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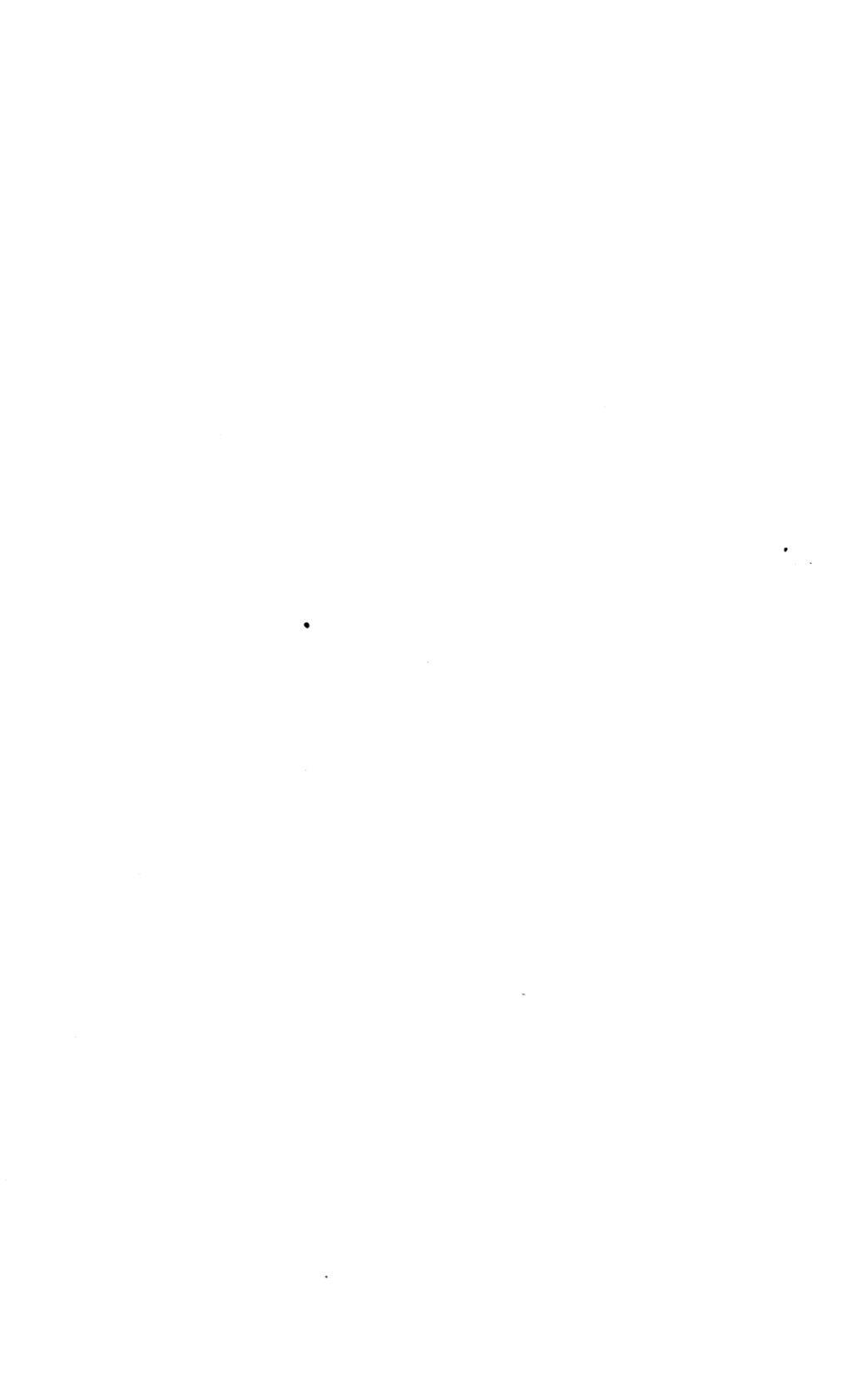
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CONTENTS

	PAGES
1. THE MYXOPHYCEAE OF MARYLAND. <i>By</i> Francis Drouet. February 28, 1939	1-14
2. FRANCIS WOLLE'S FILAMENTOUS MYXOPHYCEAE. <i>By</i> Francis Drouet. December 22, 1939	15-64
3. THE PLANKTONIC FRESHWATER SPECIES OF MICROCYSTIS. <i>By</i> Francis Drouet. December 22, 1939	65-83
4. TROPICAL MARINE ALGAE OF THE ARTHUR SCHOTT HERBARIUM. <i>By</i> William Randolph Taylor. November 29, 1941	85-104
5. THE FILAMENTOUS MYXOPHYCEAE OF JAMAICA. <i>By</i> Francis Drouet. June 15, 1942	105-122
6. STUDIES IN MYXOPHYCEAE. I. <i>By</i> Francis Drouet. June 15, 1942 . .	123-141
7. MYXOPHYCEAE OF EASTERN CALIFORNIA AND WESTERN NEVADA. <i>By</i> Francis Drouet. November 20, 1943	143-176

LIST OF ILLUSTRATIONS

PLATES

NUMBER 4

- I. *Sargassum Hystrix* var. *spinulosa* (Kütz.) Grun.
- II. *Protokuetzingia Schottii*

NUMBER 6

- I. *Chroococcus sonorensis*, *C. Prescottii*, *Plectonema Cloverianum*, *Aphanocapsa Farlowiana*, *Porphyrosiphon Velasquezii*, *Arthrospira Khannae*
- II. *Phormidium Groesbeckianum*, *Lyngbya Giuseppeii*, *L. guaymensis*, *L. Patrickiana*, *Phormidium Steyermarkii*, *P. californicum*, *P. thermale*
- III. *Phormidium Standleyi*, *P. Richardsii*, *Oscillatoria sonorensis*, *Phormidium Gardnerianum*, *P. hydrocoleoides*, *Spirulina Weissii*

TEXT FIGURES

NUMBER 2

- | | PAGE |
|--|------|
| 1. <i>Schizothrix Wollei</i> Drouet..... | 41 |

NUMBER 7

- | | |
|--|-----|
| 1. <i>Schizothrix acutissima</i> | 163 |
| 2. <i>Schizothrix Macbridei</i> | 163 |
| 3. <i>Schizothrix californica</i> | 163 |
| 4. <i>Hydrocoleum Groesbeckianum</i> | 163 |

31

THE MYXOPHYCEAE OF MARYLAND

BY
FRANCIS DROUET
CURATOR OF CRYPTOGAMIC BOTANY



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THE MYXOPHYCEAE OF MARYLAND

FRANCIS DROUET

The algal flora of the middle and southern Atlantic states is very inadequately represented in herbaria and in the literature. Taylor in his *Marine Algae of the Northeastern Coast of North America* (1937) has made this fact evident in respect to the marine flora. The fresh-water algae are known to us chiefly through the accumulated herbarium of Francis Wolle, whose publications ceased as long ago as 1893. Scattered local floras have been listed, but they are sketchy and their areas are extremely restricted; few of the specimens (if extant) which support them have found their ways out of private hands. The flora of brackish water, the most conspicuous elements of which are as a rule the Myxophyceae, has been almost totally neglected, even though the areas of salt marshes and tidewater here are probably as extensive as anywhere else in North America.

I was therefore greatly pleased to receive the invitation to visit and collect with Mr. Philip W. Wolle in Somerset County, Maryland, on the eastern shore of Chesapeake Bay, in August, 1938. Salt marshes occur along almost the entire shore of this county and on the islands attached to it. Tidewater rivers extend far inland. During a week's time, Mr. Wolle and I gathered in collections from every habitat, fresh, brackish, and semi-marine, that we could discover. We owe much of the success of this joint collecting to Mr. Roger White, Mr. Leo A. Bailey, and Dr. Robert H. Johnson, who gave us transportation to interesting and out-of-the-way places in the region.

Later, I had the pleasure of visiting Dr. Lewis P. McCann at College Park and of collecting with him and Dr. G. B. Reynard in Prince Georges County. Before leaving the state, I went with Dr. Mark W. Woods, Dr. McCann, and Mr. D. S. Stoddard on a tour into Garrett County, where opportunity arose to visit localities examined for algae in 1878 by Captain John Donnell Smith.

The number of collections of algae from eastern Maryland has been further augmented by Mr. Wolle's recent collecting. Dr. Harold C. Bold and Dr. F. E. Allison have obligingly given me much of their own blue-green algal material from the state for study.

In the citation of specimens below, serial numbers in italics are used to indicate my own collections or those made conjointly with others mentioned above. All of such collections were taken during

the period August 21–30, 1938. This material is cited as in my own herbarium, but duplicate specimens have been distributed to the Field Museum of Natural History, Mr. P. W. Wolle, the Farlow Herbarium, the Herbarium of Mr. J. C. Strickland, the New York Botanical Garden, the Naturhistoriska Riksmuseet at Stockholm, and elsewhere. In general, other specimens are to be found in herbaria as indicated by the following abbreviations: D, my personal herbarium; F, Farlow Herbarium of Harvard University; FM, Field Museum of Natural History; G, Herbarium of Goucher College; N, New York Botanical Garden; P, Herbarium of the University of Pennsylvania; U, United States National Herbarium. It is to be understood that, unless otherwise stated, references to Gomont are all to his 'Monographie des Oscillariées' (1892–93) and those to Bornet & Flahault are all to their 'Révision des Nostocacées heterocystées' (1886–88).

The Chroococcaceae

CHROOCOCCUS TURGIDUS (Kütz.) Näg., Gatt. einzell. Alg. 46 (1849). *Protococcus turgidus* Kütz., Tab. Phyc. 1: 5 (1845).—In brackish water, SOMERSET COUNTY: marsh pool at Chance, 2268 (D); marsh pool west of Ewell, Smiths Island, 2306 (D); marsh pool, Tylerton, Smiths Island, P. W. Wolle (FM, Wolle).

APHANOTHECE STAGNINA (Spreng.) A. Br. in Rabenh., Fl. Eur. Algar. 2: 66 (1865). *Coccolchloris stagnina* Spreng., Fl. Halens. Mant. 1: 14 (1807).—One specimen, from fresh water, CALVERT COUNTY: pool, Cove Point, H. C. Bold, 1936 (FM).

GOMPHOSPHAERIA APONINA Kütz., Alg. exs. Dec. 16: 151 (1836).—In brackish water, SOMERSET COUNTY: marsh pool between Chance and Dames Quarter, P. W. Wolle, June 12, 1938 (D), 2260 (D).

JOHANNESBAPTISTIA PELLUCIDA (Dickie) Tayl. & Drouet, Bull. Torr. Bot. Club 65: 285 (1938).—For the lengthy synonymy of this species, see the above reference. The three collections listed here extend the known range of this brackish-water species far to the north of that described previously. CONNECTICUT: with *Hydrocoleum Holdenii*, Fresh Pond, Stratford, I. Holden 1035, Sept. 1894 (D, F). MARYLAND: SOMERSET COUNTY: marsh pool west of Ewell, Smiths Island, 2307 (D); with *Gomphosphaeria aponina*, marsh pool between Chance and Dames Quarter, P. W. Wolle, July 12, 1938 (D).

The Stigonemataceae

STIGONEMA MINUTUM (Ag.) Hass. ex Born. & Flah.—Two specimens from wet rocks: BALTIMORE COUNTY: Loch Raven, J. E.

Humphrey, Nov. 10, 1894 (G). GARRETT COUNTY: Deep Creek, *J. D. Smith*, July 26, 1878 (U).

STIGONEMA INFORME Kütz. ex Born. & Flah.—Also from wet rocks, GARRETT COUNTY: Falls of Deep Creek, *J. D. Smith*, July 26, 1878 (P, U).

STIGONEMA MAMILLOSUM (Lyngb.) Ag. ex Born. & Flah. f. **robustum** (Gardn.), *comb. nov.* *S. robustum* Gardn., Univ. Calif. Publ. Bot. 14:9, pl. 4 (1927).—The Maryland material cited here is similar in habit and structure to the TYPE of *S. robustum* from China in the Farlow Herbarium and to material placed under the same name from Brazil (see Amer. Journ. Bot. 25: 658. 1938) in the Riksmuseet at Stockholm and from Virginia in my own herbarium. Morphologically, all of this material is indistinguishable, except for size of filaments, from those specimens cited as typical *S. mamillosum* by Bornet & Flahault. I have not had the opportunity to see a sufficient number of specimens to decide whether or not the two forms can always be separated with ease on the basis of size differences alone. One collection, from rocks partially submersed in swift, shallow water, GARRETT COUNTY: Swallow Falls, 2342 (D, FM).

HAPALOSIPHON PUMILUS (Kütz.) Kirchn. ex Born. & Flah. *H. fontinalis* (Ag.) Born., Bull. Soc. Bot. France 36: 156 (1888). *H. brasiliensis* Borge, Ark. f. Bot. 15 (13): 94 (1919).—In fresh water and wet places. WORCESTER COUNTY: Old Mill Pond, Nassawongo Creek, Atkinson's District, *P. W. Wolle*, Nov. 19, 1938 (FM). GARRETT COUNTY: 3 miles north of Oakland, 2336 (D).

The Nostocaceae

NOSTOC PISCINALE Ag. ex Born. & Flah.—In fresh water, BALTIMORE COUNTY: Loch Raven, *C. E. Waters*, July 29, 1897 (F).

NOSTOC MUSCORUM Ag. ex Born. & Flah.—A very common soil alga throughout the northeastern and north central states, often most abundantly developed in dried rain pools. SOMERSET COUNTY: Wolle Farm, 3 miles northwest of Princess Anne, 2296 (D). PRINCE GEORGES COUNTY: on bank of Paint Branch at Riggs Road west of Beltsville, 2321 (D). GARRETT COUNTY: springy places in pasture 3 miles north of Oakland, 2341 (D).

NOSTOC COMMUNE Vauch. ex Born. & Flah.—BALTIMORE COUNTY: on earth, Loch Raven, *J. E. Humphrey*, Apr. 29, 1897 (G), *C. E. Waters*, July 24, 1897 (Phyc. Bor.-Amer. 403a, D, FM); Towson, *Humphrey*, Nov. 10, 1889, 1894 (G).

ANABAENA SPHAERICA Born. & Flah.—SOMERSET COUNTY: in a brackish ditch between Wenona and Deal Island, 2265 (D).

ANABAENA VARIABILIS Kütz. ex Born. & Flah.—In fresh water, WICOMICO COUNTY: on wet sand, Sandy Hill Beach, Tyaskin, 2252 (D).

NODULARIA HARVEYANA Thur. ex Born. & Flah.—SOMERSET COUNTY: floating in a brackish pond, Rhodes Point, Smiths Island, 2302 (D).

CYLINDROSPERMUM MAJUS Kütz. ex Born. & Flah. *C. janthinum* Dickie ex Born. & Flah., sp. inquir.—On moist soil. BALTIMORE COUNTY: rocks, *J. D. Smith*, May 13, 1878 (P, U). MONTGOMERY COUNTY: banks near Glen Echo, *F. E. Allison* 37, 38, July 10, 1937 (D, F, N).

CYLINDROSPERMUM MUSCICOLA Kütz. ex Born. & Flah. *C. caeruleum* Dickie ex Born. & Flah., sp. inquir.—MONTGOMERY COUNTY: in shallow water, Dalecarlia Reservoir, Conduit Road near District of Columbia, *F. E. Allison* 42, July 10, 1937 (D).

CYLINDROSPERMUM LICHENIFORME (Bory) Kütz. ex Born. & Flah.—MONTGOMERY COUNTY: on soil near Dalecarlia Reservoir, *F. E. Allison* 40, 41, July 10, 1937 (D, N).

The Rivulariaceae

CALOTHRIX PULVINATA (Mert.) Ag. ex Born. & Flah.—In marine and brackish waters. WICOMICO COUNTY: on pilings in Nanticoke River, Sandy Hill Beach, Tyaskin, 2253 (D). SOMERSET COUNTY: with *Fremyella grisea*, on piling of old wharf at Shelltown, *P. W. Wolle*, Nov. 21, 1938 (FM).

RIVULARIA NITIDA Ag. ex Born. & Flah.—In wet brackish places. SOMERSET COUNTY: on cedar stumps at head of Pocomoke Sound, below Shelltown, *P. W. Wolle*, Nov. 21, 1938 (FM).

GLOEOTRICHIA NATANS (Hedw.) Rabenh. ex Born. & Flah. *Rivularia natans* (Hedw.) Welw. ex Born. & Flah., pro synonym. *Rivularia (Gloeotrichia) flagelliformis* Gardn.,¹ Mem. New York Bot. Gard. 7: 71 (1927).—In fresh water, CALVERT COUNTY: Pt. Patience, *H. C. Bold*, 1937 (FM).

The Scytonemataceae

FREMYELLA GRISEA (Born. & Flah.) J. DeToni, Noter. Nomencl. Algol. VIII (1936). *Microchaete grisea* Thur. ex Born. & Flah.—In

¹ The TYPE of *R. flagelliformis* in the New York Botanical Garden and an isotype in the U. S. National Herbarium (PUERTO RICO: in a water reservoir near Río Piedras, *N. Wille* 126, Dec. 28, 1914) consist of typical plants of *Gloeotrichia natans* with principally young spores and very few almost mature ones.

brackish and marine waters. SOMERSET COUNTY: on piling of old wharf at Shelltown, *P. W. Wolle*, Nov. 21, 1938 (FM).

TOLYPOTHRIX TENUIS Kütz. ex Born. & Flah. *T. rupestris* Wolle, *F. W. Alg. U. S.* 1: 265 (1887); Geitler, *Rabenh. Kryptogamen-Fl.* 14: 733 (1932).—In fresh water, BALTIMORE: on grasses in pools in abandoned brickyard, *J. E. Humphrey*, Oct. 10, 1896 (Phyc. Bor.-Amer. 257, FM).

SCYTONEMA TOLYPOTRICHOIDES Kütz. ex Born. & Flah. *S. gracile* var. *tolypotrichoides* Wittr. ex Born. & Flah., sp. inquir.—In fresh water, GARRETT COUNTY: Falls of Deep Creek, *J. D. Smith*, July 26, 1878 (P).

SCYTONEMA HOFMANNII Ag. ex Born. & Flah.—Subaerial in moist places, BALTIMORE COUNTY: on wet moss, Loch Raven, *J. E. Humphrey*, Nov. 10, 1894 (G).

SCYTONEMA OCELLATUM Lyngb. ex Born. & Flah.—Usually found on rocks and soil wet occasionally by rains. PRINCE GEORGES COUNTY: bank of Paint Branch at Riggs Road west of Beltsville, 2322 (D).

SCYTONEMA GUYANENSE (Mont.) Born. & Flah. *S. guyanense* var. *minus* Gardn.,¹ *Mem. New York Bot. Gard.* 7: 79 (1927).—On rocks and trees, most abundant in the warmer regions of the Western Hemisphere. BALTIMORE COUNTY: on wet rocks near L. Roland, *J. E. Humphrey*, Apr. 20, 1895 (G).

The Oscillatoriaceae

SCHIZOTHRIX PURPURASCENS (Kütz.) Gom. *Hydrocoleum rufescens* Gardn.,² *Mem. New York Bot. Gard.* 7: 57 (1927).—A common inhabitant of soil wet only by rains in the eastern United States. GARRETT COUNTY: in an old field 3 miles north of Oakland, 2338 (D).

SCHIZOTHRIX MUELLERI Näg. ex Gom. *Hydrocoleum Hieronymii* Richt.³ in Hauck & Richt., *Phyk. univ.* 543 (1892).—On moist soil

¹The TYPE of this variety in the New York Botanical Garden, PUERTO RICO: on rocks along the roadside, Arecibo to Utuado, *N. Wille* 1455, Mar. 4, 1915, said to have filaments more tenuous than those in the typical variety, appears to differ in no respect from material of *S. guyanense* cited by Bornet & Flahault.

²The TYPE of *Hydrocoleum rufescens* in the New York Botanical Garden, PUERTO RICO: on red soil at the Experiment Station, Mayaguez, *N. Wille* 972, Feb. 6-8, 1915, is excellent material of *Schizothrix purpurascens*.

³I can find nothing to distinguish the isotypic material of *Hydrocoleum Hieronymii* in the Farlow Herbarium, GERMANY: in Carlowitz bei Breslau, *G. Hieronymus*, Sept.-Okt. 1891 (*Phyk. univ.* 543), from specimens of *Schizothrix Muellieri* cited by Gomont. Geitler has made a similar suggestion in *Rabenh. Kryptogamen-Fl.* 14: 1157 (1932).

and rocks, GARRETT COUNTY: with *S. Friesii*, Falls of Deep Creek, J. D. Smith, July 26, 1878 (U).

HYDROCOLEUM HOLDENII Tild., *Rhodora* 3: 254 (1901); Drouet, idem 40: 229 (1938). *H. majus* Holden, idem 1: 197 (1899), not Mart.—These Maryland records extend the known distribution far to the south of southern New England, whence previously recognized material has come. As in the northern part of its range, *H. Holdenii* is here an inhabitant of brackish pools. WORCESTER COUNTY: in a salt marsh 1 mile south of Public Landing, Assateague Bay, P. W. Wolle, Nov. 19, 1938 (FM). SOMERSET COUNTY: marsh ditch at Tylerton, Smiths Island, P. W. Wolle, Aug. 12, 1938 (FM, Wolle).

MICROCOLEUS CHTHONOPLASTES (Fl. dan.) Thur. ex Gom.—Often the commonest and most conspicuous alga on shores and about brackish pools. SOMERSET COUNTY: on mud flat between Ewell and Rhodes Point, Smiths Island, 2303 (D); brackish ditch between Wenona and Deal Island, 2266 (D); wet sand along Upper Thoroughfare, Deal Island, 2263 (D); on wet soil at White Haven Ferry, Mt. Vernon, 2251 (D).

MICROCOLEUS TENERRIMUS Gom.—In marine and brackish waters, SOMERSET COUNTY: on pilings, Wenona, 2284 (D).

MICROCOLEUS VAGINATUS (Vauch.) Gom.—As abundantly represented as *Nostoc Muscorum* on open soil wet occasionally by rains in eastern North America. PRINCE GEORGES COUNTY: with *Scytonema ocellatum*, bank of Paint Branch at Riggs Road west of Beltsville, 2322 (D).

PLECTONEMA GOLENKINIANUM Gom., Bull. Soc. Bot. France 46: 35 (1899); Collins, Holden & Setchell, Phyc. Bor.-Amer. 13: 603 (1899). *Lyngbya (Leibleinia) subtilis* Holden¹ in Collins, Holden & Setchell, Phyc. Bor.-Amer. 24: 1163 (1904), not West. *Lyngbya Holdenii* Forti,¹ Syll. Myxophyc. 260 (1907).—In marine and brackish water. SOMERSET COUNTY: with *Fremyella grisea*, on piling of old wharf at Shelltown, P. W. Wolle, Nov. 21, 1938 (FM).

¹ The case of *Lyngbya subtilis* Holden is a somewhat peculiar one. The original description was published in company with specimens of a true *Lyngbya* (see below) from Massachusetts which are quite different in nature from the TYPE in the Farlow Herbarium from CONNECTICUT: Bridgeport, I. Holden, Jan. 10, 1891. The form represented in the type specimen is similar to that of the co-type of *Plectonema Golenkinianum* Gom. distributed in Phyc. Bor.-Amer. 603. The two collections, one from Maine and the other from Massachusetts, distributed in Phyc. Bor.-Amer. 1007 under the manuscript name *Lyngbya subtilis* Holden, consist of this same species of *Plectonema*. The name *L. Holdenii* was proposed by Forti to replace the name preoccupied by *L. subtilis* West, Journ. Roy. Microsc. Soc. 1892: 741 (1892). The true *Lyngbya* represented in Phyc. Bor.-Amer. 1163 has already been described by Collins as *Schizothrix Simmonsiae*, in Phyc. Bor.-Amer. 707. The isotypic specimens accompanying the description of *S. Sim-*

SYMPLOCA MUSCORUM (Ag.) Gom. *Phormidium Corium* var. *capitatum* Gardn.,¹ Univ. Calif. Publ. Bot. 14: 4 (1927). *P. interruptum* var. *capitatum* Gardn.,¹ Mem. New York Bot. Gard. 7: 44 (1927).—Also a soil form, often developing in places which are moist for a considerable part of the year. SOMERSET COUNTY: in an artesian spring, Kings Creek, 2292 (D). HARFORD COUNTY: Spesutie Island, *J. D. Smith*, Oct. 1878 (P). PRINCE GEORGES COUNTY: swamp 1 mile west of Beltsville, 2315, 2318 (D); soil under pear trees, Beltsville, *F. E. Allison* 16, June 14, 1937 (D). GARRETT COUNTY: Falls of Deep Creek, *J. D. Smith*, Oct. 1878 (U); on soil in an old field 3 miles north of Oakland, 2339 (D).

LYNGBYA AESTUARII (Mert.) Liebm. ex Gom.—Submersed and subaerial in brackish and marine waters. WORCESTER COUNTY: in a salt marsh at Public Landing, Assateague Bay, *P. W. Wolle*, Nov. 19, 1938 (FM). SOMERSET COUNTY: on mud in street, Ewell, Smiths Island, 2300 (D); brackish ditch, Ewell, 2308 (D).

LYNGBYA CONFEROIDES Ag. ex Gom.—On rocks and wood in marine waters. WORCESTER COUNTY: pilings of old wharf at Public Landing, Assateague Bay, *P. W. Wolle*, Nov. 19, 1938 (FM). SOMERSET COUNTY: jetty, Upper Thoroughfare, Deal Island, 2264 (D); on rocks, Wenona, 2282 (D).

LYNGBYA SEMIPLENA (Ag.) Ag. f. ex Gom.—On rocks etc. in marine and brackish waters. CALVERT COUNTY: in Chesapeake Bay, *H. C. Bold*, July 5, 1937 (FM).

monsiae have all the characteristics of a species of *Lyngbya* in the hormogonial state and closely related to *L. gracilis* (Menegh.) Rabenh. ex Gom. For disposal of these specimens, I propose the following:

LYNGBYA *Simmonsiae* (Collins), *comb. nov.* *Schizothrix Simmonsiae* Collins in Collins, Holden & Setchell, Phyc. Bor.-Amer. 15: 707 (1900). Fila epiphytica, recta aut flexuosa, aggregata, flexilia, rosea vel aeruginea; vaginis tenuibus usque paulo incrassatis, hyalinis, passim lamellosis, parce mucosis, chlorozincio iodurato laete caerulescentibus; trichomatibus pallide aerugineis usque roseis, ad genicula eviderter constrictis, saepe torulosis, 3μ ad 5μ crassis, haud attenuatis; articulis subquadratis usque diametro sextuplo brevioribus, 0.5μ ad 3.5μ longis; protoplasmate homogeneo, passim tenui-granuloso; cellula apicali rotundata, calyptra nulla (v. s.).—Epiphytic on larger algae in quiet marine waters of southern New England: MASSACHUSETTS: on Enteromorpha, Magnolia, *W. G. Farlow*, Sept. 1903 (co-type of *Lyngbya subtilis* Holden in Phyc. Bor.-Amer. 1163, D, F, FM, N); water sample from Vineyard Sound, *L. C. Lillick*, Summer 1938 (FM). RHODE ISLAND: on algae in high rock pool, Easton's Point, Newport, *Mrs. W. C. Simmons*, Dec. 1897 (TYPE in Herb. New York Bot. Gard.; isotypes in Phyc. Bor.-Amer. 707, D, F, FM, N).

¹ The specimens (among them the TYPE from CHINA: Kuliang near Foochow, Fukien Province, *H. H. Chung* A402) in the Farlow Herbarium which Gardner cited with the original description of *Phormidium Corium* var. *capitatum* are excellent and typical material of the inundated form of *Symploca Muscorum*. The TYPE of *Phormidium interruptum* var. *capitatum* (PUERTO RICO: side of road near Humacao, *N. Wille* 540, Jan. 20-24, 1915) in the New York Botanical Garden is to be interpreted in a similar fashion.

LYNGBYA LUTEA (Ag.) Gom. *Oscillatoria sordida* Dickie ex Forti, Syll. Myxophyc. 192 (1907).—On rocks etc. in salt and brackish water, also on wet soil on shores. DORCHESTER COUNTY: on banks of Nanticoke River opposite Sandy Hill Beach (Tyaskin), 2258 (D).

LYNGBYA OCHRACEA (Kütz.) Thur. ex Gom.—In shallow pools in springy ground. PRINCE GEORGES COUNTY: below dam of pond, Riggs Road at Paint Branch west of Beltsville, 2325 (D).

PHORMIDIUM Weissii, *sp. nov.* Stratum aerugineum aut nigrescens, mucosum vel membranaceum; trichomatibus rectis undulatisve, fragilibus, paralleliter in muco amorpho hyalino chlorozincico iodurato haud caerulescente dispositis, ad genicula evidenter constrictis,

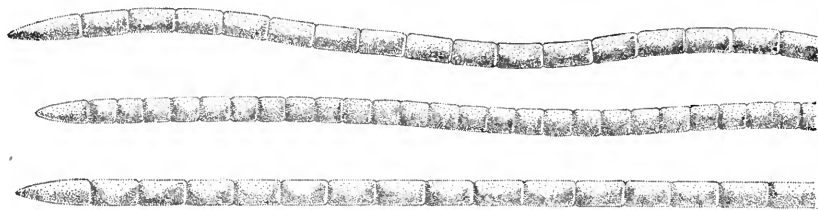


FIG. 1. *Phormidium Weissii*, *sp. nov.*, drawn from the TYPE specimen by Mrs. Inez Austin.

numquam torulosis, 1.0μ ad 2.5μ crassis, superne rectis vel curvatis uncinatisve, ad apices sensim et longe attenuatis et acutis; articulis subquadratis aut diametro usque duplo longioribus, 1.5μ ad 5μ longis; protoplasmate per totam cellulam homogeneo, raro tenui-granuloso; dissepimentis conspicuis, haud granulatis; cellula apicali acute conica, haud capitata, sine calyptra (v. v., v. s., v. in form.). Fig. 1. In brackish and marine waters of low salinity along the eastern shore of North America, MASSACHUSETTS: in high pools on rocks, Black Rock, off Sconticut Point, Fairhaven, *C. M. Palmer & Drouet* 2177, Sept. 1, 1937 [TYPE in Herb. F. Drouet; Isotypes: British Museum (Natural History), F, FM, N, Naturhistoriska Riksmuseet (Stockholm), Herb. J. C. Strickland]; on rocks in high tide pools, Penikese Island, Gosnold, *J. Cohn*, July 10, 1934 (D); Botanical Survey of Penikese Island (Herb. Marine Biol. Lab.). MARYLAND: SOMERSET COUNTY: in a brackish pool, Wenona, 2279 (D); on *Ruppia* in a marsh pool between Ewell and Rhodes Point, Smiths Island, 2305 (D); road puddle at old wharf, Shelltown, *P. W. Wolle*, Nov. 21, 1938 (FM). FLORIDA: southwest Florida, *J. D. Smith*, Mar. 1878 (D, P, U). BAHAMA ISLANDS: in the lagoon, Watling Island, *M. A. Howe* 5095, Nov. 25, 1907 (D).

This well characterized species of brackish water has passed in herbaria and literature under several names: *P. Boryanum* in herb. Wolle; *P. tenue* according to Hazen in Lewis, *Rhodora* 26: 211 (1924); *P. valderianum* in Collins' list of algae in Britton & Millspaugh, *The Bahama Flora*, p. 621 (1920); and *P. fragile* in my recent treatment of the southern Massachusetts Oscillatoriaceae in *Rhodora* 40: 260 (1938). In my own herbarium, material has heretofore been filed tentatively with *P. fragile* (Menegh.) Gom. and *P. subuliforme* Gom.; specimens of Nos. 2279 and 2305 from Maryland have been distributed to other herbaria under these names. Morphologically *P. Weissii* is closely related to these two species. It gives me much pleasure here to name this new form in honor of Mr. Philip Weiss Wolle, to whose ardent enthusiasm for microscopy and collecting I am chiefly indebted for the opportunity to study the Myxophyceae of the state of Maryland.

PHORMIDIUM INUNDATUM Kütz. ex. Gom. *P. purpurascens* var. *elegans* Drouet, Bot. Gaz. 95: 696 (1934).—One specimen from fresh water: BALTIMORE COUNTY: *J. D. Smith*, May 1878 (U).

PHORMIDIUM RETZII (Ag.) Gom. *P. leptodermum* var. *capitatum* Gardn.,¹ Mem. New York Bot. Gard. 7: 43 (1927).—In running fresh water. BALTIMORE COUNTY: on dripping rocks, Loch Raven, *J. E. Humphrey*, Apr. 4, 1895 (G). PRINCE GEORGES COUNTY: on stones in stream near Paint Branch at Riggs Road west of Beltsville, 2324 (D).

PHORMIDIUM FAVOSUM (Bory) Gom.—In running fresh water, etc. BALTIMORE COUNTY: near L. Roland, *J. E. Humphrey*, Mar. 23, 1895 (G); foul drain ditch, *J. D. Smith*, May 23, 1878 (P, U).

PHORMIDIUM SUBFUSCUM var. JOANNIANUM (Kütz.) Gom.—In running fresh water. BALTIMORE COUNTY: mill dam, *J. D. Smith*, May 1878 (P, U).

PHORMIDIUM UNCINATUM (Ag.) Gom.—In fresh water. BALTIMORE COUNTY: foul drain ditch, *J. D. Smith*, May 23, 1878 (P).

PHORMIDIUM AUTUMNALE (Ag.) Gom. *Lyngbya hahatonkensis* Drouet, Bot. Gaz. 95: 696 (1934).—On wet soil etc., seldom found submerged in fresh water. CALVERT COUNTY: watering trough, Solomons, *H. C. Bold*, July 2, 1936 (FM). CARROLL COUNTY: on soil in a farmyard at Sauble's Inn, Taneytown, *F. E. Allison* 30, July 5, 1937 (D).

¹The TYPE of *P. leptodermum* var. *capitatum* in the New York Botanical Garden, PUERTO RICO: on rocks in a stream of warm water, Coamo Springs, *N. Wille* 364, Jan. 12, 1915, is excellent material of *P. Retzii*.

OSCILLATORIA PRINCEPS Vauch. ex Gom. *O. obtusa* Gardn.,¹ Mem. New York Bot. Gard. 7: 38 (1927). *Lyngbya gigantea* Lewis, Zirkle & Patrick, Journ. Elisha Mitchell Sci. Soc. 1933: 221 (1933).—In quiet fresh water, SOMERSET COUNTY: in seepage water, Kings Creek, 2290 (D); with *O. proboscidea*. 'Red Bridge,' headwaters of the Manokin River, Princess Anne, P. W. Wolle, July 6, 1938 (D).

OSCILLATORIA PROBOSCIDEA Gom. *O. refringens* Gardn.,² Mem. New York Bot. Gard. 7: 38 (1927).—In similar situations as, and often in company with, the preceding. SOMERSET COUNTY: 'Red Bridge,' headwaters of the Manokin River, Princess Anne, P. W. Wolle, July 6, 1938 (D). BALTIMORE: Biology Laboratory, Johns Hopkins University, J. E. Humphrey, Mar. 9, 1895 (G).

OSCILLATORIA LIMOSA Ag. ex Gom.—In fresh water. GARRETT COUNTY: J. D. Smith, Aug. 4, 1878 (U).

OSCILLATORIA CURVICEPS Ag. ex Gom.—In fresh water. BALTIMORE COUNTY: in stream, Loch Raven, J. E. Humphrey, Nov. 10, 1894 (G).

OSCILLATORIA ORNATA Kütz. ex Gom.—In fresh water. CALVERT COUNTY: with *Spirulina major*, Cove Point, H. C. Bold, July 6, 1937 (FM).

OSCILLATORIA MARGARITIFERA Kütz. ex Gom.—In brackish and semi-marine waters, SOMERSET COUNTY: marsh ditch at Wenona, P. W. Wolle, June 12, 1938 (D); marsh pool at Chance, 2269 (D); with *Hydrocoleum Holdenii*, marsh ditch at Tylerton, Smiths Island, P. W. Wolle, Aug. 12, 1938 (FM, Wolle).

OSCILLATORIA NIGRO-VIRIDIS Thw. ex Gom.—In marine and semi-marine waters. SOMERSET COUNTY: on pilings, Wenona, 2283 (D).

OSCILLATORIA TENUIS Ag. ex Gom. *O. tenuis* var. *levis* Gardn.,³ Mem. New York Bot. Gard. 7: 38 (1927).—In quiet fresh water. SOMERSET COUNTY: Manokin River marsh, 2 miles west of Princess Anne, P. W. Wolle, Oct. 9, 1938 (FM). BALTIMORE COUNTY: foul drain ditch, J. D. Smith, Mar. 23, 1878 (P, U). ANNE ARUNDEL

¹ The TYPE of *O. obtusa* in the New York Botanical Garden, PUERTO RICO: in a pool, Parque Borinquen, Santurce, N. Wille 807, Feb. 3, 1915, is indistinguishable to me from other specimens which I have placed in *O. princeps*.

² The TYPE of *O. refringens*, PUERTO RICO: among water plants in the Turabo River, Caguas, N. Wille 486b, Jan. 15-17, 1915, in the New York Botanical Garden is typical material of *O. proboscidea*.

³ The TYPE of *O. tenuis* var. *levis* in the New York Botanical Garden, PUERTO RICO: among other algae in the Turabo River, Caguas, N. Wille 486a, Jan. 17, 1915, appears to represent the larger form of *O. tenuis* designated as var. *natans* (Kütz.) Gom.

COUNTY: *Smith*, May 18, 1878 (P). GARRETT COUNTY: *Smith*, July 1878 (U).

OSCILLATORIA AMPHIBIA Ag. ex Gom.—In brackish and almost fresh water. SOMERSET COUNTY: marsh pool between Chance and Dames Quarter, 2161A (D).

OSCILLATORIA SALINARUM Collins in Collins, Holden & Setchell, Phyc. Bor.-Amer. 24: 1160 (1904). *O. luteola* Drouet, Rhodora 39: 277, f. 1 (1937).—When I described *O. luteola* in 1937, it had puzzled me that I had not found an earlier name for this very often encountered species of brackish water from the coasts of both Americas. The possibility of applying the name *O. salinarum* Collins had suggested itself, but at that time I had access only to the badly preserved and uninformative isotypic specimens distributed to several eastern herbaria in Phyc. Bor.-Amer. 1160. Recently I examined with great care the copious material of the TYPE in the New York Botanical Garden. Most of it is quite as dubious as that in the Phycotheca specimens, but certain portions are sufficiently well preserved to show that the species designated by Collins is the same as *O. luteola*. Collins' description is so sketchy that it might easily apply to several of Gomont's species. For a fuller characterization of *O. salinarum*, the reader is referred to the original description of *O. luteola*. SOMERSET COUNTY: brackish ditch, Ewell, Smiths Island, 2309 (D); with *O. margaritifera*, marsh ditch near Wenona, P. W. Wolle, June 12, 1938 (D); with *Hydrocoleum Holdenii*, Tylerston, Wolle, Aug. 12, 1938 (Fi, Wolle).

OSCILLATORIA FORMOSA Bory ex Gom.—In fresh water. SOMERSET COUNTY: roadside puddle, Church Street, Princess Anne, P. W. Wolle, Aug. 25, 1938 (FM, Wolle).

OSCILLATORIA BREVIS Kütz. ex Gom.—On moist soil and in rain-water pools. SOMERSET COUNTY: on mud, Wenona, 2277 (D).

OSCILLATORIA BREVIS var. NEAPOLITANA (Kütz.) Gom.—In brackish and semi-marine waters. SOMERSET COUNTY: on pilings, Wenona, 2287 (D); with *Phormidium Weissii*, puddle at old wharf, Shelltown, P. W. Wolle, Nov. 21, 1938 (FM).

SPIRULINA MAJOR Kütz. ex Gom. *S. densa* Lillick, Amer. Midl. Nat. 16:210 (1935).—SOMERSET COUNTY: brackish pool, Wenona, 2288 (D). CALVERT COUNTY: Cove Point, H. C. Bold, July 6, 1937 (FM).

SPIRULINA TENERRIMA Kütz. ex Gom. *S. socialis* Gardn.,¹ New York Acad. Sci., Sci. Surv. Porto Rico 8: 272 (1932).—In brackish

¹ There appears to be no reason to separate the TYPE of *S. socialis* in the New York Botanical Garden, PUERTO RICO: Santurce, M. A. Howe 2162a, May 27, 1903, from other specimens of *S. tenerrima*.

and marine waters. SOMERSET COUNTY: marsh pool between Ewell and Rhodes Point, Smiths Island, 2304 (D).

SPIRULINA SUBSALSA Oerst. ex Gom. *Arthrospira subsalsa* Crow apud Croasdale, F. W. Alg. Woods Hole, Mass. 18 (1935).—In marine and brackish waters. SOMERSET COUNTY: with *Oscillatoria amphibia*, in a marsh pool between Chance and Dames Quarter, 2161A (D).

To Be Excluded

Microcystis Donnellii Wolle, Bull. Torr. Bot. Club 6: 282 (1879), is represented in the original collection by a ciliate protozoan with endophytic green cells: GARRETT COUNTY: *J. D. Smith*, July 1878 (TYPE in Herb. Univ. Pennsylvania; Isotype, U).

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INDEX

Synonyms in *italics*

- Acanthophora muscoides*, 99
 spicifera, 99
Acetabularia crenulata, 90
Agardhiella tenera, 96
Amphithrix janthina, 28, 157
 villosa, 57
Anabaena catenula, 27, 57, 156
 circinalis, 27, 81
 cupressaphila, 33, 113
 flos-aquae, 57
 flos-aquae var. *aestuarii*, 55
 gigantea, 57
 inaequalis, 156
 oscillarioides, 27, 57, 157
 scabra, 27
 sphaerica, 6
 stagnalis, 57
 torulosa, 57
 variabilis, 6, 57, 156
Anacystis amplivesciculata, 80
 anomala, 80
 brunnea, 82
 compacta, 80
 consociata, 80
 cylindrica, 80
 distans, 80
 elabens, 80
 gigas, 80
 glauca, 72, 125
 gloeocapsoides, 80
 Grevillei, 82, 147
 irregularis, 80
 magnifica, 80
 marginata, 80, 150
 microsphaeria, 80
 minutissima, 80
 nidulans, 80
 nigropurpurea, 80
 nigroviolacea, 80
 paludosa, 81
 parasitica, 81
 Peniocystis, 151
 pulchra, 81
 pulverea, 72
 radiata, 81
 radiata var. *major*, 81
 Reinboldii, 81
 rupestris, 150
 Willei, 81
Aphanocapsa biformis, 151
 Castagnei, 150
 Farlowiana, 125
 Grevillei, 147
Aphanothece Castagnei, 150
 conferta, 150
 conferta var. *brevis*, 151
 elabens, 80, 81, 82
 gelatinosa, 151
 Naegeli, 150
 Packardii, 82
 stagnina, 4
Arthrospira Jenneri, 59
 Khannae, 141
 subsalsa, 14, 54, 176
Aulosira implexa, 160

Beggiatoa hinnulea, 54
Bryopsidaceae, 90
Bryopsis plumosa, 90
Bryothamnion Seaforthii, 99
 triquetrum, 99

Cagniardia Castagnei, 150
Calothrix adscendens, 30, 158
 aeruginea, 110
 Braunii, 29, 57, 158
 Brebissonii, 57
 Castellii, 57
 Contarenii, 110
 crustacea, 110
 Dillwynii, 57
 Donnellii, 57
 Fortii, 30, 158
 gracilis, 55
 gypsophila, 57
 Hosfordii, 30
 juliana, 29, 109
 lacuola, 55
 longifila, 130
 Meneghiniana, 57
 mirabilis, 57
 Orsiniana, 57
 parietaria, 29, 158
 pilosa, 110
 pulvinata, 6, 29
 scytonemicola var. *brasiliensis*, 32, 110,
 160
 thermalis, 159
 violacea, 30, 158
Caulerpa Ashmeadii, 90
 crassifolia var. *mexicana*, 90
 cupressoides, 91
 cupressoides var. *mamillosa*, 91
 cupressoides var. *Turneri*, 91
 paspaloides var. *Wurdemannii*, 91
 prolifera, 91
 racemosa, 91
 sertularioides f. *brevipes*, 91
 sertularioides f. *longipes*, 91
 taxifolia, 91
Caulerpaeae, 90
Centroceras clavulatum, 98

- Ceramiaceae, 98
Ceramium fastigiatum, 98
 nitens, 98
 strictum, 98
 Chaetangiaceae, 95
Chaetomorpha media, 90
Chamaedoris Peniculum, 90
Chamaesiphon polonicus, 153
 Chamaesiphonaceae, 152
 Champiaceae, 98
 Chlorophyceae, 89
Chondria atropurpurea, 100
 Chroococaceae, 4, 147
Chroococcus cohaerens, 149
 decolorans, 149
 granulosus, 148
 helveticus, 148
 minutus var. *virescens*, 148
 Prescottii, 127
 rufescens, 148
 Simmeri, 148
 sonorensis, 127
 thermophilus, 149
 turgidus, 4, 149
 turgidus var. *rufescens*, 149
 varius, 149
 virescens, 148
Chrootheca cryptarum, 128
 Chylocladia ovalis, 98
 Cladophora fascicularis, 90
 Cladophoraceae, 90
 Cladophoropsis membranacea, 90
Clathrocystis aeruginosa, 74
 elongata, 82
 holsatica, 73
 reticulata, 82
 robusta, 75
 roseo-persicina, 81
Coccolithis Grevillei, 147
 stagnina, 4
 Codiaceae, 91
Codium isthmocladum, 91
Coelosphaerium genuense, 152
 Kuetszingianum, 151
 Naegelianum, 152
 Wichurae, 152
 Corallina cubensis, 95
 subulata, 95
 Corallinaceae, 95
Cryptonemia crenulata, 95
 luxurians, 95
Cylindrospermum caeruleum, 6, 28, 109,
 157
 comatum, 57
 janthinum, 6, 28, 157
 licheniforme, 6, 28, 157
 limicola, 57
 macrospermum, 57
 majus, 5, 28, 57, 157
 musicola, 6, 28, 109, 157
 riparium, 57
 Dasya pedicellata, 99
 Dasyaceae, 99
 Dasycladaceae, 90
Dermocarpa Gardneriana, 128, 153
 Hollenbergii, 152
 minuta, 130
 Setchellii, 129, 153
 Solheimii, 129
 Desmonema Wrangelii, 58
Dichothrix Bauieriana, 30
 Bornetiana, 110
 calcareo, 159
 fucicola, 110
 gypsophila, 57, 159
 Hosfordii, 30
 inyoensis, 159
 Orsiniana, 31, 159
 penicillata, 110
Dictyopteris delicatula, 92
Dictyota cervicornis, 92
 ciliolata, 92
 divaricata, 92
 Dictyotaceae, 92
Digenia simplex, 100
Diplocolon Heppii, 34
Dipterosiphonia dendritica, 100
 Ectocarpaceae, 92
Ectocarpus breviarticulatus, 92
Enteromorpha lingulata, 89
Entophysalis cryptarum, 128
 magnoliae, 148
Eucheuma acanthocladum, 96
 isiforme, 96
 Fischera thermalis, 56
Fischerella ambigua, 24, 56, 108, 153
 major, 25
 thermalis, 24
Fremyella diplosiphon, 32, 160
 grisea, 6
 longifila, 130
 striatula, 130
 tenera var. *tenuior*, 160
 Fucaceae, 93
Galaxaura marginata, 95
 oblongata, 95
 rugosa, 95
 Gelidiaceae, 95
Gelidium pusillum, 95
Gloeocapsa calcarea, 148
 gigas, 80
 Itzigsohnii, 148
 lignicola, 147
 magma, 148
 magma var. *Itzigsohnii*, 148
 multisphaerica, 148
 nigrescens, 147
 Penicocystis, 151
 purpurea, 151
 stegophila, 148

- tepidariorum*, 150
 violacea, 147
Gloeocystis Paroliniana, 81
Gloeothece decipiens, 151
 distans, 150
 rupestris, 151
 rupestris var. *tepidariorum*, 151
 tepidariorum, 150
Gloeotrichia echinulata, 31
 natans, 6, 32, 57, 110, 160
 Pisum, 32, 57
Gomphosphaeria aponina, 4, 152
 aponina var. *cordiformis*, 152
Gracilaria armata, 97
 cervicornis, 97
 compressa, 97
 confervoides, 97
 confervoides var. *longissima*, 97
 cornea, 97
 damaecornis, 97
 domingensis, 97
 ferox, 98
 foliifera, 98
 mamillaris, 98
 Gracilariaceae, 97
Grateloupia cuneifolia, 96
 Grateloupiaceae, 95

Halimeda tridens, 91
 Tuna, 92
 Tuna var. *minor*, 92
 Tuna var. *platydisca*, 92
Halymenia Floresia, 95
Hapalosiphon brasiliensis, 5, 25, 108, 154
 Brebbisonii, 56
 fontinalis, 5, 25, 108, 154
 fontinalis var. *tenuissimus*, 56
 laminosus, 154
 major, 154
 pumilus, 5, 25, 108, 154
 tenuissimus, 56
 torulosus, 56
Hassallia byssoidea, 33, 113
Herposiphonia tenella, 100
Homoethrix juliana, 109
Hormothamnion enteromorphoides, 109
Hydrocoleum comoides, 116
 confluens, 134
 floccosum, 116
 glutinosum, 44, 116
 Groesbeckianum, 166
 helveticum, 58
 Hieronymii, 7, 42, 115
 Holdenii, 8
 homoeotrichum, 58
 lyngbyaceum, 58, 116
 majus, 8
 Ravenelii, 39
 rufescens, 7, 40
Hydroepicoccum genuense, 152
Hypheothrix aikenensis, 43
 arenaria, 43
 bullosa, 56
 calcicola, 44, 165
 coriacea, 166
 hinnulea, 54
 lardacea, 43, 166
 luminosa, 58
 tenax, 48, 171
 tinctoria, 58
Hypnea cervicornis, 96
 muscififormis, 96
 spinella, 96
 Hypneaceae, 96

Inactis Austinii, 54
 ecalcareia, 157
 lacustris, 44, 115, 166
 obscura, 29, 158
 vaginata, 44
Isactis caespitosa, 57
 caespitosa var. *tenuior-viridis*, 56
 fluviatilis, 57

Jania capillacea, 95
Johannesbaptistia pellucida, 4

Lamprocystis roseo-persicina, 81
Laurencia Coralopsis, 100
 gemmifera, 100
 obtusa, 100
 papillosa, 100
 Poitei, 100
Leptobasis striatula, 130
Leptothrix bullosa, 56
 hinnulea, 54
 laminosa, 58
 ochracea, 171
 symplocoides, 132
 tenax, 48, 119, 171
 tinctoria, 58
Lyngbya aestuarii, 9, 47, 118, 170
 aestuarii f. *aeruginosa*, 47
 arboricola, 39
 arenaria, 58
 cataracta, 58
 Chungii, 134
 confervoides, 9, 119
 confervoides f. *violacea*, 119
 dendrobia, 39
 erecta, 191
 gigantea, 12, 51, 121, 174
 Giuseppi, 135
 guaymensis, 136
 hahatonkensis, 11, 50
 hinnulea, 54
 Holdenii, 8
 lutea, 10
 magnifica, 170
 major, 58
 majuscula, 47, 118
 Martensiana var. *calcareia*, 159
 membranacea, 58
 Notaristii, 39

- Lyngbya ochracea, 10, 48, 171
 ocreata, 118, 170
 Patrickiana, 135
 Phormidium var. rivularis, 54, 131
 putealis, 47, 119
 rosea, 118
 scytonematoides, 118, 171
 semiplena, 9, 47
 Simmonsiae, 9
 sordida, 118
 sordida f. rosea, 118
 splendens, 39
 subconferoides, 46, 117
 subtilis, 8
 vermicularis, 58
 versicolor, 48, 119, 171
 vulgaris, 58
 Wollei, 45
 Lyngbyopus Willei, 115
- Mastigobryum fertile, 57
 luteum, 57
 Mastigocoleus testarum, 108
 Mastigonema Donnellii, 47
 elongatum, 57
 fibrosum, 57
 fuscum, 30, 158
 halos, 57
 sejunctum, 57
 velutinum, 29
 violaceum, 30, 158
 Mastigothrix turgida, 29, 158
 Microchaete diplosiphon, 32, 160
 grisea, 6
 striatula, 130
 tenera var. tenuior, 160
 Microcoleus acutissimus, 44, 117
 anguiformis, 58
 californicus, 167
 chthonoplastes, 8, 44, 58, 117, 167
 confluens, 134
 gracilis, 58
 hyalinus, 58
 lacustris, 45, 58
 paludosus var. acuminatus, 114
 pulvinatus, 41
 purpureus, 44, 117
 Ravenelii, 39
 rupicola, 167
 sociatus var. minor, 133
 tenerrimus, 8
 vaginatus, 8, 117, 168
 Weeksii, 116
 Microcystis, 67
 aeruginosa, 74
 aeruginosa var. major, 75
 aeruginosa f. occidentalis, 75
 angulosa, 82
 atra, 82
 atrovirens, 82
 austriaca, 81
 caerulea, 74
 densa, 82
 deusta, 82
 Donnellii, 14, 81
 elabens, 80, 81
 firma, 81, 82
 flos-aquae, 75
 fuscolutea, 82
 glauca, 72, 125
 Grevillei, 82
 holsatica, 73
 ichthyoblabe, 74
 ichthyoblabe var. violacea, 81
 incerta, 73
 littoralis, 81
 lobata, 27, 81
 marginata, 81, 150
 mellea, 82
 merismopedioides, 82
 minor, 81
 Noltii, 81
 ochracea, 75
 olivacea, 81
 ovalis, 125
 pallida, 73, 82
 paludosa, 81
 parasitica, 81
 Paroliniana, 81
 piscinalis, 82
 prasina, 75
 protogenita, 82
 pulverea var. incerta, 73
 punctiformis, 82
 Reinboldii, 81
 robusta, 75
 rosea, 82
 rupestris, 81, 82, 150
 sanguinea, 82
 scripta, 75
 splendens, 125
 umbrina, 81
 violacea, 82
 viridis, 74
 Microhaloa aeruginosa, 74
 aurantiaca, 82
 botryoides, 82
 elabens, 80, 81
 ichthyoblabe, 74
 iodes, 82
 Pini-turionum, 83
 protogenita, 83
 rupestris, 150
 Monocapsa stegophila, 148
 Myxophyceae, 3, 17, 107, 145
- Nodularia Harveyana, 6, 157
 paludosa, 55
 spumigena, 157
 Nostoc amplissimum, 156
 caeruleum, 26, 56
 caladarium, 154
 callicola, 56
 carneum, 155

- comminutum, 56
 commune, 5, 25, 109, 156
 commune var. flagelliforme, 26
 ellipsoidosporum, 155
 Linckia, 155
 macrosporum, 56
 microscopicum, 26, 57
 Muscorum, 5, 155
 parmelioides, 27, 109, 156
 piscinale, 5, 25
 pruniforme, 26, 56
 rivulare, 25, 155
 rupestre, 56
 sphaericum, 56, 156
 sphaeroides, 57
 spongiiforme, 155
 tenuissimum, 56
 verrucosum, 27, 109
 Nostocaceae, 5, 25, 109, 155
 Nostochopsis, 56
- Oncobyrsa Castagnei*, 150
Oscillaria Bonnemaisionii, 58
 brevis, 59
 chalybea, 58
 crassissima, 59
 cruenta, 58
 detersa, 58
 gracillima, 59
 leptotricha, 58
 limosa, 59
 littoralis, 58
 natans, 58
 Porettana, 59
 subsalsa var. *dulcis*, 59
Oscillatoria additica, 116
 americana, 174
 amoena, 175
 amphibia, 13, 53, 175
 animalis, 53
 articulata, 54
 articulata var. *circinata*, 54
 Bonnemaisionii, 59, 121
 Boryana, 176
 brevis, 13, 54, 175
 brevis var. *neapolitana*, 13
 chalybea, 54, 59, 175
 chlorina, 174
 claricentrosa, 45
 Corallinae, 52
 cruenta, 59
 curviceps, 52
 formosa, 13, 53, 175
 Grunowiana var. *articulata*, 54
 limosa, 12, 51
 luteola, 13, 53
 margaritifera, 12, 52
 maricola, 121
 minnesotensis, 136
 nigro-viridis, 12
 obtusa, 12, 51, 121, 174
 ornata, 12, 52
- princeps*, 12, 51, 121, 174
 princeps f. *purpurea*, 121, 174
 proboscidea, 12, 51, 121
 refringens, 12, 51, 121
 salinarum, 13, 53
 sancta, 174
 sancta var. *aequinoctialis*, 51
 sancta var. *caldariorum*, 51
 sonorensis, 141
 sordida, 10
 splendida, 53, 175
 splendida f. *uncinata*, 175
 tenuis, 12, 52, 121, 174
 tenuis var. *levis*, 12, 52
 tenuis var. *natans*, 59
 terebriformis, 176
 tortuosa, 165
 trapezoidea, 175
 Oscillatoriaceae, 7, 39, 114, 162
- Padina sanctae-crucis, 92
 Vickersiae, 92
Palmella Castagnei, 150
 Grevillei, 147
 marginata, 150
 rupestris, 150
Pencillus Lamourouxii, 92
Peniocystis purpurea, 151
Petalonema alatum, 34, 111
 crustaceum, 35
 densum, 35, 111
 Phaeophyceae, 92
Phormidium angustissimum var. *saxicola*,
 119
 arenarium, 58
 autumnale, 1, 50
 autumnale var. *minus*, 49, 120
 californicum, 138
 Corium, 49
 Corium var. *capitatum*, 47, 118
 Crosbyanum, 119
 durum, 39
 epiphyticum, 169
 favosum, 11, 50
 Gardnerianum, 140
 glaciale, 169
 Groesbeckianum, 137, 171
 Hancockii, 139
 Hendersonii, 119
 hydrocoleoides, 140
 interruptum, 53
 interruptum var. *capitatum*, 47, 118
 interruptum var. *rigidum*, 24, 108, 153
 inundatum, 11, 49, 120
 Joannianum, 58
 laminosum, 171
 leptodermum var. *capitatum*, 11, 49,
 120, 173
 luridum, 48
 membranaceum, 58
 minnesotense, 136
 mucosum, 171

- Phormidium muscicola*, 68
olivaceum, 58
papyraceum, 49, 120
penicillatum, 121
pulvinatum, 117
purpurascens var. *elegans*, 11, 49, 120
 Retzii, 11, 49, 58, 120, 173
 Richardsii, 139
rubriterricola, 170
scytonematicola var. *minus*, 169
 Standleyi, 139
 Steyermarkii, 137
subfuscum, 58, 173
subfuscum var. *Joannianum*, 11, 50, 58
submembranaceum, 50
tenuis, 49, 58, 172
tenuis var. *marinum*, 118
thermale, 138
 Treleasei, 48, 172
uncinatum, 11, 50, 121, 173
valderianum, 48, 120, 173
 Weissii, 10, 49
Plectonema Battersii, 136
Cloverianum, 134
flexuosum, 108, 153
Golenkinianum, 8
Nostocorum, 46, 117, 134, 169
tenuissimum, 165
Tomasinianum, 46, 117
 Wolleii, 45, 117, 170
Pleurocapsa amethystea var. *Schmidtii*, 126
 Deeveyi, 126
fuliginosa, 126
 Kernerii, 125
varia, 149
Pleurococcus magma, 148
pulvereus, 72
rufescens, 148
turgidus, 149
Polycystis aeruginosa, 74
aeruginosa var. *major*, 74
elabens, 80, 82
elabens var. *ichthyoblabe*, 74
firma, 82
flos-aquae, 74
flos-aquae var. *prasina*, 74
flos-aquae var. *scripta*, 74
fuscolutea, 83
glauca, 125
ichthyoblabe, 74
ichthyoblabe b. *purpurascens*, 82
incerta, 73
insignis, 74
littoralis, 82
marginata, 82, 150
marginata var. *minor*, 75
ochracea, 74
Packardii, 82
pallida, 73, 82
piscinalis, 83
prasina, 74
pulverea, 72
reticulata, 83
scripta, 74
stagnalis, 73
violacea, 82
viridis, 74
Polysiphonia ramentacea, 100
Porphyrosiphon fuscus, 114, 130, 162
Kaernbachii, 39
Notarisii, 39, 114
Notarisii var. *major*, 39
robustus, 39
Velasquezii, 130
Protococcus magma, 148
rufescens, 148
turgidus, 4, 149
violaceus, 147
Protokuetzingia australasica, 102
 Schottii, 100
Rhizoclonium Kochianum, 90
 Rhodophyceae, 95
 Rhodophyllidaceae, 96
 Rhomelaceae, 99
Rivularia dura, 57
echinulata, 31
flagelliformis, 6, 32, 110, 160
haematites, 31, 51, 159
natans, 6, 32, 110, 160
nitida, 6
paradoxa, 32
Pisum, 32
 Rivulariaceae, 6, 28, 109, 157
Sargassum filipendula, 93
fluitans, 94
Hystrix var. *spinulosa*, 53
natans, 94
polyceratium, 94
vulgare, 95
Schizosiphon crustiformis, 57
Schizothrix acuminata, 114
acutissima, 162
aikenensis, 43
arenaria, 43
calicicola, 44, 165
californica, 165
chalybea, 42, 115
coriacea, 166
fragilis, 165
Friesii, 43, 116
Giuseppei, 133
Hancockii, 139
Hancockii f. *submersa*, 139
hyalina, 58
lacustris, 44, 115, 166
Lamyi, 41, 115
lardacea, 43, 166
Macbridei, 164
mexicana, 115
Muelleri, 7, 46, 115
purcellii, 43, 116, 157, 164

- purpurascens, 7
 purpurascens var. *cruenta*, 40
rhodochlamys, 158
rivularis, 131
rosea, 132
roseola, 132
rupicola, 167
Simmonsiae, 9
Stricklandii, 165
symplocoides, 132
tinctoria, 115
vaginata, 44
violacea, 115
Wollei, 41
Scytonema alatum, 111
ambiguum, 24, 58, 108, 153
Austinii, 36
azureum, 38, 113, 162
badium, 24, 108, 153
Brandegeei, 35
caldarium, 38, 113, 161
Castellii, 58
cataracta, 35
cinnatum, 38, 113
conchophilum, 108
cortex, 37
cortex f. *brunneum*, 37, 162
cortex f. *corrugatum*, 37, 162
cortex f. *saxicola*, 56
crassum, 111
crispum, 38, 113
crustaceum, 35, 58
crustaceum var. *incrustans*, 35
densum, 35, 111
dubium, 58
evanesens, 35, 111
figuratum, 36, 111, 160
Gardneri, 153
gracile var. *tolypotrichoides*, 7, 36
guyanense, 7, 38, 112
guyanense var. *epiphyllum*, 112
guyanense var. *minus*, 7, 38, 112, 161
Heppii, 34
hirtulum, 58
Hofmannii, 7, 37, 112, 162
Hofmannii f. *brunneum*, 37, 162
hyalinum, 112
javanicum, 112
junipericola, 33, 113
Kaernbachii, 39
Millei, 113
mirabile, 35, 36, 58, 111, 160
mirabile var. *majus*, 112
multiramum, 161
Myochrous, 35, 111, 160
Notarisii, 58
occidentale, 162
ocellatum, 7, 38, 111, 161
ocellatum var. *constrictum*, 161
pulchellum, 161
spirulinoides, 161
stuposum, 38, 113, 162
subgelatinosum, 162
tenellum, 161
tenuis, 153
tolypotrichoides, 7, 36, 161
varium, 38, 112
velutinum, 111
Wolleanum, 35
 Scytonemataceae, 6, 32, 111, 160
Sirocoleum guyanense, 117
Kurzii, 116
Sirosiphon acervatus, 23
argillaceus, 23
Brandegeei, 55
compactus, 56
crustaceus, 56
lignicola, 23
pulvinatus, 56
pulvinatus f. *mamillosus*, 23
 Solieraceae, 96
Sommerella hormoides, 24
Sphaerogonium polonicum, 153
Sphaerozyga Hassallii, 57
polyspermum, 57
Rolfssii, 57
saccata, 27
Smithii, 57
variabilis, 57
Spirulina densa, 176
duplex, 56
Jenneri, 59
labyrinthiformis, 176
major, 13, 176
socialis, 13, 122
subsalsa, 14, 54, 176
tenerrima, 13, 122
Weissii, 141
Spyridia aculeata var. *hypneoides*, 99
filamentosa, 99
Stigonema anomalum, 24
canadense, 22
contortum, 22
hormoides, 24
hormoides var. *rhizodes*, 56
informe, 5, 23
mamillosum, 22
mamillosum f. *robustum*, 5, 22
minutum, 4, 23
multipartitum, 22
ocellatum, 24
panniforme, 23
robustum, 5, 22
thermale, 24
 Stigonemataceae, 4, 22, 108, 153
Symphiosiphon ambiguus, 58
Austinii, 36
Bornetianus, 56
Castellii, 58
crustaceus, 58
hirtulus, 58
Wollei, 38
Symploca atlantica, 118
Howei, 117

- Symploca hydroides*, 117
 Kieneri, 170
 laete-viridis, 118
 muralis, 46, 170
 muralis var. *minor*, 46, 170
 Muscorum, 9, 47, 118
 Muscorum var. *rivularis*, 51, 131
 profunda, 121
 roseola, 132
 symbiotica, 170
 terrestris, 58
 thermalis, 170
Symplocastrum Brittonae, 43, 116
 Friesii, 43, 116

Tildenia dura, 110
 pilosa, 110
Tolypothrix bombycina, 33
 byssoidea, 33, 113
 distorta, 57
 flaccida, 57
 geminata, 58
 lanata, 33
 musciicola, 58
 pulchra, 57
 Ravenelii, 56
 rupestris, 7, 33
 tenuis, 7, 33, 58
 tenuis f. *bryophila*, 58
 Wartmanniana, 58
Turbinaria turbinata, 95

Ulva Lactuca, 90
 Lactuca var. *latissima*, 90
 Ulvaceae, 89

 Valoniaceae, 90

Wollea saccata, 27
Wurdemannia miniata, 96

Xenococcus acervatus, 125
 Kernerii, 125

Zonaria variegata, 92
Zonotrichia haematites, 57
 paradoxa, 32



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