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THE MARINE ALGAE AND MARINE
SPERMATOPHYTES OF THE TOMAS
BARRERA EXPEDITION TO CUBA

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THE MARINE ALGAE AND MARINE SPERMATOPHYTES
OF THE TOMAS BARRERA EXPEDITION TO CUBA

By MARSHALL A. HOWE

The plants named in the following brief report were collected on the western coast of Cuba in May and June, 1914, by Mr. John B. Henderson, Regent of the Smithsonian Institution, and Dr. Paul Bartsch, Curator, Division of Marine Invertebrates, of the United States National Museum. An illustrated popular account of the expedition has been written by Mr. Henderson and published in book form under the title, "The Cruise of the Tomas Barrera,"¹ the expedition taking its name from that of the Cuban schooner generously placed at the disposal of the explorers by its owners. The collecting of algae was incidental to the activities of the expedition in zoological lines, and while the list of marine algae obtained is not a long one it is longer than any hitherto published for the island of Cuba and includes a considerable number of species not hitherto attributed to this island, though some of the latter are represented in unreported collections made by the writer in the vicinity of Guantanamo Bay in 1909. Included in the list are one species (*Phormidium Hendersonii*) which the writer is venturing to describe as new and one species (*Sarcomenia filamentosa*) which was previously known from the type specimens only (from Florida). In view of these facts and in view of the paucity of published lists of Cuban algae, the list of algae of the Tomas Barrera Expedition, even though brief, seems to the writer to be worthy of publication. The list of algae embraces 65 named species and four species that are referred to genus only. In addition to the algae two species of *Halophila*, marine seed-plants representing a group that is commonly neglected by the collectors both of marine algae and of dry-land spermatophytes, are named. Both of these species appear to have been hitherto unreported for Cuba.

The principal and, it may be said, the only general treatise on the algae of Cuba, is that contributed by C. Montagne to Ramon de la

¹8 vo. Pp. i-ix + 1-320. G. P. Putnam's Sons, New York and London. 1916.

Sagra's "Histoire physique, politique et naturelle de l'île de Cuba" (1842. Spanish edition, 1845), in which 52 species of algae (excluding diatoms) are described or enumerated.

In 1871 Professor W. G. Farlow published a popular illustrated account of "Cuban Seaweeds" in *The American Naturalist* (5: 201-209). This was based upon specimens collected by Charles Wright and the author states that 46 species were identifiable. No general list, however, was published and the species mentioned and illustrated in the course of the popular discussion are all members of the order Siphonales of the Green Algae.

Two papers by M. G. de la Maza¹ on the Cuban flora include lists of algae based almost wholly upon the work of Montagne, and George Murray's "Catalogue of the Marine Algae of the West Indian Region"² includes references to Cuba based chiefly upon the papers of Montagne and of Farlow.

Dr. Otto E. Jennings,³ in a recent paper on the flora of the Isle of Pines, includes three named species of marine algae and three that are referred to genus only.

In the list, an asterisk is prefixed to the names of species that are believed to be attributed to Cuba for the first time. However, with changing conceptions as to specific limitations and with occasional uncertainties as to synonymy, it is not always possible to correlate accurately the nomenclature of the older lists with that here adopted.

CYANOPHYCEAE

Family OSCILLATORIACEAE

* *PHORMIDIUM HENDERSONII*, sp. nov.

Forming firm, cartilaginous, suborbicular or depressed-hemispheric, lubricous, bluish olivaceous or light green, often decolorate discs or cushions 2-7.5 cm. broad and 1-2.5 cm. thick, becoming corneous or corneous-coriaceous and only 1-3 mm. thick on drying, rather conspicuously lamellate, the lamellae (when fresh) mostly 300-600 μ thick, all except the youngest consisting chiefly of empty hyaline more or less confluent, though usually easily perceptible,

¹ Flora de Cuba. Tesis para el doctorado. Habana, 1887. Nociones de botánica sistemática. Habana, 1893.

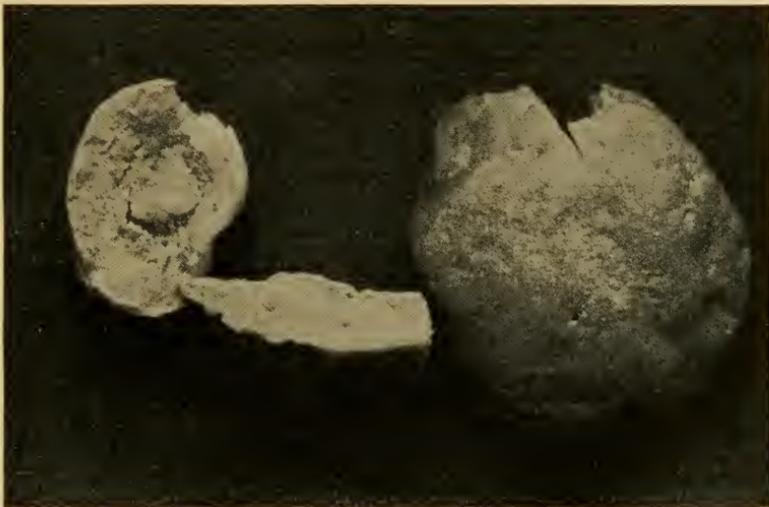
² Journ. Bot. 26: 193-196, 303-307, 331-338, 358-363. 1888; 27: 237-242, 257-262, 298-305. 1889.

³ A contribution to the botany of the Isle of Pines, Cuba, based upon the specimens of plants from that island contained in the Herbarium of the Carnegie Museum under date of October, 1916. Ann. Carnegie Mus. 11: 19-290. pl. 5-28. 1917.

sheaths with occasional flexuous or contorted living filaments and inclusions of foreign algae and varied detritus; filaments of the superficial lamella crowded, usually flexuous or contorted, occasionally rather strict and suberect; vaginae close, mostly inconspicuous, not affected by chlor-zinc-iodine; trichomata pale olivaceous, 1.5-1.8 μ thick, not constricted at the septa, the apex straight, not attenuate; cells 2-6 times as long as broad, 3-9 μ long, the apical rounded, calyptra none.

On reef at Cayo Hutía,¹ Cuba, Tomas Barrera Expedition (*Henderson & Bartsch* 103, May 14, 1914). Types in herb. U. S. Nat. Museum and in herb. N. Y. Botanical Garden.

Phormidium Hendersonii is a close relative of the Hawaiian *Phormidium Crosbyanum* Tilden (Am. Alg. 645. 1909; Minnesota



Phormidium Hendersonii M. A. Howe. Photograph of formalin-preserved material, natural size. The right-hand figure shows the type-specimen from Cayo Hutía (*Henderson & Bartsch* 103), viewed from above; the left-hand figure shows a specimen from the mouth of Guánica Harbor, Porto Rico (*Howe* 6999), viewed from below; the middle figure shows a vertical section through a disc from Cayo Don Luis, Porto Rico (*Howe* 7192).

Alg. 96. pl. 4. f. 60, 61. 1910) but seems to differ in the more rigid-cartilaginous, more distinctly lamellate cushions, and the longer, less distinctly defined cells, which average about 5.6 μ long, while those of *P. Crosbyanum* average about 3.3 μ long. Being fleshy-cartilaginous and often decolorate, it is slightly suggestive of the base of a sea-anemone or other actinarian, and is probably sometimes neglected by the botanical collector as not pertaining to his field of action. The

¹ Often spelled "Jutias" on Cuban maps.

species is of rather common occurrence on the shores of the West Indian region, finding its best development on old coral slabs, rocks, etc., just below the low-tide mark in shallow warm water. In such places, in fact, as are most favored by *Dictyosphaeria favulosa*. Recent collections by the present writer in Porto Rico are his numbers 6998 and 6999 (mouth of Guánica Harbor, June 21, 1915), 7192 (Cayo Don Luis, June 27, 1915), and 7204 (Salinas Cove, June 27, 1915).

PHORMIDIUM sp.

Station 12, between Cabo de San Antonio and Punta del Cajón, in 2-12 fathoms, May 24, 358e.

CHLOROPHYCEAE

Family CLADOPHORACEAE

CLADOPHORA FULIGINOSA Kütz.

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275 l; station 14, on reef in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 426i.

Kützing's type of the species was from Havana. This alga, plus its apparently ever-present fungus endophyte, seems to be Harvey's *Blodgettia confervoides*, described from Key West, Florida.

CLADOPHORA sp.

Station 16, Cabañas, 529.

Family VALONIACEAE

* **VALONIA VENTRICOSA** J. Ag. "Sea Bottles"

In shallow water about the keys at *Esperanza*, 16b; on a reef flat between Cayo Hutía and the little key N. E. of Light, 31e; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275b; station 13, in 2 fathoms, on mud and gravel, *Esperanza*, between anchorage and entrance, June 2, 417e.

* **VALONIA MACROPHYSA** Kütz.

Station 5, Dimas Bay, May 17, 125c; station 8, Los Arroyos, May 20, 217b; station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238d; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275j.

DICTYOSPHAERIA FAVULOSA (Ag.) Decaisne

Station 3, in 2 fathoms, Cayo Arenas, May 12, 21; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275a; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306h; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 425e and 426d; Bahía Honda, June 7, 475c; station 16, Cabañas, 506f.

*** CHAMAEDORIS PENICULUM (Ell. & Soland.) Kuntze**

Chamaedoris annulata (Lamarck) Mont.

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 358b.

*** MICRODICTYON CRASSUM J. Ag.**

On a reef flat between Cayo Hutía and the little key N. E. of Light, 31d; in 2-3 fathoms, station 10, Punta Colorada, 254a; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 425f and 426f.

ANADYOMENE STELLATA (Wulf.) Ag.

Station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238c; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275k.

Family **DASYCLADACEAE****DASYCLADUS VERMICULARIS (Scop.) Krasser**

Dasycladus clavaeformis (Roth) Ag.

On a reef flat between Cayo Hutía and the little key N. E. of Light, 31f; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306i; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 426g; Bahía Honda, June 7, 475n; Cabañas, 506g.

*** BATOPHORA OERSTEDI OCCIDENTALIS (Harv.) M. A. Howe**

Dasycladus occidentalis Harv.

Botryophora occidentalis J. Ag.

Coccocladus occidentalis Cramer

Station 7, in 1-3 fathoms, Ensenada de Santa Rosa, 174b; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306j.

CYMOPOLIA BARBATA (L.) Lamour.

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 358a.

ACETABULUM CRENULATUM (Lamour.) Kuntze

Acetabularia crenulata Lamour.

Station 7, in 1-3 fathoms, Ensenada de Santa Rosa, 174a; station 8, Los Arroyos, 217c; in 2-3 fathoms, Cayo Punta del Tolete, 238a.

Family CODIACEAE

***AVRAINVILLEA NIGRICANS Decaisne**

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275d; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 426a.

***AVRAINVILLEA LEVIS M. A. Howe**

Station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 426b.

A form with a fimbriate-margined flabellum.

***RHIPIILIA TOMENTOSA Kütz.**

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275e; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 426c.

***UDOTEA CONGLUTINATA (Ell. & Soland.) Lamour.**

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275f.

***UDOTEA CYATHIFORMIS Decaisne**

Station 8, Los Arroyos, May 20, 217f; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306g.

***UDOTEA WILSONI Gepp & Howe**

Station 13, in 2 fathoms, on mud and gravel, between anchorage and entrance, Esperanza, 417a.

Type from the Anguilla Isles, Salt Key Bank, Bahamas.

UDOTEA FLABELLUM (Ell. & Soland.) M. A. Howe

Udotea flabellata Lamour.

Bahia Honda, June 7, 475d.

PENICILLUS CAPITATUS Lamarck

On reef, off Cayo Hutía, May 14, 73d; station 8, Los Arroyos, May 20, 217d; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306f; station 13, in 2 fathoms, on mud and gravel, between anchorage and entrance, June 2, 417d.

***PENICILLUS PYRIFORMIS** A. & E. S. Gepp

On reef, off Cayo Hutía, May 14, 73e; station 5, Dimas Bay, May 17, 125a; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306e; station 16, Cabañas, 506e.

***PENICILLUS DUMETOSUS** (Lamour.) Decaisne

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306k.

RHIPOCEPHALUS PHOENIX (Ell. & Soland.) Kütz.

Station 3, in 2 fathoms, Cayo Arenas, May 12, 23a; station 5, Dimas Bay, May 17, 125b; station 8, Los Arroyos, May 20, 217a; station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238e.

RHIPOCEPHALUS OBLONGUS (Decaisne) Kütz.

Station 3, in 2 fathoms, Cayo Arenas, May 12, 23b.

***HALIMEDA TUNA** (Ell. & Soland.) Lamour.

Along the main shore and bayous opposite anchorage, Santa Lucia Bay, May 15, 110; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275c; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, 306b; station 14, in 2-3 fathoms, coral, sand, and rock bottom, June 2, 425c.

***HALIMEDA DISCOIDEA** Decaisne

Station 3, in 2 fathoms, Cayo Arenas, May 12, 22b; on reef, off Cayo Hutía, May 14, 73c; station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238b.

HALIMEDA TRIDENS (Ell. & Soland.) Lamour.

Halimeda incrassata (Ell. & Soland.) Lamour.

Station 3, in 2 fathoms, Cayo Arenas, May 12, 23c; on a reef flat between Cayo Hutía and the little key N. E. of Light, 31c; station 5, Dimas Bay, May 17, 124; station 7, in 1-3 fathoms, Ensenada de

Santa Rosa, 174c; station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306c; station 13, in 2 fathoms, on mud and gravel, between anchorage and entrance, Esperanza, June 2, 417b; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 426e; Bahía Honda, June 7, 475e; station 16, Cabañas, 506d and 506m.

* *HALIMEDA SIMULANS* M. A. Howe

Station 8, Los Arroyos, May 20, 217e; station 16, Cabañas, 506c.

* *HALIMEDA MONILE* (Ell. & Soland.) Lamour.

Station 7, in 1-3 fathoms, Ensenada de Santa Rosa, 174d; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 425d.

HALIMEDA OPUNTIA (L.) Lamour.

In shallow water about the keys at Esperanza, 16a; station 3, in 2 fathoms, Cayo Arenas, May 12, 22a; on reef, off Cayo Hutía, May 14, 73b; station 13, in 2 fathoms, on mud and gravel, between anchorage and entrance, Esperanza, June 2, 417c; station 16, Cabañas, 506b.

* *HALIMEDA LACRIMOSA* M. A. Howe

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 306d. The only known collection of this species outside of the Bahamas.

CODIUM TOMENTOSUM (Huds.) Stackh.

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275g; station 16, Cabañas, 506a.

Family CAULERPACEAE

CAULERPA PROLIFERA (Forsk.) Lamour.

Station 5, Dimas Bay, May 17, 125d.

CAULERPA SERTULARIOIDES (S. G. Gmel.) M. A. Howe

Caulerpa plumaris (Forsk.) Ag.

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275h.

CAULERPA CUPRESSOIDES (West) Ag.

Station 10, in 2-3 fathoms, Punta Colorada, 254b.

* **CAULERPA PASPALOIDES** (Bory) Grev.

On reef, off Cayo Hutía, May 14, 73a; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275m.

* **CAULERPA PASPALOIDES WURDEMANNI** (Harv.) Web. v. Bosse

Caulerpa Wurdemanni Harv.

Station 13, in 2 fathoms, on mud and gravel, between anchorage and entrance, Esperanza, June 2, 417f.

* **CAULERPA RACEMOSA OCCIDENTALIS** (J. Ag.) Børg.

In 2-4 fathoms, Santa Lucia Bay, May 13, 149.

PHAEOPHYCEAE

Family FUCACEAE

TURBINARIA TURBINATA (L.) Kuntze

Turbinaria trialata Kütz.

On reef, off Cayo Hutía, May 14, 73f.

SARGASSUM NATANS (L.) Meyen

Sargassum bacciferum (Turn.) Ag.

Station 8, Los Arroyos, May 20, 216.

Family DICTYOTACEAE

* **ZONARIA ZONALIS** (Lamour.) M. A. Howe

Zonaria lobata Ag.

Styopodium lobatum Kütz.

Bahia Honda, June 7, 475b.

ZONARIA VARIEGATA (Lamour.) Ag.

On a reef flat between Cayo Hutía and the little key N. E. of Light, 31b; on reef off Cayo Hutía, May 14, 73g; station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238f; station 11, Ensenada del Cajón, off Cabo de San Antonio, 275i; station 14, in 2-3 fathoms, on coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 425b and 426h.

NEUROCARPUS JUSTII (Lamour.) Kuntze*Dictyopteris Justii* Lamour.*Haliseris Justii* Ag.

On a reef between Cayo Hutía and the little key N. E. of Light, 31a; station 12, in 2-12 fathoms between Cabo de San Antonio and Punta del Cajón, May 24, 306a; station 14, in 2-3 fathoms, coral, sand, and rock bottom, on reef Lavesos Italianos, opposite Cayo Lavesos, June 2, 425a; station 16, Cabañas, 506h.

*** DICTYOTA BARTAYRESII Lamour.**

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 307b; station 16, Cabañas, 506i.

DICTYOTA DENTATA Lamour.

Bahia Honda, June 7, 475f.

RHODOPHYCEAE

Family CHAETANGIACEAE

*** GALAXAURA LAPIDESCENS (Ell. & Soland.) Lamour.**

Station 16, Cabañas, 506l. The plants currently referred to this species probably represent the tetrasporic phases of a species belonging in another section of the genus—the section *Eugalaxaura*.

*** GALAXAURA SQUALIDA Kjellm.**

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275n.

*** GALAXAURA OBLONGATA (Ell. & Soland.) Lamour.**

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 307a.

Family RHODOPHYLLIDACEAE

*** WURDEMANNIA SETACEA Harv.**

Station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238h; station 11, Ensenada del Cajón, off Cabo de San Antonio, 267a.

Family SPHAEROCOCCACEAE

*** GRACILARIA CONFEROIDES (L.) Grev.**

Bahia Honda, June 7, 475a.

HYPNEA MUSCIFORMIS (Wulf.) Lamour.

On a reef flat between Cayo Hutía and the little key N. E. of Light, 31g; station 16, Cabañas, 505.

Family RHODYMENIACEAE

***CORDYLECLADIA IRREGULARIS Harv.**

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 267b.

Family DELESSERIACEAE

***SARCOMENIA FILAMENTOSA M. A. Howe**

Station 16, Cabañas, 528a.

The second collection of this species. The type was from Cape Florida.

Family RHODOMELACEAE

***LAURENCIA OBTUSA (Huds.) Lamour.**

Station 16, Cabañas, 562.

LAURENCIA INTRICATA Lamour.

Station 9, in 2-3 fathoms, Cayo Punta del Tolete, 238g.

***LAURENCIA POITEI (Lamour.) M. A. Howe**

Laurencia tuberculosa J. Ag.

Laurencia gemmifera Harv.

Laurencia mexicana Kütz.

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275 o; station 13, in 2 fathoms, on mud and gravel, between anchorage and entrance, Esperanza, June 2, 417g.

LAURENCIA CORALLOPSIS (Mont.) M. A. Howe

Sphaerococcus corallopsis Mont.

Corallopsis Sagraeana Mont.

Laurencia cervicornis Harv.

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 358d.

Montagne's type of this species was from the vicinity of Havana, where it was collected by Ramon de la Sagra. Harvey's type of *Laurencia cervicornis* was from Key West, Florida.

ACANTHOPHORA SPICIFERA (Vahl) Børg.*Acanthophora Thierii* Lamour.

Bahia Honda, June 7, 475g.

DIGENEA SIMPLEX (Wulf.) Ag.

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 275p.

***DASYA RAMOSISSIMA** Harv.

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 358c.

Family CERAMIACEAE

SPYRIDIA FILAMENTOSA (Wulf.) Harv.

Bahia Honda, June 7, 475h; station 16, Cabañas, 506k.

Family SQUAMARIACEAE

***PEYSSONNELIA RUBRA** (Grev.) J. Ag.

Bahia Honda, June 7, 475 o.

Small fragments (475k and 475 l) of two other species of this genus occur under the same general number.

Family CORALLINACEAE

***LITHOTHAMNIUM FLORIDANUM** Fosl. (?)

Station 11, Ensenada del Cajón, off Cabo de San Antonio, 359.

LITHOPHYLLUM sp.

Bahia Honda, June 7, 475m—a fragment only.

***GONIOLITHON STRICTUM** Fosl.

Bahia Honda, June 7, 479; station 16, Cabañas, 524.

Foslie's type was from Florida.

CORALLINA CUBENSIS (Mont.) Kütz.

Station 12, in 2-12 fathoms, between Cabo de San Antonio and Punta del Cajón, May 24, 307c; Bahia Honda, June 7, 475i; station 16, Cabañas, 506j.

* **AMPHIROA TRIBULUS** (Ell. & Soland.) Lamour.

On a reef flat between Cayo Hutía and the little key N. E. of Light, 31h.

SPERMATOPHYTA

Family ELODEACEAE

* **HALOPHILA BAILLONIS** Asch.

Bahia Honda, June 7, 475j.

* **HALOPHILA ENGELMANNII** Asch.

On reef, off Cayo Hutía, May 14, 73h.