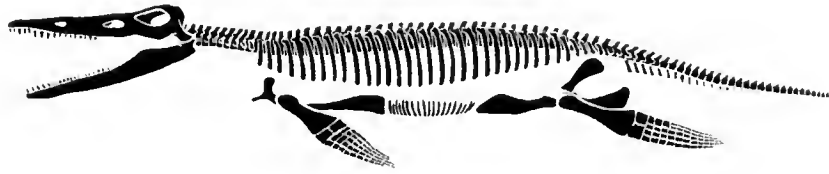


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NINETEENTH AND EARLY TWENTIETH CENTURY EXPEDITIONS: THEIR EXPLORATIONS IN BRAZIL, WITH THE FIRST CONTRIBUTIONS TO KNOWLEDGE OF THE HYDROZOA

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ABSTRACT. Prior to 1800, exploring expeditions were usually of a commercial and political nature, undertaken to colonize or expand relations with new countries and territories. Among those to be explored as the 19th century progressed was Brazil, the largest nation in South America. This account is a brief historical overview of some 19th and early 20th century expeditions to Brazil, focusing on those that included investigations of hydrozoans (phylum Cnidaria). Among the more important of these expeditions were *l'Expédition de La Coquille* (France), the Voyage of the *Beagle* (Great Britain), the United States Exploring Expedition, *l'Expédition HSWMS Eugenie* (Sweden), the *Thayer* Expedition (United States), the *Challenger* Expedition (Great Britain), the *Albatross* Expedition 1887–1888 (United States), the Scottish National (*Scotia*) Antarctic Expedition, the British Antarctic Expedition, and the *Hartt* Expedition (United States). Maps of routes taken and names of expedition commanders and scientists are provided in the supplemental material online. Also included is a list of hydrozoan species collected in Brazilian waters by the expeditions (with original and current names of taxa), together with dates and exact locations of collection, station numbers with coordinates and depths (when available), and the museums where material is presently housed, with respective catalog numbers and sources of information. Citations of sources of updated species names are also provided. Figures (diagrams and old plates prepared by expedition illustrators) are added.

KEY WORDS: 19th century expeditions; 20th century expeditions; Brazilian coast; Cnidaria; Hydrozoa; exploration; natural history

INTRODUCTION

Geographically, Brazil is the largest country in South America and fifth largest in the world. Its discovery and development opened rich opportunities for studies in natural history. Fundamental advances in knowledge of the biota of the country were

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made by pioneering scholars such as the naturalists José Mariano da Conceição Veloso (Frei Veloso) (1742–1811), Georg Heinrich von Langsdorff (1774–1852), Carl Friedrich Philipp von Martius (1794–1868), Charles Wilkes (1798–1877), Alcide Charles Victor Marie Dessalines d'Orbigny (1802–1857), Jean Louis Rodolphe Agassiz (1807–1873), Charles Robert Darwin (1809–1882), Pierre-Joseph van Beneden (1809–1894), and Johann Friedrich Theodor Müller (Fritz Müller) (1822–1897). Moreover, the coastline of Brazil, ninth longest in the world (World Resources Institute, 2012), was traversed by some of the great oceanographic expeditions of the 19th and early 20th centuries.

This paper provides a brief historical overview of several of these expeditions, focusing on those that included collections of cnidarians and especially hydroids. Specimens are deposited in several museums around the world, principally in Europe and the United States. Among these are the Naturhistoriska Riksmuseet in Stockholm, Sweden (Schwedischen Reichsmuseum, after Jäderholm, 1903); the Rijksmuseum van Natuurlijke Historie in Leiden (now the Naturalis Biodiversity Center) and the Zoological Museum at Amsterdam, both in The Netherlands (Vervoort, 1946); and the Royal Scottish Museum (now the National Museum of Scotland) in Edinburgh, Scotland (Ritchie, 1909; Rees and Thursfield, 1965). In the United States, the most important institutions holding material from Brazil are the National Museum of Natural History (Smithsonian Institution) in Washington D.C.; the Yale Peabody Museum of Natural History in New Haven, Connecticut; and the Museum of Comparative Zoology at Harvard University in Cambridge, Massachusetts.

Knowledge of the hydrozoan fauna of Brazil was advanced only modestly by those expeditions, yet accounts of expedition

materials by foreign workers (e.g., Allman, 1883, 1888; Nutting, 1900, 1904; Jäderholm, 1903; Vervoort, 1946) constituted much of what was known about the fauna of the country until the mid-1940s (Grohmann *et al.*, 2011). Significant progress has been achieved since then through the work of many Brazilian hydroid specialists, beginning with the publications of Marta Vannucci (1921–) of the University of São Paulo. Vannucci served at the Instituto Oceanográfico from 1946 to 1969 and left the Institute to join UNESCO in 1969 (Schumacher and Vital Brasil, 2000).

MATERIALS AND METHODS

Criteria for choosing which expeditions to highlight in this work were:

1. presence of hydroids collected on the coast of Brazil based on data from available reports;
2. records of hydroid material from expeditions in online catalogs of several museums in Europe and in the United States, such as those of the Swedish Museum of Natural History (Stockholm, Sweden); the Natural History Museum (London, U.K.); the University Museum of Zoology (Cambridge, U.K.); the National Museum of Natural History–Smithsonian Institution (Washington D.C., U.S.A.); the Museum of Comparative Zoology of Harvard University (Cambridge, Massachusetts, U.S.A.); and the Yale Peabody Museum of Natural History (New Haven, Connecticut, U.S.A.). Thus, data were extracted from both expedition publications and from information available via the Internet on material deposited in museum collections.

Information presented here is arranged in the same order for each expedition: route of the voyages (with map, when available) and a

brief history, names of the commanders of the vessels, names of the naturalists, localities traversed in Brazil, hydrozoan taxa collected (as contained in contemporary reports or in label data surveyed in museums), and collection localities. To better present the information and enable comparison, Appendix Table I provides (where possible) data for the date and station of collection, coordinates, depth, museum where material is deposited, number of the sample in the catalog of the institution, and source or sources where this information was obtained. When more than one source is cited, they are complementary (one contains data for species/station, another cites data for coordinates, and so forth). Appendix Table II contains updated names of species and some of the sources where synonymies were obtained.

The Hartt Expedition has been treated separately here because it comprised a series of explorations that extended inland as well as along the coast of Brazil.

Particularly important were reports of the various voyages made by the key researcher or researchers themselves, such as the narrative of the Thayer Expedition by Agassiz and Agassiz (1868). Another was the account of Agassiz and Hartt (1870), containing one of the most complete studies on geology and physical geography of Brazil. The latter publication, also containing illustrations and maps, was largely the work of the second author. When no information was available in the published literature, additional data were obtained via the Internet.

At the end of each expedition report, references are cited where additional information about each of them can be obtained.

Based on the existing published plates, comparisons were also made among species collected in the 19th and early 20th centuries with lists of species recorded from Brazil in current literature. Sources of information are listed in the right column

of Appendix Table II. All species names were checked on the World Register of Marine Species (WoRMS), and a justification is given in the respective discussion about the presence or absence of this acronym on the list.

ACRONYMS AND CODES USED IN THIS PAPER

BMNH	British Museum (Natural History), now Natural History Museum, London
GBIF	Global Biodiversity Information Facility, Copenhagen, Denmark
KU	Kansas University
MCZ	Museum of Comparative Zoology, Harvard University
NMNH	National Museum of Natural History (Smithsonian Institution)
NZ	<i>Nomenclator Zoologicus</i>
OEB	Organismic and Evolutionary Biology (Harvard University)
RSGS	Royal Scottish Geographical Society
SNAE	Scottish National Antarctic Expedition
UFRJ	Universidade Federal do Rio de Janeiro
WoRMS	World Register of Marine Species
YPM	Yale Peabody Museum of Natural History, Yale University
Exp.	Expedition
#	collecting station number
Nr	number

RESULTS AND DISCUSSION

l'Expédition de La Coquille (1822–1825) Figure 1

History. Ordered by King Louis XVIII of France (1755–1824) and carried out aboard

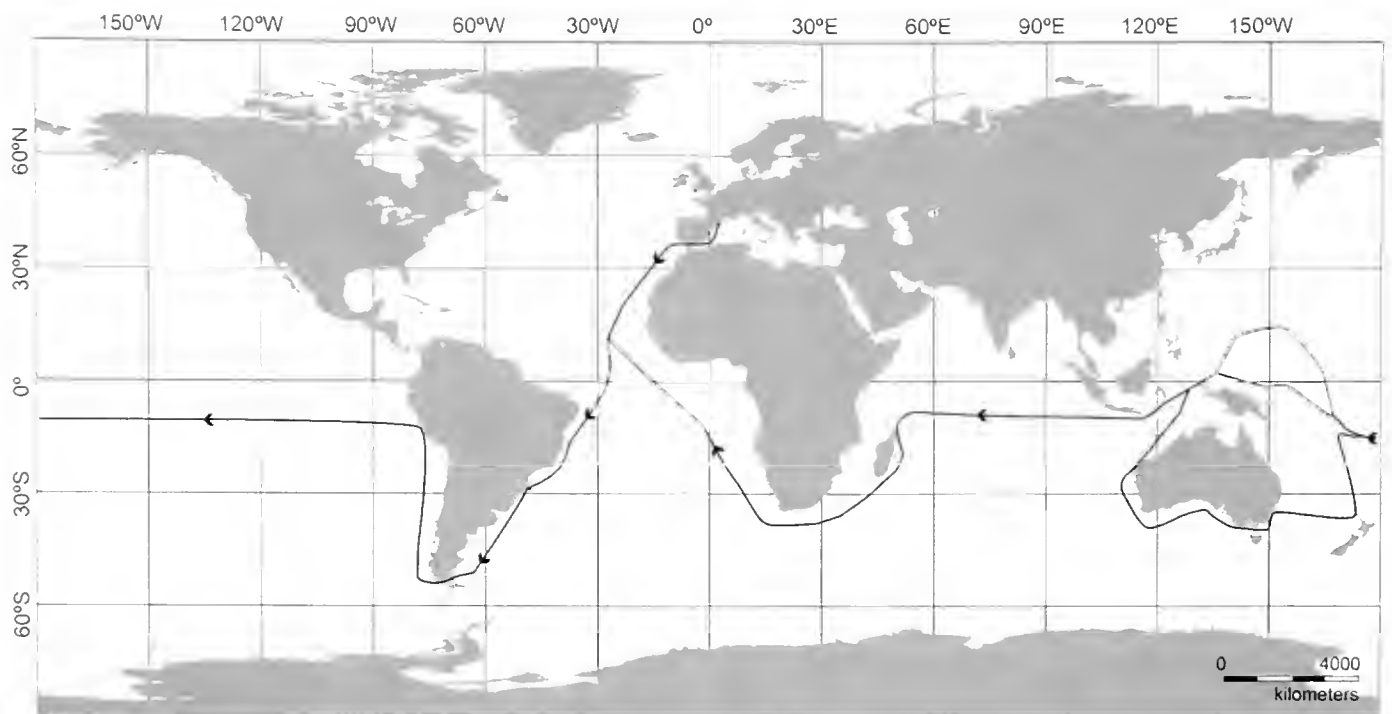


Figure 1. Route of *l'Expédition de La Coquille*. Alienor.org (1998), redrawn with permission.

the corvette of the same name, *La Coquille*, the objective of this expedition was to explore the “southern seas” and what was then called Australasia. Under the command of Lieutenant Louis Isidore Duperrey (1786–1865), with Lieutenant Jules Sébastien César Dumont d’Urville (1790–1842) as second in command, *La Coquille* left Toulon on 11 August 1822 and entered port in Brazil on 16 October of the same year at Santa Catarina. Its naturalist was René Primevère Lesson (1794–1849), and the locality sampled was Ilha de Santa Catarina (16 Oct 1822). The hydrozoan collected was the medusa *Eudora rosacea* Lesson, 1830.

Discussion. There is no figure of *E. rosacea* in the plate published by Lesson (1830), although illustrations are provided of two other species (*E. discoides* and *E. hydroportes*) that the author assigned to the same genus (Fig. 2). Both closely resemble *E. rosacea*, which he described as “... complètement hyaline, assez épaisse au milieu, bordée sur sa circonférence de une membrane mince ...” (Lesson, 1830, chap. XIV, pl. 9, figs 2, 3). Lesson was not a specialist in Cnidaria: he

was a medical doctor, Director of the Botanical Garden of Rochefort, and a representative of the Museum of Paris. He may well have confused a medusa of the family Aequoreidae, considered a group of “Scyphozoa Discophorae” at the time (Long, 1841:121), for *Eudora*. In likely being unfamiliar with the species *Aequorea forskalea* Péron and Lesueur, 1810, the name *E. rosacea* was given to the specimen he encountered. The aequoreid species *A. forskalea* (Hydrozoa, Leptothecata) is relatively common off the Brazilian coast. These medusae readily lose their tentacles during collection or when reaching the beach, thereby resembling Lesson’s account of the species. Moreover, when examining the bell or plate of the medusa in lateral view (Fig. 2A), specimens of *Eudora* (Scyphozoa, Discophorae) are much more flattened than those of *Aequorea* (Fig. 2C). The author may have been confounded by these confusing details. From the diagrams by Lesson (1830) of *E. discoides* and *E. hydroportes* (Fig. 2B), one can compare his concept of *Eudora* (Fig. 2A) with *Aequorea* (Fig. 2C) (both by Long, 1841).

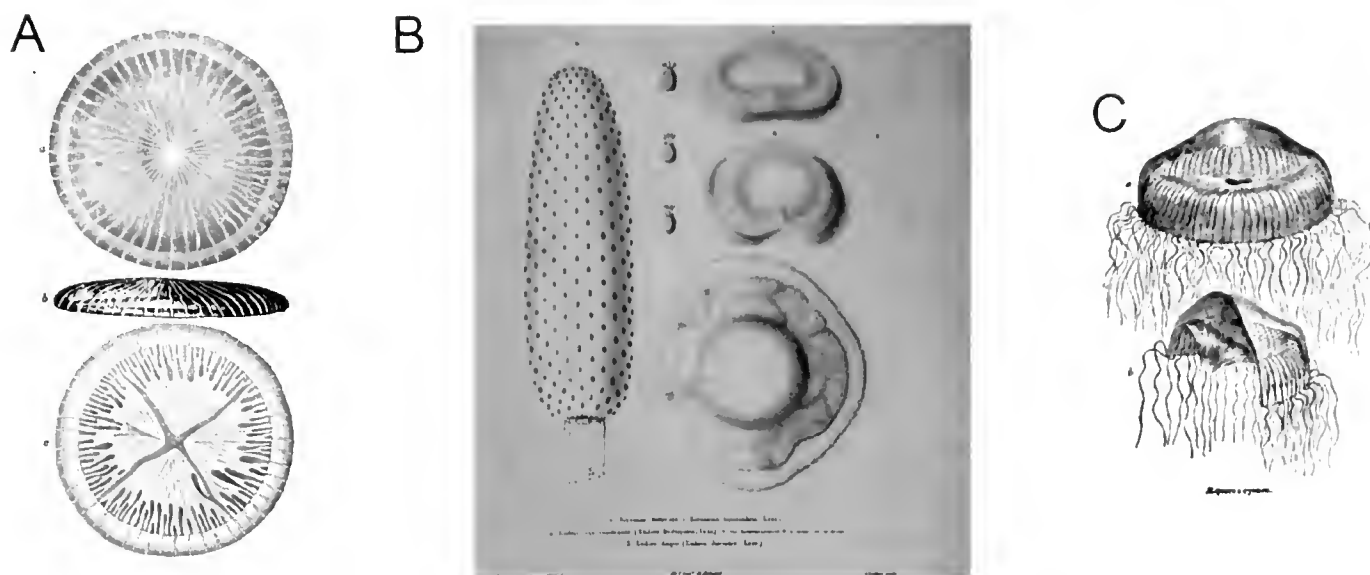


Figure 2. A. Specimen of the genus *Eudora* seen from the aboral side, in profile, and from the oral side; B. *E. hydropotes* (the two smaller specimens at top) and *E. discoides* (the large one at bottom); C. specimens of *Aequorea* (one whole specimen and one in oral–aboral section through the mouth). Note the mesogleal thickening in the apical part, resembling a delicate bell jar. Panels A and C after Long (1841:121, vol. XIX); panel B after Lesson (1830, chap. XIV, pl. 9, figs 2 and 3).

As for the name *Eudora*, it has been applied to genera in several taxonomic groups other than Cnidaria (GBIF, 2004; NZ, 2004; C. D. C. Oliveira, personal communication), including polychaetes (*Eudora* Rafinesque, 1815); mollusks (*Eudora* Gray, 1852); crustaceans (*Eudora* de Haan in Siebold, 1833, for Decapoda; *Eudora* Bate, 1856, for Cumacea), and insects (*Eudora* de Laporte in Brullé, 1840, for Coleoptera; *Eudora* Robineau-Desvoidy, 1863, for Diptera). Although *Eudora* Péron and Lesueur, 1810, is the senior homonym, the generic name is no longer used in Cnidaria (WoRMS).

For more detail, see Duperrey (1826), Lesson (1830), Souza Sobrinho (1972), and Morgat (2005).

Beagle Expedition (1831–1836)

Figure 3

History. The Voyage of the *Beagle* (1831–1836) under the British flag is one of the most widely known expeditions to pass through Brazil. Under the command of Captain Robert FitzRoy (1805–1865), the

Beagle departed Plymouth, southwest England, on 27 December 1831. Charles Robert Darwin (1809–1882), the naturalist on board, was the first to write about the sandstone and coral reefs along the coast of Pernambuco state in the northeast. Lasting nearly 5 years, this expedition passed through Brazilian waters on two occasions. On the outward leg of the voyage, the ship sailed southwestwards along the coast of Brazil towards Rio de Janeiro. En route, it passed the Arquipélago de São Pedro e São Paulo (St. Peter and St. Paul Rocks) (16 Feb 1832), Fernando de Noronha (20 Feb 1832), Pernambuco, Bahia (29 Feb 1832), and Abrolhos (18 Mar 1832), arriving in Rio de Janeiro on 4 April 1832. Members of the crew collected colonies of the hydroid family Tubulariidae while in port. On the return leg, *Beagle* traversed waters off Bahia (1 Aug 1836) and Pernambuco (12 Aug 1836) in the northeast.

Discussion. Harmer (1901) compiled a photographic report of manuscripts and data taken from the catalog of specimens orga-

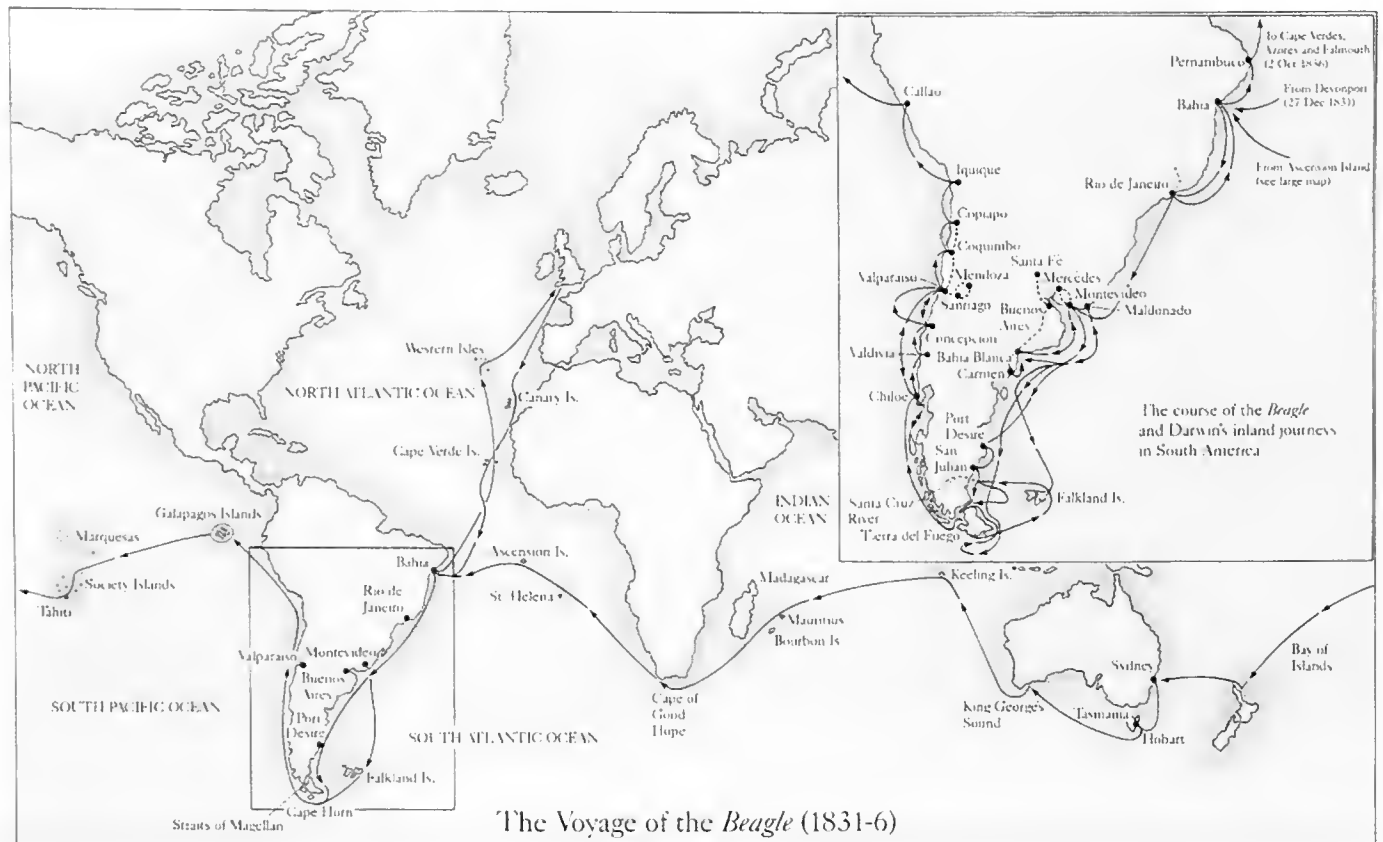


Figure 3. Route of the *Beagle* Expedition. Mayr (1993, map between pages 80 and 81), reproduced with permission.

nized by Darwin during the expedition. Darwin's catalog documented materials collected at various localities and deposited in collections. It is known, for example, that a sample collected in Rio de Janeiro during June 1832 (referred to as Nr 282), contains colonies of the hydroid families Sertulariidae and Tubulariidae. Another (from sample Nr 297) contains a fertile specimen of Sertulariidae, showing gonangia. In zoological notes and listings of specimens, Keynes (2000) alluded to a third sample containing Sertulariidae (from sample Nr 265) that was discarded by Harmer because of its extensive state of decomposition. As for material observed in Rio de Janeiro (4 Jul 1832), Darwin (1842) reported on two species of hydroids (family Tubulariidae) observed in abundance on the ship's anchor after a month in port and was struck by the rapidity of their growth. Unfortunately, the specimens were

not preserved in alcohol, as was the custom of the period (recorded in the annotations of Keynes, 2000, as "... not in spirits"). Today, hydroids are known to be among the first invertebrates to establish themselves on bacterial films in the process known as bioencrustation (Sentz-Braconnot, 1966).

For more detail, see Darwin (1871), Keynes (2000), and Rookmaaker (2009).

United States Exploring Expedition (1838–1842) Figure 4

History. On 18 August 1838, the United States Exploring Expedition, composed of six vessels (the sailing ships U.S.S. *Vincennes*, U.S.S. *Peacock*, U.S.S. *Porpoise*, U.S.S. *Relief*, U.S.S. *Flying Fish*, and U.S.S. *Sea Gull*) set sail from Norfolk, Virginia, U.S.A. The objectives of this expedition were as much commercial as scientific, with a view



Figure 4. Route of the **United States Exploring Expedition**. Philbrick (2003:xx–xxi, Preface), partially reproduced with permission.

toward expanding American influence and interests in the eastern North Pacific. Commanded by Lieutenant Charles Wilkes (1798–1877), expedition naturalists included James Dwight Dana (1813–1895), Charles Pickering (1805–1878) and Joseph Pitty Couthouy (1808–1864). While in Brazilian waters, the expedition collected at Cabo Frio, northeastern Rio de Janeiro, on 22 November 1838 and in the city of Rio de Janeiro on the following day.

Specimens identified by Dana from the United States Exploring Expedition were deposited in collections within the U.S.A., including at Peale’s Museum, the Cabinet of the Academy of Natural Sciences (now the Academy of Natural Sciences of Drexel

University in Philadelphia), and the Boston Society of Natural History (now the Museum of Science, Boston) (Dana, 1846). Only one species of hydroid was collected, described as *Tubularia ornata* Couthouy, 1846 (Fig. 5).

Discussion. The physiography of many localities mentioned in the bibliography as points of collection during some expeditions has changed over time. This is the case, for example, for collections made by the United States Exploring Expedition in Guanabara Bay, Rio de Janeiro, in November 1838 (Wilkes, 1852). The cove of Praia Grande, where some of the material was collected, is today the section of shore from Armação Hill to Gragoatá Hill in Niterói and is now a level land-filled area. Only one species of hydroid, described as *Tubularia ornata* Couthouy, 1846, was collected (*in* Dana 1846:19, vol. 7, chap. 3, fig. 1). That name of the species (Fig. 5) is no longer considered valid (WoRMS). However, *Ectopleura crocea* (L. Agassiz, 1862) is relatively common in Guanabara Bay (Absalão, 1993; Omena *et al.*, 1995) where vessels of the United States Exploring Expedition anchored on 23 November 1838. Possibly, one of the tubulariids collected some years before by the *Beagle* Expedition (1832) (see discussion of the *Beagle* Expedition above) and reported by Darwin (1842) was *E. crocea*.

See details in Dana (1846, 1849), Jenkins (1850), Wilkes (1852), Tyler (1968), and Philbrick (2003).

Eugenie Expedition (1851–1853)

Figure 6

History. At the direction of the Swedish government, the *Eugenie* Expedition left Stockholm on 24 September 1851 and came close to circumnavigating the globe. Under the command of Captain Christian Adolf Virgin (1797–1870), and with naturalist

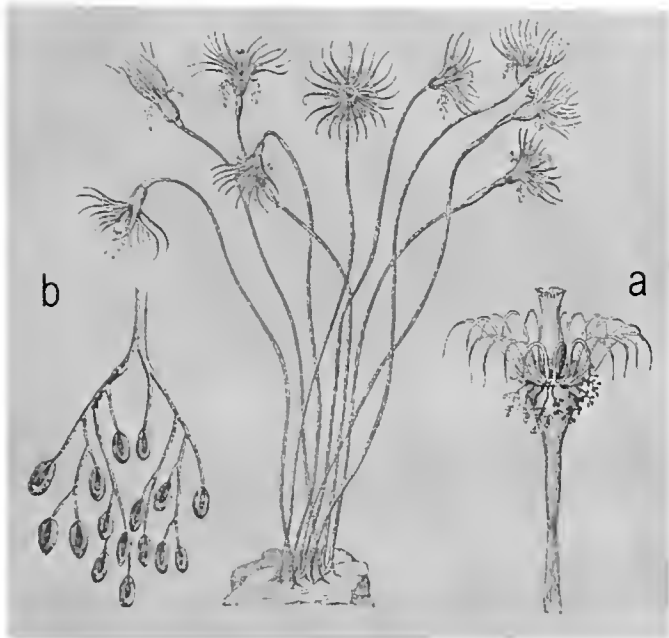


Figure 5. *Tubularia ornata* Couthouy, 1846. A. Whole polyp; B. detail of a gonophore. Based on Dana (1846:19, vol. VII, chap. III, fig. 1).

Johan Gustav Hjalmar Kinberg (1820–1908) on board, the frigate *Eugenie* sailed from Stockholm in 1851 visiting Madeira, Rio de Janeiro, Buenos Aires, the Magellan Straits, Chile, Peru, Panama, the Galapagos Islands, the Sandwich Islands, San Francisco, Tahiti, Sydney, Canton, Manila, Batavia, and the Cape of Good Hope. The frigate was at

Cabo Frio, Rio de Janeiro, in December 1851 en route to Rio Grande do Sul (off the Plate River estuary) and the Strait of Magellan. At Cabo Frio, the expedition collected the hydroids *Sertularella tenella* (Alder, 1856); *Obelia bidentata* Clark, 1875; and *Lafoea cylindrica* von Lendenfeld, 1885.

Discussion. The three hydroid species mentioned above were cited by Jäderholm (1903) as existing in the Rijksmuseum van Natuurlijke Historie in Leiden. However, the online database of the Smithsonian National Museum of Natural History lists a sample of *Sertularella tenella* Alder, 1856 (accession USNM 70696), with the same data as material at the museum in Leiden. It is possible that part of the collected sample was sent to the Smithsonian, or this may be a case of exchange of specimens between institutions. In the appendix of a paper on hydroids of the coast of São Sebastião, Brazil, Migotto (1996) questionably referred the hydroid identified as *S. tenella* by Jäderholm (1903) to *Sertularella conica* Allman, 1877. Later, Migotto *et al.* (2002) recorded *S. conica* from Rio Grande do Sul and from São Paulo to Espírito Santo states,

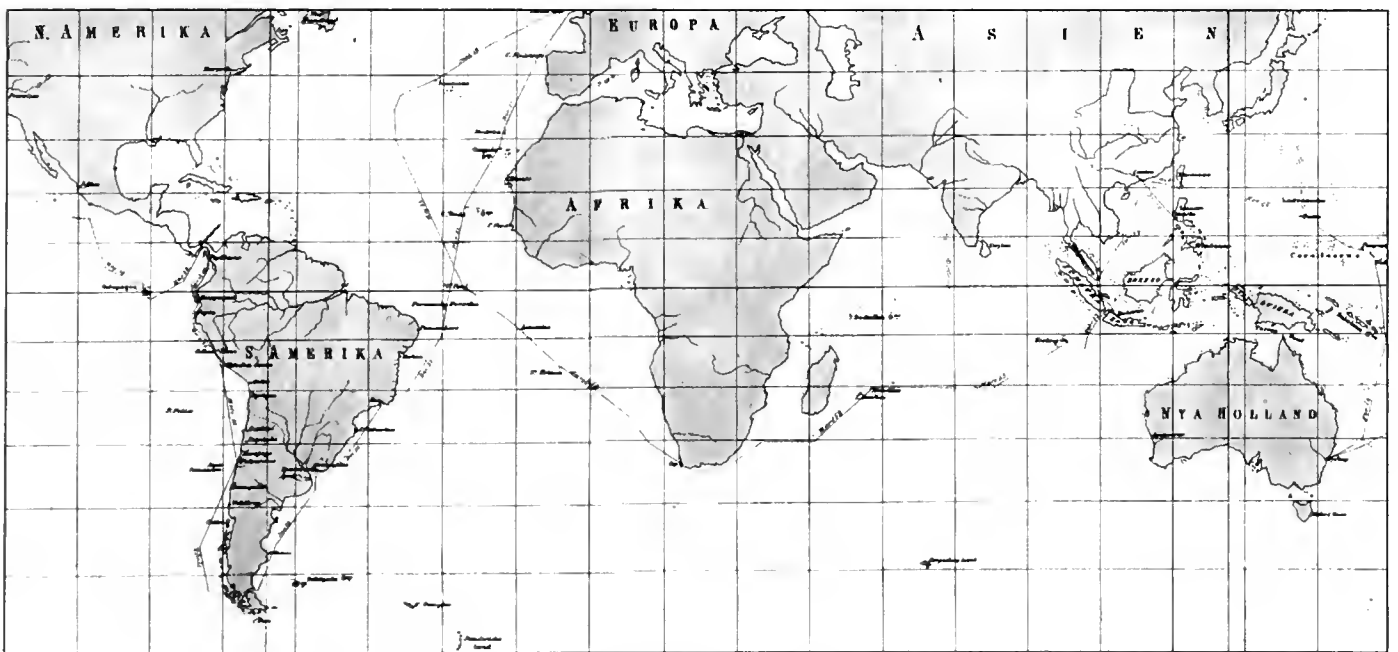


Figure 6. Route of the *Eugenie* Expedition. Skogman (1854–55).

while making no mention of the name *S. tenella*. Meanwhile, *S. tenella* has been reported from Bahia (Grohmann *et al.*, 2003) and from Rio de Janeiro (Grohmann *et al.*, 2011). Both *S. tenella* and *S. conica* are treated as valid species in WoRMS. Galea (2013:22) maintained that the hydroid identified as *S. conica* from South Carolina, U.S.A. (Calder, 1983), and Bermuda (Calder, 1991, 1993, 1998, 2000, 2013) was a new species that he renamed *Sertularella calderi*. However he, himself, regarded records of *S. conica* from Brazil as likely referable to *Sertularella peculiaris* Leloup, 1974. As for the hydroid identified as *Lafoea cylindrica* von Lendenfeld, 1885, Migotto (1996) considered it likely identical to *Hebella scandens* (Bale, 1888) and different from the true *L. cylindrica* (= *Hebellopsis cylindrica*).

For more detail, see Skogman (1854–55), and Jäderholm (1903).

Thayer Expedition (1865–1866)

Figure 7

History. The Thayer Expedition was sponsored by American financier and philanthropist Nathaniel Thayer, Jr. (1808–1883), and organized under the leadership of Louis Agassiz of Harvard College. The expedition to South America departed Boston, Massachusetts, aboard the steamship *Colorado* on 2 April 1865 and arrived in Rio de Janeiro on the 23rd of that month. Agassiz had proposed the expedition in part to recuperate from health problems and in part because of his fascination with the diversity of the fauna of Brazil after studying a collection of fish at the request of K. F. P. von Martius. Moreover, Agassiz wished to prove a theory of continental glaciation—a project later dropped—within Brazilian territory.

Under the command of Captain George Bradbury (?–?) and with the participation of other naturalists, including Joel Asaph Allen

(1838–1921) and Charles Frederick Hartt (1840–1878), the expedition collected in several states during 1865, including Rio de Janeiro (23 Apr), Espírito Santo (no exact date), Bahia (28 Jul), Alagoas (30 Jul), Pernambuco (31 Jul), Paraíba (2 Aug), Ceará (5 Aug), Maranhão (6 Aug), and Pará (10 Aug), and also passed through other inland states. This expedition collected nearly all of the species of the hydrozoan genus *Millepora* Linnaeus, 1758, that are known from Brazil: *Millepora* sp. (Maceió, Alagoas); *Millepora insignis* Verrill, 1864 (Guarapari, Espírito Santo, and Porto Seguro, Bahia); *Millepora alcicornis* var. *fenestrata* Linnaeus, 1758 (Porto Seguro, Bahia); *Millepora nitida* Verrill, 1868 (Porto Seguro, Bahia); and *Millepora boletus* Pourtalès, with no year or locality specified on the labels in the MCZ. Some minor inconsistencies in localities where the material was collected exist in the data given by Verrill (1902:197). In that work, he recognized three varieties of *M. alcicornis*: var. *cellulosa* Verrill (Rio Formoso, Pernambuco; Paraíba), var. *digitata* Esper (Rio de Janeiro, Cabo Frio; Porto Seguro and Abrolhos, Bahia; Maceió, Alagoas), and var. *fenestrata* Duchassaing and Michelotti (Abrolhos, Bahia). Verrill nevertheless suggested that when carefully studied, changes or additions might be necessary to the varieties he had recognized.

Mention should also be made that one of the participants in the expedition was William James (1842–1910). He tired of natural history collecting during the trip, eventually turned to philosophy and psychology instead, and became widely known later as “the father of American psychology.”

Discussion. One of Louis Agassiz’s objectives of the Thayer Expedition was to seek evidence that would refute the transmutation of species theory promulgated by Charles Darwin. A creationist, Agassiz’s intent was to prove that all land life would have been

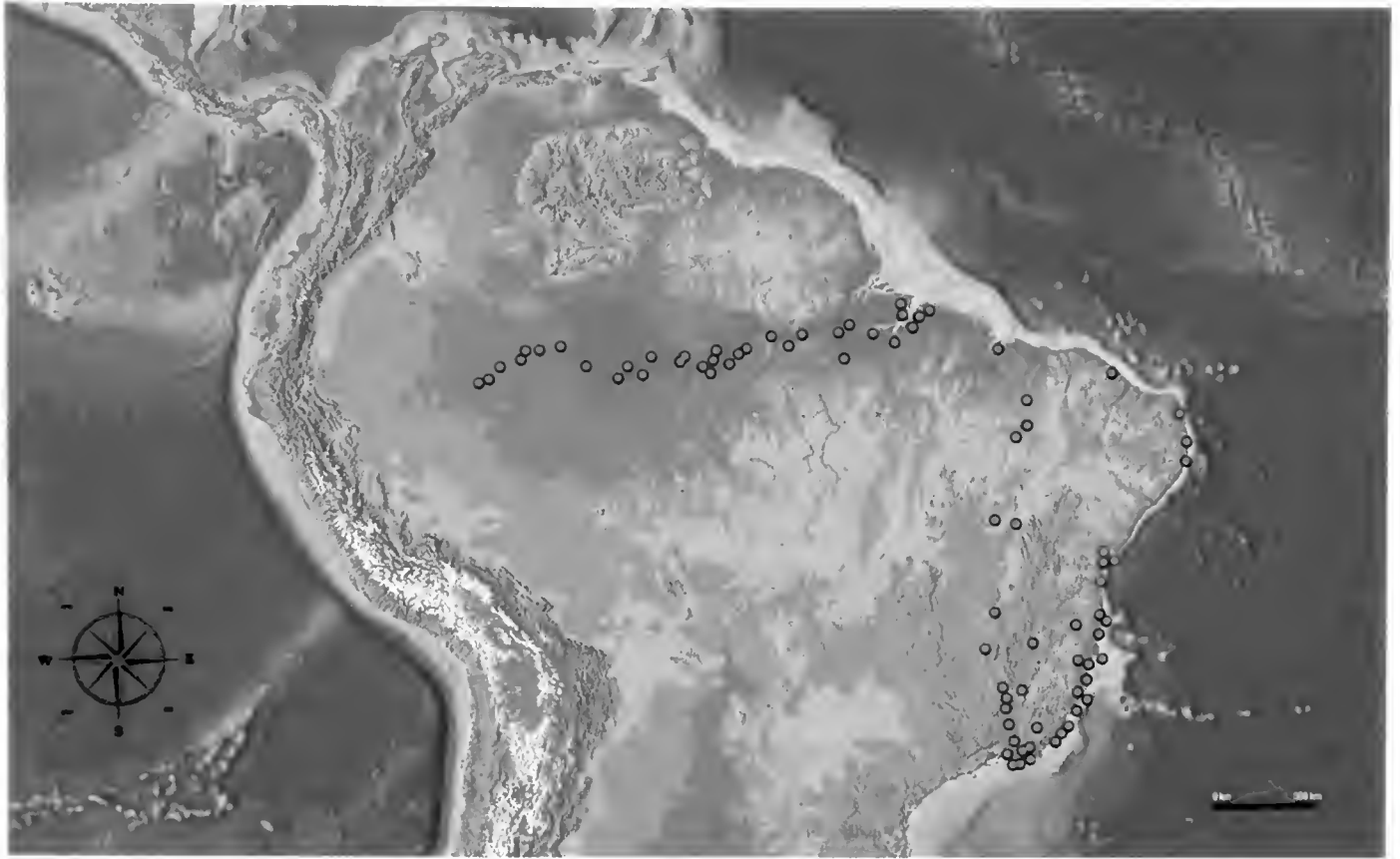


Figure 7. Stations covered by the *Thayer Expedition* in the Amazon and in the southeast (according to Higuchi, 1996). Source: MCZ, Museum of Comparative Zoology, Harvard University (http://mcz.harvard.edu/Departments/Ichthyology/expeditions_thayer_hassler.html), redrawn with permission.

destroyed by Pleistocene glaciation at sea level in the tropics. He therefore believed that the actual existence of such life could have been possible only through Divine creation. Charles Frederick Hartt, one of the expedition geologists, was skeptical about what was held to be glacial drift, a key to Agassiz's hypothesis. Hartt eventually concluded, publicly, that the supposed drift was simply material from the process of intense bedrock weathering, thereby refuting the ideas of the famous expedition leader.

This expedition without doubt collected the most hydrocorals on the coast of Brazil. The MCZ holds specimens collected by the expedition that have been identified as *Millepora alcicornis*, *M. insignis*, *M. nitida*, and *M. boletus*. In his report on milleporids from Brazil, Boshma (1962) reported *Millepora braziliensis* Verrill, 1868, *Millepora*

squarrosa Lamarek, 1816, *M. nitida*, and *M. alcicornis*. According to WoRMS, *M. insignis* has been relegated to the synonymy of *Millepora platyphylla* Hemprich and Ehrenberg, 1834. *Millepora boletus*, a species attributed to Pourtalès, is not cited in recent lists of enidarians from Brazil and was not found in any of the synonymy lists of other species. It is not listed in WoRMS and appears never to have been formally described and named. Support for this hypothesis is based on the fact that no description of it could be found in any bibliography. According to Hartt (*in* Agassiz and Hartt, 1870), Verrill distinguished three forms of the genus *Millepora* Linnaeus, 1758, along the Brazilian coast: *M. alcicornis* Linnaeus, 1758; *M. braziliensis* Verrill, 1868; and *M. nitida* Verrill, 1868. More recently, Amaral *et al.* (2002) recognized four distinct species in

Brazil: *M. alcicornis*, *M. braziliensis*, *M. nitida*, and an undescribed species referred to as *Millepora* sp. a Amaral *et al.*, 2002. In that article, the authors suggest that the Caribbean species *M. squarrosa* is distinct from *M. braziliensis*. Amaral *et al.* (2008) subsequently published an overview of Brazilian Milleporidae, finally describing and naming the new species as *Millepora laboreli* Amaral, 2008. It is possible that this species corresponds to *M. boletus*, the undescribed species attributed to Pourtalès (see above).

See details in Agassiz and Agassiz (1868), Agassiz and Hartt (1870), Dick (1977), and Higuchi (1996).

Challenger Expedition (1873–1876) Figure 8

History. The renowned *Challenger* Expedition of 1873–1876, conceived by two great British biologists, William Benjamin Carpenter (1813–1885) and Sir Charles Wyville Thomson (1830–1882), was financed by the British Treasury. The prime objective was to prove that life existed in the deep sea, notwithstanding the great pressures, the cold, and the lack of light, although investigations were also undertaken on the chemistry, geology, and physics of the open ocean. To carry out the mission, the corvette H.M.S. *Challenger* was selected. Modifications were made in its structure to facilitate the work of the scientists, including construction of a chemistry laboratory on board. The expedition was commanded by Captains Sir George Strong Nares (1831–1915) and Frank Tourle Thomson (1829–1884). The team of scientists included Sir Charles Wyville Thomson himself as well as John Murray (1841–1914), John Young Buchanan (1844–1925), Henry Nottidge Moseley (1844–1891), and Rudolf von Willemoes-Suhm (1847–1875). The expedition passed through Brazil in 1873, its route

passing the Arquipélago de São Pedro e São Paulo (28 Aug), Fernando de Noronha (2 Sep), Pernambuco (9 Sep), Alagoas (11 Sep), Sergipe (12 Sep), and Bahia (14 Sep). Hydroids (other than hydrocorals) of the expedition were examined by George James Allman (1812–1898), a leading 19th century specialist of the group (Calder, 2015). Of all expeditions reviewed here, the largest collection of hydroids from Brazil was obtained by naturalists of the *Challenger*.

Specimens were deposited in the British Museum (Natural History) (now the Natural History Museum, London) (Allman, 1883, 1888). Among the species identified were *Aglaophenia calamus* Allman, 1883; *Campanularia ptychocyathus* Allman, 1888; *Desmoscyphus acanthocarpus* Allman, 1888; *Desmoscyphus obliquus* Allman, 1888; *Desmoscyphus pectinatus* Allman, 1888; *Idiapristis* Lamouroux, 1816; *Lytocarpus racemiferus* Allman, 1883; *Sertularia cylindritheca* Allman, 1888; *Sertularia integritheca* Allman, 1888; and *Thyrosocyphus ramosus* Allman, 1877, all in Bahia; *Halicornaria plumosa* Allman, 1883, and *Stylaster duchassaingii* Pourtalès, 1867, at Barra Grande, Alagoas; and *Thuiaria hyalina* Allman, 1888, in Sergipe.

Discussion. Names of most of the species mentioned in all expeditions treated here have changed since their reports were published in the late 19th and early 20th centuries. *Aglaophenia calamus* Allman, 1883, was treated by Migotto (1996) as a species of doubtful status. Allman (1883:39) had remarked that it differed little from typical aglaopheniids. Meanwhile, Vervoort and Watson (2003:261) considered *A. calamus* to be conspecific with *Aglaophenia pluma* (Linnaeus, 1758). For now, *A. calamus* is listed in the WoRMS database as a valid species. Not listed in WoRMS is *Campanularia ptychocyathus* Allman, 1888, considered synonymous with *Clytia nolifor-*

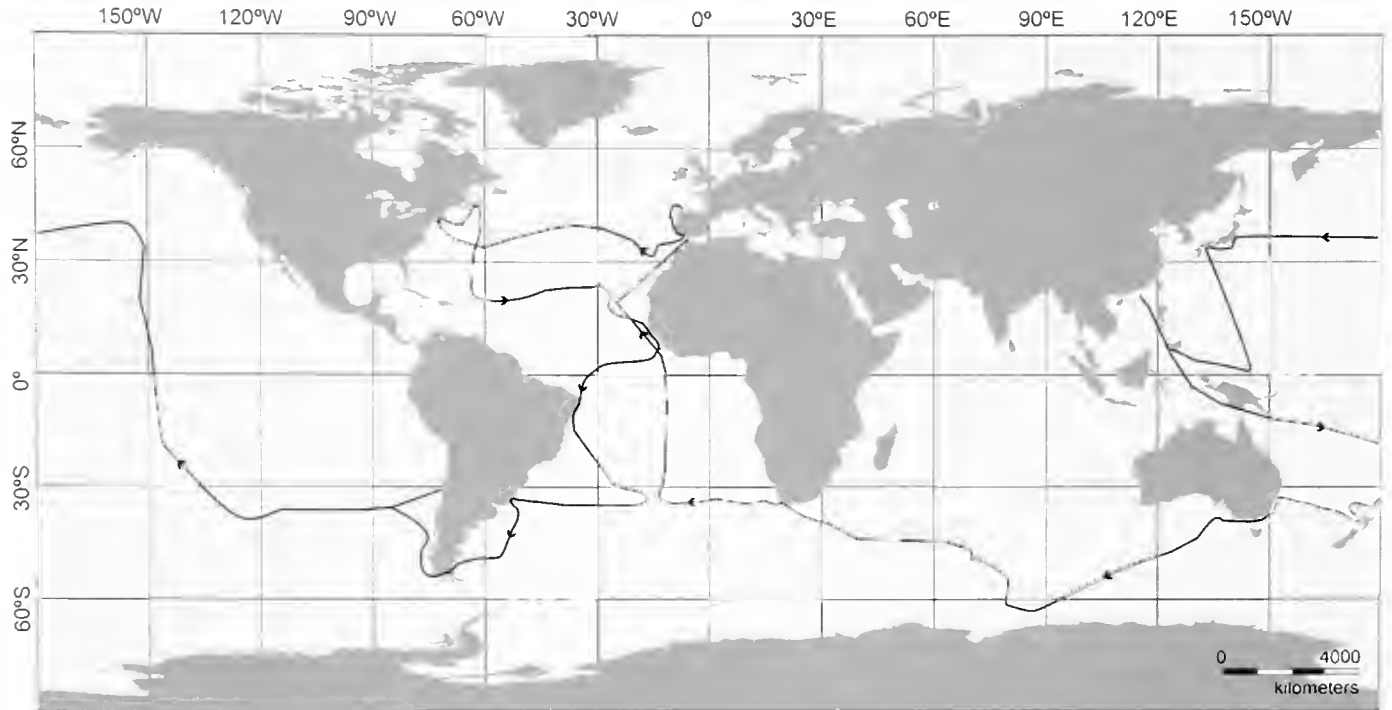


Figure 8. Route of the *Challenger Expedition*. Perry and Fautin (2003), redrawn with permission.

mis (McCrary, 1859) by Migotto (1996) but not by Calder (1991:68, 2015:236). As for the species that Allman (1888) assigned to the genus *Desmoscyphus*, *D. acanthocarpus* is referable to *Diphasia digitalis* (Busk, 1852), *D. pectinatus* is referable to *Tridentata marginata* (Kirchenpauer, 1864), although WoRMS considers this species *Sertularia marginata* (Kirchenpauer, 1864). *Desmoscyphus obliquus* is likely referable to the same species. *Idia pristis* Lamouroux, 1816; *Lytocarpus racemiferus* Allman, 1883; and *Sertularia cylindritheca* Allman, 1888, are now assigned to different genera, being known respectively as *Idiellana pristis* (Lamouroux, 1816), *Macrorhynchia racemifera* (Allman, 1883), and *Sertularelloides cylindritheca* (Allman, 1888) (Migotto, 1996; Migotto *et al.*, 2002; Bouillon *et al.*, 2004; Galea, 2013). Allman (1888:85–87) considered the diagnosis of *Idiellana pristis* by Lamouroux to be “... short and inadequate,” so a new description was provided. As for *Sertularia integritheca* Allman, 1888, it was included in the synonymy of *Sertularella formosa* Fewkes, 1881, by Migotto

(1996), then referred to the genus *Synthecium* Allman, 1872, as *Synthecium formosum* (Fewkes, 1881) by Migotto *et al.* (2002) and is now assigned to the genus *Hincksella* Billard, 1918, as *Hincksella formosa* (Fewkes, 1881) (see WoRMS). The name *Halicornaria plumosa* Allman, 1883, is an invalid junior homonym of *Halicornaria plumosa* Armstrong, 1879, and the name *Gymnangium allmanii* (Marktanner-Turneretscher, 1890) has been applied to the species (see WoRMS, although it is currently misspelled therein as *G. allmani*). Finally, the name *Thuiaria hyalina* Allman, 1888, has long been considered a synonym of *Sertularella diaphana* Allman, 1885 (see Migotto, 1996).

According to Cairns (1986:2, 73), a record of the stylasterid *Stylaster duchassaingi* collected at station 122 at a depth of 732 m is referred to as “... one dubious record, strongly queried.”

See details in Thomson and Murray (1885), Allman (1883, 1888), and Rehbock (1992).

U.S. Fish Commission Steamer *Albatross*
Expedition (1887–1888)

History. Constructed in 1882, the *Albatross* was the first ship designed and built especially for marine research. Equipped with on-board laboratories, deep-sea dredging gear, and hydrographic instruments, it was the first ship belonging to the American government to have electric lighting installed. During four decades of service, it sailed across the North and South Atlantic, North and South Pacific, and Indian oceans. Its expeditions resulted in huge museum collections and a massive number of scientific publications and is the oceanographic vessel to which is attributed the largest number of newly described marine species. During the 1877–1878 expedition, which sailed around the southern tip of South America to California, its commander was Captain Zera Luther Tanner (1835–1906), and the naturalist in charge was Leslie Alexander Lee (1852–1908). Localities sampled by the *Albatross* Expedition in Brazil during 1887 included Ceará (14 Dec), Paraíba (16 Dec), Bahia (18 Dec), Abrolhos (27 Dec), and Cabo Frio, Rio de Janeiro (30 Dec). Collecting efforts for cnidarians concentrated largely on Anthozoa (Octocorallia and Hexacorallia), and only one hydrozoan, identified as *Thyroscyphus* sp., taken at João Pessoa, Paraíba, is recorded.

For more detail, see Allard (1999).

Scottish National (*Scotia*) Antarctic
Expedition—SNAE (1902–1904)
Figure 9

History. Organized by naturalist William Speirs Bruce (1867–1921), this expedition left Troon, Scotland, on 2 November 1902. On board the ship S.Y. *Scotia*, commanded by Captain Thomas Robertson (1855–1918), the expedition objective was to increase knowledge of the Antarctic region. The

SNAE succeeded in building the first meteorological station, named Omond House, on the Antarctic continent. During its passage off Pernambuco, it was the first to take photographs of the Arquipélago de São Pedro e São Paulo.

Brazilian hydroid material collected by this expedition was limited to a single station (#81), sampled at Abrolhos, Bahia (20 Dec). The collection, deposited at the Royal Scottish Museum (now the National Museum of Scotland, Edinburgh), was examined and identified by James Ritchie (1882–1958). Taxa collected included *Aglaophenia allmani* Nutting, 1900; *Aglaophenia dubia* Nutting, 1900; *Aglaophenia minima* Nutting, 1900; *Halicornaria longicauda* Nutting, 1900; *Monostaechas quadridens* (McCrary, 1859), *Sertularia cornicina* (McCrary, 1859), *Sertularia heterodonta* Ritchie, 1909; and *Sertularia rathbuni* Nutting, 1904 (Ritchie, 1909).

Discussion. Again, changes have subsequently been made in the names of some of these species. *Aglaophenia allmani* is now referred to the genus *Macrorhynchia* Kirchenpauer, 1872, as *Macrorhynchia allmani* (Nutting, 1900) (see Migotto, 1996; Migotto *et al.*, 2002; WoRMS). *Aglaophenia minima* is a synonym of *Aglaophenia latecarinata* Allman, 1877 (WoRMS). The name *Halicornaria longicauda* is currently assigned to the genus *Gymnangium* Hincks, 1874, and taken to be a synonym of *G. allmani* (Marktanner-Turneretscher, 1890). The species has recently been redescribed by Galea (2013). *Sertularia cornicina* is usually regarded as identical with *Dynamena disticha* (Bosc, 1802) (see Migotto, 1996). *Sertularia heterodonta* is conspecific with *Tridentata distans* (Lamouroux, 1816); a syntype of the species exists in the BMNH, with a photograph from the catalog in the online database of the collection. *Sertularia rathbuni* is a synonym of *Dynamena dalmasi* (Versluys, 1899)

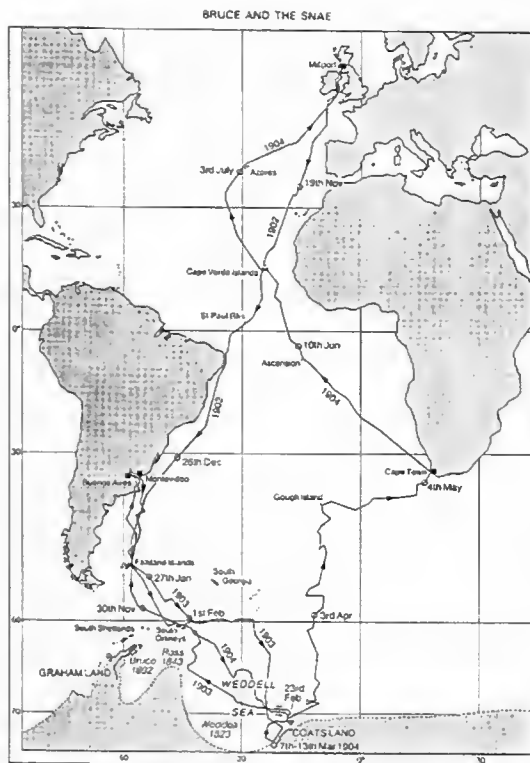


Figure 3 Track chart of the Scott 1902-1904

Figure 9. Route of the **Scottish National Antarctic Expedition**. Speak (1992), reproduced with permission.

(see Migotto, 1996; Migotto *et al.*, 2002; WoRMS).

See details in Ritchie (1907, 1909), and Speak (1992).

British Antarctic (*Terra Nova*) Expedition (1910–1913)

History. On 1 June 1910, this expedition left London for Wales, setting out from Cardiff on 15 June aboard S.S. *Terra Nova*. The prime goal of expedition leader Robert Falcon Scott (1868–1912) was to be the first to reach the South Pole. Associates Edward Adrian Wilson (1872–1912), Denis Gascoigne Lillie (1888–1963), and Edward William Nelson (1883–1923) were given responsibility for scientific aspects of the expedition. Scott soon discovered that he would have to contend with noted Norwegian explorer Roald Englebregt Gravning

Amundsen (1872–1928) to be first to reach the pole. Off Brazil, en route to Antarctica, *Terra Nova* cruised along the coast off Rio de Janeiro and the Trindade and Martim Vaz archipelago.

The misfortune of the expedition at its final destination is well known. After successfully reaching their intended destination in Antarctica, Scott and four companions discovered to their great dismay that Amundsen had reached the South Pole a month earlier. Tragically, all five died during their attempt to return to the expedition's base.

An archive of photographs from this expedition is deposited at the Scott Polar Research Institute of Cambridge University in England.

The localities sampled in Brazil were Ilha da Trindade (26–30 Jul 1910), Espírito Santo, and Rio das Ostras (2 May 1913), Rio de Janeiro. However, the species *Liriope tetraphylla* (Chamisso and Eysenhardt, 1821), collected by the *Terra Nova* and deposited in the BMNH, is without exact locality data.

Discussion. A majority of the cnidarian specimens collected by the British Antarctic Expedition were sea anemones (Anthozoa). Data for the hydromedusa *L. tetraphylla* collected during the expedition were obtained through searches made in the BMNH (under accession 1970.10.8.76–78 and 1970.10.8.89–100), although this information is absent from the listing by Totton (1930).

See details in Jones (2005).

Hartt Expedition (1875–1877)

History. As a result of his participation in the *Thayer* Expedition, geologist Charles Frederick Hartt became engrossed with Brazil and its geology. As a youth growing up in Nova Scotia, Canada, he had learned Portuguese from an immigrant shoemaker,

facilitating his work in the South American country. He returned in 1867 to undertake investigations on geology of the Bahia region and its coral reefs. Thereafter, Brazil became the focus of his research, and he returned to the country several times while on the faculty of Cornell University, Ithaca, New York, U.S.A. Hartt organized a series of voyages and traversed the coast of several Brazilian states in what became known as the *Hartt Expedition*. Recognizing the great need of a geological survey of the country, Hartt was instrumental in the founding, in April 1875, of the *Comissão Geológica do Império do Brasil*, with its headquarters in the city of Rio de Janeiro, and he was named its director. From the state of Rio de Janeiro, where he temporarily settled with his family (from 1875 to 1877, according to Brice and Figueirôa, 2003:19), Hartt and his team of researchers carried out geological explorations across the rest of the country. His contributions to geology in Brazil were carried on by noteworthy students he had influenced to undertake investigations there, such as John Casper Branner (1850–1922), Orville Adalbert Derby (1851–1915), and Richard Rathbun (1852–1918) (Menezes, 1878; Brice and Figueirôa, 2003). His team was also composed of a few Brazilian collaborators, such as the engineers Elias Fausto Pacheco Jordão (1849–1901) and Francisco José de Freitas (?–?), and the photographer Marc Ferrez (1843–1923). With his colleagues, Hartt explored the country from north to south (Amazonas to Rio Grande do Sul), dedicating at least 12 of his 38 years of life to studies of Brazilian natural history. Given his professional background, his interests in Brazil mainly involved the geology, paleontology, archeology, and physical geography of the country. Nevertheless, in the research project presented to the Brazilian government, 12 items were to be undertaken. One of them

(the ninth article) was directed to the study of marine animals—the stony corals—stating (when translated into English): “The investigation of useful and harmful animals to man, and the study of stony coral reefs to determine their structure, their mode and speed of development, their position, their extent, and their potential obstruction of ports and navigable channels (Menezes 1878: 36).”

As Hartt became ill in early 1877, work began to progress more slowly. Nevertheless, his collection by that time comprised approximately 500,000 specimens housed in an improvised house in Rio de Janeiro. By late 1877, however, finances of the Imperial Government were so dire that the ministry had to restrict public funding, and cuts were made to all nonessential spending. Seeing little immediate economic benefit and few published results, funding of the commission was reduced and then, by January 1878, finally cancelled. In early 1878, Hartt contracted yellow fever and died in a rooming house in Rio de Janeiro on 18 March at age 38, surrounded by members of his commission. A few months earlier, his family had returned to the U.S.A.

The available bibliography on the Hartt Expedition cites only the localities sampled on the coast, without mentioning dates or coordinates of the collections. The same is true for labels consulted from the museums where the material is deposited. The Hartt team visited Rio de Janeiro, where the coral-like anthothecates *Stylaster roseus* (Pallas, 1766) and *Millepora* sp. were collected. Also visited were Pernambuco, at Maria Farinha, Santo Aleixo, Rio Formoso, and Recife de Candeias. Elsewhere, at Paraíba, Alagoas (Maceió), and Bahia (Mar Grande, Itacaranha, and Periperi), most material collected was of true corals (Anthozoa, Scleractinia). Additional sampling was undertaken on the continental shelf and at Abrolhos. In Peri-

peri the expedition collected the aglaopheniid hydroid *Lytocarpus philippinus* Kirchenpauer, 1872 [= *Macrorhynchia philippina* (Kirchenpauer, 1872)]. As the data on biological material cited here were obtained by checking museum labels [online databases of the NMNH and YPM (see Appendix Table I)], no formal discussion of the data is needed.

For more detail, see Menezes (1878), Freitas (2002), and Kern (2011).

Summary of the Expeditions

With the passage of time, ongoing “progress” can be noted relative to the types of vessels used on expeditions. The earliest vessels were sailing ships, such as *La Coquille*, the *Beagle*, and ships of the United States Exploring Expedition. In succeeding decades, steamships such as the *Colorado*, used on the *Thayer* Expedition, appeared. Later, H.M.S. *Challenger* was specially modified and equipped for dredging in deep water, with a laboratory for the convenience of its scientists. The *Albatross* was the first ship designed and constructed especially for the purpose of marine research: it possessed a laboratory, deep-sea dredging gear, and modern hydrographic instruments, and was the first American ship with electric lighting in its facilities. Onboard reports of the expeditions also continually improved, with the inclusion of new data (e.g., coordinates and depth), as well as greater precision and more defined objectives.

Materials obtained by these expeditions constituted the first contributions to knowledge of the “Radiata” (a polyphyletic group recognized at the time that included Cnidaria, Ctenophora, and Echinodermata) from Brazil. Samples obtained during *l'Expédition de La Coquille* included four cnidarians (two scyphozoans; one hydrozoan, thought at the time to be a scyphozoan; one anthozoan).

Collections by the United States Exploring Expedition yielded one hydrozoan and six anthozoans (two octocorals and four hexacorals) in samples from Rio de Janeiro. Three species of hydrozoans were recorded from Rio de Janeiro by the *Eugenie* Expedition. Reports from the *Thayer* Expedition documented the most species of milleporids (five species), along with eight anthozoans. The largest collection of cnidarians was obtained by the *Challenger* Expedition, with 13 species of hydrozoans and 15 of anthozoans.

Increasing richness of resulting collections as years advanced appears to correlate at least in part with improvements in the vessels and their sampling gear. However, most of the expeditions simply passed along the Brazilian coast en route to other areas, and their exploration objectives, sampling efforts, and interests of participating naturalists varied. As for hydroids, many of which are fragile and easily overlooked, effectiveness of sample sorting becomes an issue in their discovery.

Critical Evaluation

Discoveries of hydroids and medusae during expeditions of the 19th and early 20th centuries through Brazilian waters provided initial contributions to knowledge of Hydrozoa in the country. These obscure invertebrates were totally unknown in the region at the time. Reports on them, especially Allman's (1883, 1888) accounts of species from the *Challenger* Expedition, provided a foundation for later taxonomic studies. Moreover, discoveries of a number of new species in Brazil, a country almost totally uncharted and unexplored at the time and covering a large geographic area, were of significance overall to science.

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APPENDIX TABLE 1. TAXA COLLECTED DURING SEVERAL EXPEDITIONS, WITH DATES OF THE COLLECTIONS, LOCALITIES, STATIONS WITH COORDINATES, DEPTHS, MUSEUMS WHERE SAMPLES ARE HOUSED, CATALOG NUMBERS, AND SOURCES OF THE DATA.

Expedition	Taxon assigned at the time	Date	Locality	Station	Lat	Long	Depth	Museum	Cat. nr	Source
La Coquille Exp. (1822-1825)	<i>Eudora rosacea</i>	17/Oct./1822	Santa Catarina							Lesson, 1830:128
Beagle Exp. (1831-1836)	<i>Sertulariidae</i>	Jun./1832	Rio de Janeiro, RJ							Harmer, 1901
	<i>Tubulariidae</i>	Jun./1832	Rio de Janeiro, RJ							Harmer, 1901
	<i>Tubulariidae</i>	04/Jul./1832	Rio de Janeiro, RJ		22° 58' S	43° 10' W				Darwin, 1842; Keynes, 2000; Rookmaaker, 2009 Dana, 1846
United States Exploring Exp. (1838-1842)	<i>Tubularia ornata</i>		Rio de Janeiro							
Eugenie Exp. (1851-1853)	<i>Sertularella tenella</i>	Dec./1851	Cabo Frio, RJ		22°47' S	41°27' W	30 fms	NMNH Smithsonian	USNM 70696	NMNH label; Jäderholm, 1903
	<i>Lafaea cylindrica</i>	Dec./1851	Cabo Frio, RJ		22°47' S	41°27' W	30 fms	Rijksmuseum		Jäderholm, 1903
	<i>Obelia bidentata</i>	Dec./1851	Cabo Frio, RJ		22°47' S	41°27' W	30 fms	Rijksmuseum		Jäderholm, 1903
Thayer Exp. (1865-1866)	<i>Millepora</i> sp	30/Jul./1865	Maceió, AL	# 058	9° 40' 0" S	35° 44' 0" W		MCZ Harvard	IZ 59413	MCZ label; Higuchi, 1996
	<i>Millepora insignis</i>	1866	Porto Seguro, BA	# 102	16° 25' 0" S	39° 7' 0" W		MCZ Harvard	IZ 59379	MCZ label; Higuchi, 1996
	<i>Millepora alicarmis</i> var <i>fenestrata</i>	1866	Porto Seguro, BA	# 102	16° 25' 0" S	39° 7' 0" W		MCZ Harvard	IZ 59429	MCZ label; Higuchi, 1996
	<i>Millepora nitida</i>	1866	Porto Seguro, BA	# 102	16° 25' 0" S	39° 7' 0" W		MCZ Harvard	IZ 59394	MCZ label; Higuchi, 1996
	<i>M. nitida</i>	1866	Porto Seguro, BA	# 102	16° 25' 0" S	39° 7' 0" W		MCZ Harvard	IZ 16594	MCZ label; Higuchi, 1996
	<i>Millepora insignis</i>	1866	Porto Seguro, BA	# 102	16° 25' 0" S	39° 7' 0" W		MCZ Harvard	IZ 59378	MCZ label; Higuchi, 1996
	<i>Millepora</i> sp	1866	Porto Seguro, BA	# 102	16° 25' 0" S	39° 7' 0" W		MCZ Harvard	IZ 59570	MCZ label; Higuchi, 1996
	<i>Millepora insignis</i>	1865	Guarapari, ES	# 035	20°39' S	40°31' W		MCZ Harvard	IZ 59381	MCZ label; Higuchi, 1996
	<i>Cnidaria</i>	May/1865	Rio de Janeiro		22°53' S	43°17' W		MCZ Harvard	IZ 50575	MCZ label; Higuchi, 1996
	<i>Cnidaria</i>	May/1865	Rio de Janeiro		22°53' S	43°17' W		MCZ Harvard	IZ 50573	MCZ label; Higuchi, 1996
	<i>Millepora boletus</i>	iv 1865-vii.1866	Brazil					MCZ Harvard	IZ 58934	MCZ label
Challenger Exp. (1873-1876)	<i>Halicormaria plumosa</i>	10/Sep./1873	Barra Grande/AL	#122b	9° 9' S	34° 53' W	32 fms			Allman, 1883
	<i>Syloster auchassangi</i>	10/Sep./1873	Barra Grande/AL	#122c	9° 5' S	34° 50' W	400 fms			Moseley, 1881
	<i>Thularia hyalina</i>	12/Sep./1873	Sergipe	#126	10°46' S	36°2' W	700-770 fms			Allman, 1888
	<i>Aglaophenia colimus</i>	14-28/Sep./1873	Bahia	#128	13° 6' S	38°7' W	10-20 fms	BNHM	1956.10.23.26	BNHM label; Allman, 1883
	<i>Campularia ptychocystus</i>	14-28/Sep./1873	Bahia	#128	13° 6' S	38°7' W	10-20 fms			Allman, 1888
	<i>Desmascyphus pectinatus</i>	14-28/Sep./1873	Bahia	#128	13° 6' S	38°7' W	10-20 fms	BNHM	1957.3.1.20	BNHM label; Allman, 1888
	<i>Desmascyphus obliquus</i>	14-28/Sep./1873	Bahia	#128	13° 6' S	38°7' W	10-20 fms	BNHM	1957.3.1.13	BNHM label; Allman, 1888

APPENDIX TABLE I. CONTINUED.

<i>Desmocyphus acanthocarpus</i>	14-28/Sep/1873	Bahia	#128	13° 6' S	387° W	10-20 fms	8NHM	1957.1.3.29	Allman, 1888
<i>Idia pristi</i>	14-28/Sep/1873	Bahia	#128	13° 6' S	387° W	10-20 fms	8NHM	1956.10.23.41	8NHM label; Allman, 1888
<i>Lytocarpus racemiferus</i>	14-28/Sep/1873	Bahia	#128	13° 6' S	387° W	10-20 fms	8NHM	1956.10.23.96	BNHM label, Allman, 1888
<i>Sertularia cylindrica</i>	14-28/Sep/1873	Bahia	#128	13° 6' S	387° W	10-20 fms	8NHM	1910.10.21.9	8NHM label; Allman, 1888
<i>Sertularia integritheca</i>	14-28/Sep/1873	Bahia	#128	13° 6' S	387° W	10-20 fms	8NHM		BNHM label, Allman, 1888
<i>Thyrosocyphus ramosus</i>	14-28/Sep/1873	Bahia	#128	13° 6' S	387° W	10-20 fms	8NHM		Allman, 1888
<i>Thyrosocyphus sp.</i>	16/Dec/1887	João Pessoa, PB	#2757	06° 59' 00" S	34° 47' 0" W	20 fms	NMNH Smithsonian	USNM 28755	NMNH label
<i>Sertularia comicina</i>	20/Dec./02	Abrilhos, BA	# 81	18° 24' S	37° 58' W	36 fms			Ritchie, 1909
<i>Sertularia heterodonta</i>	20/Dec./02	Abrilhos, BA	# 81	18° 24' S	37° 58' W	36 fms	BNHM	1956.9.25.3	BNHM label, Ritchie, 1909
<i>Sertularia rathbuni</i>	20/Dec./02	Abrilhos, BA	# 81	18° 24' S	37° 58' W	40-50 fms			Ritchie, 1909
<i>Monastoechnus quadrens</i>	20/Dec./02	Abrilhos, BA	# 81	18° 14' S	37° 58' W	36 fms			Ritchie, 1909
<i>Aglaophenia allmani</i>	20/Dec./02	Abrilhos, BA	# 81	18° 14' S	37° 58' W	36 fms			Ritchie, 1909
<i>Aglaophenia dubia</i>	20/Dec./02	Abrilhos, BA	# 81	18° 14' S	37° 58' W	36 fms			Ritchie, 1909
<i>Aglaophenia minima</i>	20/Dec./02	Abrilhos, BA	# 81	18° 24' S	37° 58' W	36 fms			Ritchie, 1909
<i>Halicarnana longicauda</i>	20/Dec./02	Abrilhos, BA	# 81	18° 14' S	37° 58' W	36 fms			Ritchie, 1909
<i>Liriope tetraphylla</i>	1910-1913	Brazil	plankton				8NHM	1970.10.8.76-78	8NHM label
<i>L. tetraphylla</i>	1910-1913	Brazil	plankton				BNHM	1970.10.8.89-100	BNHM label
<i>Millepora sp.</i>	1875	Rio Formoso, PE					YPM	YPM IZ 004525	YPM label
<i>Styloster roseus</i>		Rio Formoso, PE					NMNH Smithsonian	USNM 10908	NMNH label
<i>Lytocarpus philippinus</i>	1876	Periperi, BA					NMNH Smithsonian	USNM 18695	NMNH label
<i>Lytocarpus philippinus</i>	1876	Periperi, BA					NMNH Smithsonian	USNM 16506	NMNH label
<i>Hydrada</i>	1876	Rio de Janeiro		22.38	-40				
<i>Hyarada</i>	1876	Rio de Janeiro					YPM	YPM IZ 036156	YPM label

USS Albatross Exp.
(1887-1888)SNAE Exp.
(1902-1904)British Antarctic
"Terra Nova" Exp.
(1910-1913)Hartt Exp.
(1875-77)(rocky shores/
shallow waters)

APPENDIX TABLE II. TAXONOMIC LEVEL OF THE VARIOUS SPECIES COLLECTED, WITH EMPHASIS ON CURRENT CLASSIFICATION, IN ACCORDANCE WITH EXPEDITIONS ON WHICH MATERIAL WAS COLLECTED, THE SOURCES OF THE DATA, AND THEIR TYPE STATUS

Order	Subclass	Family	Species (Current Authority)	Previous Identification	Type Status	Expedition	Sources of Synonymy		
Anthomedusae	Capitata	Tubulariidae	<i>Ectopleura crocea</i> (L. Agassiz, 1862)	<i>Tabularia ornata</i>		U. S. Exploring	Imazu <i>et al.</i> , 2014; WoRMS		
			<i>Millepora nitida</i> Verrill, 1868	<i>Millepora nitida</i>		Thayer	Migotto <i>et al.</i> , 2002; WoRMS		
		Milleporidae		<i>Millepora alvicornis</i> Linnaeus, 1758	<i>Millepora alvicornis</i> var. <i>fenestrata</i>		Thayer	Migotto <i>et al.</i> , 2002; WoRMS	
				<i>Millepora platyphylla</i> Hemprich and Ehrenberg, 1834	<i>Millepora insignis</i>		Thayer	WoRMS	
				unknown	<i>Millepora boletus</i> Stylaster		Thayer	in MCZ data Cairns, 1986; WoRMS	
		Leptomedusae	Conica	Stylasteridae	<i>Stylaster duchassaingi</i> Pourtales, 1867	<i>Stylaster duchassaingi</i>		<i>Challenger</i>	
				Aequoreidae	? <i>Aequorea forskalea</i> Péron and Lesueur, 1810	<i>Endora rosacea</i>		<i>La Coquille</i>	
				Aglaopheniidae	<i>Aglaophenia plumia</i> (Linnaeus, 1758)	<i>Aglaophenia calanus</i>	Holotype at BMNH	<i>Challenger</i>	Vervoort and Watson, 2003; WoRMS
					<i>Aglaophenia dubia</i> Nutting, 1900	<i>Aglaophenia dubia</i>		Scottish Nat. Ant.	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
						<i>Aglaophenia latecariuata</i> Allman, 1877	<i>Aglaophenia minima</i>		Scottish Nat. Ant.
<i>Gymnangium allmani</i> (Marktanner-Turneretscher, 1890)	<i>Halicornaria plumosa</i>						<i>Challenger</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS	
<i>Gymnangium allmani</i> (Marktanner-Turneretscher, 1890)	<i>Halicornaria longicauda</i>						Scottish Nat. Ant.	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS	
				<i>Macrorhynchia allmani</i> (Nutting, 1900)	<i>Aglaophenia allmani</i>		Scottish Nat. Ant.	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS	

APPENDIX TABLE II. CONTINUED.

Order	Subclass	Family	Species (Current Authority)	Previous Identification	Type Status	Expedition	Sources of Synonymy
			<i>Macrorhynchia racemifera</i> (Allman, 1883)	<i>Lytocarpus racemiferus</i>	Holotype at BMNH	<i>Challenger</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
		Halopteridiidae	<i>Monostaechas quadridens</i> (McCraday, 1859)	<i>Monostaechas quadridens</i>		Scottish Nat. Ant.	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
		Sertulariidae	<i>Tridentata marginata</i> (Kirchenpauer, 1864)	<i>Desmoscyphus obliquus</i>	Holotype at BMNH	<i>Challenger</i>	Calder, 1991; Migotto, 1996
			<i>Tridentata marginata</i> (Kirchenpauer, 1864)	<i>Desmoscyphus pectinatus</i>	Holotype at BMNH	<i>Challenger</i>	Calder, 1991; Migotto, 1996
			<i>Diphasia digitalis</i> (Busk, 1852)	<i>Desmoscyphus acanthocarpus</i>		<i>Challenger</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002
			<i>Dynamena dalniasi</i> (Versluys, 1899)	<i>Sertularia rathbuni</i>		Scottish Nat. Ant.	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
			<i>Dynamena disticha</i> (Bosc, 1802)	<i>Sertularia cornicua</i>		Scottish Nat. Ant.	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
			<i>Idiellana pristis</i> (Lamouroux, 1816)	<i>Idia pristis</i>		<i>Challenger</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
			<i>Sertularella diaphana</i> (Allman, 1885)	<i>Thuiaria hyalina</i>		<i>Challenger</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
			? <i>Sertularella conica</i> (Allman, 1877)	<i>Sertularella tenella</i>		<i>Engenie</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
			<i>Sertularelloides cylindricheca</i> (Allman, 1888)	<i>Sertularia cylindricheca</i>	Holotype at BMNH	<i>Challenger</i>	Migotto, 1996; Bouillon <i>et al.</i> , 2004; WoRMS
			<i>Hincksella formosa</i> (Fwckes, 1881)	<i>Sertularia integritheca</i>	Holotype at BMNH	<i>Challenger</i>	Migotto, 1996; WoRMS
			<i>Tridentata distans</i> (Lamouroux, 1816)	<i>Sertularia heterodonta</i>	Syntype at BMNH	Scottish Nat. Ant.	Calder, 1991; Migotto, 1996

APPENDIX TABLE II. CONTINUED.

Order	Subclass	Family	Species (Current Authority)	Previous Identification	Type Status	Expedition	Sources of Synonymy
			<i>Thyrosocyphus ramosus</i> Allman, 1877	<i>Thyrosocyphus ramosus</i>		<i>Challenger</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
Proboscoida	Hydroidolina	Campanulariidae	? <i>Clytia noliformis</i> McCrary, 1859	<i>Campanularia ptychocyathus</i>		<i>Challenger</i>	Migotto, 1996; WoRMS
			<i>Obelia bidentata</i> Clarke, 1875	<i>Obelia bidentata</i>		<i>Eugenie</i>	Migotto, 1996; Migotto <i>et al.</i> , 2002; WoRMS
		Hebellidae	? <i>Hebella scandens</i> (Bale, 1888)	<i>Lafocia cylindrica</i>		<i>Eugenie</i>	Jäderholm, 1903; Migotto, 1996; WoRMS
Trachymedusae	Trachylinae	Geryoniidae	<i>Liriope tetraphylla</i> (Chamisso and Eysenhardt, 1821)	<i>Liriope tetraphylla</i>		British Antarctic (<i>Terra Nova</i>)	Migotto <i>et al.</i> , 2002; WoRMS

