

A CHECKLIST OF THE BRYOZOA OF THE GALAPAGOS

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Abstract. — The 184 records of Bryozoa known from the Galapagos archipelago (Ecuador) are listed, including 4 new records and 3 unidentified species from Academy Bay, Santa Cruz. Thirty-four species (18%) of Galapagos bryozoans are endemic. Proportionally, there are more endemic stenolaemates (42%) than there are anascans or ascophorans. The Galapagos belongs in the Panamic Province, but is represented disproportionately by colder water species of the Northern Hemisphere with weedier, r-selected tendencies. There is evidence of difficulty in arriving at the Islands and of genetic isolation and local adaptation, especially among stenolaemates.

This report lists all records of Bryozoa we know of from the Galapagos archipelago, Ecuador. The broader zoogeographical implications, discussed in detail by Banta (1991), are summarized herein.

Collections

Previous collections. — There are seven published works describing bryozoan collections from the Galapagos. Hastings (1930) had 37 taxa from 11 shallow-water sites made by C. Crossland (1927). Canu & Bassler (1930) studied 50 species from four stations collected in 1888 and 1891 from the *Albatross* collections of the U.S. Fisheries Commission. One of these stations was from relatively deep water (684 fathoms = 1251 m). Osburn (1950, 1952, 1953) and Osburn and Soule (1953) had extensive collections, from at least 25 stations, some of great depth, made in the 1930s by the *Velero III* expeditions of the Allan Hancock Foundation (see Fraser 1943). Soule (1963b) adds 3 additional records from the Hancock Galapagos collections in his monograph on Bryozoa of the Gulf of California.

New data. — In July, 1980 the senior author collected about 30 species at snorkel depth near boat docks at Academy Bay, Santa Cruz Island. Specimens were dried

and wrapped in paper for transport to the laboratory. Where necessary, calcareous specimens were cleaned in dilute KOCl. Specimens are for deposit in the National Museum of Ecuador, Quito.

Four of the specimens collected are new records for the Galapagos: *Lichenopora fimbriata*, *Membranipora arborescens*, *Arthropoma circinata* and *Parasmittina crosslandi*. Another three are undetermined species, probably new, unnamed taxa: *Hippoporella* sp., with affinities in *H. gorgonensis* (Hastings 1930); *Lagenicella* sp., with affinities in *L. lacunosa* (Bassler 1934); and *Parasmittina* sp., with affinities in *P. hastingsae* Soule & Soule 1973.

Known records in the Galapagos. — The appendix includes every record we were able to find where bryozoan species or subspecies were identified from the Galapagos Islands. Bryozoan subspecies in the Galapagos are based entirely on morphological features; no good criteria are known to distinguish subspecies from species in the area. Authorities for Galapagos records are listed. These are followed by the family of each species and the islands from which each record was taken. The order of the Islands is arbitrary. Where there is more than one name for an Island we use the name in most common use by the inhabitants of the Ga-

lapagos (Bowman 1966). The distributions listed are culled from scattered literature. We place each species into one of seven general distribution categories: (1) Cosmopolitan: recorded worldwide from the equator into Arctic and Antarctic waters; (2) Circumglobal: worldwide, but absent from high latitudes above about 60°N and S; (3) Pan American: recorded in both the eastern Pacific and the Caribbean or Gulf of Mexico; present or absent elsewhere in the Atlantic and the Mediterranean; (4) Pacific: known from both the eastern and western Pacific; (5) Eastern Pacific: found exclusively along the western coasts of the Americas, including areas outside the Panamic; (6) Panamic: coastal areas of the Americas from about the U.S. Mexican border to Guayaquil in Ecuador; (7) Endemic: not recorded outside the Galapagos.

Summary of the Zoogeography of Galapagos Bryozoa

One hundred eighty-four species of bryozoans are known from the Galapagos Islands, a number comparable to that of the most diverse bryozoan faunas known. This number is probably an underestimate, especially for the soft-bodied ctenostomes. The sparse data provide no evident patterns of differential distribution of species among the islands, so at least for the purposes of this report, the Galapagos can be treated as a single zoogeographical unit. Although the relative numbers of anascan and ascophoran cheilostomes are near the average for the rest of the world, the proportion of stenolaemates (18%) is about twice as high as that in the rest of the Panamic. Comparable proportions of stenolaemates are found in the Magellanic and Chilean waters off South America, but otherwise there is zoogeographic affinity between these areas and the Galapagos. Relatively low water temperatures and elevated productivities associated with upwelling do not fully explain the high proportion of stenolaemates in Galapagos waters.

At the family level, few absences are conspicuous, except for the Steginoporellidae, characteristic of coral communities, rare in the Galapagos.

Zoogeographically, the Galapagos Islands belong to the Northern Hemisphere, securely in the Panamic Province, with 46% of Galapagos species shared with the rest of the Panamic. The distribution of Panamic bryozoans seems to divide the Panamic into two subprovinces near 10°N. Within the Panamic, strong affinities also are seen among the Galapagos and Cocos Island and the Gulf of California. More distant affinities are seen with the Gulf of Mexico and Indo-Pacific. The fauna seems unrelated to that of the Chilean and Magellanic Provinces of South America. The few shared species are mostly circumglobal or cosmopolitan in distribution.

Thirty-four of 184 species (18%) of Galapagos bryozoans are endemic to the Islands. This proportion is comparable to that of other major groups of shallow-water animals, but smaller than that of the molluscs, especially gastropods. There are 2 endemic genera among 53 in the islands, about 4%. Proportionally, there are more endemic stenolaemates (14 of 33 species, 42%) than endemics in anascans or ascophorans. This difference does not seem to be a simple case of more lumping in the Cheilostomata than among stenolaemates; on the contrary, lumping probably has been more severe among stenolaemates.

Affinities with neighboring zoogeographical provinces are stronger for cheilostomes than for stenolaemate Bryozoa. This, taken together with the higher rate of endemism for stenolaemates, suggests that the dispersal abilities of stenolaemates are inferior to those of cheilostomes. The difference cannot be accounted for by the presence of planktotrophic larvae among some cheilostomes, because Panamic species with planktotrophic larvae are no better represented in the Islands than are those with lecithotrophic larvae.

In general, the Galapagos bryozoan fauna seems to be proportionately more represented by species which range into latitudes higher than about 30 degrees. There also are proportionately more species with geographical ranges wider than those indigenous to waters nearer the Galapagos.

The bryozoan distribution data taken as a whole convey a picture of the Galapagos as a biological isolate belonging securely in the Panamic Province, but represented disproportionately by colder water species of the Northern Hemisphere with weedier, r-selected tendencies. There is evidence of difficulty in arriving at the Islands and of genetic isolation and local adaptation, especially among stenolaemates. The rarity of some habitats, notably estuaries and coral reefs, has contributed to a unique species composition.

The stenolaemates of the Galapagos in particular are disproportionately abundant relative to the rest of the Panamic. There is evidence that the Galapagos stenolaemate fauna may be more isolated and/or more rapidly evolving than the cheilostome fauna.

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- Appendix
- Bryozoan species known from the Galapagos Archipelago, arranged alphabetically within Orders (there are no Phylactolaemata known).
- STENOLAEMATA
- Borgiola rugosa* (Borg, 1933).—Osburn, 1953:697. Heteroporidae. Islands: Marchena. Distribution: Japan and the Galapagos (Pacific).
- Borgiola* sp. (Canu & Bassler, 1930).—*Heteropora* sp.—Canu & Bassler, 1930:60. Heteroporidae. Islands: Española. Distribution: Endemic. Apertures measure 0.10 mm in diameter and lunaria are present; we assign it tentatively to *Borgiola*, distinct from *B. rugosa* (Borg, 1933). Probably a new endemic species.
- Cavaria praesens* Canu & Bassler, 1930.—Canu & Bassler, 1930:58. Lichenoporidae. Islands: Floreana. Distribution: Endemic.
- Crisia maxima* Robertson, 1910.—Osburn, 1953:682. Crisiidae. Islands: Española, San Cristóbal, Santa Fé. Distribution: British Columbia to the Gulf of California and the Galapagos (Eastern Pacific).
- Crisia occidentalis* Trask, 1857.—Osburn, 1953:680. Crisiidae. Islands: Seymour. Distribution: British Columbia to Costa Rica and the Galapagos (Eastern Pacific).
- Crisia serrulata* Osburn, 1953.—Osburn, 1953:679. Crisiidae. Islands: Isabela, Floreana, San Cristóbal, Santa Cruz, Onslow. Distribution: British Columbia, California and the Galapagos (Eastern Pacific).
- Crisulipora occidentalis* Robertson, 1910.—Osburn, 1953:686. Crisiidae. Islands: Española. Distribution: California, Peru, Japan, Brazil, Panama, Gulf of California, Baja California (Pan American).
- Diaperoecia flabellata* (Canu & Bassler, 1923).—Canu & Bassler, 1930:52. Diaperoeciidae. Islands: Española. Distribution: Pleistocene of California; Galapagos (Endemic).
- Disporella astraia* Osburn, 1953.—Osburn, 1953:719. Lichenoporidae. Islands: Floreana, Isabela. Distribution: Endemic.
- Disporella octoradiata* (Waters, 1904).—? *Disporella octoradiata*.—Osburn, 1953:718. Lichenoporidae. Islands: Isabela. Distribution: Antarctic, Chile (Moyano 1983:15) (Eastern Pacific). Osburn's query mark reflected his uncertainty about the generic placement, not his confidence in the species determination.
- Disporella ovoidea* Osburn, 1953.—Osburn, 1953:713.—*Lichenopora radiata*.—Canu & Bassler, 1928. Lichenoporidae. Islands: Isabela, Española. Distribution: California, Colombia and the Galapagos (Eastern Pacific).
- Entalophora* sp. Osburn, 1953.—*Entalophora* sp.—Osburn, 1953:669. Entalophoridae. Islands: Isabela. Distribution: Endemic. The animal appears to be distinct; Osburn did not describe it because ovicells were lacking.
- Entalophora symmetrica* Osburn, 1953.—Osburn, 1953:667. Entalophoridae. Islands: San Cristóbal. Distribution: Endemic.
- Heteropora* sp. Osburn, 1953.—Osburn, 1953:695. Heteroporidae. Islands: Wenman, San Cristóbal. Distribution: Unknown. Similar to *Heteropora pacifica* Borg, 1933:317 in its measurements, but available specimens are in poor condition.

- Lichenopora (Radiopora) pacifica* (Osburn, 1953.—*Defrancia stellata*.—Canu & Bassler, 1930:57.—*Disporopora stellata* var. *pacifica*.—Osburn, 1953:716. Lichenoporidae. Islands: Wenman, Isabela, Española, Gardner-by-Hood. Distribution: Endemic. This 'variety' surely deserves specific status.
- Lichenopora fimbriata* Busk, 1875.—Present study. Lichenoporidae. Islands: Santa Cruz. Distribution: British Columbia, California, Chile, Falklands, Tristan de Cunha, Azores, Cape Verde Islands, Australia, New Zealand, Kerguelens, Juan Fernandez (Circumglobal). First record in the Galapagos. For description see Osburn 1952:709.
- Lichenopora novae-zelandiae* (Busk, 1875).—Osburn, 1953:705. Lichenoporidae. Islands: Floreana. Distribution: New Zealand, Australia, Ceylon, Japan, British Columbia, California (Pacific).
- Plagioecia lactea* Calvet, 1903.—Canu & Bassler, 1930:48.—? *Plagioecia lactea*.—Osburn, 1953:653. Diastoporidae. Islands: Wenman, Española. Distribution: Atlantic (France), Galapagos (Pan American). The identity with Atlantic specimens is questionable.
- Plagioecia meandrina* (Canu & Bassler, 1930).—Osburn, 1953:635.—*Diaperoecia meandrina*.—Canu & Bassler, 1930:51. Diastoporidae. Islands: Wenman, San Cristóbal, Española, Isabela, Floreana, Gardner-by-Hood. Distribution: California, Guadalupe Island (off Mexico), Galapagos (Eastern Pacific).
- Plagioecia patina* (Lamarck, 1816).—Osburn, 1952:631. Diastoporidae. Islands: Wenman, Isabela, San Cristóbal. Distribution: British Columbia to Baja California and the Galapagos; Atlantic. (Pan American).
- Plagioecia sarniensis* (Norman, 1864).—Osburn, 1953:632. Plagioeciidae. Islands: Santa Fé. Distribution: Colombia, California, Washington; "Cosmopolitan" (Osburn 1953:633) (Circumglobal).
- Plagioecia striatula* Canu & Bassler, 1930.—*Diaperoecia striatula*.—Canu & Bassler, 1930:49. Diaperoeciidae. Islands: Española. Distribution: Endemic. See Osburn (1953:641) regarding generic placement of this species.
- Plagioecia subpapyracea* Canu & Bassler, 1930.—*Diaperoecia subpapyracea*.—Canu & Bassler, 1930:50. Diaperoeciidae. Islands: Española. Distribution: Endemic. See Osburn (1953:641) regarding the generic placement of this species.
- Plagioecia tubiabortiva* Canu & Bassler, 1930.—Osburn, 1953:636.—*Microecia tubiabortiva*.—Canu & Bassler, 1930:48. Diastoporidae. Islands: Wenman, Española. Distribution: Endemic.
- Platonea expansa* Osburn, 1953.—Osburn, 1953:663. Tubuliporidae. Islands: Isabela, Española, Gardner-by-Hood. Distribution: Endemic.
- Platonea veleronis* Osburn, 1953.—Osburn, 1953:662. Tubuliporidae. Islands: Isabela, Española, Duncan, Floreana, Gardner-by-Hood, Santa Fé. Distribution: Endemic.
- Proboscina lamellifera* Canu & Bassler, 1930.—Canu & Bassler, 1930:46.—Osburn, 1953:623. Oncousoeciidae. Islands: Wenman, Española, Isabela, Gardner-by-Hood. Distribution: Endemic.
- Proboscina major* (Johnston, 1847).—Osburn, 1953:621.—Present study.—*Proboscina (Oncousoecia) major* Canu & Bassler, 1930:46. Oncousoeciidae. Islands: Española, Isabela, Santiago, Santa Fé, Santa Cruz. Distribution: British Columbia to Costa Rica, Cocos Island, Galapagos; Norway to the Cape Verde Islands; Mediterranean (Osburn 1953:621); Chile (Moyano 1983:15) (Pan American).
- Tubulipora flexuosa* (Pourtalès, 1867).—Osburn, 1953:653. Tubuliporidae. Islands: San Salvador. Distribution: California, Cocos Island, the Galapagos, Cuba, Porto Rico and the southern shore of the Caribbean Sea. (Pan American).
- Tubulipora liliacea* var. *tenuis* Canu & Bassler, 1930.—Canu & Bassler, 1930:55. Tubuliporidae. Islands: Floreana. Distribution: Endemic.
- Tubulipora pulchra* MacGillivray, 1885.—Osburn, 1953:653. Tubuliporidae. Islands: San Salvador. Distribution: Australia, California, British Columbia, Mexico, Costa Rica (Pacific).
- Tubulipora* sp. Canu & Bassler, 1930.—Canu & Bassler, 1930:54. Tubuliporidae. Islands: Española. Distribution: Unknown.
- Tubulipora* sp. Canu & Bassler, 1930.—Canu & Bassler, 1930:52. Tubuliporidae. Islands: Floreana. Distribution: Not given (Unknown).

CTENOSTOMATA

- Amathia vidovici* (Heller, 1867).—Osburn & Soule, 1953:741. Vesiculariidae. Islands: Not specified. Distribution: California to Ecuador and Galapagos; Massachusetts to Colombia; France to the Mediterranean and the Cape Verde Islands; eastern; Indian Ocean (Prenant & Bobin 1966:283) (Pan American).
- Buskia seriata* Soule, 1953.—Soule in Osburn & Soule, 1953:747. Buskiidae. Islands: Seymour. Distribution: California and the Galapagos (Eastern Pacific).

ANASCA

- Aetea anguina* (Linnaeus, 1758).—Hastings, 1930:702.—Osburn, 1950:11. Aeteidae. Islands: Santiago, Santa Cruz, Isabela; Osburn's stations unspecified. Distribution: Arctic, Great Britain, Maine to Brazil, Mediterranean, Indian Ocean, Malay, Australia, Japan, Chile, Patagonia, Juan Fernandez, California, British Columbia, Antarctic (Cosmopolitan). Prenant and Bobin (1966:80) present an extensive synonymy.
- Aetea ligulata* (Busk, 1852).—Osburn, 1950:13. Aeteidae. Islands: Isabela, San Cristóbal, Bartolomé. Distribution: British Columbia to Chile, Caribbean to Argentina, Red Sea, Baja California, Panama, Colombia, New Zealand, possibly the Mediterranean (Gordon 1984:39); South Atlantic. (Circumglobal).

- Aetea recta* Hincks, 1861.—Osburn, 1950:12. Aeteidae. Islands: Isabela, Santiago. Distribution: Europe south, Caribbean, Brazil, Gulf of California, Washington, Galapagos, Chile (Pan American). *Velero III* Station converted from Fraser (1943).
- Aetea truncata* (Landsborough, 1852).—Osburn, 1950:13. Aeteidae. Islands: Isabela. Distribution: Europe, Indian Ocean, Japan to Australia, Nova Scotia to Brazil, British Columbia, California, Colombia, Peru and the Galapagos; Chile (Cosmopolitan). Synonymy, Prenant and Bobin 1966:86.
- Alderina smitti* Osburn, 1950.—Osburn, 1950:60. Alderinidae. Islands: Isabela, San Cristóbal. Distribution: Gulf of Mexico, Caribbean, California, Gulf of California, Baja California, Panama (Pan American).
- Antropora claustracrassa* (Canu & Bassler, 1930).—Osburn, 1950:53.—*Membrendoecium claustracrasum*.—Canu & Bassler, 1930:7. Hincksinidae. Islands: Española, Floreana and unspecified stations of Osburn 1950:53. Distribution: Guaymas (Mexico) to Ecuador and the Galapagos (Panamic).
- Antropora tincta* (Hastings, 1930).—Osburn, 1950:54.—Present study.—*Crassimarginatella tincta*.—Hastings, 1930:708.—Osburn, 1950:54. Hincksinidae. Islands: Isabela, Santa Cruz; Osburn's collection sites not specified. Distribution: California to the Galapagos (Eastern Pacific). There is much variation in avicularium shape among Pacific specimens.
- Aplousina filum* (Jullien, 1903).—Canu & Bassler, 1930:7.—Osburn, 1950:47. Hincksinidae. Islands: Española, Daphne Major. Distribution: Eastern Atlantic, Gulf of Mexico, Gulf of California, Cocos Island (Pan American).
- Aplousina major* Osburn, 1950.—Osburn, 1950:48. Alderinidae. Islands: Santa Fé. Distribution: California, Mexico, Galapagos, Chile (Eastern Pacific).
- Beania mirabilis* Johnston, 1840.—Osburn, 1950:170. Bugulidae. Islands: Isabela. Distribution: Scandinavia to the Mediterranean; California to Panama and the Galapagos, Australia, Indian Ocean (Prenant & Bobin 1966:555) (Circumglobal).
- Bugula californica* Robertson, 1905.—Osburn, 1950:157. Bugulidae. Islands: San Cristóbal. Distribution: Brazil, British Columbia, California, Gulf of California, Galapagos (Pan American).
- Bugula longirostrata* Robertson, 1905.—Osburn, 1950:156. Bugulidae. Islands: Isabela (Tagus Cove), Santiago. Distribution: California, Gulf of California, Galapagos (Eastern Pacific).
- Bugula minima* (Waters, 1909).—*Bugula neritina* var. *minima*.—Hastings, 1930:704. Bugulidae. Islands: Isabela. Distribution: Gulf of Mexico, Caribbean, Red Sea, Indian Ocean, Malay, Australia; Cocos Island, Costa Rica, Panama and the Galapagos (Osburn 1950:155) (Circumglobal).
- Bugula mollis* Harmer, 1926.—Hastings, 1930:704.—Osburn, 1950:158. Bugulidae. Islands: Santiago, Isabela. Distribution: New Guinea, Java Sea, California to Panama and the Galapagos (Pacific).
- Bugula neritina* (Linnaeus, 1758).—Hastings, 1930:704.—Osburn, 1950:155.—Present study. Bugulidae. Islands: Santiago, Isabela, Floreana, Santa Cruz. Distribution: Worldwide in warm ports (Circumglobal).
- Bugula uniserialis* Hincks, 1884.—Hastings, 1930:705. Bugulidae. Islands: Isabela. Distribution: Western Australia, California (Pacific).
- Callopora horrida* (Hincks, 1880).—Osburn, 1950:70. Alderinidae. Islands: Isabela (Tagus Cove), Daphne Major. Distribution: California, Puget Sound, British Columbia, Gulf of California. (Eastern Pacific).
- Callopora verrucosa* Canu & Bassler, 1929.—Canu & Bassler, 1930:10. Alderinidae. Islands: Española. Distribution: Endemic. Osburn 1950:71 questions the generic assignment.
- Cauloramphus brunea* Canu & Bassler, 1930.—Canu & Bassler, 1930:10.—Osburn, 1950:56.—Present study. Alderinidae. Islands: Santiago, Isabela, Floreana, Santa Cruz. Distribution: Alaska to Colombia and the Galapagos. (Eastern Pacific). The report of '*Cauloramphus brunnea*' in Alaska (Dick & Ross 1985:89) is of *C. variegatus* (Dick & Ross 1988:41; California: Banta 1969a:419 (as '*C. brunnea*').
- Cauloramphus spiniferum* (Hincks, 1838).—Hastings, 1930:713. Alderinidae. Islands: Santiago. Distribution: Britain, Chile, California, British Columbia, Alaska; South Atlantic (see Moyano 1983:18) (Eastern Pacific).
- Cellaria diffusa* Robertson, 1905.—Osburn, 1950:118. Cellariidae. Islands: Santiago. Distribution: Southern California, Baja California, Galapagos (Eastern Pacific).
- Cellaria veleronis* Osburn, 1950.—Osburn, 1950:118. Cellariidae. Islands: Isabela, Daphne Major, Marchena, Santiago. Distribution: Clipperton Island, Cocos Island and the Galapagos (Soule 1963a:232) (Panamic).
- Chaperiopsis condylata* (Canu & Bassler, 1930).—*Chapperia condylata*.—Canu & Bassler, 1930:44.—Osburn, 1950:91. Chaperiidae. Islands: Floreana. Distribution: Southern California to Colombia and the Galapagos; Post-Pleistocene of Louisiana (Cheetham & Sandberg 1964:1020) (Eastern Pacific). = *Chaperiella condylata*: Soule 1963b, Cocos Island. Gordon (1982) discusses the Chaperiidae.
- Chaperiopsis frontalis* Osburn, 1950.—*Chapperia frontalis*.—Osburn, 1950:93. Chaperiidae. Islands: Española, Isabela, Santa Cruz. Distribution: Endemic.
- Copidozoum planum* (Hincks, 1880).—Hastings, 1930:713. Alderinidae. Islands: Santiago. Distribution: Australia; Mediterranean, Japan, California, Colombia, Panama (Osburn 1952:73) (Circumglobal). This record may belong to *C. tenuirostre* (Hincks); see Osburn 1952:72.
- Copidozoum tenuirostre* (Hincks, 1880).—Osburn,

- 1952:72.—*Callopora tenuirostris*.—Canu & Bassler, 1929:9. Alderiniidae. Islands: Española, Floreana; Osburn's stations are unspecified. Distribution: Western Atlantic, Gulf of Mexico, Caribbean, Brazil; Mediterranean; Indian Ocean, Western Pacific, British Columbia to Peru and the Galapagos (Prenant & Bobin 1966:257) (Circumglobal).
- Cupuladria canariensis* (Busk, 1885).—Osburn, 1950:33. Cupuladriidae. Islands: Not given. Distribution: Gulf of California to Ecuador and the Galapagos; Gulf of Mexico; Eastern Atlantic, Mediterranean (Cheetham & Sandberg 1964:1021) (Pan American).
- Discoporella umbellata* (Defrance, 1823).—Hastings, 1930:719.—Osburn, 1950:113.—*Cupularia umbellata*.—Canu & Bassler, 1930:12. Cupuladriidae. Islands: Santiago, Española; Osburn's stations not specified. Distribution: Gulf of Mexico, Eastern and Western Atlantic; Mediterranean; South Africa, California, Cocos Island and the Galapagos (Cheetham and Sandberg 1964:1022) (Pan American).
- Electra bellula* var. *bicornis* (Hincks, 1881).—Hastings, 1930:706. Electrinidae. Islands: Floreana. Distribution: Pacific (Pacific).
- Membranipora aragoi* var. *pacifica* Osburn, 1950.—Osburn, 1950:175. Membraniporidae. Islands: Wenman, Isabela. Distribution: Gulf of California, Baja California, Galapagos (Panamic).
- Membranipora arborescens* (Canu & Bassler, 1928b) (Morocco).—Present study. Membraniporidae. Islands: Santa Cruz. Distribution: Morocco, West Africa, Panama, Galapagos (Pan American). Closely related and possibly identical to *M. savarti* and *M. tenuis*. If so, it is a circumglobal subtropical to tropical species (see Banta & Carson 1977:387).
- Membranipora savarti* (Audouin, 1826).—Osburn, 1950.—27.—*Acanthodesia savartii* (Canu & Bassler, 1930:4). Membraniporidae. Islands: Santiago, Española, Santa Cruz, San Cristóbal. Distribution: California, Baja California, Costa Rica, Panama, Gulf of Mexico, Caribbean, Philippines, Australia. (Circumglobal.)
- Membranipora tenuis* Desor, 1848.—*Acanthodesia denticulata*.—Hastings, 1930:707. Membraniporidae. Islands: Isabela. Distribution: Cape Cod to Brazil; Baja California, Panama, Galapagos, Peru, Gulf of California (Osburn 1950:27). (Pan American.) See Osburn (1950:27) about the identity of *Acanthodesia denticulata* with *M. tenuis*.
- Membranipora tuberculata* (Bosc, 1803).—Osburn, 1950:23.—*Nichtina tuberculata*.—Hastings, 1930:706. Membraniporidae. Islands: Isabela; Osburn's stations not listed. Distribution: British Columbia to Peru, Massachusetts to Patagonia; Europe to Angola; Japan to Australia and New Zealand; Indian Ocean (Gordon 1984:24); Chile (Circumglobal).
- Micropora coriacea* (Esper, 1794).—Hastings, 1930.—Canu & Bassler, 1930:11.—Osburn, 1950:105. Microporidae. Islands: Española, Santiago, Isabela, Floreana; Osburn's stations not specified. Distribution: British Columbia to Chile, the Juan Fernandez Islands and the Galapagos; Britain to the Mediterranean, Antarctic, South Atlantic, Tasman Sea (Circumglobal).
- Micropora coriacea* var. *inarmata* Soule, 1959.—Soule, 1959:29. Microporidae. Islands: Marchena, Santa Cruz. Distribution: Baja California, Socorro Island, Cocos Island, New Zealand (Gordon 1984:52) (Pacific).
- Parellisina curvirostris* (Hincks, 1862).—Osburn, 1950:75.—Present study.—*Ellisina curvirostris*.—Hastings, 1930:711.—*Callopora curvirostris* Canu & Bassler 1930:9. Alderiniidae. Islands: Isabela, Floreana, Española, Santa Cruz. Distribution: Gulf of Mexico, Caribbean, Mexico to the Cocos Island and the Galapagos, Britain to Morocco, Hawaii, Western Pacific, Indian Ocean, Indonesia (Winston & Heimberg 1986:6) (Circumglobal).
- Retevirgula areolata* (Canu & Bassler, 1923).—Soule, 1963a:233. Alderiniidae. Islands: Not given. Distribution: California to the Galapagos Islands, Cocos; (Soule 1963a); Chile (Moyano 1983:21) (Eastern Pacific). "Common at the Galapagos Islands" (Soule 1963a:233).
- Retevirgula lata* Osburn, 1950.—Osburn, 1950:87. Calloporidae. Islands: Santiago, off Santa Cruz. Distribution: Endemic.
- Retevirgula tubulata* (Hastings, 1930).—Osburn, 1952:86.—*Pyrulella tubulata*.—Hastings, 1930:709. Calloporidae. Islands: Floreana, Marchena, San Cristóbal, Isabela. Distribution: Baja California and the Gulf of California to Panama and the Galapagos (Panamic).
- Scruparia ambigua* d'Orbigny, 1841.—*Scruparia chelata*.—Hastings, 1930:702. Scrupariidae. Islands: Isabela (Tagus Cove). Distribution: "Distributed throughout the world except in polar waters" (Ryland & Hayward 1977:50) (Circumglobal). Confused with *S. chelata* until about 1941.
- Scrupocellaria bertholleti* (Audouin, 1826).—Hastings, 1930:733.—*S. bertholleti* (sic).—Osburn, 1950:133. Scrupocellariidae. Islands: Santiago, Floreana, Isabela. Osburn reports it from Galapagos at stations not specified. Distribution: Southern California to Panama and the Galapagos; Atlantic, Mediterranean, Red Sea (Circumglobal).
- Scrupocellaria ferox* Busk, 1852.—Osburn, 1950:137. Scrupocellariidae. Islands: San Cristóbal, South of Santa Cruz, Isabela (Tagus Cove). Distribution: Widely distributed in the Indian and Pacific oceans, Zanzibar, the eastern Pacific (Circumglobal).
- Scrupocellaria harmeri* Osburn, 1947.—Osburn, 1950:138. Scrupocellariidae. Islands: Isabela. Distribution: Caribbean, California, Galapagos (Pan American).
- Scrupocellaria panamensis* Osburn, 1950.—Osburn,

1950:142. Scrupocellariidae. Islands: Floreana. Distribution: Panama and the Galapagos (Panamic).

Scrupocellaria pugnax Osburn, 1950.—Osburn, 1950:143. Scrupocellariidae. Islands: Floreana. Distribution: Endemic.

Scrupocellaria scruposa (Linnaeus, 1758).—Hastings, 1930:703. Scrupocellariidae. Islands: Santiago. Distribution: Europe, Madeira, New Zealand. "Widely distributed in warm and temperate seas" (Ryland & Hayward 1977:140) (Circumglobal).

Scrupocellaria unguiculata Osburn, 1950.—Osburn, 1950:149. Scrupocellariidae. Islands: Santiago; south of Santa Cruz; Floreana. Distribution: Endemic.

Sessibugula translucens Osburn, 1950.—Osburn, 1950:164.—Present study. Bugulidae. Islands: Isabela, Santa Cruz. Distribution: Gulf of California, Costa Rica, Galapagos (Panamic).

Smittipora americana (Canu & Bassler, 1930).—*Velumella americana*.—Osburn, 1950:103. Onychocellidae. Islands: San Cristóbal. Distribution: West Indies, Panama, Galapagos (Pan American).

Thalamoporella californica (Levensen, 1909).—Hastings, 1930:716.—Osburn, 1950:112. Thalamoporellidae. Islands: Santiago, Santa Cruz, Isabela; Osburn's stations not given. Distribution: California to Colombia and the Galapagos (Eastern Pacific).

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Aimulosia palliolata (Canu & Bassler, 1928).—Osburn, 1952:353. Hippoporinidae. Islands: Wenman. Distribution: Florida, Gulf of California and Galapagos (Pan American).

Aimulosia uvulifera (Osburn, 1914).—Osburn, 1952:352. Hippoporinidae. Islands: South Seymour. Distribution: Florida, Caribbean, Baja California, Costa Rica, Ecuador, Cocos Island (Pan American).

Arthropoma cecili (Audouin, 1826).—Canu & Bassler, 1930:16. Schizoporellidae. Islands: Española. Distribution: Western Pacific, Indian Ocean, Red Sea, Mediterranean, Britain to South Africa, Brazil, British Columbia to the Galapagos (Gordon 1984:85) (Circumglobal).

Arthropoma circinatum (MacGillivray, 1868).—Present study. Schizoporellidae. Islands: Santa Cruz. Distribution: Australia, New Zealand, Tristan da Cunha, Southern California to Colombia and the Galapagos (Osburn 1952:334) (Circumglobal). First record in the Galapagos.

Bellulopora bellula (Osburn, 1950).—*Colletosia bellula*.—Osburn, 1950:189. Cribrilinidae. Islands: Isabela. Distribution: Cape Hatteras to Florida, Gulf of Mexico, Gulf of California, Baja California, Pleistocene of California, Galapagos (Winston 1982:134); Chile (Moyano 1983:17) (Pan American). See Lagaaij (1963:183) regarding generic placement of this species.

Celleporaria albirostris (Hincks, 1884).—*Holoporella*

albirostris.—Osburn, 1952:498. Celleporariidae. Islands: Daphne Major. Distribution: Florida, Gulf of Mexico and Caribbean, Indian Ocean, Australia, New Zealand (Circumglobal).

Celleporaria brunnea (Hincks, 1884).—Present study.—*Holoporella brunnea*.—Hastings, 1930:731.—Osburn, 1952:497. Celleporariidae. Islands: Santiago, Santa Cruz, Isabela; Osburn records it from "21 stations in the Galapagos." Distribution: British Columbia to Ecuador, Cocos Island and the Galapagos. (Eastern Pacific.)

Celleporaria hancocki (Osburn, 1952).—*Holoporella hancocki*.—Osburn, 1952:500. Celleporidae. Islands: "Between Seymour and Daphne" and at Daphne Major. Distribution: Endemic.

Celleporaria peristomata (Osburn, 1952).—*Holoporella peristomata*.—Osburn, 1952:501. Celleporidae. Islands: "Between South Seymour and Daphne," Santiago, Isabela. Distribution: Endemic.

Celleporaria quadrispinosa Canu & Bassler, 1930.—*Holoporella quadrispinosa*.—Canu & Bassler, 1930:38. Celleporidae. Islands: Española, Floreana. Distribution: Baja California and the Galapagos (Panamic).

Celleporella hyalina (Linnaeus, 1767).—*Hippothoa hyalina*.—Hastings, 1930:720.—Osburn, 1953:277. Hippothoidae. Islands: Santiago, Isabela; Osburn's stations not specified. Distribution: Cosmopolitan.

Chorizopora brogniarti (Audouin, 1826).—Canu & Bassler, 1930:14. Chorizoporidae. Islands: Española. Distribution: Australia, New Zealand, Philippines, China, Burma, Sri Lanka, Red Sea, Mediterranean, Britain, South Africa, Galapagos: Gordon 1984:113. (Circumglobal.)

Cigclisula hexagonalis (Canu & Bassler, 1929).—*Holoporella hexagonalis*.—Canu & Bassler, 1930:39.—*Trematoecia hexagonalis*.—Osburn, 1952:503. Stomachetosellidae. Islands: Española, San Cristóbal, Isabela, Floreana, Santa Fé. Distribution: Gulf of California, Mexico, Galapagos (Panamic).

Cigclisula porosa (Canu & Bassler, 1929).—Present study.—*Holoporella porosa*.—Canu & Bassler, 1930:39.—*Trematoecia porosa*.—Osburn, 1952:503. Stomachetosellidae. Islands: Floreana, Santa Cruz. Distribution: Gulf of California and the Galapagos (Panamic).

Cigclisula tridenticulata (Busk, 1884).—*Holoporella tridenticulata*.—Canu & Bassler, 1930:41.—Osburn, 1952:499. Celleporidae. Islands: Wenman, Floreana, Isabela, San Cristóbal, Santiago. Distribution: Indian Ocean, Australia, New Zealand; Galapagos (Pacific).

Cigclisula turrita (Smitt, 1873).—*Holoporella turrita*.—Hastings, 1930:732. Celleporidae. Islands: Isabela. Distribution: Indian Ocean, China, Philippines, Florida, Pleistocene of Panama (Circumglobal). Powell 1971:773 gives a synonymy. American species of *Cigclisula* are often difficult to distinguish and

- several species may be confused under this name (Banta & Carson 1977:400).
- Cleidochasma contractum* (Waters, 1899).—*Perigastrella contracta*.—Hastings, 1930:722.—*Hippoporina contracta*.—Osburn, 1952:347. Cleidochasmatidae. Islands: Santiago, Isabela; Osburn's Galapagos stations not given. Distribution: Madeira; Gulf of Mexico, Caribbean, Massachusetts to Brazil; Gulf of California to Ecuador and the Galapagos (Cheetham & Sandberg 1964:1032 (Pan American)).
- Cleidochasma porcellanum* (Busk, 1860).—Present study.—*Hippoporina porcellana*.—Hastings, 1930:722.—Osburn, 1952:345.—*Hippoporina cleidostoma*.—Canu & Bassler 1929:19. Cleidochasmatidae. Islands: Santiago, Isabela, Santa Cruz. Distribution: Gulf of Mexico, Caribbean; Gulf of California, Brazil, Pliocene; British Columbia to Peru; Mediterranean, Eastern Central Atlantic, Japan, Indonesia, New Zealand (Gordon 1984:124) (Circumglobal).
- Cleidochasma tuberculata* Osburn, 1952.—Present study.—*Hippoporina tuberculata*.—Osburn, 1952:346. Cleidochasmatidae. Islands: San Cristóbal, Santa Cruz. Distribution: Endemic. Absence of spines is a useful character to distinguish *C. tuberculata* from *C. porcellana*.
- Codonellina anatina* (Canu & Bassler, 1927).—Osburn, 1952:42.—*Codonella granulata*.—Canu & Bassler, 1930:29.—Hastings, 1930:725. Hippoporinidae. Islands: Wenman, Isabela, Santiago, Floreana, Onslow, Española, San Cristóbal, 'Albany.' Distribution: Gulf of California, Galapagos, Hawaii, Gulf of Mexico (Osburn 1952:422) (Pan American). Osburn synonymized *C. granulata* and *C. anatina*, but suggested there may be 'varietal' differences. Galapagos specimens identified as *C. anatina* may be of a distinct species (Soule & Soule 1973:431).
- Crepidacantha poissoni* (Audouin, 1826).—Present study.—*Hippoporina porcellana*.—Hastings, 1930:722.—Osburn, 1952:345.—*Hippoporina cleidostoma* Canu & Bassler 1929:19. Crepidacanthidae. Islands: Española, Floreana; Osburn's stations not specified. Distribution: Southern California, Gulf of California, Panama, Cocos Island, Ecuador, Galapagos, Hawaii, Tahiti, New Zealand, Madeira, Indonesia, Red Sea; Florida, Brazil (Gordon 1984:124) (Circumglobal).
- Crepidacantha setigera* (Smitt, 1873).—Osburn, 1952:479. Crepidacanthidae. Islands: Wenman, Isabela. Distribution: Florida, Cocos Island, Galapagos (Soule 1963b) (Panamic).
- Cyclicopora longipora* (MacGillivray, 1883).—Osburn, 1952:285. Cyclicoporidae. Islands: Southwest of Santa Cruz. Distribution: Gulf of California, Galapagos, San Bonito Ids.; Australia (Pacific).
- Cycloperiella rosacea* Osburn, 1947.—Osburn, 1952:297. Petraliidae. Islands: Isabela, Santa Cruz. Distribution: Caribbean; Mexico, Panama, Galapagos (Pan American).
- Dakaria biserialis* (Hincks, 1885).—Osburn, 1952:330. Schizoporellidae. Islands: San Cristóbal. Distribution: New Zealand, Cocos Island, Galapagos, Chile (Pacific). Ascribed to *Arthropoma* by Moyano 1983:17.
- Dakaria sertata* Canu & Bassler, 1930.—Canu & Bassler, 1930:57.—Osburn, 1952:329.—Present study. Schizoporellidae. Islands: Floreana, Española, Isabela, Gardner-by-Hood, Santa Cruz. Distribution: Southern California, Gulf of California, Galapagos (Eastern Pacific).
- Diplonotos costulatus* Canu & Bassler, 1930.—Canu & Bassler, 1930:31 (as *D. costulatum*). Sertellidae. Islands: Española, Marchena. Distribution: Endemic. S. Cairns (pers. comm.) points out *Diplonotos* must be masculine; it could be neuter only if it ended in *-on* or *-um*. The correct name, therefore, appears to be *D. costulatus*.
- Enantiosula manica* Canu & Bassler, 1929.—Canu & Bassler, 1929.—Osburn, 1952:469.—Present study. Cheiloporinidae. Islands: Isabela, San Cristóbal, Duncan, Gardner, Santiago, Onslow, South Seymour, Floreana. Distribution: Mexico, Gulf of California, Cocos Island, Galapagos (Panamic). Among the most common and characteristic of the Galapagos bryozoans.
- Escharella major* (Hincks, 1884).—*Mucronella major*.—Osburn, 1952:439. Smittinidae. Islands: Isabela, Santiago, Floreana. Distribution: Southern California, Gulf of California (Eastern Pacific).
- Escharina pesanseris* Smitt, 1973.—*Mastigophora pesanseris*.—Osburn, 1952:480. Crepidacanthidae. Islands: Wenman, Daphne Major, Isabela. Distribution: Florida, Gulf of Mexico, Caribbean, Brazil; Gulf of California, Panama, Colombia (Pan American).
- Escharoides praestans* (Hincks, 1882).—Osburn, 1952:373. Exochellidae. Islands: Wenman, Isabela, Daphne Major. Distribution: Australia, New Zealand, Baja California, Galapagos (Pacific).
- Fenestulina malusi* (Audouin, 1826).—Osburn, 1952:388. Microporellidae. Islands: Wenman, Isabela, Floreana. Distribution: British Columbia to the Galapagos; Gulf of Mexico, Caribbean, Bermuda; north Atlantic, Mediterranean; Western Pacific; Indian Ocean (Cheetham & Sandberg 1964:103); Australia, Chile, southern Atlantic (Moyano 1983:19) (Circumglobal). Possibly a cosmopolitan species, but morphological differences exist between Alaskan specimens and more southern material (Dick & Ross 1988:77).
- Hippaliosina rostigera* (Smitt, 1873).—Osburn, 1952:475. Cheiloporinidae. Islands: Isabela. Distribution: Caribbean, Gulf of Mexico, Gulf of California to Colombia and the Galapagos (Cheetham & Sandberg 1964:1044) (Pan American).
- Hippomonavella parvicapitata* (Canu & Bassler, 1930).—Osburn, 1952:367.—*Hippomonella parvicapitata*.—Canu & Bassler, 1930:19. Hippoporini-

- dae. Islands: Wenman, Española. Distribution: Gulf of California, Ecuador, Colombia (Panamic).
- Hippopleurifera mucronata* (Smitt, 1873).—Osburn, 1952:301. Umbonulidae. Islands: North Seymour, Isabela, Española. Distribution: Cape Hatteras south (Maturo 1968:278), Gulf of Mexico; Gulf of California to Colombia and the Galapagos (Pan American).
- Hippopodinella adpressa* (Busk, 1854).—Hastings, 1930:729.—Osburn, 1952:467.—Present study. Cheiloporinidae. Islands: Santa Cruz, Isabela. "A common species" at unnamed Galapagos stations (Osburn 1952:467). Distribution: Gulf of California to Costa Rica, Panama, Ecuador, Chile, and the Galapagos; Falklands, Antarctic; Britain, Mediterranean (Pan American).
- Hippopodinella turrita* Osburn, 1952.—Osburn, 1952:468. Cheiloporinidae. Islands: Floreana, San Cristóbal. Distribution: Endemic.
- Hippoporella gorgonensis* Hastings, 1930.—Hastings, 1930:723.—Osburn, 1952:349.—Present study. Cleidochasmatidae. Islands: Wenman, Santiago, Santa Cruz, Santiago, Isabela, Española. Distribution: Southern California to the Galapagos (Eastern Pacific).
- Hippoporella rimata* Osburn, 1952.—Osburn, 1952:352. Cleidochasmatidae. Islands: Isabela, San Cristóbal. Distribution: Ecuador, Mexico, Galapagos (Panamic).
- Hippoporella* species indetermined.—Present study. Hippoporellidae. Islands: Santa Cruz. Distribution: Endemic. Resembles *H. gorgonensis*, but there are six oral spines and the colony is persistently unilaminar.
- Hippoporidra granulosa* Canu & Bassler, 1930.—Canu & Bassler, 1930:43.—Osburn, 1952:357. Cleidochasmatidae. Islands: San Cristóbal. Distribution: Gulf of California and the Galapagos (Panamic).
- Hippoporidra spiculifera* (Canu & Bassler, 1930).—Present study.—*Hippotrema spiculifera*.—Canu & Bassler, 1930:43. Cleidochasmatidae. Islands: Española, Floreana, Santa Cruz. Distribution: Mexico, Clarion Island, Panama, Galapagos (Panamic).
- Hippoporina ampla* Osburn, 1952.—Osburn, 1952:348. Hippoporinidae. Islands: San Cristóbal, Floreana, Santiago. Distribution: Endemic.
- Hippoporina pertusa* (Esper, 1796).—*Hippodiplosia pertusa*.—Hastings, 1930:724. Hippoporinidae. Islands: Santiago, Isabela. Distribution: Gulf of Mexico, Caribbean, Massachusetts to Brazil; Spitzbergen to the Mediterranean; southern California to Colombia and the Galapagos (Pan American). Cheetham & Sandberg (1964:1041) discuss the generic placement.
- Hippoporina verilli* Maturo & Schopf, 1968:56.—*Hippodiplosia americana*.—Osburn, 1952:339. Hippoporinidae. Islands: Isabela, Santiago. Distribution: Massachusetts to Brazil, Gulf of Mexico; Gulf of California, to Panama, Costa Rica, and the Galapagos (Winston 1982:139) (Pan American).
- Hippothoa divaricata* (Lamouroux, 1821).—Osburn, 1952:278. Hippothoidae. Islands: Not listed. Distribution: Widely distributed (Cosmopolitan). Detailed synonymy and distribution in Ryland & Gordon (1977:20). "Typical *H. divaricata* seems to be Atlantic in distribution" Gordon (1984:111). A subspecies occurs in New Zealand.
- Hippothoa flagellum* Manzoni, 1870.—Osburn, 1952:278. Hippothoidae. Islands: Not given. Distribution: Europe, Southeastern U.S., Caribbean, Japan, Hawaii, California, Mexico, Galapagos (Morris 1980); Chile, south Atlantic (Moyano 1983:20) (Circumglobal). The world wide synonymy is complex. Ryland & Gordon (1977:25) consider many eastern Pacific specimens to belong to a distinct species.
- Lagenicella hippocrepsis* (Busk, 1856).—*Costazia hippocrepsis*.—Hastings, 1930:731.—*Lagenipora hippocrepsis* (Busk, 1856).—Osburn, 1952:489. Teuchoporidae. Islands: Wenman, Floreana. Distribution: Southern California to Panama and the Galapagos (Eastern Pacific).
- Lagenicella lacunosa* Bassler, 1934.—*Lagenipora verrucosa*.—Canu & Bassler, 1930:35.—*Lagenipora lacunosa*.—Osburn, 1952:491. Teuchoporidae. Islands: Wenman, Floreana, Isabela, Santiago, Española, Fernandina. Distribution: southern California to Peru and the Galapagos (Eastern Pacific). The family Teuchoporidae Neviani, 1895 has priority over the Phylactellidae Harmer, 1957:896 (Gordon 1984:80).
- Lagenicella marginata* Canu & Bassler, 1929.—*Lagenipora marginata*.—Osburn, 1952:490. Teuchoporidae. Islands: Isabela, San Cristóbal, Española, Santa Fé. Distribution: Panama, Cocos Island, Gulf of California, Galapagos; east coast of Florida, Gulf of Mexico (see Winston 1982:144) (Pan American).
- Lagenicella punctulata* (Gabb & Horn, 1862).—*Lagenipora punctulata*.—Osburn, 1952:486. Teuchoporidae. Islands: Not given. Distribution: Alaska to the Galapagos (Eastern Pacific).
- Lagenicella* species undetermined.—Present study. Teuchoporidae. Islands: Santa Cruz. Distribution: Endemic. Oligoserial like *L. lacunosa* Bassler, but the zooids are minute for this genus (0.35×0.22 mm); peristome low, much shorter than zooids; inner ends of pseudopores circular. No complete ovicells observed.
- Lagenicella spinulosa* Hincks, 1884.—*Lagenipora spinulosa*.—Hastings, 1930:730. Teuchoporidae. Islands: Santiago. Distribution: Alaska, British Columbia, California, Gulf of California (Osburn 1952:487) (Eastern Pacific).
- Mamillipora cupula* Smitt, 1873.—Osburn, 1952:517.—Canu & Bassler, 1928:45. Mamilliporidae. Islands: Española (Canu & Bassler 1928a:45) 'Abundant about the Galapagos Islands' (Osburn 1952:

- 518). Distribution: Gulf of California to Panama and the Galapagos; Gulf of Mexico, Caribbean. (Pan American.)
- Microporella californica* (Busk, 1856).—Osburn, 1952: 382. Microporellidae. Islands: Isabela, Santiago. Distribution: British Columbia to the Galapagos (Eastern Pacific).
- Microporella ciliata* (Pallas, 1766).—Hastings, 1930: 727.—Osburn, 1952:377. Microporellidae. Islands: Santiago, Isabela; Osburn's stations not given. Distribution: Australia, New Zealand; Philippines, Oregon to the Galapagos; Chile, Falklands, Juan Fernandez, Tristan de Cunha; Britain, Mediterranean (Gordon 1984:101) (Circumglobal).
- Microporella gibbosula* Canu & Bassler, 1930.—Canu & Bassler, 1930:20.—Osburn, 1952:386.—Present study. Microporellidae. Islands: Española, Santa Cruz; Osburn recorded it from 8 unspecified stations in the Islands. Distribution: Gulf of California, Panama, Costa Rica, Colombia and the Galapagos (Osburn 1952:386) (Panamic).
- Microporella marsupiata* (Busk, 1860).—Osburn, 1952: 383. Microporellidae. Islands: Isabela, Santiago, Santa Fé, San Cristóbal. Distribution: Gulf of California, Cocos Island and the Galapagos (Pan American). Synonym, *M. coronata* Marcus 1938:235: "Mediterranean, Madeira, Cape Verde Islands, Britain, Gulf of Guinea, Saint Helena." The synonymy of American species is in doubt (Gordon 1984:102).
- Microporella pontifica* Osburn, 1952.—Osburn, 1952: 383. Microporellidae. Islands: Isabela. Distribution: Gulf of California to the Galapagos; Post-Pleistocene of Louisiana (Pan American).
- Microporella tractabilis* Canu & Bassler, 1930.—Canu & Bassler, 1930:22.—Present study. Microporellidae. Islands: Española, Floreana, Santa Cruz. Distribution: Colombia, Panama, Galapagos; Post-Pleistocene of Louisiana (Pan American). Cheetham & Sandberg (1964:1036) found Osburn's descriptions differed in important respects from Canu & Bassler's Galapagos specimens.
- Pachyleithonia nigra* Canu & Bassler, 1930.—Canu & Bassler, 1930:27. Watersiporidae. Islands: Española. Distribution: Endemic. Osburn (1952:472) considered *P. nigra* a subspecies of *W. cucullata* (Busk 1854). At least some of his *P. nigra* specimens were of *W. arcuata* Banta 1968. See also Soule & Soule (1975:308).
- Parasmittina californica* (Robertson, 1908).—Osburn, 1952:416. Smitthinidae. Islands: Wenman. Distribution: Southern California, Baja California, Galapagos (eastern Pacific). The identity of Galapagos material with that of *Mucronella californica* Robertson 1908:308 is questionable. Confused with and possibly identical to *P. trispinosa* of authors (Soule & Soule 1973:424).
- Parasmittina crosslandi* (Hastings, 1930).—Present study. Smitthinidae. Islands: Santa Cruz. Distribution: Gulf of California, Baja California, Panama and the Galapagos (Panamic). The first record in the Galapagos, if Soule & Soule (1973:382) are correct in regarding all of Canu & Bassler's and Osburn's specimens of *P. crosslandi* as *P. dolobrata*.
- Parasmittina dolobrata* Soule & Soule, 1973.—*Smitthina crosslandi*.—Hastings, 1930:726.—*Parasmittina crosslandi*.—Osburn, 1952:418 (part).—*Parasmittina trispinosa*: Canu & Bassler 1930:27; Osburn 1952:418 (part); *P. spathulata*: Osburn 1952:415 (part); *Parasmittina dolobrata*: Soule & Soule 1973: 421 and 393. See Soule & Soule (1973:421). Smitthinidae. Islands: Wenman, Santiago, Santa Cruz, San Cristóbal, Marchena, Floreana, Baltra, Isabela, Española. Distribution: Colombia, Panama, Costa Rica and the Galapagos (Soule & Soule 1973:423) (Panamic).
- Parasmittina frazeri* Osburn, 1952.—Osburn, 1952:420. Smitthinidae. Islands: Isabela. Distribution: Mexico, Ecuador, Galapagos (Panamic).
- Parasmittina* species undetermined.—Present study. Smitthinidae. Islands: Santa Cruz. Distribution: Endemic. Like *P. hastingssae* Soule & Soule 1973:417, but smaller, and the aperture is broader than long.
- Phidolipora pacifica* (Robertson, 1908).—Osburn, 1952: 449. Sertellidae. Islands: Wenman, Isabela, Santiago. Distribution: Oregon, Gulf of California, to Peru and the Galapagos (Eastern Pacific).
- Phylactella aperta* Osburn, 1952.—Osburn, 1952:482. Phylactellidae. Islands: Isabela. Distribution: Endemic.
- Porella columbiana* O'Donoghue, 1923.—Osburn, 1952:398. Smitthinidae. Islands: Isabela and at a station between Floreana and Santa Fé. Distribution: British Columbia, Puget Sound, Southern California (Eastern Pacific).
- Porella patens* Osburn, 1952.—Osburn, 1952:397. Smitthinidae. Islands: Wenman. Distribution: Southern California, Baja California, Cocos Island, Galapagos (Eastern Pacific).
- Puellina innominata* (Couch, 1844).—Canu & Bassler, 1930:13.—Present study. Cribrilinidae. Islands: Española. Distribution: Philippines, India, Mediterranean, Britain, Madeira, Gulf of Mexico, California, Australia, New Zealand (Gordon 1984:64); Peru, Chile (Moyano 1983:19) (Circumglobal). Osburn (1950:187) considered *P. innominata* to be synonymous with *Cribrillaria radiata*; some of his records of *C. radiata* in the Galapagos may be of *P. innominata*.
- Puellina radiata* (Moll, 1803).—Canu & Bassler, 1930: 13.—Present study.—*Colletosia radiata*.—Osburn, 1950:188. Cribrilinidae. Islands: Floreana, Santa Cruz. Distribution: British Columbia to Peru, Cocos Island and the Galapagos; Gulf of Mexico, Caribbean, North Carolina to Brazil; Western Pacific, In-

dian Oceans (Circumglobal). The *Cribilina radiata* of MacGillivray (1889:317) and Powell 1967:223 is probably *C. innominata* (Gordon 1984:64). See Gordon for generic placement.

Puellina setosa (Waters, 1889).—Osburn, 1950:186. Cribilinidae. Islands: Isabela. Distribution: British Columbia, Puget Sound, Oregon, California, Madeira, Naples (Pan American).

Reptadeonella tubulifera (Canu & Bassler, 1930).—*Adeona tubulifera*.—Canu & Bassler, 1930:34.—Osburn, 1952:442. Adeonidae. Islands: Wenman, Isabela, San Cristóbal, Santa Fé, Santiago, Floreana, Española. Distribution: Ecuador and the Galapagos Islands (Osburn 1952:442) (Eastern Pacific).

Reptadeonella violaceae (Johnston, 1847).—*Adeona violaceae*.—Osburn, 1952:441. Adeonidae. Islands: Not given. Distribution: Britain, Mediterranean, Cape Verde Islands, Western Africa, Gulf of Mexico, Caribbean; Baja California to Colombia and the Galapagos (Hayward & Ryland 1979:82) (Pan American).

Reteporella striata Canu & Bassler, 1930.—*Diplonotos striatum*.—Canu & Bassler, 1930:32. Sertellidae. Islands: Marchena. Distribution: Endemic. See Harmer (1934:624) regarding the tentative generic placement of this species.

Reteporellina denticulata var. *gracilis* Osburn, 1952.—Osburn, 1952:447. Sertellidae. Islands: Wenman, Isabela, South Seymour, Daphne Major, Santiago. Distribution: Costa Rica, Cocos Island, Galapagos (Panamic).

Rhynchozoon rostratum (Busk, 1856).—Hastings, 1930:728.—Osburn, 1952:456.—Present study. Sertellidae. Islands: Santa Cruz; unspecified stations in the Galapagos (Osburn 1952:458). Distribution: Caribbean, Gulf of Mexico, Southern California to Colombia, Panama and the Galapagos; Indonesia (see Winston & Heimberg 1986:38) (Circumtropical). If *R. rostratum* is synonymous with *R. tumulosum* (Soule & Soule 1964:33), the range is Arctic to tropical eastern Pacific (Dick & Ross 1988:84).

Robertsonidra oligopus Osburn, 1952.—Osburn, 1952:295. Petraliidae. Islands: about 30 km northeast of Pinta. Distribution: California, Baja California, Galapagos (eastern Pacific).

Savignyella lafontii (Audouin, 1826).—*Savignyella lafonti*.—Osburn, 1952:288. Savignyellidae. Islands: Isabela. Distribution: Circumglobal in warmer waters, including in America, the Gulf of Mexico, Brazil, California, Colombia, Galapagos (Circumglobal).

Schizmopora anatina Canu & Bassler, 1930.—Osburn, 1952:493.—*Osthimosia anatina*.—Canu & Bassler, 1930:42. Celleporidae. Islands: Isabela, Floreana, South Seymour, Santiago, Española, Marchena, Santa Fé, Gardner, Duncan. Distribution: Gulf of California, Mexico, Panama (Panamic).

Schizmopora margaritacea (Pourtales, 1867).—Osburn, 1952:495. Celleporidae. Islands: Santiago. Distribution: North Carolina to the Caribbean; Galapagos (Pan American).

Schizoporella cornuta (Gabb & Horn, 1862).—Hastings, 1930:721.—Osburn, 1952:321.—Present study.—*Schizopodrella biaperta*.—Canu & Bassler, 1930:1. Schizoporellidae. Islands: Española, Santiago, Isabela, Santa Cruz; Osburn's stations not listed. Distribution: Alaska to the Galapagos; Gulf of Mexico, Caribbean, Massachusetts to Florida (Cheetham & Sandberg 1964:1030) (Circumglobal).

Schizoporella dissimilis Osburn, 1952.—Osburn, 1952:322. Schizoporellidae. Islands: Isabela, Santiago, Santa Fé. Distribution: Gulf of California and the Galapagos (Panamic).

Schizoporella trichotoma (Waters, 1918).—Hastings, 1930:721.—Osburn, 1952:318. Schizoporellidae. Islands: Wenman, Floreana, San Cristóbal, Santa Cruz, Isabela. Distribution: Cape Verde Islands; Gulf of California, Galapagos (Pan American).

Schizoporella unicornis (Johnston, 1847).—Osburn, 1952:317. Schizoporellidae. Islands: Santiago. Distribution: Reported from almost every ocean, but lumping makes many of these records suspect (Cosmopolitan).

Schizotheca umbonata Osburn, 1952.—Osburn, 1952:452. Sertellidae. Islands: Isabela. Distribution: Endemic.

Semihalswellia sulcosa Canu & Bassler, 1930.—Canu & Bassler, 1930:15.—Osburn, 1952:304. Gigantoporidae. Islands: Marchena, Isabela. Distribution: Endemic.

Smittina landsborovi (Johnston, 1847).—Osburn, 1952:401. Smittinidae. Islands: Not listed. Distribution: Western Norway to the western Mediterranean; dubiously recorded world wide (Hayward & Ryland 1979:99) (Cosmopolitan). The identity with European material is questionable.

Smittina smittiella Osburn, 1947.—Osburn, 1952:405. Smittinidae. Islands: Wenman, Santa Cruz, Isabela. Distribution: Gulf of Mexico, Caribbean, Brazil; Ecuador and the Galapagos (Pan American).

Smittoidea pacifica Soule & Soule, 1973.—Osburn, 1952:410.—Soule & Soule, 1973:381.—*Smittina reticulata*.—Canu & Bassler, 1930:27.—*Smittoidea pacifica* Soule & Soule 1973:380. Smittinidae. Islands: Wenman, Isabela, San Cristóbal, Duncan, Santiago (Osburn 1952:410); off Floreana (Canu & Bassler 1930:27). Distribution: Hawaii, Galapagos (Soule & Soule 1973:380) (eastern Pacific).

Stephanosella vitrea Osburn, 1952.—Osburn, 1952:370. Hippoporinidae. Islands: San Cristóbal. Distribution: Puget Sound to the Galapagos (eastern Pacific).

Stylopoma informatum (Lonsdale, 1845).—Osburn, 1952:337. Schizoporellidae. Islands: Floreana, Santiago. Distribution: West Indies, Brazil, Galapagos.

- I have a specimen from the Gulf of California. (Pan American).
- Stylopoma spongites* (Pallas, 1766).—Hastings, 1930: 721. Schizoporellidae. Islands: Santiago, Isabela. Distribution: Florida, Gulf of Mexico, Caribbean; Bermuda, Brazil, Pliocene of Panama, Galapagos (Pan American). The taxonomy is discussed by Cheetham & Sandberg (1964:1030).
- Tetraplaria veleroae* Osburn, 1952.—Osburn, 1952:467. Cheiloporinidae. Islands: About 10 km SSW of Floreana; Isabela. Distribution: Endemic.
- Trypostega venusta* (Norman, 1864).—Canu & Bassler, 1930:15.—Osburn, 1952:281.—Present study. Hippothoidae. Islands: Española, Floreana, Santa Cruz; Osburn's stations not listed. Distribution: Britain to the Caribbean, Gulf of Mexico; Indian Ocean; California to Cocos Island and Ecuador, the Philippines, Australia, Loyalty Islands, and elsewhere. (Circumglobal).
- Watersipora arcuata* Banta, 1968.—*Watersipora cucullata*.—Hastings, 1930:729.—*Watersipora cucullata* var. *nigra*.—Osburn, 1952:472. Watersiporidae. Islands: Santiago, Isabela; Osburn's stations in the Galapagos are unspecified. Distribution: California, Baja California, Gulf of California and the Galapagos; Australia and New Zealand (Pacific). Hastings's Pl. 15, figs. 99 and 101, are probably of *W. arcuata*. Some or all of Osburn's records of this species in the Galapagos probably belong here. See Soule & Soule 1975:308.
- Watersipora cucullata* (Busk, 1854).—Hastings, 1930: 729.—Osburn, 1950:472. Watersiporidae. Islands: Santiago, Isabela; Osburn's stations unspecified. Distribution: Atlantic, Mediterranean, Red Sea, Indian Ocean, Amoy (Circumglobal). This species has not yet been recorded with certainty in the Galapagos; it may be present but lumped with *W. arcuata* and *Pachycleithonia nigra*; see Soule & Soule (1975: 308, 1985:297).



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