

MARINE ALGAE OF THE SMITHSONIAN-HARTFORD EXPEDITION TO THE WEST INDIES, 1937

By WILLIAM RANDOLPH TAYLOR

INTRODUCTION

THE Smithsonian-Hartford Expedition was made possible through the generosity of George Huntingdon Hartford, 3d, on his full-rigged ship, the *Joseph Conrad*. The scientific work was under the direction of Dr. Waldo L. Schmitt, of the U. S. National Museum, Smithsonian Institution, with G. Robert Lunz, Jr., of the Charleston Museum, assisting. They collected the algae that form the subject of this report. Dr. Schmitt's (1938, p. 57) popular account of the trip calls attention to the unique character of this voyage, for although scientific work done in fore-and-aft rigged craft is still common, even for considerable distances with or without auxiliary power, it is a very long time since an American biological expedition has operated from a square-rigged vessel. The itinerary of the 4,500-mile trip provided stops at 15 islands and occasions for important scientific collecting. For the opportunity to study the marine algae the writer is particularly indebted to Dr. Schmitt and the authorities of the Smithsonian Institution.

Of the 81 collections of which the writer is informed, 21 were recognized by the collectors as containing algae. Some were relatively unfruitful, but in excess of 130 numbers were segregated, and several species recognized as epiphytes or contaminants of masses of larger plants. Since the areas visited were in the region of most extensive West Indian phycological study, it is not surprising that there are no new species to report. However, there are numerous records new to the islands or island groups concerned.

The algae of the Bahamas were reported by Howe (1904, p. 164; 1920, p. 553; 1924, p. 351; and others), but there have been no considerable additions to the recorded collections from these islands since. Practically nothing was known of the algae of Hispaniola until collections were made there by C. H. Arndt and studied by the writer (Taylor and Arndt, 1929, p. 651), followed by additions chiefly collected by C. R. Orcutt (Taylor, 1933, p. 401). These almost all came from the southwestern peninsula, with a few from Cap-Haïtien, so that the additions from this station and those from Île de la Tortue

are very welcome. So far as the latter place is concerned the records are all new but should not be differentiated from those on the main island. Considerable unreported collections of Puerto Rican algae have been assembled by M. A. Howe, who did not publish much upon his work there during his life, although, with the earlier accounts, there are already quite a number of algae known from the island (Hauck, 1888, p. 457; Howe, 1903, p. 171, 1915, p. 219; Foslie and Howe, 1906, p. 577).

The algae of the Virgin Islands have probably had much more thorough field study than any other area in the West Indies; the notable report on this district by Børgesen (1913-1920) covers his and previous work. The algae of adjacent Beata Island have also been reported upon by him (Børgesen, 1924, p. 14). Martinique curiously missed the attention of the earlier French phycologists who so thoroughly explored other islands (particularly Schramm and Mazé, 1865, 1866; Mazé and Schramm, 1870-1877). However, more recently attention has been directed here (Hamel, 1929, p. 53; Hamel and Hamel-Joukov, 1931-1933), and a number of species have been attributed to it.

It is not inappropriate here to mention briefly the curious editions of the studies of Schramm and Mazé, for the determination of whose specimens the brothers Crouan, pharmacists and well-known phycologists of Brest, were largely responsible. By chance Dr. Schmitt at St. Thomas, Virgin Islands, found in the possession of a resident several old natural-history books, a list of which he communicated to the writer, among others. Noting an unexpected date attributed to an old account of Guadeloupe algae, the writer secured this book through the kindness of Dr. Schmitt, and when it arrived it proved to be an issue quite unknown to him. Through correspondence he determined it to be a second and almost unknown edition of the well-known "Algues de la Guadeloupe." The situation appears to be that the first edition was set in type, was printed on one side of the page in two columns, and was published in 1865 at Basse-Terre, Guadeloupe. It had one partial page of introduction, described or listed in some detail 449 algae, and named 13 diatoms. The authors are given as "A. Schramm et H. Mazé." The second edition is, except for the title page, an autographic one, lithographed on both sides of the paper, the lines running across the page, and was published in 1866 at Cayenne, French Guiana. The writer's copy was apparently, by the inscription, a gift from Schramm to P. Duchassaing. In the three pages of introduction we learn that the inception of the study of Guadeloupe algae is to be ascribed to Duchassaing. In this edition numerous changes and additions occur, to the effect that 502 algae (including 14 diatoms) are listed in some detail or described.

The third edition is printed from type across the page, on both sides of the paper. Its title-page claims that it is the "2e Édition," and it appeared at Basse-Terre in 1870-1877. The introductory matter is much more extensive, and 940 algae including diatoms are involved, but the descriptions of the various species, in the earlier editions too brief, are here yet more curtailed or omitted. However, the citations of localities for the several species are fortified by the mention of specimen numbers. One notes that the authorship is now ascribed to "H. Mazé et A. Schramm" and learns from the introduction (signed in all editions "H. M.") that Schramm was deceased. It is this edition, rare in the original, which has been reissued in facsimile, and which is well known. The earlier editions are likewise rare and, because of the inclusion of species descriptions, important to taxonomists. The misleading title-page on the third edition has caused phycologists to neglect the true second edition, which merits consideration. The writer is particularly indebted to Dr. Schmitt for the opportunity of securing this rare book, to A. E. Townsend and G. Tandy, of the British Museum (Natural History), London, for a photostat of a Paris copy of the first edition, and for information regarding the earlier editions to Dr. O. C. Schmidt, of Berlin, Dr. R. Lami, of Paris, and Dr. D. H. Linder, of Cambridge.

The algae of Barbados are known by reason of the work of Vickers (*loc. cit.*), particularly her beautifully illustrated "Phycologia Barbadosensis," which comprised selected Chlorophyceae and Phaeophyceae only. Earlier Dickie (1875, p. 146) and later Howe (1928, p. 186) also wrote on the algae of this island. Finally, and referring to all the islands visited by the expedition, one may mention the comprehensive but indiscriminating list of Murray (1888-1889), covering the previous publications on West Indian marine algae up to the date of his publication. Most of the species mentioned in the present paper are described, and many figured, in the present writer's volume on the "Marine Algae of Florida" (1928). Other islands at which the expedition stopped yielded no algae; this is the more regrettable since they were rather less known in this respect than those from which collections were brought.

LIST OF SPECIES

MYXOPHYCEAE

OSCILLATORIACEAE

Microcoleus tenerrimus Gomont.

HISPANIOLA*¹: On a reef at 1.0 meter, Île de la Tortue, Haiti (2 *in part*), 21 March 1937. Determined by the kindness of Dr. Francis Drouet.

Symploca hydroides Kützing ex Gomont.

HISPANIOLA*: On a reef at 1.0 meter, Île de la Tortue, Haiti (2), 21 March 1937. Det. F. Drouet.

RIVULARIACEAE

Calothrix confervicola C. Agardh ex Bornet & Flahault.

VIRGIN ISLANDS*: Charlotte Amalia, St. Thomas, littoral and in tide pools as an epiphyte (58), 4 April 1937. Det. F. Drouet.

Dichothrix fucicola (Kützing) Bornet & Flahault.

HISPANIOLA*: Epiphytic on *Digenia*, on a reef at 1.0 meter, Île de la Tortue, Haiti (3 *in part*), 21 March 1937. Det. F. Drouet.

CHLOROPHYCEAE

ULVACEAE

Enteromorpha flexuosa (Wulfen) J. Agardh.

VIRGIN ISLANDS: With a large sterile species of *Spirogyra* in a stream by Tucker Road, St. Thomas (129), 25 April 1937.

Ulva fasciata Delile.

MARTINIQUE: Littoral, Fort de France (109), 15 April 1937.

Ulva lactuca Linnaeus.

BARBADOS: On rocks and coral along shore, Pelican Island, Carlisle Bay (118), 19 April 1937.

VALONIACEAE

Anadyomene stellata (Wulfen) J. Agardh.

HISPANIOLA: On a reef at 1.0 meter, Île de la Tortue, Haiti (12), 21 March 1937. PUERTO RICO: Littoral and in tidepools, Fort San Gerónimo, San Juan Island (39), 28 March 1937.

Cladophoropsis membranacea (C. Agardh) Børgesen.

HISPANIOLA: On a reef at 1.0 meter, Île de la Tortue, Haiti (9), 21 March 1937. PUERTO RICO: Littoral and in tidepools, Fort San Gerónimo, San Juan Island (37 *in part*, 38), 27 March 1937. VIRGIN ISLANDS: Charlotte Amalia, St. Thomas (57), 4 April 1937; on the littoral of Banana Bay, Water Island, St. Thomas (123), 24 April 1937.

¹ Where a record is believed to be new to an island or island group, the name of the island or group is marked by an asterisk (*), but no special designation is made of minor new station records, of which there are many.

Dictyosphaeria cavernosa (Forsskål) Børgesen.

HISPANIOLA: On a reef at 1.0 meter, Île de la Tortue, Haiti (4 in part, 11), 21 March 1937; littoral near Dames Point, Cap-Haïtien, Haiti (26), 22 March 1937. PUERTO RICO*: Littoral and in tidepools, Fort San Gerónimo, San Juan Island (40), 28 March 1937. VIRGIN ISLANDS: On a coral reef off Lagoon Point, St. John (68), 6 April 1937; on the littoral of Banana Bay, Water Island, St. Thomas (125), 24 April 1937.

This species was discussed and figured by the writer (1928, p. 72) as *Dictyosphaeria favulosa* (C. Agardh) Decaisne.

Valonia ocellata Howe.

PUERTO RICO: Littoral and in tide pools, Fort San Gerónimo, San Juan Island, (30), 7 March 1937.

Valonia ventricosa J. Agardh.

HISPANIOLA: On a reef at 1.0 meter, Île de la Tortue, Haiti (5), 21 March 1937. VIRGIN ISLANDS: On a coral reef off Lagoon Point, St. John (69), 6 April 1937; on the Middle Ground coral reef, St. Croix (83), 6 April 1937; on the littoral of Banana Bay, Water Island, St. Thomas (126), 24 April 1937.

CLADOPHORACEAE

Chaetomorpha brachygonia Harvey.

BARBADOS: Among rocks and coral along shore, Pelican Island, Carlisle Bay (113), 19 April 1937.

Cladophora fascicularis (Mertens) Kützinger.

BARBADOS: On rocks and coral along shore, Pelican Island, Carlisle Bay (114), 19 April 1937.

Cladophora fuliginosa Kützinger.

HISPANIOLA: On a reef at 1.0 meter, Île de la Tortue, Haiti (4 in part, 6, 12 in part), 21 March 1937; on a rocky point, Île de la Tortue (19), 21 March 1937.

DASYCLADACEAE

Cymopolia barbata Lamouroux.

HISPANIOLA: On a rocky point, Île de la Tortue, Haiti (20), 21 March 1937.

BRYOPSIDACEAE

Bryopsis pennata Lamouroux.

VIRGIN ISLANDS: On the Middle Ground coral reef at 0.5 meter, St. Croix, (75), 8 April 1937. MARTINIQUE: In the littoral, Fort de France (110), 15 April 1937.

CAULERPACEAE

Caulerpa crassifolia (C. Agardh) J. Agardh.

HISPANIOLA*: Littoral near Dames Point, Cap-Haïtien, Haiti (23), 22 March 1937. PUERTO RICO: Dredged off the west shore, San Juan Harbor (47), 29 March 1937. VIRGIN ISLANDS: Charlotte Amalia, St. Thomas, dredged at 8-10 feet near the anchorage in the harbor (62), 5 April 1937.

Caulerpa racemosa var. *microphysa* (Weber-van Bosse) Taylor.

PUERTO RICO*: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (31), 27 March 1937.

Caulerpa racemosa var. *clavifera* (Turner) Weber-van Bosse.

VIRGIN ISLANDS: Littoral and in tide pools on the eastern side of the harbor, Charlotte Amalia, St. Thomas (59), 4 April 1937.

Caulerpa sertularioides var. *brevipes* (J. Agardh) Svedelius.

VIRGIN ISLANDS: Littoral and in tide pools on the eastern side of the harbor, Charlotte Amalia, St. Thomas (58), 4 April 1937.

Caulerpa sertularioides var. *farlowii* (Weber-van Bosse) Børgesen.

PUERTO RICO*: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (40), 28 March 1937.

CODIACEAE

Halimeda opuntia (Linnaeus) Lamouroux.

HISPANIOLA: On a reef at 1.0 meter depth, Île de la Tortue, Haiti (14), 21 March 1937. VIRGIN ISLANDS: Littoral and in tide pools on the eastern side of the harbor, Charlotte Amalia, St. Thomas (52), 4 April 1937; littoral of Banana Bay, Water Island, St. Thomas (127), 24 April 1937.

Halimeda simulans Howe.

VIRGIN ISLANDS: On a reef on the north side of Buck Island, St. Croix (97), 10 April 1937.

Halimeda tuna (Ellis & Solander) Lamouroux.

VIRGIN ISLANDS: On the Middle Ground coral reef at 0.5 meter, St. Croix (88), 8 April 1937.

Penicillus capitatus Lamarck.

HISPANIOLA: In sand on a reef with *Thalassia* at 1.0 meter depth, Île de la Tortue, Haiti (13), 21 March 1937. PUERTO RICO: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (36), 28 March 1937. VIRGIN ISLANDS: On the Middle Ground coral reef at 0.5 meter, St. Croix (86), 8 April 1937; on a reef in Smith Bay, St. Thomas (130), 25 April 1937.

Udotea flabellum (Ellis & Solander) Howe.

PUERTO RICO: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (29), 27 March 1937. VIRGIN ISLANDS: Reef in Smith Bay, St. Thomas (131), 25 April 1937.

PHAEOPHYCEAE

ASPEROCOCCACEAE

Colpomenia sinuosa (Roth) Derbés & Solier.

VIRGIN ISLANDS: At 0.5 meter on the Middle Ground coral reef, St. Croix (77), 8 April 1937.

Hydroclathrus clathratus (Bory) Howe.

VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (74), 8 April 1937.

Rosenvingea sanctae-crucis Børgesen.

MARTINIQUE: In the littoral, Fort de France (106), 15 April 1937.

DICTYOTACEAE

Dictyopteris delicatula Lamouroux.

HISPANIOLA: In the littoral near Dames Point, Cap-Haitien, Haiti (22), 22 March 1937. PUERTO RICO: In the littoral or in tide pools, near Fort San Gerónimo, San Juan Island (31), 27 March 1937; dredged off the west shore

of San Juan Harbor (49), 29 March 1937. VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (73), 8 April 1937.

Dictyota cervicornis Kützling.

VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (76), 8 April 1937; reef, north side of Buck Island, St. Croix (99), 10 April 1937.

MARTINIQUE: Dredged at 15-20 meters in Fort de France Harbor (111), 17 April 1937. BARBADOS: On rocks and corals along shore, Pelican Island, Carlisle Bay (117), 19 April 1937.

Dictyota dentata Lamouroux.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (7), 21 March 1937. BARBADOS: On rocks and coral along shore, Pelican Island, Carlisle Bay (116), 19 April 1937.

Dictyota divaricata Lamouroux.

MARTINIQUE*: Dredged at 15-20 meters, Fort de France Harbor, 17 April 1937.

Dilophus guineensis (Kützling) J. Agardh.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (8), 21 March 1937; rocky point on Île de la Tortue, Haiti (18), 21 March 1937.

Padina sanctae-crucis Børgesen.

HISPANIOLA: Rocky point on Île de la Tortue, Haiti (17), 21 March 1937. VIRGIN ISLANDS: Littoral and in tide pools, east side of the harbor, Charlotte Amalia, St. Thomas (53), 4 April 1937; on the beach and on weedy rocks, juvenile, Coral Harbor, St. John (66), 6 April 1937.

Padina vickersiae Hoyt.

HISPANIOLA*: In the littoral near Dames Point, Cap-Haïtien, Haiti (25), 22 March 1937. MARTINIQUE*: In the littoral, Fort de France Harbor (107), 15 April 1937.

FUCACEAE

Sargassum platycarpum Montagne.

HISPANIOLA: Littoral near Dames Point, Cap-Haïtien, Haiti (24), 22 March 1937. PUERTO RICO: In the littoral and in tide pools, juvenile, Fort San Gerónimo, San Juan Island (34), 27 March 1937. VIRGIN ISLANDS: On the beach and on weedy rocks, Coral Harbor, St. John (65), 6 April 1937; littoral, Judith Fancy Bay (94), 9 April 1937.

Sargassum polyceratium Montagne.

VIRGIN ISLANDS: Littoral and in tide pools, eastern side of the harbor, Charlotte Amalia, St. Thomas (54), 4 April 1937; at 0.5 meter on the Middle Ground coral reef, St. Croix (93), 8 April 1937.

Turbinaria tricostata Barton.

VIRGIN ISLANDS*: On the beach and weedy rocks, Coral Harbor, St. John Island (64), 6 April 1937.

Turbinaria turbinata (Linnaeus) Kuntze.

HISPANIOLA: On the reef at 1.0 meter, Île de la Tortue, Haiti (15), 21 March 1937. PUERTO RICO: Along shore in the littoral and in tide pools, Fort San Gerónimo, San Juan Island (28), 27 March 1937.

RHODOPHYCEAE

BANGLACEAE

Asterocytis ramosa (Thwaites) Gobi.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (12), 21 March 1937.

CHAETANGIACEAE

Galaxaura cylindrica (Solander) Lamouroux.

VIRGIN ISLANDS: In the littoral at Judith Fancy Bay, St. Croix (95), 9 April 1937.

Galaxaura squalida Kjellman.

PUERTO RICO: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (42), 28 March 1937. VIRGIN ISLANDS: At 0.5 meter on the Middle Ground coral reef, St. Croix (85), 8 April 1937.

Galaxaura subverticillata Kjellman.

VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (80), 8 April 1937. BARBADOS: On rocks and coral along shore, Pelican Island, Carlisle Bay (115), 19 April 1937.

GELIDIACEAE

Gelidiella acerosa (Forsskål) Feldmann & Hamel.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (16), 21 March 1937. PUERTO RICO*: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (32), 27 March 1937, and (37), 28 March 1937. VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (87), 8 April 1937, and on a reef on the north side of Buck Island, St. Croix (96), 10 April 1937.

Discussed and figured by the writer (1928, p. 143) as *Gelidium rigidum* (Vahl) Greville.

RHIZOPHYLLIDACEAE

Ochtodes secundiramea Montagne.

PUERTO RICO: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (43), 28 March 1937.

CORALLINACEAE

MELOBESIEAE

Fosliella farinosa var. *solmsiana* (Falkenberg) Taylor. Pl. 20, fig. 2

HISPANIOLA: On *Valonia* at 1.0 meter on a reef, Île de la Tortue, Haiti (5 in part), 21 March 1937.

Discussed by the writer (1928, p. 211) as *Melobesia farinosa* var. *solmsiana* (Falkenberg) Lemoine.

Lithophyllum pustulatum (Lamouroux) Foslie.

VIRGIN ISLANDS*: At 0.5 meter on a Middle Ground coral reef, St. Croix (89), 8 April 1937.

Lithothamnion incertum Foslie.

BAHAMAS*: In the littoral, rocky point south of Cockburn Town, San Salvador (1), 19 March 1937.

Lithothamnion occidentale Foslie.

MARTINIQUE*: Dredged at 15-20 meters, Fort de France Harbor (121), 17 April 1937.

Melobesia membranacea (Esper) Lamouroux.

Pl. 20, fig. 1

HISPANIOLA*: On *Thalassia*, littoral on rocky point east of Tierra Baja Road, Île de la Tortue, Haiti (21), 21 March 1937. PUERTO RICO: On *Thalassia*, littoral near Fort San Gerónimo, west end of San Juan Island (44), 28 March 1937.

VIRGIN ISLANDS*: On *Thalassia* growing on the Middle Ground coral reef, St. Croix (90), 8 April 1937.

Melobesia membranacea (Taylor, 1937, p. 267) forms more or less gregarious crusts, which are often zonate, smooth, with moderately to very prominent domed to mammillate cystocarpic conceptacles with a small pore, and plane to slightly elevated flat tetrasporangial conceptacles, which are perforated by several to many pores through which the tetraspores emerge individually. After discharge the conceptacles of both types may lose their covers and become simply cavernous.

This species has not been frequently recorded from the eastern American coast. However, it is supposed to have been found in Massachusetts, Rhode Island, New York (Long Island), Jamaica, Puerto Rico, Guadeloupe, and Brazil. The exceptionally fine tetrasporiferous material brought by this expedition caused the writer to review the specimens available in his collection and those in the Collins Herbarium in the New York Botanical Garden, which were kindly lent for the purpose. The Collins New England specimens were in no case in a state that permitted confirmation of the records by the multipored tetrasporangial conceptacles, though perhaps sectioning would have given other conclusive information. One Florida specimen showed the tetrasporangial conceptacles clearly; the writer is not aware that the record was ever published. Then the writer reviewed his own material of *Fosliella farinosa* and *F. lejolisii* and there found much more *Melobesia* material admixed. In no case did he get any unmistakable *Melobesia* on the New England specimens. He secured several samples, mostly with *F. farinosa*, from his Florida and West Indies material. He is able to confirm from these the presence of this species in Florida*, Jamaica, Hispaniola, Puerto Rico, Virgin Islands, and Colombia. With one exception the *Melobesia* was found on *Thalassia* in the following collections:

FLORIDA: Key West, *E. Palmer 39b*, 1874 (Herb. N. Y. Bot. Gard.); Key West, *W. R. Taylor 68a*, 31 May 1925; Dry Tortugas Islands, off Laboratory Pier, Loggerhead Key, *W. R. Taylor 421a*, 18 June 1924; Dry Tortugas Islands, dredged at station 1 near Long Key, *W. R. Taylor 185a*, 1 July 1924; Dry Tortugas Islands, dredged at station 308 in shallow water near Bird Key, *W. R. Taylor 1235a*, June 1926; Dry Tortugas Islands, dredged at 6 meters at station 311 off East Key, *W. R. Taylor 1252a*, 10 June 1926. JAMAICA: Navy Yard, Port Antonio, *G. F. Papenfuss*, 2 July 1932. HISPANIOLA: Miragoane, Haiti, *C. H. Arndt*, 1 February 1929. COLOMBIA: Littoral and in tide pools, Old Providence Island, on *Cymodocea manatorum*, *W. L. Schmitt 43a, 44*, 6 August 1938.

CORALLINEAE

Amphiroa fragillissima (Linnaeus) Lamouroux.

PUEBTO RICO: In littoral and in tide pools, Fort San Gerónimo, San Juan Island (38 in part), 28 March 1937. VIRGIN ISLANDS: Littoral and in tide pools, eastern side of the harbor, Charlotte Amalia, St. Thomas (56), 4 April 1937; on a coral reef off Lagoon Point, St. John (70), 6 April 1937; at 0.5 meter on the Middle Ground coral reef, St. Croix (72, 82 in part), 8 April 1937; on a reef, north side of Buck Island, St. Croix (98), 10 April 1937. MARTINIQUE: Littoral, Fort de France (120), 15 April 1927; dredged at 15-20 meters, Fort de France Harbor (122), 17 April 1937.

Corallina cubensis (Montagne) Decaisne.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (4), 21 March 1937.

Jania adherens Lamouroux.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (4 *in part*), 21 March 1937. PUERTO RICO*: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (37 *in part*), 28 March 1937. VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (82 *in part*), 8 April 1937; on a reef on the north side of Buck Island, St. Croix (98 *in part*), 10 April 1937.

Jania capillacea Harvey.

HISPANIOLA: At 1.0 meter on a reef. Île de la Tortue, Haiti (3 *in part*), 21 March 1937. PUERTO RICO*: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (35 *in part*), 27 March, and (37 *in part*, 38 *in part*), 28 March 1937. VIRGIN ISLANDS: Littoral and in tide pools, eastern side of the harbor, Charlotte Amalia, St. Thomas (55), 8 April 1937; reef on the north side of Buck Island, St. Croix (98 *in part*), 10 April 1937.

Jania pumila Lamouroux.

HISPANIOLA: Upon *Turbinaria* at 1.0 meter on a reef at Île de la Tortue, Haiti (16 *in part*), 21 March 1937.

GRATELOUPIACEAE

Grateloupia cuneifolia J. Agardh.

MARTINIQUE: In the littoral north of the fort, Fort de France (105), 15 April 1937.

RHODOPHYLLIDACEAE, *Incertae sedis?**Wurdemannia miniata* (Draparnaud ex DeCandolle) Feldmann & Hamel.

VIRGIN ISLANDS: Littoral and in tide pools, eastern side of the harbor, Charlotte Amalia, St. Thomas (60), 4 April 1937.

Discussed and figured by the writer (1928, p. 145) as *Wurdemannia setacea* Harvey.

HYPNEACEAE

Hypnea cervicornis J. Agardh.

VIRGIN ISLANDS: At 0.5 meter on the Middle Ground coral reef, St. Croix (92), 8 April 1937.

Hypnea musciformis (Wulfen) Lamouroux.

PUERTO RICO: Littoral and in tide pools, Fort San Gerónimo, San Juan Island (51), 29 March 1937. VIRGIN ISLANDS: On a reef on the north side of Buck Island, St. Croix (101), 10 April 1937.

GRACILARIACEAE

Gracilaria ferox J. Agardh.

VIRGIN ISLANDS: At 0.5 meter on the Middle Ground coral reef, St. Croix (78), 8 April 1937.

Gracilaria mamillaris (Montagne) Howe.

VIRGIN ISLANDS*: At 0.5 meter on Middle Ground coral reef, St. Croix (89), 8 April 1937. MARTINIQUE: Littoral, Fort de France (103), 15 April 1937.

CERAMIACEAE

Centroceras clavulatum (C. Agardh) Montagne.

PUERTO RICO: Littoral and in tidepools, Fort San Gerónimo, San Juan Island (35), 27 March 1937.

Spyridia filamentosa (Wulfen) Harvey.

MARTINIQUE: Littoral, Fort de France (104), 15 April 1937.

RHODOMELACEAE

Acanthophora spicifera (Vahl) Børgesen.

PUERTO RICO: Dredged off the west shore of San Juan Harbor (50), 29 March 1937. VIRGIN ISLANDS: Dredged at 8–20 feet from near the anchorage in the harbor, Charlotte Amalia, St. Thomas (63), 5 April 1937; at 0.5 meter on Middle Ground coral reef, St. Croix (79), 8 April 1937.

Bryothamnion triquetrum (Gmelin) Howe.

VIRGIN ISLANDS: At 0.5 meter on Middle Ground coral reef, St. Croix (81), 8 April 1937.

Digenia simplex (Wulfen) C. Agardh.

HISPANIOLA: At 1.0 meter on a reef, Île de la Tortue, Haiti (3), 21 March 1937. PUERTO RICO*: Littoral and in tidepools, Fort San Gerónimo, San Juan Island (35), 27 March 1937.

Herposiphonia tenella (C. Agardh) Ambronn.

MARTINIQUE: Littoral, Fort de France (108), 15 April 1937.

Laurencia obtusa (Hudson) Lamouroux.

VIRGIN ISLANDS: At 0.5 meter on the Middle Ground coral reef, St. Croix (82), 8 April 1937; on a reef, north side of Buck Island, St. Croix (102), 10 April 1937; littoral, Banana Bay St. Thomas (124), 24 April 1937.

Laurencia papillosa (Forsskål) Greville.

PUERTO RICO: Littoral and in tidepools, Fort San Gerónimo, San Juan Island (27, 33), 27 March 1937. VIRGIN ISLANDS: On the beach and on weedy rocks, Coral Harbor, St. John (67), 6 April 1937; at 0.5 meter on Middle Ground coral reef, St. Croix (91), 8 April 1937.

Vidalia obtusiloba (Mertens) J. Agardh.

PUERTO RICO*: Dredged off the west shore of San Juan Harbor (46), 29 March 1937.

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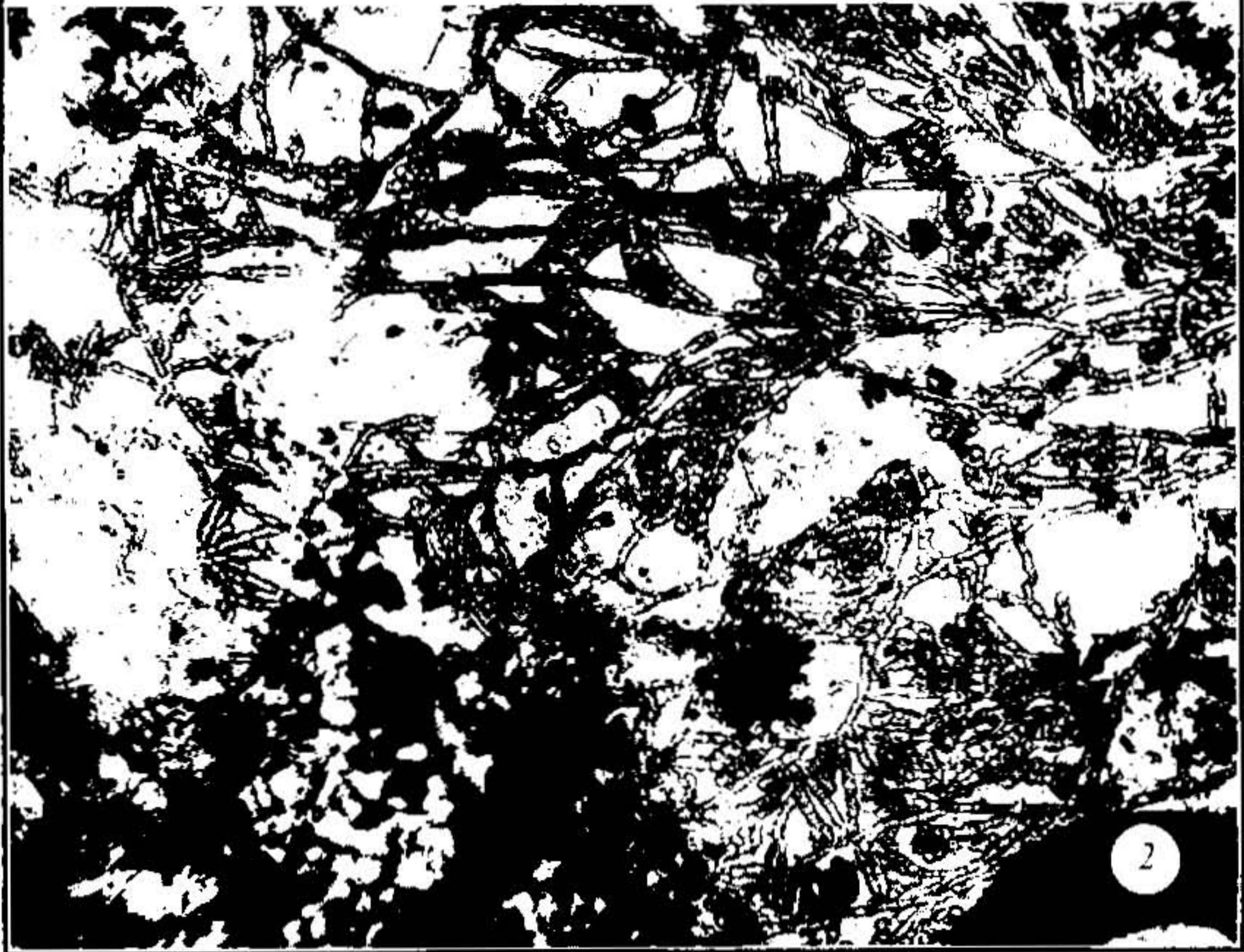
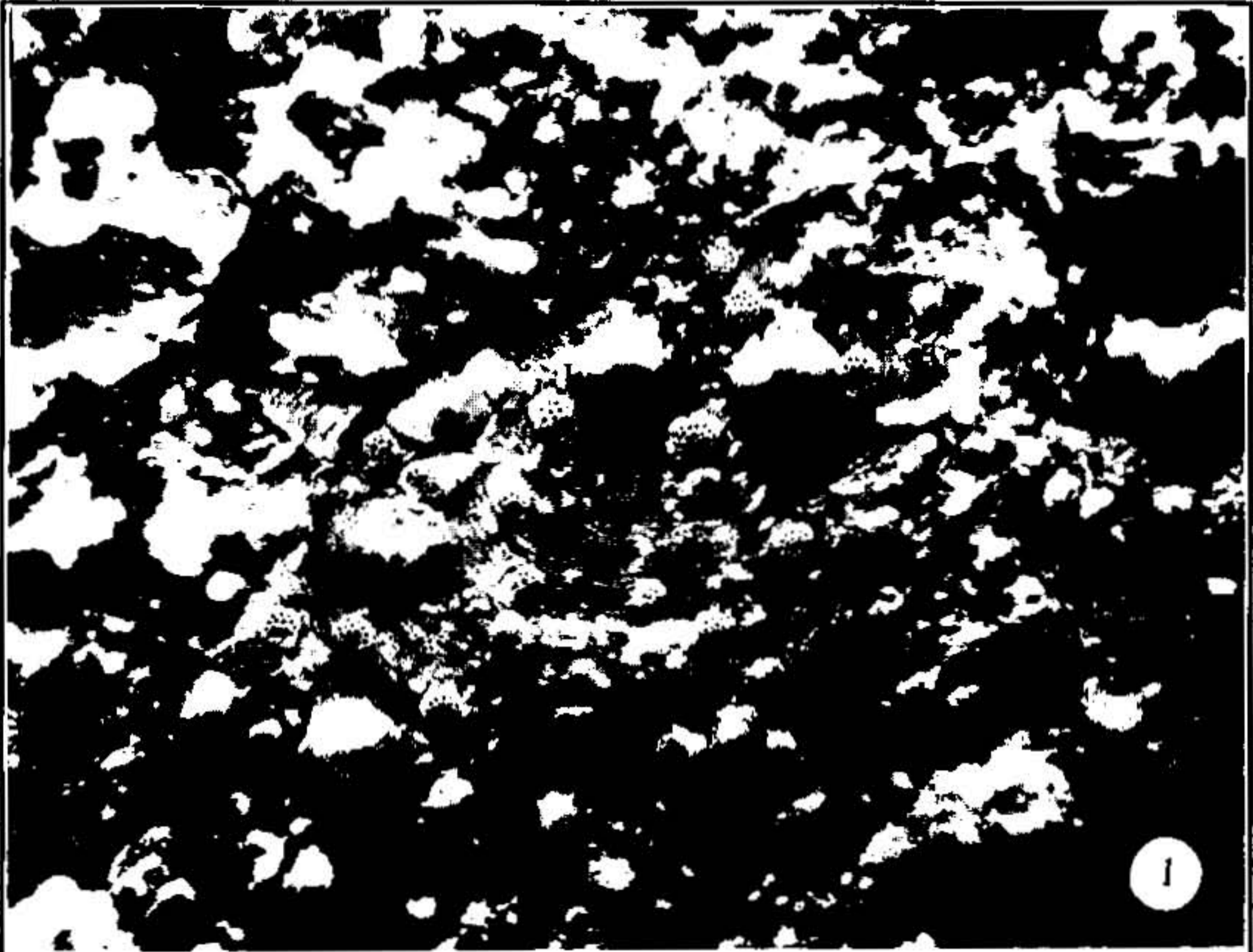
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EXPLANATION OF PLATE 20

1. *Melobesia membranacea*. Details of thalli bearing cystocarpic and tetrasporangial conceptacles. The pores in the latter have been retouched to make them show in the picture as reproduced. In printing for contour and detail it has been impossible to preserve the nearly white aspect of the thallus. Specimen from Île de la Tortue, $\times 35$.
2. *Fostiella farinosa* var. *solmsiana*. Filaments of the variety spreading over the membrane of *Valonia ventricosa*. In this specimen there is almost no tendency to form radiating disk thalli; this is an extreme form of the variety. The very great fragility of the plant makes it difficult to secure in a place suitable for photographing by transmitted light, and practically impossible to secure flat over a large area. Specimen from Île de la Tortue, $\times 65$.





MELOBESIA AND FOSLIELLA.