaophenia ramosa* Allman, 1877, not *A. ramosa* (Busk, 1852)].
Aglaophenia longiramosa Fraser, 1945a: 22, figs. 2a–c.
Macrorhynchia allmani.—Cairns *et al*., 1991: 29.

Holotype. USNM 43463: USA, Florida, Gulf of Mexico off Panama City, R/V *Pelican* Sta. 142-5, 29°58'N,

86°03'W, 04 March 1939, one colony with many detached hydrocladia, ca. 12 cm high, in very good condition, without gonophores, labelled "type"; ethanol.

Paratype. BCPM 976-00788-001: USA, Alabama, off Mobile Bay, 29°58'N, 88°03'W (corrected to 29°58'N, 86°03'W), 16 fm (29 m), one colony fragment, 7 cm high, in rather poor condition, without gonothecae; dry (but see Remarks below).

Type locality. USA, Florida: R/V *Pelican* Sta. 142-5, Gulf of Mexico off Panama City, 29°58'N, 86°03'W; "U.S.N.M. 43463" (Fraser 1945a).

Current status. Invalid.

Remarks. Fraser (1945a) designated material at the NMNH (USNM 43463) as the "type" of *Aglaophenia longiramosa*. That collection was thereby fixed as the name-bearing type of the species. It is currently listed as syntype material in the online database of the NMNH, but the single colony in the collection constitutes a holotype. A specimen of the species in the Fraser Hydroid Collection at the RBCM (BCPM 976-00788-001), from the same location, was not fixed as a name-bearing type. The hydroid, now dry, is a paratype (ICZN Art. 72.1.3).

In the original description of *Aglaophenia longiramosa* by Fraser (1945a), and in a record of the species in the Fraser Hydroid Collection at the RBCM (BCPM 976-00788-001) by Arai (1977), locality data are given as *Pelican* Sta. 142-5, 29°58'N, 88°03'W, 16 fm (29 m). In being in the Gulf of Mexico off Mobile Bay, Alabama, that does not coincide with location data accompanying the holotype (USNM 43463) in the NMNH online database. The latter, centroid latitude 29.9667, longitude -86.05 (29°58'N, 86°03'W), Gulf of Mexico off Panama City, Florida, is accepted here as being correct. Additional supportive evidence is provided by location data on a label with the specimen (29°58'N, 86°03'W). It is likely that the discrepancy is due to a typographical error in the longitude record (88°03'W instead of 86°03'W).

Another sample of the species at the NMNH (USNM 70027), from a station off the coast of southern South Carolina, was not mentioned in the original description of the species and is not type material. While Fraser (1947a) reported *A. longiramosa* only from off northern Georgia, a geographically equivalent location, it does not accord with the type locality of *A. longiramosa*.

Bogle (1975) and Calder (1997) regarded *Aglaophenia longiramosa* as probably conspecific with *Macrorhynchia allmani* (Nutting, 1900). The binomen *M. allmani* is a replacement name for *Aglaophenia ramosa* Allman, 1877, a junior secondary homonym of *A. ramosa* (Busk, 1852). Although secondary homonymy no longer exists, with the junior name now assigned to *Macrorhynchia* Kirchenpauer, 1872, the name *M. allmani* is nevertheless valid under the Code (ICZN Art. 59.3) (see Calder 1997: 65).

Aglaophenia meganema Fraser, 1937b

Aglaophenia meganema Fraser, 1937b: 4, pl. 1, figs. 6a, b.

Holotype. USNM 43290: Puerto Rico, northeast coast near Las Cucarachas light, Johnson-Smithsonian Deep-Sea Expedition Sta. 69, 18°24'30"N, 65°38'30"W, 9 fm (16 m), 24 February 1933, R/V *Caroline*, one colony with several plumes on an alga, ca. 2 cm high, in quite good condition, without gonophores, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Paratype. BCPM 976-00790-001: Puerto Rico, north coast, Johnson Hydro Sta. 69, 24 February 1933, on algae, several colonies, in relatively poor condition, without corbulae, labelled "cotype"; 60% IPA.

Type locality. Puerto Rico: 18°24'30"N, 65°38'30"W, 9 fm (16 m) (Bartsch 1933, Sta. 69; Fraser 1937b).

Current status. Valid.

Remarks. Fraser (1937b) described *Aglaophenia meganema* based on material collected during the Johnson-Smithsonian Deep-Sea Expedition to Puerto Rico and vicinity. No gonosome was observed. The holotype designated by Fraser is currently recorded as a syntype at the NMNH (USNM 43290), although the specimen count is given as one. We found a single colony with several plumes in the collection, constituting the holotype. Material of the species at the RBCM (BCPM 976-00790-001), labelled "co-type", is a paratype.

Bogle (1975) regarded *A. meganema* as a probable synonym of *Macrorhynchia grandis* (Clarke, 1879). It is currently listed as valid in WoRMS, and we adopt that conclusion. While no corbulae were present on the holotype, its morphology corresponds well with diagnoses of the genus *Aglaophenia* Lamouroux, 1812.

Aglaophenia raridentata Fraser, 1944a

Aglaophenia apocarpa Allman, 1877: 41, pl. 24, figs. 5–9.
Aglaophenia elegans Nutting, 1900: 94, pl. 19, figs. 3, 4 [invalid junior primary homonym of *Aglaophenia elegans* Lamouroux, 1816].
Aglaophenia raridentata Fraser, 1944a: 387, pl. 83, figs. 376a, b [replacement name for *Aglaophenia elegans* Nutting, 1900, not *Aglaophenia elegans* Lamouroux, 1816].

Syntypes. USNM 18645: USA, Florida, Straits of Florida, Florida Keys, 8 miles (13 km) off American Shoal Light, State University of Iowa Bahamas Expedition of 1893, Sta. 62, 128–146 m, 29 June 1893; two slides.

USNM 69685: USA, Florida, Straits of Florida, Florida Keys, 8 miles (13 km) off American Shoal Light, State University of Iowa Bahamas Expedition of 1893, Sta. 62, 128–146 m, 29 June 1893; ethanol.

Type locality. USA, Florida: off Sand Key, 70–80 fm (128–146 m) (Nutting 1900).

Current status. Invalid.

Remarks. The binomen *Aglaophenia raridentata* was proposed by Fraser (1944a) as a new replacement name for *Aglaophenia elegans* Nutting, 1900 (not *Aglaophenia elegans* Lamouroux, 1816). The two therefore have the same type locality and the same name-bearing type material (ICZN Arts. 67.8, 72.7).

A degree of uncertainty exists about specimens that qualify as name-bearing types of new species described by Nutting (1900), including *Aglaophenia elegans*. A procedure was established by him whereby "…three series of slides [were prepared] from the same type specimen… These series were then distributed to the United States National Museum, the Museum of the State University of Iowa, and the private collection of the author" (Nutting 1900: 58). In Nutting's monograph, catalogue numbers were provided for slides at the "USNM" (NMNH) and at the university museum at Iowa (designated as "Type slides"), but not for the "type specimen" from which the slides were made, nor for slides in the Nutting Collection. Unless other evidence is found, the original "type specimen" cannot clearly be identified as such. The NMNH online database lists as types only those specimens on numbered slides.

In his account of *Aglaophenia elegans*, Nutting (1900) explicitly assigned type status to material on slides at the NMNH (USNM 18645), at the Museum of the State University of Iowa (No. 15354), and in his personal collection (unnumbered). The latter two collections are likely to have been sent to the NMNH in a transfer of collections from Iowa after Nutting's death (Calder 2004: 23). It is unclear whether those slides were combined to form part of the syntype material listed above. Meanwhile, material of the species in ethanol at the NMNH (USNM 69685) is part of the same collection as the syntype slides, but it is not classified in the online database as part of the type series. It is regarded here as part of the syntype series.

Aglaophenia elegans and its objective synonym *A. raridentata* are subjective junior synonyms of *A. apocarpa* Allman, 1877, a hydroid described from the same area (Sand Key) in the Straits of Florida (Bedot 1921; Bogle 1975; Cairns *et al*. 2002). As for the binomen *A. apocarpa*, confusion persists over whether it or *A. lophocarpa* Allman, 1877 has precedence when the two are considered synonyms. As First Reviser (ICZN Art. 24.2), Bedot (1921) assigned precedence to the name *A. apocarpa* (see Calder 1997: 54).

Aglaophenia transitionis Fraser, 1941b

Aglaophenia transitionis Fraser, 1941b: 87, pl. 18, figs. 14a, b.

Holotype. USNM 43458: USA, California, San Francisco, off Golden Gate, R/V *Albatross* Sta. 3150, 37°47'N, 122°44'10"W, 38 m, 21 March 1890, large beam trawl, one colony, badly broken up, with several fragments of a hydrocaulus and numerous detached, fragmented hydrocladia, without gonophores, labelled "type"; ethanol.

Paratypes. BCPM 976-00811-001: USA, California, San Francisco, off Golden Gate, 38 m, several colony fragments, up to 6.3 cm high, in poor condition, without gonophores; dry.

Type locality. USA, California: off Golden Gate, 37°47'N, 122°44'10"W, 21 fm (38 m) (Fraser 1941b).

Current status. Valid.

Remarks. In describing *Aglaophenia transitionis*, Fraser (1941b) designated material from the NMNH (USNM 43458) as the "type." That collection, thereby fixed as the name-bearing type (ICZN Art. 72.1.2), is

currently listed as a syntype in the NMNH online database. Although Fraser's "type" is now badly fragmented, we believe it is based on a single specimen and is a holotype. Material from the same collection at the RBCM (BCPM 976-00811-001) is excluded as a name-bearing type in not having been fixed as such in the original description (ICZN Art. 72.1.2). It constitutes a paratype.

Fraser (1941b) did not observe fertile specimens of *Aglaophenia transitionis*, and we saw no gonophores on the holotype. This species is listed as valid in WoRMS but remains poorly known.

Genus *Aglaophenoides* Fraser, 1943a

Aglaophenia Lamouroux, 1812: 184.
Aglaophenoides Fraser, 1943a: 82.

Type species. *Aglaophenia mammillata* Nutting, 1900, by monotypy.

Current status. Invalid.

Remarks. Fraser (1943a) established *Aglaophenoides* as a new genus for *Aglaophenia mammillata* Nutting, 1900 after discovering unusual gonophores in its hydroid. Rather than being protected by a corbula formed in place of a hydrocladium, each gonophore arose from the cavity of a hydrotheca. The trophosome of *A. mammillata* is otherwise indistinguishable morphologically from *Aglaophenia latecarinata* Allman, 1877, and the two forms exist in the same geographic area. Calder (1997) concluded that the unusual gonophores upon which *Aglaophenoides* is based were abnormalities, and returned its type species to *Aglaophenia* Lamouroux, 1812. That conclusion is upheld in WoRMS.

Cladocarpus longipinna Fraser, 1945a

Cladocarpus longipinna Fraser, 1945a: 22, figs. 3a–d.

Holotype. USNM 43465: USA, Louisiana, R/V *Pelican* Sta. 13, Gulf of Mexico, 29°20'N, 88°16'W, 05 February 1938, one colony, ca. 7 cm high when extended, in good condition, with gonophores and antler-shaped phylactocarpia, labelled "type"; ethanol.

Type locality. USA, Louisiana: R/V *Pelican* Sta. 13, 29°20'N, 88°16'W, 33 fm (60 m) (Fraser 1945a).

Current status. Valid.

Remarks. Fraser (1945a) described *Cladocarpus longipinna* from a fragmentary colony ("Fragment of colony, 4 cm, was not branched;…"). The specimen, in collections at the NMNH (USNM 43465), was designated by him as the "type" of the species. While currently listed as a syntype in the current online database of the NMNH, a single colony is present and it is regarded here as the holotype. No other type specimens of *C. longipinna* are known to exist.

The specific name *longipinna*, derived from a combination of the Latin words *longus* (long) and *pinna* (feather), is taken to be a noun in apposition. Its ending therefore need not agree with the gender of the generic name with which it is combined (ICZN Art. 34.2.1). The name is misspelled (as both "*longispina*" and "*longispinna*") on several labels accompanying the holotype, but the binomen is written as "*Cladocarpus longipinna*" on a small label in Fraser's handwriting and in the published account of the species.

Cladocarpus longipinna is an obscure species known primarily from the original description and from the holotype colony. According to Fraser (1947a), it resembles *C. septatus* Nutting, 1900, but differs in having a polysiphonic stem, longer and more slender hydrothecae with a greater number of small marginal cusps, and simpler phylactogonia. After examining the holotype, we question whether the hydrocaulus is truly polysiphonic. The species is currently recognized as valid (Bouillon *et al*. 2006; Calder & Cairns 2009; WoRMS), although further study of its taxonomic status is warranted.

Cladocarpus vancouverensis Fraser, 1914a

Cladocarpus vancouverensis Fraser, 1914a: 204, pl. 35, figs. 132A–D.

Syntypes. BCPM 976-00846-001: Canada, British Columbia, N of Lasqueti Island, 19 June 1912, 27–46 m; 60% IPA.

BCPM 976-00847-001: Canada, British Columbia, Northumberland Channel, near Dodd Narrows, 12 August 1912, 18–37 m; 60% IPA.

BCPM 976-00848-001: near West Rocks, 17 October 1912, 15–37 m; 60% IPA.

Lectotype, by present designation. BCPM 976-00847-001: Canada, British Columbia, Northumberland Channel, near Dodd Narrows, 18–37 m, 12 August 1912, one colony with a broken hydrocaulus, total length ca. 12 cm high, with numerous gonophores, in fair but brittle condition; 60% IPA.

Paralectotypes. BCPM 976-00846-001: Canada, British Columbia, N of Lasqueti Island, 19 June 1912, 27–46 m, several fragments of more than one colony, condition barely fair, brittle, without gonophores; 60% IPA.

BCPM 976-00848-001: near West Rocks, 17 October 1912, 15–37 m, one colony, in poor condition, without gonophores; 60% IPA.

Type locality. Canada, British Columbia: Northumberland Channel, near Dodd Narrows, 18–37 m (Fraser 1914a).

Current status. Valid.

Remarks. No name-bearing type was designated by Fraser (1914a) in establishing *Cladocarpus vancouverensis*, but syntypes of the species exist in the Fraser Hydroid Collection at the RBCM (BCPM 976-00846-001, BCPM 976-00847-001, BCPM 976-00848-001). Of the syntype series, the largest and best colony (12 cm high, with gonophores) was collected in Northumberland Channel, BC (BCPM 976-00847-001) (Fraser 1914a). That single specimen is designated here as the lectotype. The remaining hydroids of the original syntype series are paralectotypes (BCPM 976-00846-001, BCPM 976-00848-001). Other materials assigned to this species, at the NMNH (USNM 43755: 20 June 1901, no location data) and in the Fraser Hydroid Collection at the RBCM (BCPM 976-00849-001: Virago Sound, 30 July 1936, 110 m; BCPM 976-00850-001: off Masset Inlet, 30 July 1936, 82 m), do not form part of the type series.

Cladocarpus vancouverensis is considered a valid species (Cairns *et al*. 2002; WoRMS). As noted by Fraser (1914a), the occurrence of this species in relatively shallow subtidal waters of the northeastern North Pacific is noteworthy, given the preponderance of congeners that occur in deeper waters and at lower latitudes. The species is reported to range from the Queen Charlotte Islands (=Haida Gwaii) southward to Baja California (Fraser 1948; Hochberg & Ljubenkov 1998).

Halicornaria indivisa Fraser, 1936c

Halicornaria indivisa Fraser, 1936c: 52, figs. 7a–d.
Haliaria indivisa.—Yamada, 1959: 83.
Gymnangium indivisum.—Vervoort & Watson, 2003: 286.

Syntype. BCPM 976-00857-001: Japan, Sagami Bay; slide.

Lectotype, by present designation. BCPM 976-00857-001: Japan, Sagami Bay, one colony fragment, 1.2 cm high, in good condition, with gonophores; slide.

Type locality. Japan: Sagami Bay, 90 m (Fraser 1936c).

Current status. Valid, as *Gymnangium indivisum* (Fraser, 1936c).

Remarks. Fraser (1936c) described *Halicornaria indivisa* from hydroids obtained by Emperor Hirohito at a depth of 90 m in Sagami Bay, Japan. No name-bearing types were designated by him in the original account of the species. Fraser described *H. indivisa* as "Colony large, 25 cm. in length…", but the only specimen of the species in the Fraser Hydroid Collection at the RBCM (BCPM 976-00857-001) is a small fragment of a colony on a microscope slide. We nevertheless conclude that it is a type, possibly a fragment of the large colony described by Fraser. Rather than assume that it is the holotype by monotypy, however, we have designated the specimen as the lectotype of *H. indivisa* (ICZN Recommendation 73F).

Records of three collections of this species (as *Haliaria indivisa*) in the Emperor Shōwa Hydroid Collection at NMNS (NSMT-HyR 1424–NSMT-HyR 1426) generally correspond with Fraser's distribution data. Others (NSMT-HyR 1427–NSMT-HyR 1443) were obtained either at different depths or were collected after Fraser's manuscript was presented at a meeting of the Royal Society of Canada in May, 1936.

This hydroid, now known as *Gymnangium indivisum*, is regarded as a valid species in WoRMS. The colony, described as robust and unbranched, attained a height of 25 cm. Better illustrations than those in Fraser (1936c) are provided by Hirohito (1995, as *Haliaria indivisa*).

Halicornaria sinuosa Fraser, 1925

Halicornaria sinuosa Fraser, 1925: 171, figs. 7A–C.
Gymnangium sinuosum.—Vervoort, 1968: 114.

Syntypes. CAS-IZ 021804.00: USA, Florida, USS *Fish Hawk* Sta. 7511, Gulf Stream off Cape Florida, 2 1/8 miles (3.4 km) SSE of Fowey Rocks Lighthouse, 45 fm (82 m), 25 May 1903, labelled "syntype"; 10% formalin.

BCPM 976-00861-001: USA, Florida, Gulf Stream off Cape Florida, 45 fm (82 m), several colony fragments, up to 5.9 cm high, in fair condition, without gonophores, labelled "co-type"; 60% IPA.

BCPM 976-00861-002: USA, Florida, Gulf Stream off Cape Florida, 45 fm (82 m), one colony fragment, 1.5 cm high, in good condition, without gonophores; slide.

Lectotype, by present designation. BCPM 976-00861-002: USA, Florida, Gulf Stream off Cape Florida, 45 fm (82 m), one colony fragment, 1.5 cm high, in good condition, without gonophores; slide.

Paralectotypes. CAS-IZ 021804.00: USA, Florida, USS *Fish hawk* Sta. 7511, Gulf Stream off Cape Florida, 2 1/8 miles (3.4 km) SSE of "Fovey Rock Light" (=Fowey Rocks Light), 45 fm (82 m), 25 May 1903, numerous colony fragments, in poor condition, with *Aglaophenia rigida* (=*A. trifida* Agassiz, 1862), labelled "syntype"; 10% formalin.

BCPM 976-00861-001: USA, Florida, Gulf Stream off Cape Florida, 45 fm (82 m), several colony fragments, up to 5.9 cm high, in fair condition, without gonophores, labelled "co-type"; 60% IPA.

Type locality. USA, Florida: Gulf Stream off Cape Florida, 2 1/8 miles (3.4 km) SSE of Fowey Rock Light, 45 fm (82 m) (Fraser 1925).

Current status. Valid, as *Gymnangium sinuosum* (Fraser, 1925).

Remarks. In describing *Halicornaria sinuosa*, no name-bearing type was fixed by Fraser (1925). However, syntype material of *Halicornaria sinuosa* was located at both the CAS (CAS-IZ 021804.00) and the RBCM (BCPM 976-00861-001, BCPM 976-00861-002). The material at CAS is fragmentary and in poor condition. We therefore designate the best available syntype material as the lectotype (BCPM 976-00861-002).

The species, now assigned to genus *Gymnangium* Hincks 1874 as *G. sinuosum*, is regarded as valid (Cairns *et al*. 2002; Calder & Cairns 2009; WoRMS). The synonymy of this species has been listed elsewhere, along with re-descriptions, additional illustrations, and taxonomic remarks (Bogle 1975; Calder 1997; Ansín Agís *et al*. 2001).

Streptocaulus gracilis Fraser, 1937b

Streptocaulus gracilis Fraser, 1937b: 6, pl. 2, fig. 10.

Holotype. USNM 43293: Puerto Rico, off northeast coast, 18°30'20"N, 65°57'00"W, Johnson-Smithsonian Deep-Sea Expedition Sta. 9, 01 February 1933, 240–280 fm (439–512 m), R/V *Caroline*, one colony, ca. 9 cm high, in fairly good condition, without gonophores, coll. Paul Bartsch, labelled "type" and "holotype"; ethanol.

Schizoholotype. BCPM 976-00946-001, Puerto Rico, one colony fragment, 1.3 cm high, in good condition, without gonophores; slide (slide is broken lateral to mount).

Type locality. Puerto Rico: off northeast coast, 18°30'20"N, 65°57'00"W, 240–280 fm (439–512 m) (Johnson-Smithsonian Deep-Sea Expedition Sta. 9; Bartsch, 1933).

Current status. Valid.

Remarks. The name-bearing type of *Streptocaulus gracilis* (USNM 43293), designated by Fraser (1937b) as a

holotype, is listed in the NMNH database as a syntype. Examination of the type material confirms the existence of a single specimen, i.e., the holotype.

The single location record of the species as cited in Fraser's original account, from the slope north of Puerto Rico (18°33'15"N, 65°56'45"W, 240 fathoms), does not match that of type material (USNM 43293) in the current online database record of the NMNH (syntype, N of St. Thomas, U.S. Virgin Islands, centroid latitude 18.5583, longitude -65, Johnson-Smithsonian Deep-Sea Expedition Sta. 98, 549 m). Neither of these locations appears to be correct. A label in the vial with the holotype specimen indicates that it was collected at Johnson-Smithsonian Deep-Sea Expedition Station 9, not Station 98. According to Bartsch (1933), Stn 9 was occupied at 18°30'20"N, 65°57'00"W, 240–280 fm (439–512 m) on 01 February 1933. He reported that at Station 98, sampling gear did not touch bottom and only pelagic animals were collected. A slide of *S. gracilis* exists in the RBCM (BCPM 976-00946-001), but no collection data are provided with it. The species was not listed in Arai (1977). Collection data recorded above correspond with those of Station 9 in Bartsch (1933).

Streptocaulus gracilis, held to be valid in WoRMS, was described from a single specimen. Its trophosome was said by Fraser (1937b) to be a "Colony 8 cm in height…", and the record in the NMNH database (USNM 43293) lists a specimen count of "1." That specimen is the holotype, and material on a slide at the RBCM (BCPM 976-00946-001) represents a fragment of the holotype (i.e., a schizoholotype).

Ramil & Vervoort (1992: 175) suggested that *Streptocaulus gracilis* may be referable to family Plumulariidae rather than Aglaopheniidae based on trophosomal morphology. If so, it warrants assignment to a genus other than the aglaopheniid taxon *Streptocaulus* Allman, 1883. The gonosome of *S. gracilis* is unknown.

Family Bonneviellidae Broch, 1909

Bonneviella gracilis Fraser, 1939b

Bonneviella gracilis Fraser, 1939b: 59, figs. 1a–c.

Syntypes. BCPM 976-00454-001: Canada, Nunavut, Dease Strait, 25 July 1937, labelled "type"; 60% IPA.

BCPM 976-00454-002: Canada, Nunavut, Dease Strait, 25 July 1937; slide.

Lectotype, by present designation. RBCM 976-00454-003: Canada, Nunavut, Dease Strait, 40 fm (73 m), 25 July 1937, RCMP Vessel *St. Roch*, dredge, one colony fragment, attached to stolon of another hydroid species, 4 mm high, in good condition, without gonophores, coll. Sgt. H.A. Larsen; slide.

Paralectotypes. BCPM 976-00454-001: Canada, Nunavut, Dease Strait, 40 fm (73 m), 25 July 1937, RCMP Vessel *St. Roch*, dredge, several colony fragments, in unsatisfactory condition, without gonophores, coll. Sgt. H.A. Larsen, labelled "type"; 60% IPA.

BCPM 976-00454-002: Canada, Nunavut, Dease Strait, 40 fm (73 m), 25 July 1937, RCMP Vessel *St. Roch*, dredge, one colony fragment, attached to hydrocaulus of a sertulariid, 3 mm high, in good condition, without gonophores, coll. Sgt. H.A. Larsen; slide.

Type locality. Canada, Nunavut: Dease Strait, 68°58'N, 106°20'W, 40 fm (73 m) (Fraser 1939b).

Current status. Valid, but see Remarks below.

Remarks. In the absence of a type designation of *Bonneviella gracilis* by Fraser (1939b), a name-bearing type has been selected from syntype material of the species in the Fraser Hydroid Collection at the RBCM (BCPM 976-00454-001; BCPM 976-00454-002). The two samples are part of the same collection, obtained by Sgt. H.A. Larsen aboard the Royal Canadian Mounted Police vessel *St. Roch* while stuck in the ice in Dease Strait, Nunavut, Canada (Fraser 1939b). The best of the available specimens, designated here as the lectotype, is one of two colony fragments on a microscope slide (BCPM 976-00454-002). Occurring on the right side of the slide, it is attached to the stolon of another hydroid species. This specimen (RBCM 976-00454-003) consists of a hydrotheca with a largely intact hydranth, together with a hydrothecal pedicel and part of a stolon. The other colony fragment of *B. gracilis*, attached to a sertulariid on the same slide, is a paralectotype (BCPM 976-00454-002). While also in good condition overall, its hydranth is more deteriorated than that of the lectotype. Additional paralectotypes are fragments of the species in fluid preservative (BCPM 976-00454-001). Although labelled "type", they are now in unsatisfactory condition. No other type material is known to exist.

Fraser (1939b) described this species from sterile specimens overgrowing colonies of a hydroid identified by

him as *Thuiaria similis* (*Sertularia similis* Clark, 1877). Although currently accepted as valid in WoRMS, studies are needed to confirm the identity of Fraser's *Bonneviella gracilis* at the ranks of family, genus, and species.

Family Campanulariidae Johnston, 1837

? *Campanularia abyssa* Fraser, 1940a

? *Campanularia abyssa* Fraser, 1940a: 576, pl. 32, figs. 2a, b.

Holotype. USNM 43434: USA, Massachusetts, SE of Nantucket Shoals, *Albatross* Sta. 2041, 39°22'50"N, 68°25'W, 19 July 1883, deep sea trawl, several detached fragments of what is likely a single colony, the longest of them 2 cm high, in fairly poor condition, without gonophores, labelled "type"; ethanol.

Type locality. USA, Massachusetts: continental slope SE of Cape Cod, 39°22'50"N, 68°25'W, 1608 fm (2941 m) (Fraser 1940a).

Current status. Valid, but see Remarks below.

Remarks. A specimen at the NMNH (USNM 43434) was designated by Fraser (1940a) as the "type" of *Campanularia abyssa.* That hydroid is recorded as a holotype in the NMNH online database (ICZN Art. 73.1.1). No specimens of the species were listed as part of the Fraser Hydroid Collection by Arai (1977), and no records of it exist in the RBCM online database.

Fraser (1940a) provisionally assigned *C. abyssa* to the genus *Campanularia* Lamarck, 1816, but was uncertain it was even referable to the family Campanulariidae Johnston, 1837. No gonosome was present and its identity remains obscure, although it seems more likely to be a lafoeoid than a campanulariid. WoRMS is followed in simply retaining the name *C. abyssa* for it until its identity can be better established.

Campanularia castellata Fraser, 1925

not *Campanularia castellata* Clarke, 1894: 71, 72 [*nomen nudum*].
? *Campanularia castellata* Fraser, 1925: 170, figs. 4A, B.
? *Campanularia castella*.—Arai, 1977: 27 [incorrect subsequent spelling].

Syntypes. CAS-IZ 21801.00: USA, California, San Francisco Bay, near Alcatraz Island, 10–17 fm (18–31 m), labelled "type"; 10% formalin.

BCPM 976-00342-001: USA, California, San Francisco Bay, 10–17 fm (18–31 m), labelled "co-type"; 60% IPA.

Lectotype, by present designation. CAS-IZ 21801.00**:** USA, California, San Francisco Bay, near Alcatraz Island, 10–17 fm (18–31 m), colony fragments on *Salacia desmoides*, without gonothecae; 10% formalin.

Paralectotype. BCPM 976-00342-001: USA, California, San Francisco Bay, 10–17 fm (18–31 m), several fragments on *Salacia desmoides*, in poor condition, without gonothecae, labelled "co-type"; dry sometime in the past; 60% IPA.

Type locality. USA, California: San Francisco Bay, near Alcatraz Island, 10–17 fm (18–31 m) (Fraser 1925).

Current status. *Species inquirenda*.

Remarks. No name-bearing type was fixed by Fraser (1925) in describing *Campanularia castellata*. Specimens of the type series occur at both the CAS (CAS-IZ 21801.00) and the RBCM (BCPM 976-00342-001). The syntype at CAS contains colony fragments of *Salacia desmoides* (Torrey, 1902) supporting epizoic *C. castellata*, together with a handwritten label bearing the word "type". The vial is inside a jar with a label bearing the designation "XLIV.3.5257". According to the CAS label, this designation refers to a Scripps Institution dredging station near San Pedro, CA. However, given that this label is not in direct association with the specimen in the vial and that the CAS specimen appears to be similar to the RBCM specimen in its fragmentary nature and epizoic association, we believe that both are syntypes representing material collected from San Francisco Bay as indicated by Fraser (1925: 170). Although fragmentary, we conclude that that the CAS specimen (CAS-IZ 21801.00) constitutes a single colony of *C. castellata* epizoic on *S. desmoides.* It has been selected here as the lectotype. The RBCM sample (BCPM 976-00342-001) is designated as a paralectotype.

Fraser (1925) founded *C. castellata* on infertile material, and the gonosome of the species remains undescribed. Its specific identity is thus unclear (Calder 1991). Fraser noted a close resemblance of his hydroid to *C. groenlandica* Levinsen, 1893, although longitudinal folds were completely absent on walls of the hydrothecae of *C. castellata*.

The binomen *Campanularia castellata* as used earlier by Clarke (1894) is a *nomen nudum* (ICZN Art. 11.5) and does not threaten the identical name used later by Fraser. The name appeared in two introductory lists of species in Clarke's paper but, in all subsequent parts of that publication, including the descriptive account and figure captions of the species, *Obelia castellata* was used as the valid name. In remarks on the species, Clarke commented "It is, of course, impossible to determine whether this belongs in the genus *Obelia* or in *Campanularia*, without knowing its manner of reproduction; and it is from its general similarity to some of the Obelias, *longissima* and especially *gelatinosa*, that I place it provisionally here" (as *Obelia castellata*).

While listed as valid in Cairns *et al*. (2002), WoRMS is followed here in considering *Campanularia castellata* a *species inquirenda*.

? *Campanularia fasciculata* Fraser, 1941b

? *Campanularia fasciculata* Fraser, 1941b: 81, pl. 15, figs. 6a, b.

Holotype. USNM 43454: USA, Massachusetts, off Chatham, Crab Ledge, R/V *Fish Hawk* Sta. 984, 41°31'N, 69°28'W, 60 m, 30 August 1881, trawl, one colony with some parts on and others detached from a barnacle, largest fragment 2 cm high, in fairly good condition, without gonophores, labelled "type"; ethanol.

Paratypes. BCPM 976-00346-001: USA, Massachusetts, Cape Cod, off Chatham, several colony fragments, up to 2 cm high, in poor condition, without gonothecae, labelled "cotype"; dry sometime in the past, 60% IPA.

Type locality. USA, Massachusetts: off Chatham, 41°31'N, 69°28'W, 33 fm (60 m) (Fraser 1941b).

Current status. *Species inquirenda*.

Remarks. Fraser (1941b) designated material at the NMNH (USNM 43454) as the "type" of *Campanularia fasciculata*. Although the specimen count of the species in the NMNH online database is listed as "1", the collection is currently listed as syntype material. We believe the type represents several pieces of a single colony, growing on a barnacle, and therefore constitutes a holotype. Colony fragments in the Fraser Hydroid Collection at the RBCM (BCPM 976-00346-001), labelled "cotype", are paratypes. Other material assigned to the species in collections at the NMNH (USNM 86217, USNM 86218) were collected during the 1980s and are not types.

This species was assigned by Fraser (1941b), with question, to *Campanularia* Lamarck, 1816. It is unlikely referable to that genus in having hydrothecae with a true diaphragm rather than a basal annular thickening of perisarc, in lacking a characteristic subhydrothecal spherule, and in having an erect rather than a typically stolonal colony form. In such characters, the hydroid conforms with species of Obeliidae Haeckel, 1879 rather than Campanulariidae Johnston, 1837. Cairns *et al*. (2002: 58) included *C. fasciculata* as a possible synonym of *Obelia longissima* (Pallas, 1766). That now seems unlikely based on its colony form. While the hydroid somewhat resembles *O. longissima*, it differs in the mode of branching and in having a peculiar polysiphonic hydrocaulus. The species is currently regarded as a *taxon inquirenda* in WoRMS, a view adopted here. Gonophores were not observed in the type material, adding to uncertainties about classification of the species. The binomen *Campanularia fasciculata* is provisionally retained for it here given its doubtful affinities.

Campanularia magnifica Fraser, 1913b

Campanularia crenata Allman, 1876: 258, pl. 11, figs. 1, 2.
Campanularia magnifica Fraser, 1913b: 164, pl. 11, figs. 1–3.

Syntypes. BCPM 976-00355-001: Canada, Nova Scotia, Canso, Canso Banks.

BCPM 976-00355-002: Canada, Nova Scotia, Canso, Canso Banks.

Lectotype, by present designation. BCPM 976-00355-001: Canada, Nova Scotia, Canso Banks, 50 fm (91 m), 1902 (?), originally on a stalked ascidian, one colony fragment, 4 mm high, in fairly good condition, without gonophores; slide.

Paralectotype. BCPM 976-00355-002: Canada, Nova Scotia, Canso Banks, 50 fm (91 m), 1902 (?), originally on a stalked ascidian, one colony fragment, 2.5 mm high, in fairly good condition, without gonophores; slide.

Type locality. Canada, Nova Scotia: Canso Banks, 50 fm (91 m), on a stalked ascidian (Fraser 1913b).

Current status. Invalid.

Remarks. In the original description of *Campanularia magnifica*, no name-bearing type was designated by Fraser (1913b). However, syntype material of the species exists on two slides in the Fraser Hydroid Collection at the RBCM (BCPM 976-00355-001, BCPM 976-00355-002). After examining both slides, we selected the specimen on the first of these (BCPM 976-00355-001) as the lectotype. The specimen on the other (BCPM 976-00355-002) is assigned paralectotype status. Collections of the species at the NMNH (USNM 23969, USNM 42745) are from sites (Grand Banks, St. Pierre Bank) outside the type locality (Canso Bank, NS) and are not part of the type series.

Cornelius (1982: 52) included *Campanularia magnifica* Fraser, 1913b from Nova Scotia, along with *C. speciosa* Clark, 1877 from Alaska, in the synonymy of *C. crenata* Allman, 1876 from Japan. Geographically, the synonymy seems plausible because the species is circumpolar (Naumov 1960, as *C. speciosa*; Antsulevich 2015, as *Tulpa crenata*), including the North American Arctic and Subarctic (Calder 1970, as *C. speciosa*). Currently listed as *Campanularia crenata* in WoRMS, it is included here in *Tulpa* Stechow, 1921a, as *T. crenata*.

Family Clytiidae Cockerell, 1911

Clytia laxa Fraser, 1937b

Clytia laxa Fraser, 1937b: 1, figs. 1a, b.

Syntypes. USNM 43285: Dominican Republic, Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 16 February 1933, 6–14 fm (11–26 m), ca. 12 colonies or colony fragments, up to ca. 4.6 cm high, in fairly good condition, some with gonophores, coll. Paul Bartsch, labelled “type” and “holotype”; ethanol.

Lectotype, by present designation. USNM 43285: Dominican Republic, Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 16 February 1933, 6–14 fm (11–26 m), one detached colony with hydrorhiza, hydrocaulus, and hydrothecae, ca. 4.6 cm high, in fairly good condition, with gonophores, coll. P. Bartsch; ethanol.

Paralectotypes. USNM 1458871: Dominican Republic, Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 16 February 1933, 6–14 fm (11–26 m), ca. 11 colonies or colony fragments, up to 2.5 cm high, in fairly good condition, some with gonophores, coll. P. Bartsch; ethanol.

USNM 43333: Dominican Republic, Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 16 February 1933, 6–14 fm (11–26 m), several attached (to bryozoans, an antipatharian, and a shell fragment) and detached colonies and colony fragments, up to 4 cm high, in fair to fairly poor condition, some with gonophores, coll. Paul Bartsch; ethanol.

BCPM 976-00380-001: Dominican Republic, Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 16 February 1933, 6–14 fm (11–26 m), several colony fragments, in poor condition, with gonothecae, labelled “cotype”; 60% IPA.

BCPM 976-00380-002: Dominican Republic, Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 16 February 1933, 6–14 fm (11–26 m), two colonies or colony fragments, in relatively poor condition, with gonothecae; slide.

Type locality. Dominican Republic: Bahía Samaná, Johnson-Smithsonian Deep-Sea Expedition Sta. 51, 19°10’35”N, 69°20’45”W, 6–14 fm (11–26 m) (Bartsch 1933).

Current status. Valid.

Remarks. Fraser’s (1937b) supposed holotype of *Clytia laxa* (USNM 43285) contained some 12 detached fragments of the species. It is questionable if they are all part of the same colony. The largest and, in our opinion, the best fragment was isolated and designated here as the lectotype. The others, removed to a different bottle and assigned a new collection number (USNM 1458871), are part of the paralectotype series. So too are others of the species from the same station (USNM 43333, BCPM 976-00380-001, BCPM 976-00380-002).

The type locality of *Clytia laxa*, a species collected during the Johnson-Smithsonian Deep-Sea Expedition, was

listed by Fraser (1937b) as "East coast of Haiti, lat. 19°10'35"N., long. 69°20'45"W.; 15 fathoms." Meanwhile, the holotype designated by him is currently recorded in the NMNH online database (USNM 43285) as being from Puerto Rico. Neither Haiti nor Puerto Rico is the correct location. Material at the RBCM (BCPM 976-00380-001; BCPM 976-00380-002) was reported to be from "E of Haiti" by Arai (1977), and as "Johnson Hydro Station 51" in the online database of the museum. A label accompanying the syntypes at the NMNH, listed above, repeats the location ("E coast of Haiti") and the station data ("Lat. 19°10'35"N. Long. 69°20'45"W….fms 15") but also lists the station as "51". According to Bartsch (1933), Station 51 of the Johnson-Smithsonian Deep-Sea Expedition, located at 19°10'35"N, 69°20'45"W and sampled 16 February 1933 with a 6-foot beam trawl at depths of 6–14 fathoms (11–26 m), was in Samaná Bay (Bahía Samaná), Dominican Republic. Many hydroids were said to be present in the sample. That information coincides with a record of material of the species at the NMNH (USNM 43333), which is considered here to be part of the paratype series along with the two collections at the RBCM. Of the three locations variously given for the collection, station data in Bartsch (1933) are taken to be correct here.

Clytia laxa is listed as a valid species in WoRMS. Hydroids identified as *C. laxa* have been studied recently in Caribbean waters by Galea & Ferry (2015), and described earlier by Galea (2010) as *Clytia tottoni* (Leloup, 1935).

Clytia longitheca Fraser, 1914a

Campanularia paulensis Vänhoffen, 1910: 298, figs. 19a, b.
Clytia longitheca Fraser, 1914a: 137 (footnote).
Campanularia longitheca Fraser, 1914a: 137, pl. 11, figs. 32A–D.
Clytia (?) *paulensis*.—Stechow, 1919: 45.

Syntypes. BCPM 976-00382-001: Canada, British Columbia, between Round Island and entrance to Boat Harbour, 18 June 1913, 15–25 fm (27–46 m), rocky; dry.

BCPM 976-00383-001: Canada, British Columbia, entrance of Whaleboat Passage, 28 July 1913, 15–30 fm (27–55 m); dry.

BCPM 976-00384-001: Canada, British Columbia, near Round Island in Dodd Narrows; slide.

BCPM 976-00384-002: Canada, British Columbia, near Round Island in Dodd Narrows; slide.

BCPM 976-00385-001: Canada, British Columbia, Nanoose Bay, outside Entrance Rock, 31 July 1914, 10–20 fm (18–37 m), muddy or sandy, with gonangia (Arai 1977); dry.

Lectotype, by present designation. BCPM 976-00384-002: Canada, British Columbia, near Round Island in Dodd Narrows, one colony, up to ca. 4 mm high, in only fair condition, without gonothecae; slide.

Paralectotypes. BCPM 976-00382-001: Canada, British Columbia, between Round Island and entrance to Boat Harbour, 18 June 1913, 15–25 fm (27–46 m), rocky; dry.

BCPM 976-00383-001: Canada, British Columbia, entrance of Whaleboat Passage, 28 July 1913, 15–30 fm (27–55 m); dry.

BCPM 976-00384-001: Canada, British Columbia, near Round Island in Dodd Narrows, one colony, in only fair condition, without gonothecae; slide.

BCPM 976-00385-001: Canada, British Columbia, Nanoose Bay, outside Entrance Rock, 31 July 1914, 10–20 fm (18-37 m), muddy or sandy, with gonothecae; dry.

Type locality. Canada, British Columbia: near Round Island in Dodd Narrows (Fraser 1914a).

Current status. Invalid.

Remarks. Fraser did not designate a name-bearing type of *Clytia longitheca* in his original description of the species. In choosing a lectotype, we examined several syntypes of this hydroid in the Fraser Hydroid Collection at the RBCM (BCPM 976-00382-001, BCPM 976-00383-001, BCPM 976-00384-001, BCPM 976-00384-002, BCPM 976-00385-001). No other type material is known to exist. Hydroids in three of those collections (BCPM 976-00382-001, BCPM 976-00383-001, BCPM 976-00385-001), formerly in fluid preservative, are now dry and in very poor condition. Those on the two slides (BCPM 976-00384-001, BCPM 976-00384-002) are better, but still only marginally satisfactory. As the lectotype, we selected the colony on one of those slides (BCPM 976-00384-002), with the other (BCPM 976-00384-001) assigned paralectotype status. Dry samples of the species, mentioned above, are included as paralectotypes.

Fraser (1914a) intended at first to assign this species to *Campanularia* Lamarck, 1816, as *C. longitheca*. After

the manuscript had gone to press, he discovered material with gonothecae bearing nascent medusae, and in a footnote of the published paper correctly assigned it instead to *Clytia* Lamouroux, 1812, as *C. longitheca*.

Calder (1971) and Cairns *et al*. (2002) regarded *Clytia longitheca* Fraser, 1914a as a probable synonym of *C. paulensis* (Vänhoffen, 1910). Peña Cantero & García Carrascosa (2002) treated the two as conspecific, an opinion currently upheld in WoRMS. An extensive synonymy of *C. paulensis* was given by Medel & Vervoort (2000).

Family Obeliidae Haeckel, 1879

Gonothyraea integra Fraser, 1940a

Lomedea gracilis Dana, 1846: 689, pl. 61, figs. 7a, b [incorrect subsequent spelling of the generic name *Laomedea*] [binomen suppressed by the ICZN for the purposes of both the Principle of Priority and the Principle of Homonymy (Opinion 1465)].
Obelia hyalina Clarke, 1879: 241, pl. 4, fig. 21.
Obelia congdoni Hargitt, 1909: 375.
Laomedea sargassi Broch, 1913: 13.
Gonothyraea integra Fraser, 1940a: 576, pl. 32, fig. 3.

Holotype. USNM 43435: USA, Rhode Island, Block Island, near North Light, 24 August 1880, R/V *Fish Hawk*, 24 m, one colony, now on four fragments of a species of *Sargassum* and with some hydroid fragments detached, 8 mm high, in fair to fairly poor condition, with gonophores, labelled "type"; other species of hydroids present; ethanol.

Paratypes. BCPM 976-00403-001: USA, Rhode Island, Block Island, near North Light, 24 August 1880, 24 m, on *Sargassum*, in poor condition, with gonothecae, labelled "cotype"; dry at some time, 60% IPA.

BCPM 976-00403-002: USA, Rhode Island, Block Island, North Light, 24 August 1880, on *Sargassum*, one colony, 1.2 cm high, in relatively poor condition, with gonothecae; slide (slide cover slip broken).

Type locality. USA, Rhode Island: Block Island, 1¼ miles (2 km) from North Light, 13 fathoms (24 m), on sunken *Sargassum* (Fraser 1940a).

Current status. Invalid.

Remarks. Fraser (1940a) designated material at the NMNH (USNM 43435) as the "type" (i.e., the name-bearing type) of *Gonothyraea integra*. It is listed as the holotype in the online database of the NMNH. While its substrate (a species of *Sargassum*) is now in four fragments, the hydroids on them are likely all part of the same colony and indeed comprise the holotype. Specimens in the Fraser Hydroid Collection at the RBCM (BCPM 976-00403-001; BCPM 976-00403-002) are paratypes.

Hydroids described as *Gonothyraea integra* by Fraser (1940a) were collected on sunken *Sargassum* at a depth of 13 fm (24 m) off Block Island, Rhode Island, USA. From his generic assignment of the species, Fraser must have assumed that its gonophores were vestigial medusoids but, from examination of the holotype, we believe they are developing medusae. It is probable that this species is the common obeliid of the pelagic *Sargassum* community in the North Atlantic Ocean. That hydroid, commonly assigned over the last few decades of the 20th century to *Obelia dichotoma* (Linnaeus, 1758), is now considered a different species. The earliest name applied to it was *Lomedea gracilis* Dana, 1846 (=*Laomedea gracilis*), based on specimens from "Gulf-weed" in the Gulf Stream off North Carolina. That specific name, however, has been placed on the Official Index of Rejected and Invalid Specific Names in Zoology (ICZN Opinion 1465). *Obelia hyalina* Clarke, 1879, the next available name, was resurrected for the species in a previous work (Calder 2013). Junior synonyms of *O. hyalina*, recognized as the valid name of the species here, include *O. congdoni* Hargitt, 1909 and *Laomedea sargassi* Broch, 1913. Names applied by Bosc (1797) to hydroids on pelagic *Sargassum*, including one vaguely resembling *O. hyalina*, have not been used as valid for more than a century. Most are *nomena dubia*, and in the interests of nomenclatural stability are best abandoned.

Obelia irregularis Fraser, 1943a

Obelia irregularis Fraser, 1943a: 77, pl. 16, fig. 3.

Holotype. MCZ-IZ 9013: St Kitts and Nevis, off St Kitts, 17°19'27"N, 62°50'30"W, USCSS *Blake*, 250 fm (457 m), 14 January 1879, two fragments of a colony, ca. 3 cm high, in poor condition, coll. A. Agassiz, labelled "type"; 70% ethanol.

Type locality. St. Kitts and Nevis: off St Kitts, 17°19'27"N, 62°50'30"W, 250 fm (457 m) (Fraser 1943a).

Current status. Valid.

Remarks. *Obelia irregularis* was described by Fraser (1943a) in a collection sent on loan to him from the MCZ. As with other species in that collection, no name-bearing types were designated for it. The species is not represented in the Fraser Hydroid Collection at the RBCM, and the only known type material of *O. irregularis* is that returned by Fraser to the MCZ (MCZ-IZ 9013). The count number ("1") accompanying the type (MCZ–IZ 9013), and Fraser's (1943a) description ("Colony 3 cm. in height…"), indicate that the species was described from a single hydroid. Although two fragments were found in the type collection examined at the MCZ, they are considered parts of the same colony. The specimen is therefore taken to be the holotype by monotypy (ICZN Art. 73.1.2). Another hydroid recorded as *O. irregularis* at the MCZ (MCZ-CNID 77), from Grand Manan, New Brunswick, Canada, is not part of the type series. That identification is dubious given the much different environmental conditions of the collection locality.

In his account of *O. irregularis*, Fraser (1943a) observed and briefly described hydrothecae and gonothecae. The holotype examined here is now in poor condition, and neither of these structures could be distinguished with certainty.

Obelia irregularis is listed as a valid species in WoRMS, a conclusion that seems justified at present given the location, depth, and distinctive morphology of the hydroid as described by Fraser (1943a). In particular, the hydrothecal rim was said to have "…10 regularly rounded teeth [cusps], the division between them extending deep into the hydrothecal wall." Hydrothecal pedicels are wavy but not noticeably annulated. While gonothecae were described by Fraser, the character of the gonophores remains unknown. Uncertainty therefore exists about the generic assignment of the species.

Obelia multidentata Fraser, 1914a

? *Obelia multidentata* Fraser, 1914a: 154, pl. 17, figs. 56A, B.

Syntypes. BCPM 976-00438-001: USA, Washington, Friday Harbor; slide.

BCPM 976-438-002: USA, Washington, Friday Harbor; slide.

Lectotype, by present designation. RBCM 976-00438-003: USA, Washington, Friday Harbor, one colony (at the top of slide BCPM 976-00438-002), 1.0 cm high, in fairly good condition, without gonophores; slide.

Paralectotypes. BCPM 976-00438-001: USA, Washington, Friday Harbor; slide.

BCPM 976-00438-002: USA, Washington, Friday Harbor; slide.

Type locality. USA, Washington: Friday Harbor (Fraser 1914a).

Current status. *Species inquirenda*.

Remarks. No specimens have previously been fixed as name-bearing types of *Obelia multidentata* Fraser, 1914a. However, syntypes of the species exist on two slides in the Fraser Hydroid Collection at the RBCM (BCPM 976-00438-001, BCPM 976-00438-002). Others, from the Vancouver Island area (BCPM 976-00439-001: Departure Bay, 07 June 1915), were collected after the species was described and are not types. Also not part of the type series is a collection from Alaska at the CAS (CAS-IZ 14343.00). We designate, as lectotype of the species, a fragment of a colony on one of the syntype slides (BCPM 976-00438-002). That specimen (RBCM 976-00438-003), one of two on the slide, is recognizable in being 1.0 cm high and in being the one at the top. It best exhibits the morphology of the hydrotheca and the marginal cusps, and even the hydranths. The other specimen on that slide is a paralectotype (BCPM 976-00438-002).

Obelia multidentata was included in the synonymy of *O. bidentata* Clark, 1875 by Cornelius (1975, 1982). That synonymy has been repeated in the current WoRMS list. As noted earlier (Calder 1991: 72), such a conclusion is incorrect because marginal cusps on the hydrothecal rim are not bimucronate as in *O. bidentata*. It appears closer to *O. longissima* (Pallas, 1766) than to *O. bidentata*, although marginal cusps appear to be more deeply cut and fluted than in the former species. Detailed re-examination of Fraser's *O. multidentata* is warranted to clarify affinities of the species. It was listed as valid in Cairns *et al*. (2002).

? *Obelia racemosa* Fraser, 1941b

? *Obelia racemosa* Fraser, 1941b: 82, pl. 15, fig. 7.

Holotype: USNM 4883: Canada, Nova Scotia, Western Bank, 91–119 m, 07 June 1880, schooner *Mist*, one colony, 25 cm high (Fraser 1941b), in poor condition, gonophores not seen, labelled "syntype"; ethanol.

Type locality. Canada, Nova Scotia: Western Bank off Cape Breton Island, 50–65 fm (91–119 m) (Fraser 1941b).

Current status. *Species inquirenda*.

Remarks. In being designated as the "type", material of *Obelia racemosa* at the NMNH (USNM 4883) was fixed as the name-bearing type of the species by Fraser (1941b). Although listed as a syntype in the online database, the specimen count is given as "1." Fraser's (1941b) original account of the species implies that it was based on a single specimen, as his description began with the words "Colony large…." The type examined here, consisting of one colony and a few fragments of it, is considered the holotype. *Obelia racemosa* has not been reported again. The holotype specimen is in poor condition, with no hydranths, little or no coenosarc, and few hydrothecae.

Gonosomes were lacking in Fraser's (1941b) hydroid, and he assigned the species to *Obelia* Péron & Lesueur, 1810 with question. From his description and illustration, and from the type specimen, however, we consider that generic assignment to be correct.

The principal distinguishing characters of *O. racemosa* appear to be: (1) the stiff racemes formed by distal branchlets and pedicels, and (2) the densely clustered arrangement of the hydrothecae. Although regarded as a synonym of *O. dichotoma* (Linnaeus, 1758) in WoRMS, *O. racemosa* somewhat resembles *O. plicata* Hincks, 1868 in its strongly polysiphonic colony form. The latter species too, however, is considered identical with *O. dichotoma* in the current WoRMS list, likely following Cornelius (1990, 1995). Its general mode of branching is similar to *O. longissima* (Pallas, 1766), but the hydrocaulus of that species is usually monosiphonic. Further study is needed to explore the status of these putative species. Fraser's hydroid was considered a valid species in Cairns *et al*. (2002), and listed as *O. racemosa*.

Acknowledgements

Particular thanks are extended to Geoff Keel, Bill Moser, and Allen Collins for help during a visit by DRC in September 2017 to the Museum Support Center of the Smithsonian Institution, United States National Museum. Similar gratitude is expressed by DRC to Adam Baldinger, Jennifer Lenihan-Trimble, and Penny Benson for assistance during a visit to the Museum of Comparative Zoology, Harvard University, in November 2017. Christina Piotrowski provided a loan, to HHCC, of type specimens held at the California Academy of Sciences. Lily Berniker and Estefania Rodriguez of the American Museum of Natural History arranged a loan of types to Sebastian Kvist, on behalf of DRC. Heidi Gartner and Hugh McIntosh provided valuable input on cataloguing, and collections assistance, at the RBCM. Jeanette Watson and Stephen Keable assisted in determining the location of the hydroid types of *Halecium gracile* Bale, 1888. Horia R. Galea offered insights on the likely synonymy of *Diphasia crassa* Fraser, 1940a. Thanks are extended to Claudia Mills for checking collections at the Friday Harbor Laboratories, University of Washington, for hydroids that might have been types of species described by Fraser. The manuscript was strengthened by the constructive reviews of referees Horia R. Galea and Daphne Fautin, and by the editing of Allen Collins. Irene Wu of the Royal Ontario Museum Library, and Karen Suurtamm of the University of Toronto Archives, were instrumental in determining publication dates of the three books on hydroids by Fraser. We are grateful to Sheldon Goldfarb, Archivist & Clerk of Council, Alma Mater Society, University of British Columbia, for granting permission to use the photographs of Fraser shown elsewhere in this report. Assistance in acquiring the photographs was also provided by Tessa Grogan, AMS Archives Assistant at UBC. Financial support was provided for parts of this study by the United States National Science Foundation program Partnerships for Enhancing Expertise in Taxonomy (PEET), and the Royal Ontario Museum–Smithsonian Institution joint project "Systematics, Evolution, and Biogeography of Marine Organisms in Tropical Marine Habitats" (funded by an anonymous donor).

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