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# CHECKLIST OF MARINE ALGAE AND SEAGRASSES FROM THE PONDS OF THE PELICAN CAYS, BELIZE

BY

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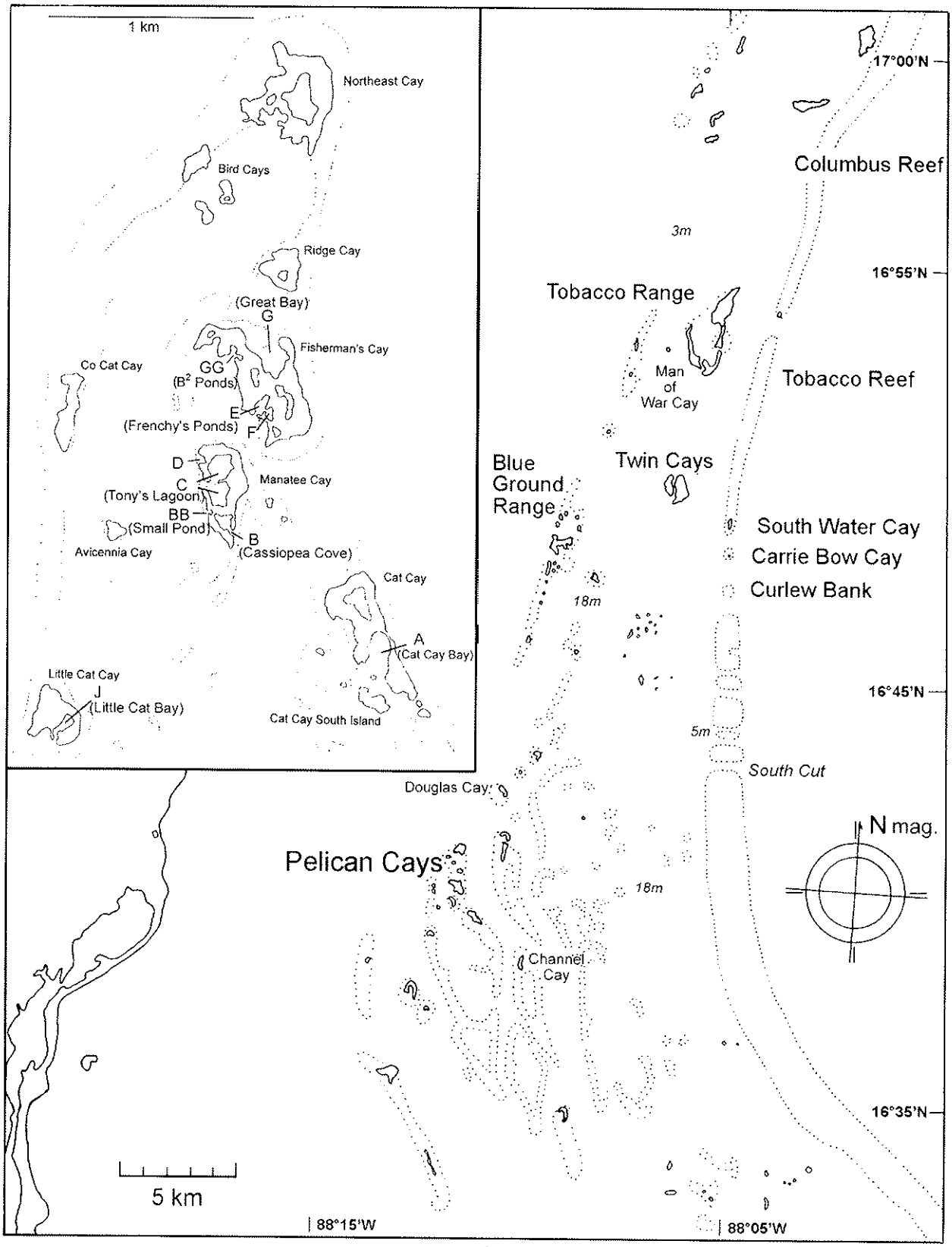


Figure 1. Location of the atoll-like Pelican Cays group on the Central Province of the Belize Barrier Reef, Central America. Enlarged view of the major islands and habitats surveyed during the present study shown in inset (adapted from drawing by M.K. Ryan).

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## ABSTRACT

One hundred and fifty two species of marine macrophytes (148 algae and 4 vascular plants) were recorded from ponds (embayments, bays, coves, and lagoons) within the Pelican Cays, a recently recognized atoll-like system of the Rhomboid Cays in the Central Province of the Belize Barrier Reef. Of the algae, 64 were Rhodophyta, 59 Chlorophyta, 16 Phaeophyta, and 9 Cyanophyta; 4 Magnoliophyta also were present. This unusually high marine plant biodiversity (for such a small geographic area) can be traced to the unique commingling of four major biomes–mangrove, coral, seagrass, and algal–under stable oligotrophic conditions (as indicated, for example, by the area's consistently "gin-clear" waters).

The cays also have three distinct habitat types: hanging roots, peat banks, and pond floors. The pond floors (bases) contain abundant psammophytic seagrasses and Chlorophyta (rhizophytes), anchored on the shallow horizontal margins. The suspended mangrove roots support combinations of delicate plant and animal taxa not found on the embedded roots, peat banks, or pond bases. The adjacent peat banks support more herbivore-resistant (calcified, tough, and chemically defended) taxa, indicative of a relatively grazer-accessible habitat. Between-pond floristic differences appear to be minor, but populational abundances vary greatly, probably because of the circulation and size of the ponds. One algal species, the giant-cell *Caulerpa nummalaria,* has not been found elsewhere in the Western Atlantic. Commercially valuable red algal agar-producers (*Gracilaria, Hydropuntia*) and carigeenan-producers (*Meristiella*) abound near the openings to several of the ponds. An unusual number of macroalgal species have attained record large sizes in these ponds. We fully documented all taxa to provide an initial checklist, with collection data for the major ponds of the Pelican Cays, as well as overall ranges for the Caribbean and adjacent seas.

## INTRODUCTION

The Belize Barrier Reef (10 to 32 km wide and about 250 km long; Rützler and Macintyre, 1982) contains hundreds of mangrove islands, diverse intertidal and subtidal barrier- and patch-reef zones, two large atolls, and vast lagoonal seagrass beds. The benthic plant communities of these and mainland habitats have received inadequate attention, however,

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especially in light of Belize's increasing development and its growing popularity with the diving and scientific communities. Only five algal floristic accounts have been published thus far: the earliest, by Taylor (1935), documents 84 marine algae; Tsuda and Dawes (1974) list 104 marine plants collected at Glovers Reef; Norris and Bucher (1982) treat 165 taxa of benthic marine algae from the vicinity of Carrie Bow Cay, Southwater Cay, and Twin Cays; Littler et al. (1995) document 63 marine macrophytes from Tobacco Range; and Littler and Littler (1997) illustrate 190 species as an initial field guide to encourage conservation efforts in the Pelican Cays. In addition, specialized generic treatments have identified a number of taxa new to Belize: 7 *Polysiphonia* (Kaprann and Norris, 1982), 7 *Udotea* (Littler and Littler, 1990), 1 *Anadyomene* (Littler and Littler, 1991), and 8 *Avrainvillea* (Littler and Littler, (1992). To our knowledge, no other floristic studies of such high-diversity, interspersed, mangrove/ algal/coral/seagrass habitats have been carried out.

## STUDY AREA

The atoll-like Pelican Cays, located in the Central Province of the Belize Barrier Reef (Fig. 1), comprise a pristine, low-energy, mangrove-island ecosystem dominated by sessile photosynthetic and filter-feeding populations. Most are morphologically delicate and vulnerable to damage from boat wakes, physical disturbance, and sedimentation, as well as natural (Lapointe et al., 1993) and anthropogenic (Littler et al., 1993) eutrophication. Almost all of the intertidal habitats contain the upper band of *Bostrychia/Catenella* ubiquitous in the Caribbean. The predominant algal groups (67%) are coarsely branched thick-leathery or calcareous forms (Littler and Littler 1997), which are indicative of constant, low-nutrient conditions. There is a paucity of the filamentous and sheet-like green algal forms that characterize bird islands (Lapointe et al., 1993) such as nearby eutrophic mangrove cays (e.g., Man-of-War Cay, Channel Cay, Douglas Cay).

The macrophyte biodiversity of the Pelican Cays area (190 taxa) is greater than that of any comparable system studied in the Caribbean (Littler and Littler, 1997). By comparison, only 209 taxa have been reported from the Caribbean and adjacent seas as a whole (Littler et al., 1989). In the past, we have recorded rich floras of undocumented macrophytes in Belizean mangrove systems such as Twin Cays (Littler et al., 1985) and Tobacco Range (Littler et al., 1995). However, the macrophyte diversity of the Pelican Cays far exceeds that of Twin Cays and Tobacco Range combined (cf. Littler et al., 1985, 1995; Littler and Littler, 1997). This unusually high marine plant diversity in such a small geographic area is thought to be due to the stable oligotrophic history, the commingling of various habitat types, and the close juxtaposition of complex coral, seagrass, macroalgal, and mangrove biomes.

## METHODS

This study was restricted to selected ponds (embayments, coves, bays, and lagoons) and primarily to the large macrophytic forms that are not ubiquitously dispersed by birds, wind-aerosols, and ships. We covered the three major phyla of marine algae, Rhodophyta (red algae, 64 taxa), Chlorophyta (green algae, 59 taxa), and Phaeophyta (brown algae, 16 taxa). Also included were Cyanophyta (blue-green algae, 9 taxa), which represent an important macrophyte

component in some habitats, and the flowering plant phylum Magnoliophyta (seagrasses, 4 taxa). Though generally omitted from algal floras and texts, the seagrasses play a major role in the ecology and population dynamics of nearly all Pelican Cays' ecosystems.

The algal diversity of the Pelican Cays' pond systems was documented as a further step toward establishing a baseline of systematic information of use to governmental agencies. Collections from the mangrove hanging (suspended) roots, seagrass floors, and shallow peat banks (including embedded roots) within ponds were made from February 1992 to May 1995 by snorkeling. During February 1992, we began recording observations of populations and island systems in the Pelican Cays group using names of locations from charts and some of our own site designations (Littler and Littler, 1997, Fig. 1). The present treatment also uses the letter designations for "ponds" (A-J) employed in this volume. Our research team has now made multiple seasonal marine plant collections at 43 sites from the 11 major islands of the Pelican Cays: 11 sites at Manatee Cay, 6 at Bird Cays, 5 at Fisherman's Cay, and 3 at each of the remaining cays. For consistency, however, this report is restricted to the ponds lettered A-G and J in Fig. 1. Specimens for pressing were combined in large mesh bags, while separate plants were placed in individual plastic bags at the time of collection, later transferred to polycarbonate vials, fixed in 5% Formalin, and finally preserved in 70% ethyl alcohol. In the laboratory, portions of each species' collection were retained in vials with liquid preservative, while the remainder of thalli and bulk materials were dried and pressed as herbarium specimens. Dried herbarium collections, wet preserved materials, and, when at the Carrie Bow Cay (CBC) field station, living specimens were examined macroscopically and microscopically, after portions were prepared on glass slides for anatomical study. Thallus sections were made by hand (in the field) or by freezing microtome, stained with 1% aniline blue, and mounted using a 20% glucose syrup (Karo Syrup, Corn Products, Inc.) solution in distilled water containing a trace of phenol.

Predominant taxa were listed in phylogenetic order for higher taxa following Wynne (1998), with the species appearing alphabetically. Identifications were checked against type specimens or the original published descriptions. Species names are followed by a citation of the original publication, and the basionym with its reference given below if the species is based on an earlier name. Specimens cited (Table 1) are only those collected during this specific study and are deposited in the Algal Collection, U.S. National Herbarium, Department of Botany, National Museum of Natural History, Smithsonian Institution (US).

## DOMINANT MACROPHYTES OF THE PELICAN CAYS' PONDS

Pond A (= Cat Cay Bay), is a southwestward-facing pond (Fig. 1). The western margin of this bay (from the ribbon reef to the northernmost limit) is one of the richest (greatest biodiversity) sites in the Pelican Cays. As mentioned above, the reason is the unusual combination of coral, mangrove, algal, and seagrass systems related to the stable seawater quality in this compact pond. The eastern margin of Pond A is richer in algal populations than the invertebrate-dominated western margin. Particularly striking dominants of the hanging root communities in the southern portion of Pond A (= Cat Cay Bay) are colorful red algae *Coelothrix irregularis, Acanthophora spicifera, Spyridia filamentosa,* the brown algae *Lobophora variegata, Dictyota* spp., *Padina sanctae-crucis,* and the green algae *Caulerpa racemosa* var. *occidentalis, C. sertularioides, C. mexicana, C. verticillata, Halimeda opuntia,* and *Dictyosphaeria cavernosa* (selected examples in Figs. 2-9). Such epiphyte-free macroalgal populations are indicative of

Table 1. Location of voucher specimens preserved in the algal collection of the U.S. National Herbarium. See Figure 1 for pond names.

| Taxa | Ponds | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | BB | C | E & F | G | J |
| *Acanthophora spicifera* | X | X | | X | | | |
| *Acetabularia* sp. | | | | | | X | |
| *Amphiroa fragilissima* | | | | X | | X | |
| *Amphiroa rigida* | | | | | | X | |
| *Amphiroa* sp. | | X | | X | | X | |
| *Anadyomene* sp. | | | | | | X | |
| *Anadyomene saldanhae* | | | | X | | X | |
| *Anotrichium barbatum* | | | | X | X | | |
| *Antithamnion* sp. | | | | X | | | |
| *Avrainvillea asarifolia* | | | | | X | | |
| *Avrainvillea digitata* | | | | X | | X | |
| *Avrainvillea longicaulis* | | | X | | | | |
| *Avrainvillea* sp. | | | | | | X | |
| *Bostrychia* sp. | | X | | | | X | |
| *Bostrychia tenella* | | | X | | | | |
| *Botryocladia* cf. *shanksii* | X | | | | | | |
| *Botryocladia spinulifera* | X | | | X | | | |
| *Brachytrichia quoyi* | | | | | | X | |
| *Bryopsis hypnoides* | | | | X | | | |
| *Bryopsis pennata* | | | | X | | | |
| *Bryopsis plumosa* | | | | | | | X |
| *Bryopsis ramulosa* | | | | X | | | |
| *Bryopsis* sp. | | | X | | | | |
| *Callithamnion* sp. | | | | X | | | X |
| *Caloglossum leprieurii* | X | | | X | | | |
| *Catenella* sp. | | X | | | | | |
| *Catenella caespitosa* | X | | | | | X | |
| *Caulerpa cupressoides* var. *flabellata* | | | | X | | | |
| *Caulerpa cupressoides* | | | | X | | | |
| *Caulerpa macrophysa* | | | | X | | | X |
| *Caulerpa mexicana* | | | X | X | | | |
| *Caulerpa nummularia* | X | | | X | | | |
| *Caulerpa pusilla* | | | | | | | X |
| *Caulerpa racemosa* var. *lamourouxii* | | | | X | | | |
| *Caulerpa racemosa* var. *occidentalis* | | | | X | | | X |
| *Caulerpa racemosa* var. *peltata* | X | | | | | | X |
| *Caulerpa racemosa* | X | | | X | | | |
| *Caulerpa sertularioides* | | | X | X | | | |

*Table 1.--continued*

| Taxa | Ponds | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | BB | C | E & F | G | J |
| *Caulerpa* sp. | | | | | | X | |
| *Caulerpa taxifolia* | X | | X | | | | X |
| *Caulerpa verticillata* | | X | | X | | | |
| *Centroceras clavulatum* | X | X | | | | | |
| *Centroceras* sp. | | | | | X | | |
| *Ceramium brevizonatum* | | | | X | | | |
| *Ceramium byssoideum* | | | | X | | | |
| *Ceramium nitens* | | X | | X | | | |
| *Ceramium* sp. | | | | | | | X |
| *Chaetomorpha* sp. | | | | | | | X |
| *Champia parvula* var. *prostrata* | | | | | | X | |
| *Cladophora* sp. | | | | | X | | |
| *Cladophoropsis macromeres* | | | | X | | | |
| *Cladophoropsis* sp. | | | | | | X | |
| *Codium decorticatum* | | | | | | X | |
| *Codium intertextum* | X | | | | | X | |
| *Codium* sp. | | | X | | | | |
| *Codium taylorii* | X | | | | | | |
| *Coelothrix irregularis* | X | | | X | | | |
| *Dasya* sp. | | X | | X | | | |
| *Dasya spinulegra* | | | | X | X | | |
| *Derbesia fastigiata* | | | | X | | | |
| *Derbesia osterhoutii* | X | | | | | | |
| *Dictyota cervicornis* | X | | | X | | | |
| *Dictyota indica* | | | | X | | | |
| *Dictyota menstrualis* | | | | X | | | |
| *Dictyota pulchella* | | | | X | X | | X |
| *Dictyota* sp. | X | X | | X | | X | |
| *Dictyosphaeria cavernosa* | | | | X | | | |
| *Digenea simplex* | X | | | | | | |
| *Fosliella farinosa* var. *callithamnioides* | | | | X | | | |
| *Galaxaura lapidescens* | | | | X | | | |
| *Galaxaura marginata* | X | | | | | | |
| *Galaxaura rugosa* | | | | X | | X | |
| *Galaxaura* sp. | | | | | | | X |
| *Galaxaura subverticillata* | X | | | | | X | |
| *Gelidiopsis intricata* | X | | | X | | | |
| *Gelidiopsis planicaulis* | | | | X | | | |
| *Gracilaria mammillaris* | | X | | X | | X | |
| *Gracilaria* sp. | | X | | | | X | |
| *Halimeda discoidea* | | | | X | | | |

*Table 1.--continued*

| Taxa | Ponds | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | BB | C | E & F | G | J |
| *Halimeda incrassata* | | | | X | | | |
| *Halimeda monile* | X | | | | | | |
| *Halimeda opuntia* | | | | X | | | |
| *Halimeda simulans* | X | | | | | | |
| *Halimeda* sp. | X | X | | | | X | |
| *Halodule wrightii* | | X | | X | | | |
| *Halophila decipiens* | | X | | X | | | |
| *Herposiphonia pecten-veneris* | | | | X | | | |
| *Hetersiphonia* sp. | | | | | | X | |
| *Hincksia mitchelliana* | | | | | | X | |
| *Hydropuntia cornea* | X | | | X | | | |
| *Hydropuntia* sp. | | X | | | | | |
| *Hypnea* sp. | | X | | | | X | |
| *Hypoglossum tenuifolium* | | | | | X | | |
| *Jania adhaerens* | X | | | | | | |
| *Laurencia gemmifera* | | X | | | | | |
| *Laurencia intricata* | | X | | | | | X |
| *Laurencia obtusa* | | | | X | | | |
| *Laurencia papillosa* | | X | | X | | X | |
| *Laurencia poiteaui* | | | | | | X | |
| *Laurencia scoparia* | | | | | | | X |
| *Laurencia* sp. | X | X | X | X | | | |
| *Lejolisia exposita* | | | | X | | | |
| *Lobophora variegata* | X | | | X | | X | |
| *Lomentaria baileyana* | | | | X | | | X |
| *Lyngbia majuscula* | | | | X | | | |
| *Lyngbya aestuarii* | | | | | | X | |
| *Lyngbya cladophorae* | | | | X | | | |
| *Lyngbya confervoides* | | X | | | | | |
| *Lyngbya polychroa* | | | | | | X | |
| *Meristiella echinocarpum* | X | | | | | | |
| *Mesophyllum mesomorphum* | | | | X | | | |
| *Murrayella periclados* | X | | | | | | |
| *Neomeris annulata* | X | | | | | | |
| *Neomeris* sp. | | | | | | X | |
| *Ochtodes secundiramea* | | | | | | X | |
| *Oscillatoria acuminata* | | | X | | | | |
| *Padina pavonica* | | | | X | | | |
| *Padina sanctae-cruis* | X | | | | | | |
| *Padina* sp. | | X | | | | X | |
| *Penicillus capitatus* | | | | | | X | |

*Table 1.--continued*

| Taxa | Ponds | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | BB | C | E & F | G | J |
| *Penicillus dumetosus* | X | | | | | X | |
| *Penicillus lamourouxii* | | | | X | | X | |
| *Penicillus pyriformis* | | | | X | | | |
| *Penicillus* sp. | | | | X | | | |
| *Peyssonnelia boergesenii* | | | | X | | X | |
| *Phormidium crosbyanum* | | | | | | X | |
| *Phormidium laysanense* | | | | | | X | |
| *Polysiphonia atlantica* | X | | | | | | |
| *Polysiphonia havanensis* | | | | | | | X |
| *Polysiphonia scopulorum* | X | | | | | | |
| *Polysiphonia* sp. | | | | X | | | |
| *Rhipocephalus phoenix* f. *brevifolia* | | | | X | | | |
| *Rhizoclonia riparium* | | | | | | | X |
| *Sargassum fluitans* | X | | | | X | | |
| *Sargassum polyceratium* var. *ovatum* | | | | X | | | |
| *Sargassum ramifolium* | X | | | | | | |
| *Sargassum* sp. | | | | | | X | |
| *Schizothrix calcicola* | X | | | | | X | |
| *Spyridia* sp. | | | | | | X | |
| *Spyridia aculeata* | | | | | | | X |
| *Spyridia hypnoides* ssp. *complanata* | | | | X | | | |
| *Spyridia filamentosa* | | | | X | | | |
| *Spyridia* sp. | | | | | | X | |
| *Syringodium filiforme* | | X | | | | | |
| *Thalassia testudinum* | | X | | X | | | |
| *Trichogloeopsis pedicellata* | X | | | | | | |
| *Tricleocarpa oblongata* | | | | X | | | |
| *Turbinaria tricostata* | X | | | X | | | |
| *Turbinaria turbinata* | X | | | | | | |
| *Udotea cyathiformis* | | | | X | | X | |
| *Udotea flabellum* | | | | X | | | |
| *Udotea occidentalis* | X | | | X | | X | |
| *Udotea wilsonii* | | | | X | | | |
| *Ulva rigida* | | | X | | | X | |
| *Ulvella lens* | | | | X | | | |

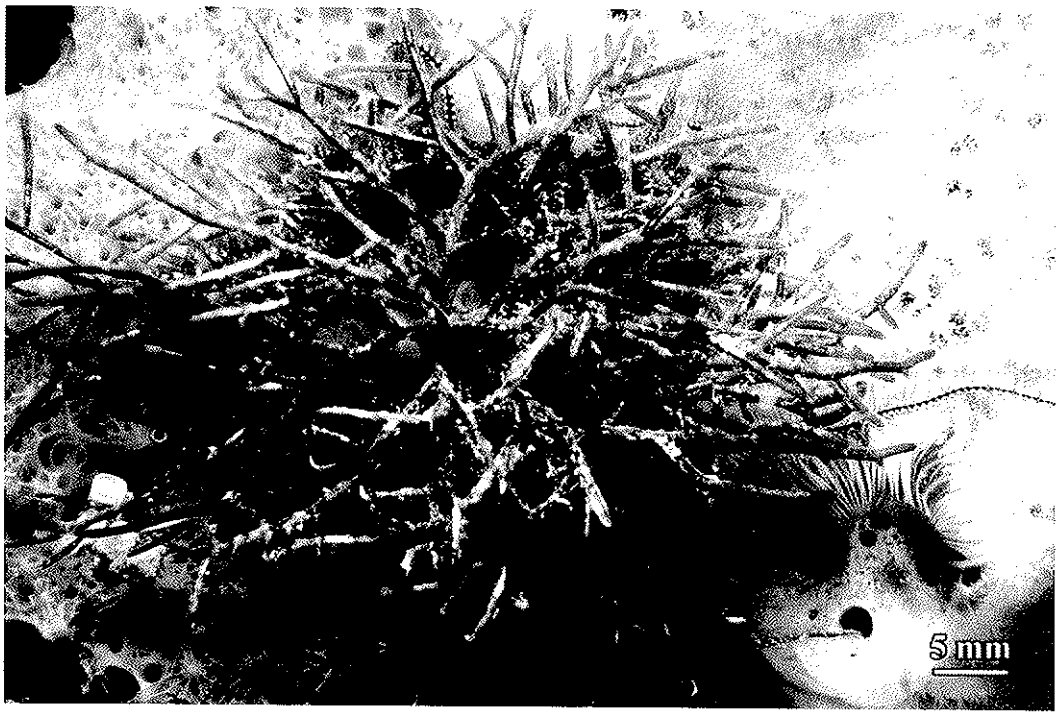


Figure 2. The red alga *Coelothrix irregularis* epiphytic on sponge on mangrove hanging root.

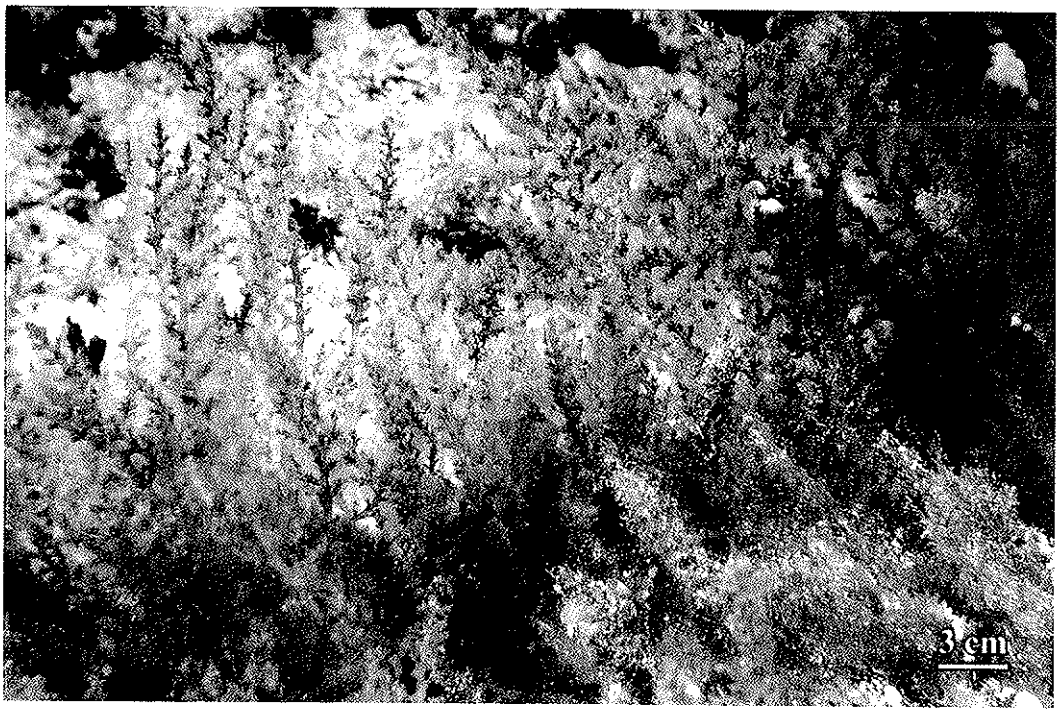


Figure 3. The red alga *Acanthophora spicifera* at Pond A (= Cat Cay Bay).


Figure 4. The decumbent form of the brown alga *Lobophora variegata* characteristic of the peat bank habitat.

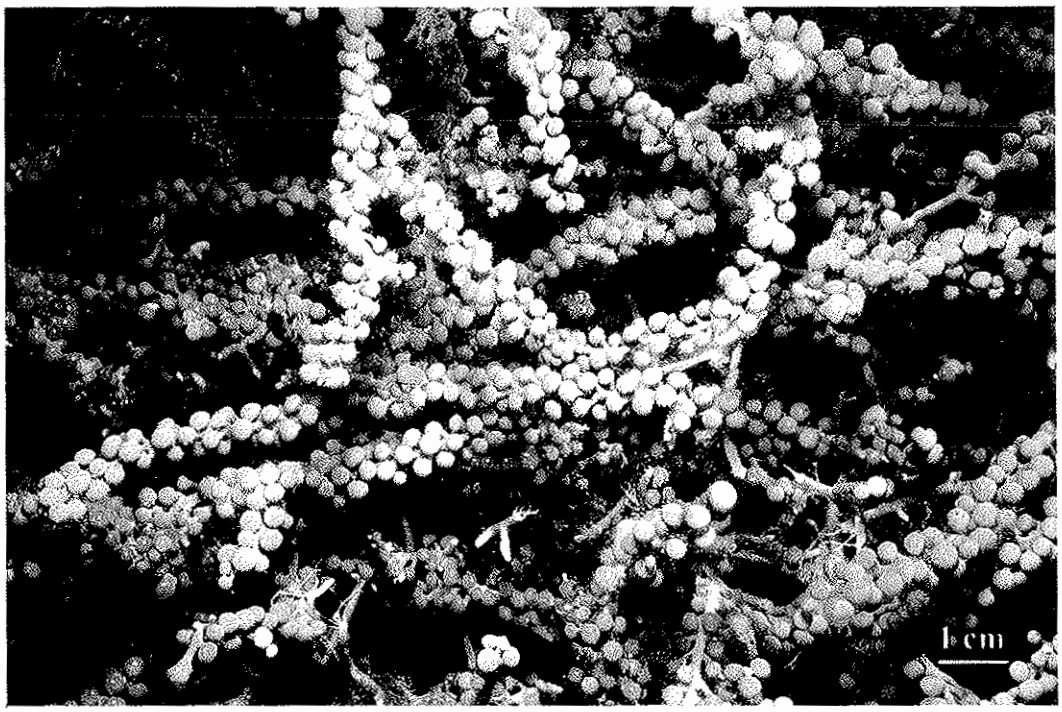


Figure 5. The green alga *Caulerpa racemosa* var. *occidentalis* on suspended mangrove root.


Figure 6. The green alga *Caulerpa sertularioides* on suspended mangrove root.

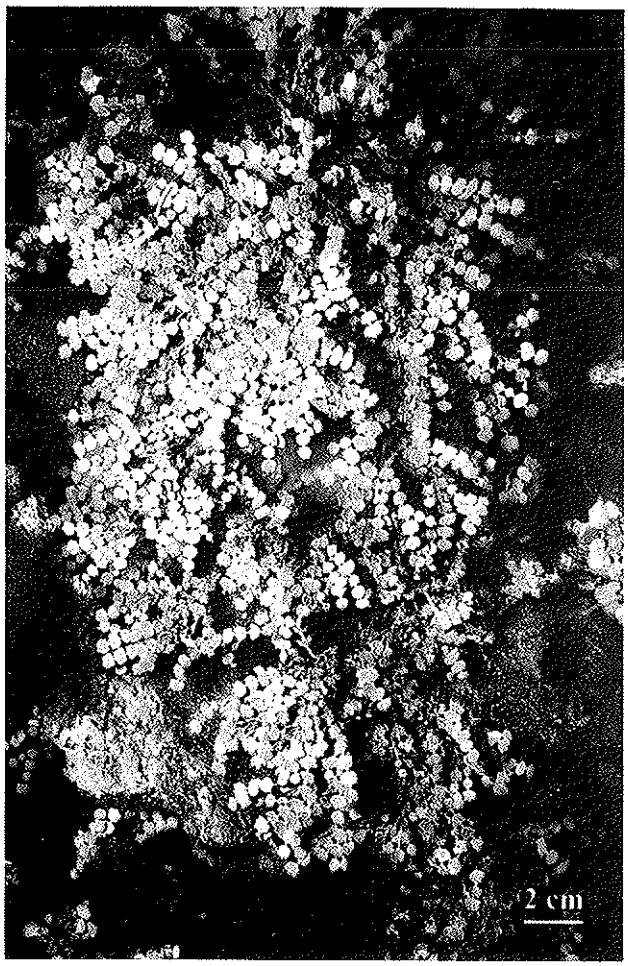


Figure 7. The segmented calcareous green alga *Halimeda* on mangrove peat bank.

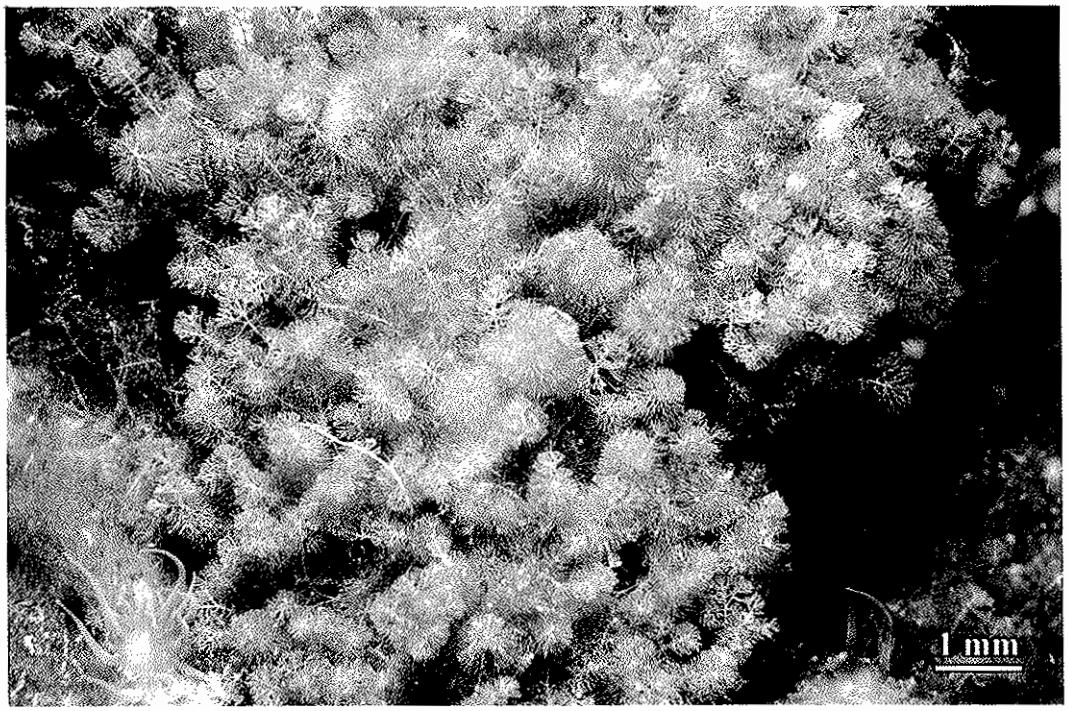


Figure 8. The green alga *Caulerpa verticillata* on peat bank.

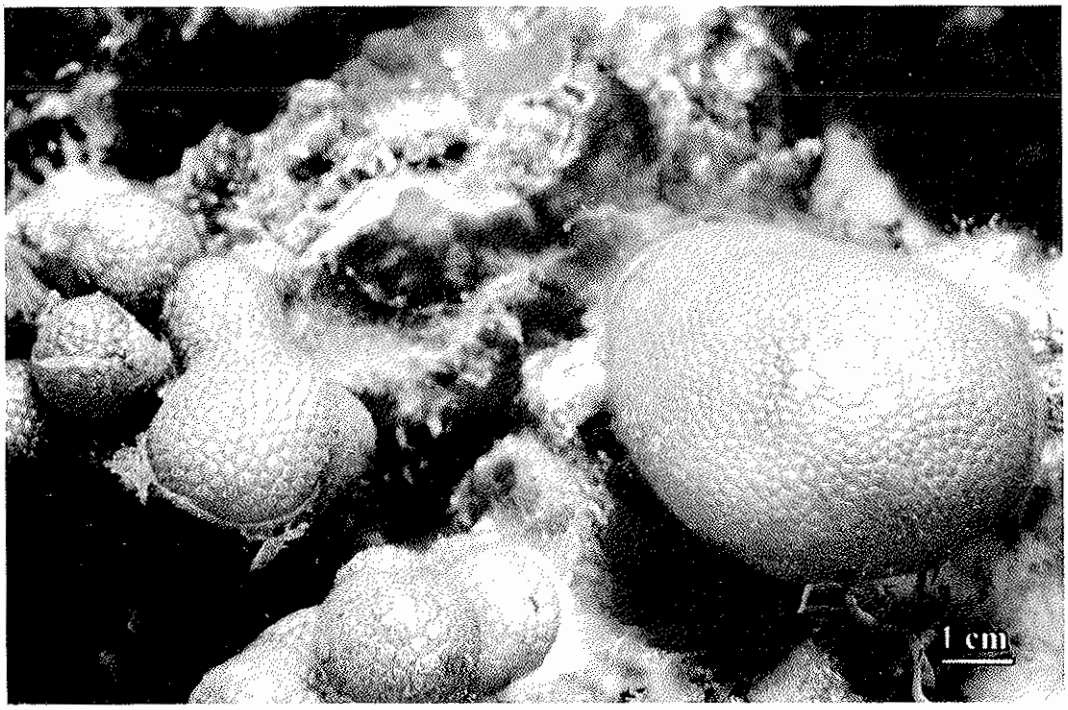


Figure 9. The green alga *Dictyosphaeria cavernosa* on hanging mangrove root.


Figure 10. The agarophyte red alga *Gracilaria mammillaris* on seagrass bed.


Figure 11. The red foliose *Meristiella echinocarpum* growing on seagrass bed.

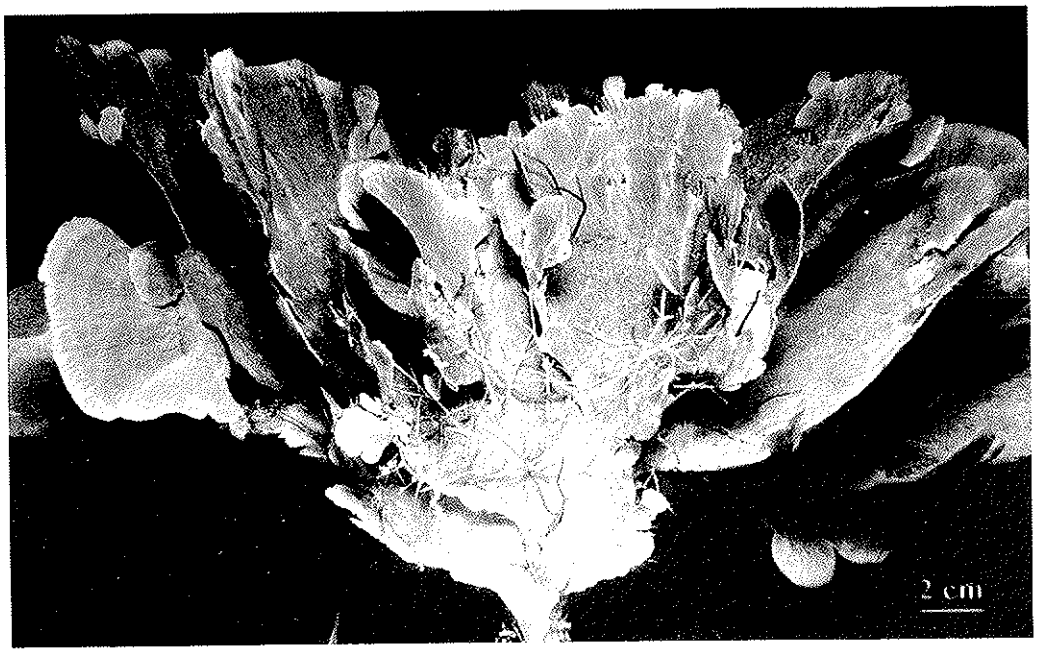


Figure 12. Typical giant specimen of the calcareous green alga *Udotea occidentalis* characteristic of rhizophytic seagrass beds in Pelican Cays' ponds.


*Figure* 13. The green alga *Codium intertextum* on embedded mangrove root.


Figure 14. The red alga *Hydropuntia cornea* (purported to be an aphrodisiac) lying on seagrass bed.


Figure 15. Seamoss drinks (from *Hydropuntia cornea*) bottled commercially in the Lesser Antilles.


Figure 16. The manatee grass *Syringodium filiforme* in Pond B (= Cassiopea Cove).

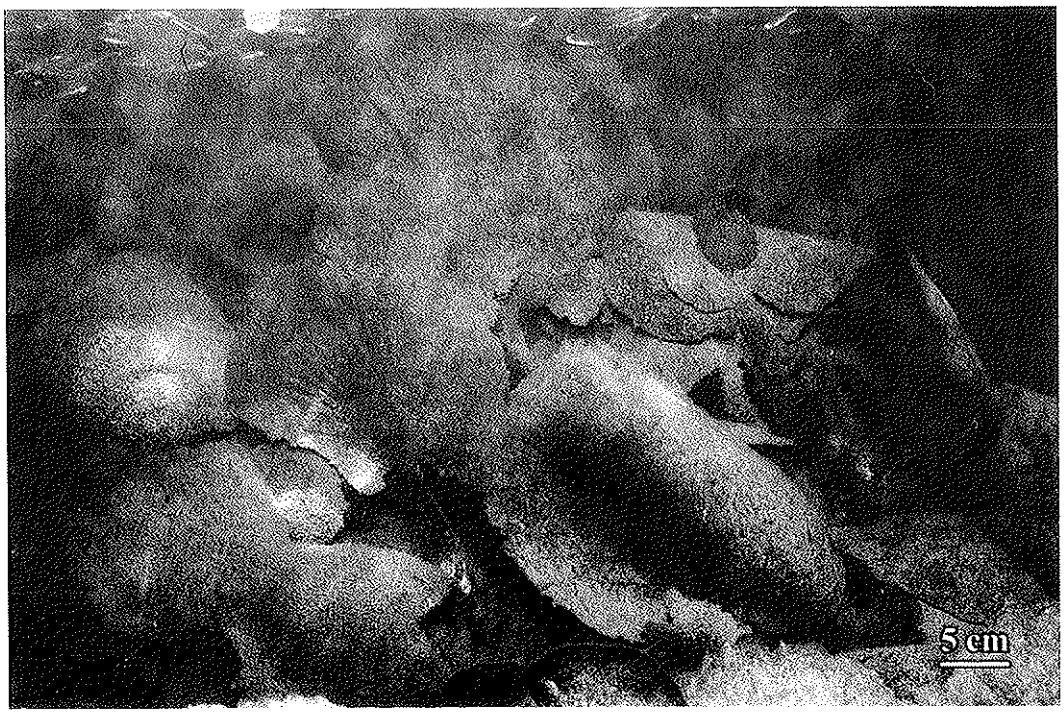


Figure 17. Population of giant *Avrainvillea asarifolia* in Pond BB (= Small Pond).


Figure 18. Giant fronds of the alga *Bryopsis plumosa* on hanging roots in Pond BB (= Small Pond).

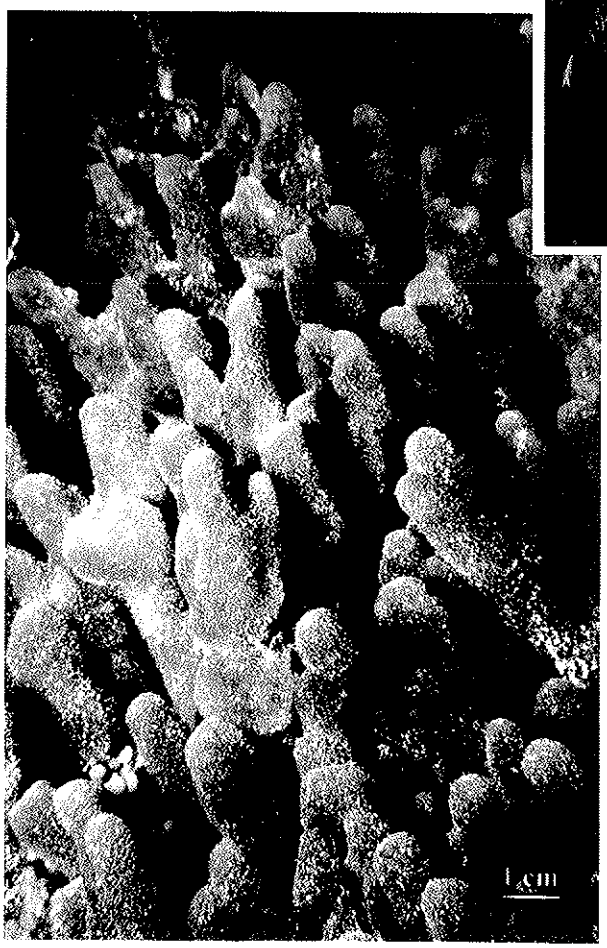


Figure 19. Giant finger-like thalli of the green alga *Avrainvillea digitata* at the north peat bank of Pond C (= Tony's Lagoon).

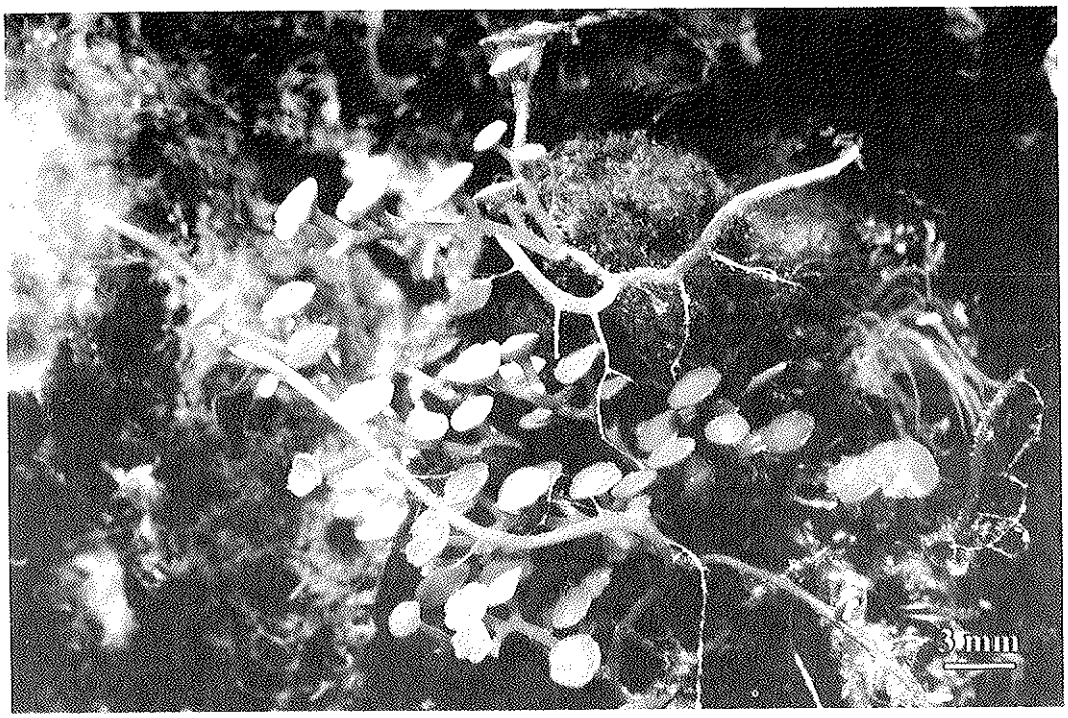


Figure 20. The giant cell *Caulerpa nummalaria* on hanging root of Pond BB (= Small Pond).

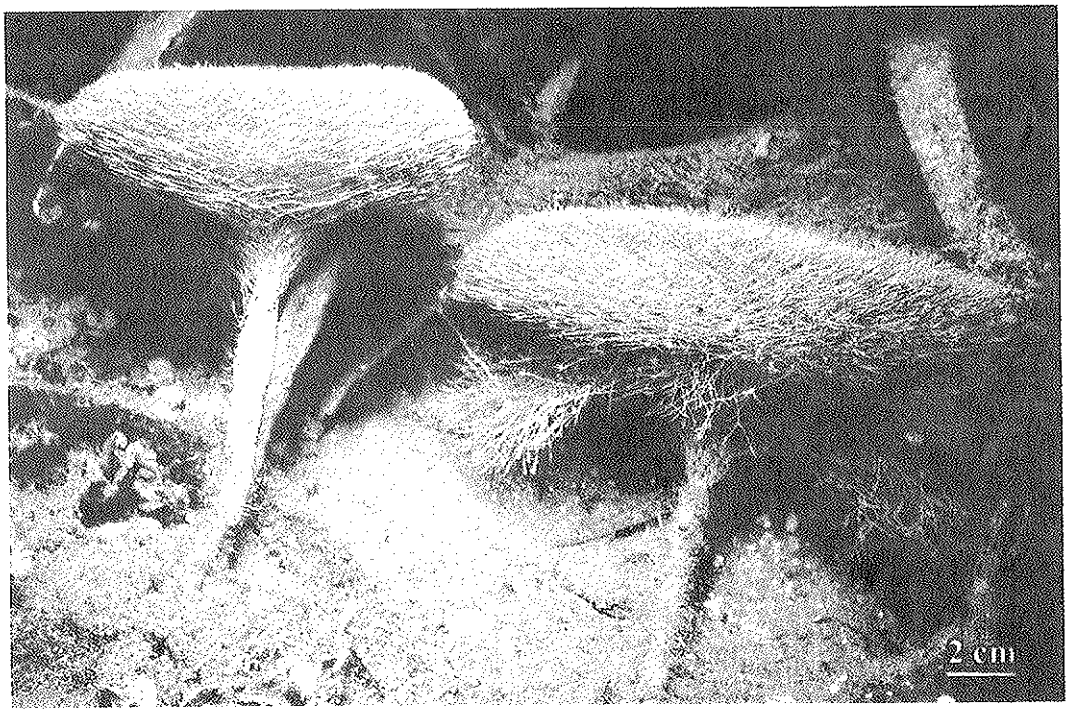


Figure 21. Giant thalli of the brush-like green alga *Penicillus pyriformis* on grass bed at north side of Pond C (= Tony's Lagoon).


Figure 22. The calcareous red alga *Galaxaura subverticillata* (and *Padina* sp.) on suspended root.


Figure 23. The calcareous green alga *Acetabelaria* sp. characteristic of hard substrates scattered on seagrass beds.

constant, stable, unpolluted conditions (Littler et al., 1993). Unusual species include foliose fleshy red forms *Gracilaria* and *Meristiella* (Figs. 10 and 11), epiphytic crustose corallines, and the large sand-dwelling green alga *Udotea* cf. *Occidentalis* (Fig. 12). Three markedly different growth forms of the green algal genus *Codium* spp. (Fig. 13) are also present. Several of the extended flats contain large populations of the commercially valuable red alga *Hydropuntia cornea* (Fig. 14), locally considered an aphrodisiac when prepared in porridge and commercially produced as "Double Trouble Sea Moss" in the Lesser Antilles (Fig. 15).

Pond B (= Cassiopea Cove; Fig. 1) has a shallow *Thalassia testudinum* flat containing a row of *Rhizophora mangle* islets that demarcate and obscure the eastern-facing entrance. The outer, northern margins of these have several large populations of the agar-producers *Gracilaria* sp., *G. mammillaris,* and *Hydropuntia cornea* (Figs. 10, 11, and 14). This elongated south-to-north lagoon is characterized by exceptionally long blades of the seagrasses *Syringodium filiforme* (Fig. 16) and *T. testudinum* (>1.0 m). Ulvalean algal indicators of eutrophication were only observed along the eastern margin, which is otherwise unremarkable. The hanging root populations along the west side, while diverse, contain no unusual algae and are not as impressive as those of Ponds A and C (= Cat Cay Bay, Tony's Lagoon) or Pond G (= Great Bay).

A small but noteworthy pond (Pond BB = Small Pond, Fig. 1) to the south of Pond C, with a shallow entrance from the west, contains several unique features. Foremost is a spectacular population of giant *Avrainvillea asarifolia* (blades measure 30 cm x 20 cm; Fig. 17) at the south entrance. The feathery green *Bryopsis plumosa* also is exceptionally robust (Fig. 18), reaching 15 cm long here. The hanging roots contain an interesting form of the siphonaceous green *Caulerpa nummularia* (Fig. 20) with convex lower surfaces of the ramuli, a species that has not been found elsewhere in the Western Atlantic.

Manatee Cay (Fig. 1), at the westward-facing lagoon (Pond C = Tony's Lagoon), was surveyed in considerable detail. This is by far the most spectacular large habitat in the Pelican Cays. At the north and south of the entrance (cut off by a shallow ribbon reef of the leaf coral *Agaricia tenuifolia*) are uniquely large populations of the red agarophyte *Gracilaria mammillaris* (Fig. 10); several other commercially valuable *Gracilaria* spp. are present as well. A remarkable hanging population of extraordinarily large finger-like *Avrainvillea digitata* (Fig. 19) occurs beginning at the intertidal level of the north side of Pond C. Nearby, to the east, are gigantic brush-like *Penicillus pyriformis* (up to 20 cm in diameter; Fig. 21) among the *Thalassia testudinum* blades. The entire margin of the pond was surveyed, and all indications are of a delicate long-lived community that has undergone little human disturbance, most likely because of the shallow ribbon reef barrier across the mouth (restricting boat access) and the large volume of the pond. Interestingly, large patches of grazed *T. testudinum* during February 1994 and May 1995 indicated the presence of manatees.

Ponds E & F (= Frenchy's Ponds), on the southwestern region of Fisherman's Cay (Fig. 1) are rich in sessile invertebrates but tend toward algal domination. Noteworthy algal populations are draped masses of the calcareous green alga *Halimeda opuntia* suspended from mangrove prop roots and mound-like colonies of the paddle-shaped green alga *Avrainvillea asarifolia*. Many of the latter are overgrown by epiphytic *Caulerpa racemosa* var. *occidentalis* (Fig. 5). Communities on mangrove prop roots indicate little physical disturbance; however, they are not as spectacular as those of Ponds A, C, and G (= Cat Cay Bay, Tony's Lagoon, or Great Bay).

Pond G (= Great Bay, Fig. 1), at the north of Fisherman's Cay, has a north-facing entrance and is entered over a broad *Thalassia testudinum* flat containing isolated coral heads with scattered islets of *Rhizophora mangle* along the western sill. Noteworthy features are abundant

standing crops of commercial agarophytes, such as *Gracilaria* sp., *G. mammillaris* (Fig. 10) and the carigeenan-producer *Meristiella* echinocarpum (Fig. 11) along the northwestern (outer) border of the lagoon among isolated colonies of the fire coral *Millepora complanata*. Sheet-like *Ulva rigida* blades are prevalent on a nearby islet's roots beneath a bird roosting site. *Avrainvillea* sp. forms a sparse aggregation on the shallow peat bank at the southern margin, beneath which are gigantic specimens of the calcareous rhizophyte *Udotea* cf. *occidentalis* (Fig. 12) extending in a strip measuring 10 m x 1.0 m. Further back among the shallow roots is an extensive patch of *A. digitata*. Dominant macroalgae on the roots are *Acanthophora spicifera* (Fig. 3), *Galaxaura subverticillata* (Fig. 22), and various forms of *Caulerpa racemosa*. *Coelothrix irregularis* (Fig. 2) forms dramatic neon-blue patches on submerged fallen logs. The benthic community just beneath the mangrove roots lies on a bivalve/*Halimeda*-hash substrate and is dominated by rhizophytic plants (*Thalassia testudinum* and *Caulerpa racemosa* covered by large mats of *Ceramium* sp., Caulerpa mexicana, *Caulerpa sertularioides,* and *Acetabularia* sp.; Fig. 23). Dominants on the peat bank among shallow prop roots are the blade-like *Padina gymnospora* (Fig. 22) and the filamentous green *Caulerpa verticillata* (Fig. 8).

In contrast to our observations in 1992-1993, we recently found GG Ponds (= B2 Ponds), the triple-pond system of the northeast area of Fisherman's Cay (Fig. 1), to be considerably degraded, possibly by sedimentation and boat damage (physical). Colorful sponges and algae cover the mangrove prop roots of both ponds. The western margin is healthy and contains a mangrove root community dominated by algae such as shelf-like *Lobophora variegata* (Fig. 4). Adjacent is a seagrass bed with Bryopsidales, red and green forms of *Laurencia, Coelothrix irregularis,* and *Ceramium* sp. grading into a ribbon reef before dropping sharply to lagoon depths (24 m).

Pond J (= Little Cat Bay) contains several unusually large forms of seaweeds, particularly *Udotea* cf. *Occidentalis* (Fig. 12), and has a shallow seagrass ribbon flat across its mouth. The southern portion outside of the mouth is especially rich in seaweeds that exhibit "gigantism." The mangrove prop roots on the western tip of Little Cat Cay are heavily epiphytized by the weedy red alga *Acanthophora spicifera* (Fig. 3).

In summary, the ponds of the Pelican Cays represent spectacular, high-biodiversity, low-energy environments dominated by photosynthetic and filter-feeding populations. Most are physically delicate and highly susceptible to damage from boat wakes, physical contact (e.g., trampling), sedimentation, and nutrient enrichment. As at Twin Cays (see Taylor et al., 1986), the most delicate and palatable macroalgal forms occur on the suspended mangrove roots, a habitat that is relatively inaccessible to invertebrate grazers. Few of the ephemeral sheet-like and filamentous green algae indicative of eutrophic bird islands or anthropogenically polluted systems are present. This survey and inventory of the remarkable Pelican Cays marine plant life, where coral reef, mangrove, seagrass, and macroalgal ecosystems merge, contributes toward a baseline for conservation and management of this resource.

## ACKNOWLEDGMENTS

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# TAXONOMIC CHECKLIST

## PHYLUM RHODOPHYTA
## RED ALGAE

### ORDER: CORALLINALES
### FAMILY: CORALLINACEAE

***Amphiroa fragilissima*** (Linnaeus) J.V. Lamouroux 1816: 298.
Basionym: *Corallina fragilissima* Linnaeus 1758: 806.

*Common:* lightly attached on hard substrates, often intermixed with other species among seagrasses or in rock crevices; to 60 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30060 (US), D.&M. Littler 30061 (US), D.&M. Littler 30294 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55189 (US).

***Amphiroa rigida*** J.V. Lamouroux 1816: 297, pl. 11, fig. 1.

*Common:* loosely attached to rock or dead coral fragments, often in seagrass beds; to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55238 (US)

***Amphiroa sp.***

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55349 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30065 (US), D.&M. Littler 30271 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55209 (US).

***Hydrolithon farinosa* f. *callithamnioides*** (Foslie) Chamberlain 1983: 351, fig. 20b.
Basionym: Melobesia farinosa f. callithamnioides Foslie 1905: 96.

*Common:* inconspicuous; epiphytic on larger marine plants; to 15 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30280 (US).

***Jania adhaerens*** J.V. Lamouroux 1816: 270.

*Common:* typically on hard surfaces or epiphytic on other marine plants; to 18(–35) m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30102 (US).

***Mesophyllum mesomorphum*** (Foslie) W.H. Adey 1970: 25.
Basionym: *Lithothamnion mesomorphum* Foslie 1901: 5.

*Common:* typically in shady cracks and crevices or epiphytic on other algae; to 35 m deep.

*Distribution:* Florida, Bahamas, Lesser Antilles, Southern Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30282 (US).

## ORDER: GELIDIALES
## FAMILY: GELIDIACEAE

***Trichogloeopsis pedicellata*** (M. Howe) I.A. Abbott & Doty 1960: 638, figs. 18–20.
Basionym: *Liagora pedicellata* M. Howe 1920: 556.

*Common:* typically on rocks or coral fragments, in spur-and-groove areas seaward of reef crests; to 12 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30071 (US).

## FAMILY: GALAXAURACEAE

***Galaxaura marginata*** (J. Ellis & Solander) J.V. Lamouroux 1816: 264.
Basionym: *Corallina marginata* J. Ellis & Solander 1786: 115, pl. 22, fig. 6.

*Common:* in tide pools, on shallow reef flats, or mangrove prop roots, in protected locations; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30070 (US).

***Galaxaura rugosa*** (J. Ellis & Solander) J.V. Lamouroux 1816: 263.

### Gametophytic Stage

Basionym: *Corallina rugosa* J. Ellis & Solander 1786: 115, pl. 22, fig. 3.

*Common:* on coral fragments, rocks, or mangrove prop roots, in protected areas; to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30029 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55216 (US).

### Tetrasporic Stage

Basionym: *Galaxaura lapidescens* (J. Ellis & Solander) J.V. Lamouroux 1816: 264.

*Common:* on coral fragments, mangrove prop roots, or rocks, in protected sandy areas; to 12 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30066 (US).

***Galaxaura* sp.**

*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30221 (US), D.&M. Littler 30227 (US).

***Galaxaura subverticillata*** Kjellman 1900: 48, pl. 3, figs. 12–14; pl. 20, fig. 17.

*Common:* typically on coral fragments or rocks, often in areas of moderate wave surge; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.

*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30085 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55169 (US).

***Tricleocarpa fragilis*** (Linnaeus) Huisman & R.A. Townsend 1993: 100, table 2.
Basionym: *Eschara fragilis* Linnaeus 1758: 805. — Synonyms: *Corallina oblongata* J. Ellis & Solander 1786: 114, pl. 22, fig. 1; *Galaxaura oblongata* (J. Ellis & Solander) J.V. Lamouroux 1816: 262; *Tricleocarpa oblongata* (J. Ellis & Solander) Huisman & Borowitzka 1990: 168, figs. 46–49, 53–56 (see Silva et al., 1996).

*Common:* typically on coral fragments or rocks, in protected sandy areas; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30063 (US).

## ORDER: GIGARTINALES

## FAMILY: CAULACANTHACEAE

***Catenella caespitosa*** (Withering) L.M. Irvine in Parke & Dixon 1976: 590.
Basionym: *Ulva caespitosa* Withering 1776: 735. [*Catenella repens* (Lightfoot) Batters 1902: 69 (see Parke & Dixon, 1976)]

*Common:* on mangrove prop roots, rocks, or coral fragments; extreme high intertidal.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30078 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55175 (US).

***Catenella* sp.**
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55343

## FAMILY: HYPNEACEAE

***Hypnea* sp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55073 (US), D.&M. Littler 55347 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55164 (US).

## FAMILY: PEYSSONNELIACEAE

***Peyssonnelia boergesenii*** Weber-van Bosse in Børgesen 1916: 137, figs. 142–145.

*Common:* on hard substrates, often clinging to mangrove prop roots; intertidal to 40 m deep.
*Distribution:* Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55070 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55157 (US), D.&M. Littler 55239 (US).

## FAMILY: RHIZOPHYLLIDACEAE

***Ochtodes secundiramea*** (Montagne) M. Howe 1920: 583.
*Hypnea secundiramea* Montagne 1842a: 255.

*Common:* typically on hard substrates, in turbulent to moderately turbulent areas; to 15 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55227 (US).

## FAMILY: SOLIERIACEAE

***Meristiella echinocarpum*** (Areschoug) D.P. Cheney & P.W. Gabrielson in Gabrielson & Cheney 1987: 483, fig. 6. Basionym: *Eucheuma echinocarpum* Areschoug 1854: 349.

*Uncommon:* typically on reef flats tightly adhering to substrate or as mounds in protected pristine waters; to 20 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30093 (US).

## ORDER: GRACILARIALES
## FAMILY: GRACILARIACEAE

***Gracilaria mammillaris*** (Montagne) M. Howe 1918: 515.
Basionym: *Rhodymenia mammillaris* Montagne 1842a: 252.

*Uncommon:* on rocks, mangrove prop roots, or other hard surfaces, in protected areas or exposed to moderate wave action; to 18(–60) m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55346 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30013 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55187 (US).

***Gracilaria* sp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55075 (US), D.&M. Littler 55353 (US), D.&M. Littler 55354 (US), D.&M. Littler 55355 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55186 (US), D.&M. Littler 55188 (US), D.&M. Littler 55204 (US).

***Hydropuntia cornea*** (J. Agardh) M.J. Wynne 1989: 476.
Basionym: *Gracilaria cornea* J. Agardh 1852 [1851–1863]: 598. — Synonyms: *Gracilaria debilis* (Forsskål) Børgesen 1932: 7; *Polycavernosa debilis* (Forsskål) Fredericq & J.N. Norris 1985: 152 (see Wynne 1989).

*Common:* attached to rubble fragments on protected sand-covered reef flats and turtle-grass beds; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30110 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30038 (US).

***Hydropuntia* sp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55345 (US).

## ORDER: RHODYMENIALES
## FAMILY: CHAMPIACEAE

***Champia parvula* var. *prostrata*** L.G. Williams 1951: 155.

*Uncommon:* typically as inconspicuous epiphyte on other marine plants; to 15 m deep.
*Distribution:* Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30259 (US).

## FAMILY: LOMENTARIACEAE

***Lomentaria baileyana*** (Harvey) Farlow 1876: 698.
Basionym: *Chylocladia baileyana* Harvey 1853: 185, pl. 20, fig. C.

*Uncommon:* epiphytic on other plants; to 33 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55063 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30211 (US).

## FAMILY: RHODYMENIACEAE

***Botryocladia shanksii*** E.Y. Dawson 1962: 385, pl. 1, fig. a; pl. 2, figs. a, b; pl. 5, fig. b.

*Uncommon:* on rock or other hard surfaces in shaded habitats; intertidal to 55 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30072 (US).

***Botryocladia spinulifera*** W.R. Taylor & I.A. Abbott 1973: 410, figs. 1–4.

*Locally abundant:* inconspicuous; typically mixed in turf communities just behind reef crest on carbonate substrates; intertidal to 49 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30115 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30295 (US).

***Coelothrix irregularis*** (Harvey) Børgesen 1920: 389, figs. 373, 374.
Basionym: *Cordylecladia irregularis* Harvey 1853: 156.

*Common:* forming sparse to dense mats in shaded cracks or crevices or under ledges, often on mangrove prop roots; intertidal to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30111 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30057 (US).

***Gelidiopsis intricata*** (C. Agardh) Vickers 1905: 61.
Basionym: *Sphaerococcus intricata* C. Agardh 1822 [1822–1823]: 333.

*Uncommon:* forming large mats on mangrove prop roots or other hard surfaces; intertidal to 10 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30095 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30274 (US).

***Gelidiopsis planicaulis*** (W.R. Taylor) W.R. Taylor 1960: 353.
Basionym: *Wurdemannia miniata* var. *planicaulis* W.R. Taylor 1943: 158.

*Common:* inconspicuous; on hard surfaces, often as tufts on mangrove prop roots; to 1 m deep.
*Distribution:* Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30056 (US).

## ORDER: CERAMIALES
## FAMILY: CERAMIACEAE

***Anotrichium barbatum*** (J.E. Smith) Nägeli 1862: 398.
Basionym: *Conferva barbata* J.E. Smith 1807 [1790–1814]: pl. 1814. — Synonyms: *Griffithsia barbata* C. Agardh 1828: 132 (see Baldock 1976).

*Rare:* inconspicuous; occurring on stones or other hard objects, often epiphytic on calcareous algae or as translucent tufts on mangrove prop roots; to 30 m deep.
*Distribution:* Florida, Lesser Antilles, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30296 (US), D.&M. Littler 30267 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30247 (US), D.&M. Littler 30260 (US).

***Antithamnion* sp.**

*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30266 (US), D.&M. Littler 30037 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30216 (US).

***Centroceras clavulatum*** (C. Agardh) Montagne 1846: 140. [var. *clavulatum*]
Basionym: *Ceramium clavulatum* C. Agardh 1822: 2.

*Common:* as mats, drooping clusters, or bushy tufts on rocks, ropes, or mangrove prop roots; intertidal zone to 5 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30106 (US); B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55084 (US).

***Centroceras* sp.**

*Pelican Cays Ponds:* E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30256 (US).

***Ceramium brevizonatum* var. *caraibicum*** H.E. Petersen & Børgesen in Børgesen 1924: 29, fig. 11.

*Common:* on dead corals or epiphytic on other algae; to 1 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30018 (US).

***Ceramium flaccidum*** (Kützing) Ardissone 1871: 40.
Basionym: *Hormoceras flaccidum* Kützing 1862: 21, pl. 69, figs. a–d. — Synonyms: *Ceramium byssoideum* Harvey 1853: 218, *nom. illeg.; C. transversale* Collins & Hervey 1917: 145, pl. 5, figs. 29–31 (see Womersley 1978).

*Common:* epiphytic on seagrasses or coarser algae; to 22 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30044 (US).

***Ceramium nitens*** (C. Agardh) J. Agardh 1851 [1851–1863]: 130.
Basionym: *Ceramium rubrum* var. *nitens* C. Agardh 1824: 136.

*Common:* on dead corals or epiphytic on other algae; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles.

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55085 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30062 (US).

***Ceramium* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55152 (US), D.&M. Littler 55185 (US).

***Lejolisia exposita*** C.W. Schneider & Searles in Searles & Schneider 1989: 736, figs. 18–28.

*Uncommon:* inconspicuous; epiphytic or growing as fine low turf on mangrove prop roots; lower intertidal to 32 m deep.
*Distribution:* Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30048 (US).

***Spyridia filamentosa*** (Wulfen) Harvey in W. Hooker 1833: 337.
Basionym: *Fucus filamentosus* Wulfen 1803: 64.

*Common:* on solid substrates in calm protected areas; to 8 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30047 (US).

***Spyridia hypnoides*** (Bory de Saint-Vincent) Papenfuss 1968: 281. [subsp. *hypnoides*]
Basionym: *Thamnophora hypnoides* Bory de Saint-Vincent 1834: 175.

*Uncommon:* in calm protected areas; to 8 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30226 (US).

***Spyridia hypnoides* subsp. *complanata*** (J. Agardh) M.J. Wynne 1998: 93.
Basionym: *Spyridia complanata* J. Agardh 1851 [1851–1863]: 343.

*Common:* in calm protected areas, on mangrove roots, docks, and other solid structures; intertidal to 3 m deep.
*Distribution:* Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30036 (US).

***Spyridia* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55190 (US), D.&M. Littler 55173 (US), D.&M. Littler 55174 (US), D.&M. Littler 55213 (US).

## FAMILY: DASYACEAE

***Dasya spinuligera*** Collins & Hervey 1917: 130, pl. 4, figs. 24, 25.

*Uncommon:* on sponges or mangrove peat in protected areas; to 40 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30067 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30251.

***Dasya* spp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55078 (US), D.&M. Littler 55090 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30045 (US), D.&M. Littler 55065 (US), D.&M. Littler 30276 (US), D.&M. Littler 30281 (US), D.&M. Littler 30298 (US).

## FAMILY: DELESSERIACEAE

***Caloglossa leprieurii*** (Montagne) G. Martens 1869: 234, 237.
Basionym: *Delesseria leprieurii* Montagne 1840: 196, pl. 5, fig. 1.

*Common:* inconspicuous; on mangrove prop roots, rocks, or other hard substrates, in protected areas; upper intertidal.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30079 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30050 (US).

***Hypoglossum tenuifolium*** (Harvey) J. Agardh 1898: 186.
Basionym: *Delesseria tenuifilia* Harvey 1853: 97, pl. 22.

*Locally common:* typically epiphytic or on rocks and coral fragments of deep sand plains; 45–60 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30261 (US).

## FAMILY: RHODOMELACEAE

***Acanthophora spicifera*** (Vahl) Børgesen 1910: 201, figs. 18, 19.
Basionym: *Fucus spiciferus* Vahl 1802: 44.

*Common:* early colonizer on dead coral fragments, wood substrates, pebbles, or other organisms in calm waters; intertidal to 8 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30103 (US); B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55342 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30010 (US).

***Bostrychia tenella*** (J.V. Lamouroux) J. Agardh 1863 [1851–1863]: 869.
Basionym: *Plocamium tenellum* J.V. Lamouroux 1813: 138. — Synonyms: *Fucus tenellus* Vahl 1802: 45, *nom. illeg.*; *Bostrychia binderi* Harvey 1849 [1847–1849]: 68, pl. 28 [in part] (see King, Puttock & Vickery, 1988).

*Common:* forming tightly adhering mats on rocks, seawalls, or mangrove prop roots; upper intertidal.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30059 (US), D.&M. Littler 30051 (US).

***Bostrychia* sp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55340 (US), D.&M. Littler 55356 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55147 (US), D.&M. Littler 55217 (US), D.&M. Littler 55236 (US)

***Digenea simplex*** (Wulfen) C. Agardh 1822 [1822–1823]: 389.
Basionym: *Conferva simplex* Wulfen 1803: 17.

*Common:* typically on hard surfaces, often overgrown by filamentous epiphytes, abundant in heavy-surf conditions, dwarfed and denuded when buried by sand; lower intertidal to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30087 (US).

***Herposiphonia pecten-veneris*** (Harvey) Falkenberg 1901: 315.
Basionym: *Polysiphonia pecten-veneris* Harvey 1853: 46, pl. 16.

*Common:* on hard surfaces or epiphytic on larger plants and animals; to 2 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30043 (US).

***Herposiphonia* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55166 (US).

***Laurencia gemmifera*** Harvey 1853: 73, pl. 18.b.

*Uncommon:* typically on hard surfaces of shallow reef flats or attached to dead coral rubble on shallow sand plains; to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55077 (US).

***Laurencia intricata*** J.V. Lamouroux 1813: 131, pl. 9, figs. 8, 9.

*Common:* typically on rocks, shells, or coral fragments in protected sandy areas; to 3 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55079 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30223 (US).

***Laurencia obtusa*** (Hudson) J.V. Lamouroux 1813: 130.
Basionym: *Fucus obtusus* Hudson 1778: 586.

*Common:* typically in shallow wave-dashed habitats or areas of strong currents; to 8 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30040 (US).

***Laurencia papillosa*** (C. Agardh) Greville 1830: 52.
Basionym: *Chondria papillosa* C. Agardh 1822 [1851–1863]: 344.

*Common:* typically on hard surfaces exposed to moderate wave action; intertidal to 7 m deep.

*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55076 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30064 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55167 (US), D.&M. Littler 55201 (US).

***Laurencia poiteaui*** (J.V. Lamouroux) M. Howe 1918: 518.
Basionym: *Fucus poiteaui* J.V. Lamouroux 1805: 63, pl. 31, figs. 2, 3.

*Common:* typically abundant in wave-surge areas attached to rocks near base of gorgonian corals; often found in deep spur-and-groove areas on reefs; to 40 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55197 (US).

***Laurencia filiformis*** (C. Agardh) Montagne 1845: 125.
Basionym: *Chondria filiformis* C. Agardh 1822 [1822–1823]: 358. — Synonym: *Laurencia scoparia* J. Agardh 1852 [1851–1863]: 746 (see Rodríguez de Rios & Saito 1982).

*Common:* on hard substrates or mangrove prop roots; to 2 m deep.
*Distribution:* Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30222 (US).

***Laurencia* sp.**

*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30074 (US); B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55344 (US); BB [Manatee Cay, Small Pond] D.&M. Littler 55047 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55064 (US).

***Murrayella periclados*** (C. Agardh) F. Schmitz 1893: 227, footnote.
Basionym: *Hutchinsia periclados* C. Agardh 1828: 101.

*Common:* on mangrove prop roots, rocks, pier pilings, or seawalls in protected locations; upper intertidal.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30100 (US).

***Polysiphonia atlantica*** Kapraun & J.N. Norris 1982: 226, figs. 107a–c.

*Common:* typically on bedrock or other hard surfaces; lower intertidal to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30083 (US).

***Polysiphonia havanensis*** Montagne 1837: 352.

*Common:* typically on hard surfaces or epiphytic on larger algae; to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30213 (US).

***Polysiphonia scopulorum*** Harvey 1855: 540. [var. *scopulorum*]

*Uncommon:* inconspicuous; epiphytic on larger algae or seagrasses, in shallow calm waters; to 3 m deep.
*Distribution:* Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30099 (US).

***Polysiphonia* sp.**

*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30270 (US).

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# PHYLUM PHAEOPHYTA
# BROWN ALGAE

## ORDER: ECTOCARPALES
## FAMILY: ECTOCARPACEAE

***Hincksia mitchelliae*** (Harvey) P.C. Silva in Silva et al. 1987: 73.
Basionym: *Ectocarpus mitchelliae* Harvey 1852: 142, pl. 12, G.

*Common:* inconspicuous; on rocks or epiphytic on other algae, often found as brown fuzz on mangrove prop roots; less than 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30088 (US); B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55342 (US); BB [Manatee Cay, Small Pond] D.&M. Littler 55059 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30032 (US), D.&M. Littler 55059 (US), D.&M. Littler 55060 (US), D.&M. Littler 55061 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30248 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 30248 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30248 (US).

## ORDER: DICTYOTALES
## FAMILY: DICTYOTACEAE

***Dictyota cervicornis*** Kützing 1859: 11, pl. 24, fig. 2.

*Common:* attached to rocks, shell fragments, or large plants in sandy shallow areas; to 3 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30107 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30054 (US).

***Dictyota caribaea*** Hörnig & Schnetter in Hörnig et al. 1992: 58.

Synonym: *Dictyota indica* Kützing 1859: 8, pl. 17, fig. 1, *sensu* Vickers 1908 (see Hörnig et al. 1992).

***Note:*** according to Hörnig et al. (1992: 58) this entity previously was identified as *Dictyota indica* Kützing 1859: 8, pl. 17, fig. 1, *sensu* Vickers 1908: 39, pl. 18. However, because the type of *D. indica* is synonymous with *D. cervicornis,* a new name was assigned.
*Common:* on rocks, other hard substrates, or mangrove peat; most commonly found in shallows around mangrove islands; to 3 m deep.

*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] specimen lost.

***Dictyota menstrualis*** (Hoyt) Schnetter, Hörnig & Weber-Peukert 1987: 195, figs. 5, 6.

Basionym: *Dictyota dichotoma* var. *menstrualis* Hoyt 1927: 616.

*Common:* typically on small rocks, sponges, or coral fragments in sandy areas; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30015 (US), D.&M. Littler 30269 (US).

***Dictyota pulchella*** Hörnig & Schnetter 1988: 285, fig. 7.

*Common:* on dead coral, mangrove peat, shell fragments, wood, or epiphytic on seagrasses and coarse algae in shallow areas; to 70 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30041 (US), D.&M. Littler 30055 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30258 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30225 (US).

***Dictyota* sp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55072 (US), D.&M. Littler 55351 (US), D.&M. Littler 55352 (US). D.&M. Littler 55357 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30017 (US), D.&M. Littler 55051 (US), D.&M. Littler 55067 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55162 (US), D.&M. Littler 55163 (US), D.&M. Littler 55165 (US), D.&M. Littler 55208 (US). D.&M. Littler 55218 (US), D.&M. Littler 55219 (US), D.&M. Littler 55220 (US), D.&M. Littler 55228 (US).

***Lobophora variegata*** (J.V. Lamouroux) Womersley *ex* E.C. Oliveira 1977: 217.
Basionym: *Dictyota variegata* J.V. Lamouroux 1809a: 40.

***LOBOPHORA VARIEGATA* HAS THREE DISTINCT FORMS DEPENDING ON DEPTH AND HABITAT CONDITIONS.**

DECUMBENT FORM

*Common:* in Pelican Cays on both Peat Banks and mangrove roots, in shaded shallow areas or in deep water habitats with moderate herbivory; often dominant plant at 100 m deep; to 120 m deep.

CRUST FORM

*Common:* in Pelican Cays on mangrove roots, tightly adherent on dead coral, mangrove prop roots, or sunken logs in shallow subtidal areas where grazing is intense; to 30 m deep.

RUFFLED FORM

*Common:* in Pelican Cays lying free in *Thalassia* beds, in calm, shallow waters with low fish grazing; to 8 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30096 (US), D.&M. Littler 30097 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30016 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55202 (US), D.&M. Littler 55203 (US).

***Padina pavonica*** (Linnaeus) Thivy in W.R. Taylor 1960: 234.
Basionym: *Fucus pavonicus* Linnaeus 1753: 1162.

*Common:* on rocks, corals, or mangrove prop roots; found in sheltered or moderately wave-exposed areas; lower intertidal to 20 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30028 (US).

***Padina sanctae-crucis*** Børgesen 1914a: 45, figs. 27, 28 [continuous pagination: 201, figs. 153, 154].

*Common:* typically on rocks, shells, or dead coral on shallow reef flats; to 5 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30089 (US).

***Padina* sp.**

*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55074 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55215 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30248 (US).

***Sargassum fluitans*** (Børgesen) Børgesen 1914a: 66 (footnote) [continuous pagination: 222].
Basionym: *Sargassum hystrix* var. *fluitans* Børgesen 1914b: 11, fig. 8.

*Common:* typically pelagic, floating in large clumps or rafts; major component of beach drift; one of two species characteristic of the Sargasso Sea.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30092 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30257 (US).

***Sargassum polyceratium* var. *ovatum*** (Collins) W.R. Taylor 1928: 129, pl. 18, figs. 7, 10; pl. 19, fig. 16. Basionym: *Sargassum vulgare* f. *ovatum* Collins 1901: 248.
*Common:* typically on rocks in moderately turbulent habitats, often behind reef crest in rubble-pavement zone; lower intertidal to 14 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30039 (US).

***Sargassum ramifolium*** Kützing 1861: 10, pl. 32, fig. 1a, 1b.

*Uncommon:* on rocks or coral fragments, often around mangrove islands; 1–3 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30091 (US).

***Sargassum* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55196 (US), D.&M. Littler 55199 (US), D.&M. Littler 55200 (US).

***Turbinaria tricostata*** E.S. Barton 1891: 218, pl. 54, figs. 3–4.

*Common:* typically on rocks or dead coral fragments; in shallow areas on reef crest in strong currents or heavy wave action; lower intertidal to 1 m deep.

*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30090 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55184 (US).

***Turbinaria turbinata*** (Linnaeus) Kuntze 1898: 434.
Basionym: *Fucus turbinatus* Linnaeus 1753: 1160.

*Common:* typically adhering tightly to hard substrates immediately behind reef crest in areas of strong turbulence; to 5 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30105 (US).

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# PHYLUM CHLOROPHYTA
# GREEN ALGAE

## ORDER: ULVALES
## FAMILY: ULVACEAE

***Ulva rigida*** C. Agardh 1823 [1822–1823]: 410.
Basionym: *Ulva lactuca* var. *rigida* (C. Agardh) Le Jolis 1863: 38 (see Bliding 1969).

*Uncommon:* near bird roosting sites, typically on hard surfaces, in areas of active water motion; intertidal to 2 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 30262 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55170 (US).

## FAMILY: ULVELLACEAE

***Ulvella lens*** P. Crouan & H. Crouan 1859: 288, pl. 22, fig. E.

*Common:* inconspicuous; on shells, hydroids, or epiphytic on other marine plants, commonly occurring on *Ventricaria ventricosa*; intertidal to 2 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30273 (US).

## ORDER: CLADOPHORALES
## FAMILY: ANADYOMENACEAE

***Anadyomene saldanhae*** A.B. Joly & E.C. Oliveira 1969: 30, figs. 1–3.

*Common:* on hard substrates, sponges, or mangrove prop roots; lower intertidal to 30(–79) m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30053 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55226 (US).

***Anadyomene* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55195 (US).

***Chaetomorpha* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55158 (US), D.&M. Littler 55183 (US), D.&M. Littler 55192 (US), D.&M. Littler 55225 (US).

***Cladophora* spp.**

*Pelican Cays Ponds:* E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30254 (US), D.&M. Littler 30255 (US), D.&M. Littler 30299 (US).

***Rhizoclonium riparium*** (Roth) Kützing *ex* Harvey 1849 [1846–1851]: pl. 238.
Basionym: *Conferva riparia* Roth 1806: 216.

*Common:* typically on rocks, pebbles, or other hard substrates; often tangled among other species; intertidal to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30217 (US).

## FAMILY: SIPHONOCLADACEAE

***Cladophoropsis macromeres*** W.R. Taylor 1928: 64, pl. 4, figs. 15, 16.

*Common:* forming cushion-like clumps in calm shallow habitats or tangled with other algae; to 5 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30034 (US), D.&M. Littler 30268 (US).

***Cladophoropsis* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55211 (US).

***Dictyosphaeria cavernosa*** (Forsskål) Børgesen 1932: 2, pl. 1, fig. 1.
Basionym: *Ulva cavernosa* Forsskål 1775: 187.

*Common:* typically lightly attached to rocks or dead coral heads; often forming extensive mats; to 40 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30000 (US).

***Ventricaria ventricosa*** (J. Agardh) J.L. Olsen & J.A. West 1988: 104, figs. 1–4, 11.
Basionym: *Valonia ventricosa* J. Agardh 1887: 96.

*Common:* in cracks and crevices on hard substrates or scattered among other algae on mangrove prop roots; to 80 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30007 (US).

## ORDER: BRYOPSIDALES
## FAMILY: BRYOPSIDACEAE

***Bryopsis hypnoides*** J.V. Lamouroux 1809b: 135, pl. 1, figs. 2a, 2b [also 1809a: 333].

*Common:* on mangrove prop roots or other hard substrates; lower intertidal to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30046 (US), D.&M. Littler 302745 (US).

***Bryopsis pennata*** J.V. Lamouroux 1809a: 333. [var. *pennata*]

*Common:* on mangrove prop roots or other solid substrates in calm shallow waters; lower intertidal to 5 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30277 (US).

***Bryopsis plumosa*** (Hudson) C. Agardh 1823 [1822–1823]: 448.
Basionym: *Ulva plumosa* Hudson 1778: 571.

*Common:* typically on hard substrates, in tidepools, protected habitats, or in moderate surf behind reef crest; intertidal to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30212 (US).

***Bryopsis ramulosa*** Montagne 1842b: 16, pl. 3III, fig. 2.

*Uncommon:* inconspicuous; on mangrove prop roots or other hard surfaces; intertidal to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30035 (US).

***Bryopsis* sp.**

*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 55043 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30032 (US), D.&M. Littler 55059 (US), D.&M. Littler 55060 (US), D.&M. Littler 55061 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30248 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 30248 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30248 (US).

***Derbesia fastigiata*** W.R. Taylor 1928: 94, pl. 11, figs. 1–3.

*Uncommon:* inconspicuous; typically epiphytic on other marine plants; intertidal to 1 m deep.
*Distribution:* Florida, Greater Antilles, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30038 (US).

***Derbesia osterhoutii*** (L. Blinks & A. Blinks) Page 1970: 375, figs. 1–6. **[*Halicystis* stage]**
Basionym: *Halicystis osterhoutii* L. Blinks & A. Blinks 1931: 389, pls. 22, 23, figs. 1–12, text fig. 18.

*Common:* typically growing on crustose coralline algae such as *Sporolithon* or *Hydrolithon*, in shaded cracks and crevices; to 18 m deep.

*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30094 (US).

## FAMILY: CODIACEAE

***Codium decorticatum*** (Woodward) M. Howe 1911: 494.
Basionym: *Ulva decorticata* Woodward 1797: 55.

*Common:* on rock or other firm objects in protected areas; lower intertidal to 15 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55171 (US).

***Codium* sp.**

*Rare:* typically adhering to rock or other hard surfaces, seasonally (summer) occurring off the east coast of Florida; to 20 m deep.
*Distribution:* Florida.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 55040 (US), D.&M. Littler 55046 (US).

***Codium intertextum*** Collins & Hervey 1917: 54.

*Common:* typically tightly adhering to rock or other solid surfaces; often forming distinct zone near low-tide mark; to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30073 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55193 (US).

***Codium taylorii*** P.C. Silva 1960: 510, pl. 112, 118b, 119, 120a, 120b.

*Common:* on mangrove prop roots, reef rubble, or other hard surfaces; to 10(–60) m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30069 (US).

## FAMILY: CAULERPACEAE

***Caulerpa cupressoides*** (Vahl) C. Agardh 1817: 23. [var. *cupressoides*]
Basionym: *Fucus cupressoides* Vahl 1802: 38.

*Common:* on sandy bottoms or in mangrove muds; to 3 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30021 (US).

***Caulerpa cupressoides* var. *flabellata*** Børgesen 1907: 368, figs. 18, 19.

*Uncommon:* on sedimentary bottoms, anchored in fine silty sediments of mangrove lakes; to 3 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30042 (US).

***Caulerpa macrophysa*** (Sonder *ex* Kützing) G. Murray 1887: 38.
Basionym: *Chauvinia macrophysa* Sonder *ex* Kützing 1857: 6, pl. 15.

*Common:* typically forming intertwined mats tightly attached to rock or other solid substrates, often in areas of moderate surf; intertidal to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30026 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30219 (US).

***Caulerpa mexicana*** Sonder *ex* Kützing 1849: 496.

*Common:* attached to small coral fragments or pebbles on sand or mud bottoms, in lagoons, mangroves, or seagrass beds; to 15 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 55144 (US), D.&M. Littler 55312 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30009 (US).

***Caulerpa nummularia*** Harvey *ex* J. Agardh 1873: 38.

*Uncommon:* in low-light habitats such as shaded mangrove prop roots or under ledges in reef habitats; to 84 m deep.
*Distribution:* Western Caribbean (Pelican Cays).
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55071 (US).

***Caulerpa pusilla*** (Kützing) J. Agardh 1873: 6.
Basionym: *Chauvinia pusilla* Kützing 1849: 500.

*Rare;* inconspicuous; typically forming mats or small aggregations on deep sand plains; to 40 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean.
*Pelican Cays Ponds:* J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30215 (US).

***Caulerpa racemosa*** (Forsskål) J. Agardh 1873: 35. [var. *racemosa*]
Basionym: *Fucus racemosa* Forsskål 1775: 191.

*Common:* forming intertwined mats tightly adhering to rocks, in moderately heavy surf areas or in calm lagoons and bays, often present in seagrass beds; intertidal to 2 (–50) m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30088 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30032 (US), D.&M. Littler 55059 (US), D.&M. Littler 55060 (US), D.&M. Littler 55061 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30248 (US).

***Caulerpa racemosa* var. *lamourouxii*** (Turner) Weber-van Bosse 1898: 369, pl. 32, figs. 1–4.
Basionym: *Fucus lamourouxii* Turner 1811–1819: 79, pl. 229.

*Uncommon:* on silty substrates, generally in shallow shaded habitats such as mangrove lakes; to 30 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30033 (US), D.&M. Littler 55058 (US).

***Caulerpa racemosa* var. *occidentalis*** (J. Agardh) Børgesen 1907: 379, figs. 28, 29.
Basionym: *Caulerpa chemnitzia* var. *occidentalis* J. Agardh 1873: 37.

*Common:* adhering to mangrove prop roots or other hard surfaces in calm waters; to 3 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30026 (US), D.&M. Littler 30264 (US), D.&M. Littler 55062 (US); J [Little Cat Bay] D.&M. Littler 30220 (US).

***Caulerpa racemosa* var. *peltata*** (J.V. Lamouroux) Eubank in Stephenson 1944: 349.
Basionym: *Caulerpa peltata* J.V. Lamouroux 1809a: 332.

*Common:* on shaded mangrove prop roots, in dark crevices, or under ledges; to 5 m deep.
*Distribution:* Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30098 (US); E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30250 (US); J [Little Cat Bay] D.&M. Littler 30214 (US).

***Caulerpa sertularioides*** (S. Gmelin) M. Howe 1905: 576. [f. *sertularioides*]
Basionym: *Fucus sertularioides* S. Gmelin 1768: 151, pl. 15, fig. 4.

*Common:* forming large stands in shallow sandy areas or on mangrove prop roots, often present in seagrass beds; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 55041 (US), D.&M. Littler 55143 (US), D.&M. Littler 55311 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30008 (US).

***Caulerpa taxifolia*** (H. West) C. Agardh 1817: 22.
Basionym: *Fucus taxifolia* H. West in Vahl 1802: 36.

*Uncommon:* growing in sand on reef flats or in fine sediments adjacent to mangrove islands in protected or moderately wave-exposed areas; to 15 m deep.
*Distribution:* Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30104 (US); BB [Manatee Cay, Small Pond] D.&M. Littler 55042 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30218 (US).

***Caulerpa verticillata*** J. Agardh 1847: 6. [as "*verticillatam*"]

*Common:* as large aggregations on stable substrates, mangrove prop roots, or peat; often present as an understory in seagrass beds; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55358 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30022 (US).

***Caulerpa* sp.**

***Pelican Cays Ponds:*** G [Fisherman's Cay, Great Bay] D.&M. Littler 55161 (US); D.&M. Littler 55194 (US).

## FAMILY: UDOTEACEAE

***Avrainvillea asarifolia*** Børgesen 1909: 34, fig. 4 in text, pl. 3. [f. *asarifolia*]

*Common:* typically in lagoons or sand pockets between coral heads on fore-reef slopes; to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 31279 (US), E & F [Fisherman's Cay, Frenchy's Ponds] D.&M. Littler 30252 (US).

***Avrainvillea digitata*** D.S. Littler & M.M. Littler 1992: 379, fig. 3.

*Common:* on carbonate sediments or mangrove peat, growing as large mats in shallow waters (<1 m), often interspersed among *Thalassia testudinum* or at the edges of mangrove islands; deeper forms (>3 m) have narrow uprights with bluntly pointed apices; Puerto Rican specimens have more club-shaped uprights; to 5 m deep.
*Distribution:* Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30014 (US), D.&M. Littler 55054 (US); G [Fishermans Cay, Great Bay] D.&M. Littler 55235 (US).

***Avrainvillea longicaulis* f. *laxa*** D.S. Littler & M.M. Littler 1992: 397, fig. 13.

*Common:* on nutrient-rich organic substrates, in interior lagoons of mangrove islands; to 2 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 55039 (US).

***Avrainvillea sp.***

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55212 (US).

***Halimeda discoidea*** Decaisne 1842: 102.

*Common:* typically on shells, coral fragments, or other sand-covered hard surfaces; to 80 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30025 (US).

***Halimeda incrassata*** (J. Ellis) J.V. Lamouroux 1816: 307.
Basionym: *Corallina incrassata* J. Ellis 1768: 408, pl. 17, figs. 20–27.

*Common:* associated with seagrasses or on shallow sand flats; to 12 (–65) m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30019 (US).

***Halimeda monile*** (J. Ellis & Solander) J.V. Lamouroux 1816: 306.
Basionym: *Corallina monile* J. Ellis & Solander 1786: 110, pl. 20, fig. c.

*Common:* on sand flats and among seagrasses; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30114 (US).

***Halimeda opuntia*** (Linnaeus) J.V. Lamouroux 1816: 308. [f. *opuntia*]
Basionym: *Corallina opuntia* Linnaeus 1758: 805.

*Common:* tightly adhering to, and forming patches on, shallow reef crests, as mounds in sand or *Thalassia* beds; to 25 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30001 (US), D.&M. Littler 30018 (US), D.&M. Littler 55057 (US).

***Halimeda simulans*** M. Howe 1907: 503, pl. 29.

*Common:* often associated with mangrove peat communities or other nutrient-rich substrates; to 8 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30113 (US).

***Halimeda* sp.**

*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30112 (US); B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55348 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55205 (US), D.&M. Littler 55206 (US) , D.&M. Littler 55207 (US).

***Penicillus capitatus*** Lamarck 1813: 299.

*Common:* in calm lagoons and bays on mud or sand bottoms; often intermixed with seagrasses or among mangrove prop roots; to 12 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55176 (US).

***Penicillus dumetosus*** (J.V. Lamouroux) Blainville 1834: 553.
Basionym: *Nesaea dumetosa* J.V. Lamouroux 1816: 259, pl. 8, fig. 3a, 3b.

*Common:* in sandy protected areas, often intermixed with seagrasses; to 15 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30109 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55177 (US), D.&M. Littler 55240 (US).

***Penicillus lamourouxii*** Decaisne 1842: 97.

*Common:* individuals widely scattered, often intermixed with seagrasses, in calm lagoons and bays on mud or sand bottoms; to 12 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30011 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55178 (US).

***Penicillus pyriformis*** A. Gepp & E. Gepp 1905: 1, pl. 468, fig. 1. [f. *pyriformis*]

*Common:* on sandy bottoms in calm lagoons and bays; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30004 (US), D.&M. Littler 30006 (US).

***Penicillus* sp.**

*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55052 (US).

***Rhipocephalus phoenix* f. *brevifolius*** A. Gepp & E. Gepp 1911: 95, pl. 31, figs. 184–186.

*Common:* in sandy or silty areas, most commonly occurring in shallow back-reef habitats; to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30003 (US),

***Udotea cyathiformis*** Decaisne 1842: 106. [f. cyathiformis]

*Common:* in many environments from shallow mangrove peat to deep sand plains; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30002 (US), D.&M. Littler 55055 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55191 (US), D.&M. Littler 55224 (US).

***Udotea flabellum*** (J. Ellis & Solander) M. Howe 1904: 94.
Basionym: *Corallina flabellum* J. Ellis & Solander 1786: 124, pl. 24.

*Common:* widespread; occurring in sandy areas or seagrass beds; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30012 (US).

***Udotea occidentalis*** A. Gepp & E. Gepp 1911: 127, pl. 2, figs. 18, 22a, 22b; pl. 7, figs. 63–65.

*Rare:* in shallow sandy areas; to 10 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30084 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55156 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55179 (US).

***Udotea wilsonii*** A. Gepp, E. Gepp & M. Howe in Gepp & Gepp 1911: 130, 144, pl. 7, fig. 66; pl. 3, figs. 67, 68. [as '*wilsoni*']

*Locally abundant*: in organically rich silt or on sand plains, often growing with many thalli in close proximity due to stolonous clonal reproduction; to 18 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30005 (US).

## ORDER: DASYCLADALES
## FAMILY: DASYCLADACEAE

***Neomeris annulata*** Dickie 1874: 198.

*Common:* abundant on mangrove prop roots, coral fragments, or rocks in shallow sandy areas; intertidal to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30076 (US).

***Neomeris* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55159 (US).

## FAMILY: POLYPHYSACEAE

***Acetabularia* sp.**

*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55160 (US).

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# PHYLUM: CYANOPHYTA
# BLUE-GREEN ALGAE

## ORDER: OSCILLATORIALES
## FAMILY: OSCILLATORIACEAE

***Lyngbya* cf. *aestuarii*** (Martens) Liebman 1839: 492.
Basionym: *Conferva aesturii* Martens in Jürgens 1816: fasc. 2: no. 8.

*Common:* as spreading mats or clumps in calm waters, appearing as wooly tufts; intertidal to 2 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55231 (US).

***Lyngbya* cf. *cladophorae*** Tilden 1910: 116, pl. 5, fig. 34.

*Uncommon:* on mangrove roots or other firm objects in calm waters; intertidal to 1 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55066 (US), D.&M. Littler 55069 (US).

***Lyngbya confervoides*** C. Agardh 1824: 73.

*Common:* on stone or other hard surfaces, mangrove prop roots, or epiphytic on seagrasses or larger seaweeds; to 2 m deep.
*Distribution:* Florida, Lesser Antilles, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55094 (US).

***Lyngbya polychroa*** (Meneghini) Rabenhorst 1847: 83.
Basionym: *Leibleinia polychroa* Meneghini 1844: 304.

*Common:* epiphytic on other marine plants, often as long dark undulating masses in mangrove lagoons; intertidal to 2 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30049 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55148 (US), D.&M. Littler 55153 (US).

***Oscillatoria acuminata*** Gomont 1893: 247, pl. 7, fig. 12.

*Common:* inconspicuous, binding surface layer of fine sediments in mangrove lakes or calm bays; to 3 m deep.
*Distribution:* Western Caribbean.
*Pelican Cays Ponds:* BB [Manatee Cay, Small Pond] D.&M. Littler 55050 (US).

## FAMILY: PHORMIDIACEAE

***Phormidium laysanense*** Lemmerman 1905: 619, pl. 7, figs. 4, 5.

*Uncommon*: growing over other algal species or as finger-like projections from sand with basal filaments clinging to sand grains; to 2 m deep.
*Distribution:* Greater Antilles, Lesser Antilles, Western Caribbean, Southern Caribbean.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55234 (US); J [Little Cat Cay, Little Cat Bay] D.&M. Littler 30248 (US).

## FAMILY: PSEUDOANABAENACEAE

***Spirocoleus* cf. *crosbyanus*** (Tilden) P.C. Silva in Silva et al. 1996: 62.
Basionym: *Phormidium crosbyanum* Tilden 1909 [1894–1909]: 645.

*Common:* forming hard button-like mounds on firm surfaces such as rocks, mangrove prop roots, or dead coral; to 2 m deep.
*Distribution:* Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55168 (US).

## FAMILY: SCHIZOTHRICHACEAE

***Schizothrix calcicola*** (C. Agardh) Gomont 1890: 352.
Basionym: *Oscillatoria calcicola* C. Agardh 1812 [1810–1812]: 37.

*Common*: typically on rocks or other hard surfaces on shallow reef flats; to 2 m deep.
*Distribution:* Florida, Lesser Antilles, Southern Caribbean, Western Caribbean.
*Pelican Cays Ponds:* A [Cat Cay, Cat Cay Bay] D.&M. Littler 30084 (US); G [Fisherman's Cay, Great Bay] D.&M. Littler 55154 (US).

## ORDER: STIGONEMATALES
## FAMILY: MASTIGOCLADACEAE

***Brachytrichia quoyi*** (C. Agardh) Bornet & Flahault 1886: 373.
Basionym: *Nostoc quoyi* C. Agardh 1824: 22.

*Uncommon:* epiphytic on other marine plants or on mangrove prop roots, common on pilings and breakwaters, found on rock, wood, or other firm substrates; intertidal.
*Distribution:* Gulf of Mexico, Florida, Greater Antilles, Lesser Antilles.
*Pelican Cays Ponds:* G [Fisherman's Cay, Great Bay] D.&M. Littler 55145 (US).

# PHYLUM MAGNOLIOPHYTA
# FLOWERING PLANTS (SEAGRASSES)

## ORDER: HYDROCHARITALES
## FAMILY: HYDROCHARITACEAE

***Halophila decipiens*** Ostenfeld 1902: 260, with fig.

*Common:* in calm waters on soft sand or fine sedimentary bottoms; to 30 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55099 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 55053 (US).

***Thalassia testudinum*** Banks *ex* König 1805: 96.

*Common:* abundant, conspicuous; forming extensive meadows on shallow sandy or muddy bottoms; lower intertidal to 20 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55332 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30025 (US).

## FAMILY: CYMODOCEACEAE

***Halodule wrightii*** Ascherson 1868: 19.

*Common:* on sandy, soft, muddy bottoms; lower intertidal to 5 m deep.
*Distribution:* Florida, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55333 (US); C [Manatee Cay, Tony's Lagoon] D.&M. Littler 30024 (US).

***Syringodium filiforme*** Kützing in Hohenacker 1852–1962: 426.

*Common:* widely distributed, forming dense stands in sand or fine mud sediments; to 25 m deep.
*Distribution:* Florida, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico.
*Pelican Cays Ponds:* B [Manatee Cay, Cassiopea Cove] D.&M. Littler 55331 (US).

## REFERENCES


Abbott, I. A., and M. S. Doty
1960. Studies in the Helminthocladiaceae, II. *American Journal of Botany* 47(8): 632–640.

Adey, W. H.
1970. A revision of the Foslie crustose coralline herbarium. *Kongelige Norske Videnskabers Selskabs Skrifter* 1970(1): 1–46.

Agardh, C. A.
1810–1812. *Dispositio algarum Sueciae* ... Berling: Lundæ [Lund]. Part 1, pp. [1]–16 (1810), part 2, pp. 17–26 (1811), part 3–5, pp. 27–45 (1812), + 3 pls.
1817. *Synopsis algarum Scandinaviae* ... Berling: Lundæ [Lund]. xl + 135 pp.
1822–1823. *Species algarum* ... Vol. 1, part 2. Berling:Lundae [Lund]. [i–viii +] 169–398 (1822), 399–531 (1823) pp.
1822. Algae. Pages 1–16. *In:* C. S. Kunth (ed.), *Synopsis plantarum, quas, in itinere ad plagam aequinoctialem orbis novi, collegerunt Al. de Humboldt et Am. Bonpland.* Levrault: Paris.
1828. *Species algarum* ... Vol. 2. part 1. E. Martitius: Gryphiae [Greifswald]. lxxvi + 189 pp.

Agardh, J. G.
1851–1863. *Species genera et ordines algarum ... Volumen secundum: algas florideas complectens.* T. O. Weigel: Lundae [Lund]. Part 1, pp. [i]–xii + [1]–336 + 337–351 (Addenda & Index) (1851); part 2, fasc. 1, pp. 337–504 (1851); part 2, fasc. 2, pp. 505–700 + 701–720 (Addenda & Index) (1852); part 3, fasc. 1, pp. 701–786 (1852); part 3, fasc. 2, pp. 787–1291 (1139–1158 omitted) (1863).
1873. Till algernes systematik. Nya bidrag. *Lunds Universitets Års-Skrift, Afdelningen för Mathematik och Naturvetenskap* 9. 71 pp.
1876. *Species genera et ordines algarum ... Volumen tertium: de Florideis curae posteriores.* Part 1. T. O. Weigel: Lipsiae [Leipzig]. vii + 724 pp.
1887. Till algernes systematik. Nya bidrag (Femte afdelningen). *Lunds Universitets Års-Skrift, Afdelningen för Mathematik och Naturvetenskap* 23(2): 1–174, I–V pls.
1898. *Species genera et ordines algarum. Voluminis tertii, pars tertia: De dispositione Delesseriearum curae posteriores.* Lundae [Lund]. [vii] + 239 pp.

Ardissone, F.
1871. Rivista dei Ceramii della flora italiana. *Nuovo Giornale Botanico Italiano* 3: 32–50.

Areschoug, J. E.
1854. Phyceae novae et minus cognitae in maribus extraeuropaeis collectae quas descriptionibus atque observationibus adumbravit John Erh. Areschoug. *Nova Acta Regiae Societatis Scientiarum Upsaliensis,* Series 3, 1: 329–372.

Ascherson, P.
1868. Männliche blüthen von *Cymodocea manatorum* u. *Halodule wrightii.* Sitzungs-Bericht der Gesellschaft naturforschender Freunde zu Berlin. A. Effert & L. Lindtner: Berlin. 1868(16 Juni): 18–19.

Baldock, R. N.
1976. The Griffithsieae group of the Ceramiaceae (Rhodophyta) and its southern Australian representatives. *Australian Journal of Botany* 24: 509–593.

Barton, E. S.
1891. A systematic and structural account of the genus *Turbinaria,* Lamx. *Transactions of the Linnean Society of London, Second Series, Botany* 3: 215–226.

Batters, E. A. L.
1902. A catalogue of the British marine algae. *Journal of Botany* 40(suppl.): 1–107.
Blainville, H. M. D. de
1834. *Manuel d'actinologie ou de zoophytologie.* F. G. Levrault: Paris. viii + 694 pp.
Bliding, C.
1969. A critical survey of European taxa in Ulvales, II. *Ulva, Ulvaria, Monostroma, Kornmannia. Botaniska Notiser* 121(4): 535–629.
Blinks, L. R., and A. H. Blinks
1931. Two genera of algae new to Bermuda. *Bulletin of the Torrey Botanical Club* 57: 389–396.
Børgesen, F.
1907. An ecological and systematic account of the Caulerpas of the Danish West Indies. *Kongelige Danske Videnskabernes Selskabs Skrifter, 7. Række, Naturvidenskabelig og Mathematisk Afdeling* 4: 337–392.
1909. The species of *Avrainvilleas* hitherto found on the shores of the Danish West Indies. *Videnksabelige Meddelelser fra Dansk naturhistorisk Forening i Kjøbenhavn* 1908: 27–44.
1910. Some new or little known West Indian Florideae. II. *Botanisk Tidsskrift* 30: 177–207.
1914a. The marine algae of the Danish West Indies. Part 2. Phaeophyceae. *Dansk Botanisk Arkiv* 2(2): 1–66 + [2].
1914b. The species of *Sargassum* found along the coasts of the Danish West Indies with remarks upon the floating forms of the Sargasso Sea. Pages 1–20. *In:* H. F. E. Jungersen and E. Warming (eds.), *Mindeskrift i Anledning af Hundredaaret for Japetus Steenstrup Fødsel.* Art. 32.
1916. The marine algae of the Danish West Indies. Part III. Rhodophyceae (2). *Dansk Botanisk Arkiv* 3: 81–144.
1920. The marine algae of the Danish West Indies. Part III. Rhodophyceae (6), with addenda to the Chlorophyceae, Phaeophyceae and Rhodophyceae. *Dansk Botanisk Arkiv* 3: 369–498 + [6].
1924. Marine algae. *In*: Plants from Beata Island, St. Domingo, collected by C. H. Ostenfeld. (Botanical Results of the Dana-Expedition 1921–22, No. 1) *Dansk Botanisk Arkiv* 4(7): 14–35.
1932. A revision of Forsskål's algae mentioned in Flora Aegyptiaco-Arabica and found in his herbarium in the Botanical Museum of the University of Copenhagen. *Dansk Botanisk Arkiv* 8(2): 1–14 + [1 index].
Bornet, É., and C. Flahault
1886. Revision des Nostocacées hétérocystées contenues dans les principaux herbiers de France. *Annales des Sciences Naturelles, Botanique*, Série 7, 3: 323–380.
Bory de Saint-Vincent, J. B. G. M.
1834. Hydrophytes, Hydrophytae. Pages 159–178, pls. XV, XVI. *In:* C. Bélanger, *Voyage aux Indes-Orientales, par le nord de l'Europe, les provinces du Caucase, la Géorgie, l'Arménie et la Perse, suive de détails ... pendant les années 1825, 1826, 1827, 1828 et 1829*: Botanique, IIe Partie, Cryptogamie. Aurthus Bertrand: Paris.
Chamberlain, Y. M.
1983. Studies in the Corallinaceae with special reference to *Fosliella* and *Pneophyllum* in the British Isles. *Bulletin of the British Museum (Natural History), Botany* 11(4): 291–463.
Collins, F. S.
1901. The algae of Jamaica. *Proceedings of the American Academy of Arts & Sciences* 37: 229–270.

Collins, F. S., and A. B. Hervey
1917. The algae of Bermuda. *Proceedings of the American Academy of Arts & Sciences* 53: 1–195.
Crouan, P. L., and H. M. Crouan
1859. Notice sur quelques espèces et genres nouveaux d'algues marines de la rade de Brest. *Annales des Sciences Naturelles, Botanique*, série 4, 12: 288–292.
Decaisne, J.
1842. Essais sur une classification des algues et des polypiers calcifères de Lamouroux. Mémoire sur les corallines ou polypiers calcifères. *Annales des Sciences Naturelles, Botanique*, série 2, 18: 96–128.
Dickie, G.
1874. On the algae of Mauritius. *Journal of the Linnean Society [London], Botany* 14: 190–202.
Ellis, J.
1768. Extract of a letter from John Ellis, Esquire, F.R.S. to Dr. Linneaus, of Upsal, F.R.S. on the animal nature of the genus of zoophytes, called *Corallina*. *Philosophical Transactions [Royal Society of London]* 57: 404–420, pls. XVII, XVIII.
Falkenberg, P.
1901. Die Rhodomelaceen des Golfes von Neapel und der angrenzenden meerse-abschnitte. *Fauna und flora des Golfes von Neapel, Monographie* 26. Friedländer & Sohn: Berlin. xvi + 754 pp.
Farlow, W. G.
1876. List of the marine algae of the United States. *Report of the United States Fish Commissioner* 1873/1875: 691–718.
Foslie, M.
1901. New Melobesieae. *Kongelige Norske Videnskabers Selskabs Skrifter* 1901(6). 24 pp.
1905. Remarks on northern Lithothamnia. *Kongelige Norske Videnskabers Selskabs Skrifter* 1905(3). 138 pp.
Fredericq, S., and J. N. Norris
1985. Morphological studies on some tropical species of *Gracilaria* Grev. (Gracilariaceae, Rhodophyta): taxonomic concepts based on reproductive morphology. Pages 137–155 *In:* I. A. Abbott and J. N. Norris (eds), *Taxonomy of economic seaweeds with reference to some Pacific and Caribbean species.* California Sea Grant College Program [Report T-CSGCP-011]: La Jolla.
Gabrielson, P. W., and D. P. Cheney
1987. Morphology and taxonomy of *Meristiella* gen. nov. (Solieriaceae, Rhodophyta). *Journal of Phycology* 23: 481–493.
Gepp, A., and E. A. Gepp
1905. Notes on *Penicillus* and *Rhipocephalus*. *Journal of Botany, British & Foreign* 43: 1–5.
1911. The Codiaceae of the Siboga expedition including a monograph of Flabellarieae and Udoteae. *In: Siboga-expeditie Monographie* 62. E. J. Brill: Leiden. 150 pp., XXII pls.
Gomont, M.
1890. Essai de classification des Nostocacées homocystées. *Journal de Botanique* 4: 349–357.
Greville, R. K.
1830. *Algae britannicae* ... MacLachlan & Stewart: Edinburgh. lxxxviii + 218 pp.
Grunow, A.
1867. Algae. Pages [1] + 104, pls. I, Ia, II–XI. *In:* E. Fenzl (ed.), *Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859 ... Botanischer Theil. Erster Band: Sporenpflanzen.* Heft 1 K.K. Hofund Staatsdruckerei: Wien [Vienna].

Harvey, W. H.
1846–1851. *Phycologica britannica* ... Reeve Brothers: London. Vol. 1. pp. [i–iii] [Title page ("1846")], v–viii [Advertisement], ix–xv [List], i–vi [Index], pls. 1–120 with unpaginated text. Vol. 2. pp. [i–ii] [Title page ("1849")], i–vi [Index], pls. 121–240 with unpaginated text. Vol. 3. pp. [i–ii] [Title page ("1851")], iii–iv [Preface], v–xxxix [Synopsis], xli–xlv [General index], pls. 241–360 with unpaginated text. [ Plates I–LXXII (1846); LXXIII–CXLIV (1847); CXLV–CCXVI (1848); CCXVII–CCCVI (1849); CCCVII–CCCLIV (1850); CCCLV–CCCLX (1851).
1847–1849. *Nereis australis.* Reeve Brothers: London. Pp. i–viii + 1–64, pls. I–XXV (1847); pp. 65–124, pls. XXVI–L (1849).
1852. Nereis boreali-americana ... Part I. Melanospermeae. *Smithsonian Contributions to Knowledge* 3(4). ii + 150 pp., I–XII pls.
1855. Some account of the marine botany of the colony of Western Australia. *Transactions of the Royal Irish Academy* 22(Science): 525–566.
Hohenacker, R. F.
1852–1862. *Algae marinae siccatae* ...Esslingen (Kirchheim from Fasc. VII). Fasc. I–XII. Nos. 1–600. [Exsiccata with printed labels.]
Hooker, W. J.
1833. Class XXIV. Cryptogamia. Pages [i]–x + [1]–4 + [1]–432 pp. *In:* J. E. Smith (ed.), *English flora.* Vol. V. Part 1. Comprising the mosses, Hepaticae, lichens, Characeae and algae. London.
Hörnig, I., and R. Schnetter
1988. Notes on *Dictyota dichotoma, D. menstrualis, D. indica and D. pulchella* spec. nov. (Phaeophyta). *Phyton* 28: 277–291.
Hörnig, I., R. Schnetter, W. F. Prud'homme van Reine, et al.
1992. The genus *Dictyota* (Phaeophyceae) in the North Atlantic. I. A new generic concept and new species. *Nova Hedwigia* 54: 45–62.
Howe, M. A.
1904. Notes on Bahaman algae. *Bulletin of the Torrey Botanical Club* 31: 93–100.
1905. Phycological studies—II. New Chlorophyceae, new Rhodophyceae, and miscellaneous notes. *Bulletin of the Torrey Botanical Club* 32: 563–586.
1911. Phycological studies—V. Some marine algae of lower California, Mexico. *Bulletin of the Torrey Botanical Club* 38: 489–514.
1918. Class 3. Algae. Pages 489–540. *In:* N. L. Britton (ed.), *Flora of Bermuda (illustrated).* Charles Scribner's Sons: New York.
1920. Class 2. Algae. Pages 553–618. *In:* N. L. Britton and C. F. Millspaugh (eds.), *The Bahama Flora.* New York.
Hoyt, W. D.
1927. The periodic fruiting of *Dictyota* and its relation to the environment. *American Journal of Botany* 14: 592–619.
Hudson, W.
1778. *Flora anglica ... Editio altera.* Londini [London]. [iii +] xxxviii + 690 pp.
Huisman, J. M., and R. A. Townsend
1993. An examination of Linnaean and pre-Linnaean taxa referable to *Galaxaura* and *Tricleocarpa* (Galaxauraceae, Rhodophyta). *Botanical Journal of the Linnean Society [London]* 113: 95–101.
Joly, A. B., and E. C. de Oliveira
1969. Notes on Brazilian algae II. A new *Anadyomene* of the deep water flora. *Phykos* 7: 27–31.

Jürgens, G. H. B.
1816 [1816–1822]. Algae aquaticae quas in littore markis Dynastium Jeveranam et Frisiam orientalem alluentis rejectas et in harum terrarum aquis habitantes collegit. Decades 1–20. Jever.
Kapraun, D. F., and J. N. Norris
1982. The red alga *Polysiphonia* Greville (Rhodomelaceae) from Carrie Bow Cay and vicinity, Belize. *Smithsonian Contributions to the Marine Sciences* 12: 225–238.
King, R. J., C. F. Puttock, and R. S. Vickery
1988. A taxonomic study on the *Bostrychia tenella* complex (Rhodomelaceae, Rhodophyta). *Phycologia* 27: 10–19.
Kjellman, F. R.
1900. Om Floridé-slägtet *Galaxaura*, dess organografi och systematik. *Konglige Svenska Vetenskaps-Akademiens Handlingar, ny följd* [series 4], No. 33. 109 pp., 20 pls.
König, C. K. D. E.
1805. Addition to M. Cavolini's treatise on *Zostera oceanica* L. König & Sims. *Annals of Botany [London]* 2: 91–98.
Kuntze, O.
1898. *Revisio generum plantarum* ... Part 3[3]. Arthur Felix: Leipzig. i–iv + 1–576 pp.
Kützing, F. T.
1849. *Species algarum*. F.A. Brockhaus: Lipsiae [Leipzig]. vi + 922 pp.
1857. *Tabulae phycologicae* ... Vol. 7. Nordhausen. ii + 40 pp., 100 pls.
1859. *Tabulae phycologicae* ... Vol. 9. Nordhausen. viii + 42 pp., 100 pls.
1861. *Tabulae phycologicae* ... Vol. 11. Nordhausen. [iii +] 32 pp., 100 pls.
1862. *Tabulae phycologicae* ... Vol. 12. Nordhausen. iv + 30 pp., 100 pls.
Lamarck, J. B. de
1813. Sur les polypiers empâtés. *Annales du Muséum d'Historie Naturelle [Paris]* 20(7): 294–312.
Lamouroux, J. V. F.
1805. *Dissertations sur plusieurs espèces de Fucus* ... Agen. xxiv + 83 [85 errata] pp., XXXVI pls.
1809a. Exposition des caractères du genre *Dictyota*, et tableau des espèces qu'il renferme. *Journal de Botanique [Desvaux]* 2: 38–44.
1809b. Mémoire sur trois nouveaux generes de la famille des algues marines. *Journal de Botanique [Desvaux]* 2: 129–135, pl. I; pl. III: fig. 1.
1813. Essai sur les genres de la famille des thallassiophytes non articulées. *Annales du Muséum d'Historie Naturelle [Paris]* 20: 21–47, 115–139, 267–293.
Lapointe, B. E., M. M. Littler, and D. S. Littler
1993. Modification of benthic community structure by natural eutrophication: the Belize barrier reef. *Proceedings of the seventh International Coral Reef Symposium, Guam, 1992*. 1: 323–334.
Lemmermann, E.
1905. Die Algenflora der Sandwich-Inseln. Ergebnisse einer Reise nach dem Pacific. H. Schauinsland 1896/97. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 34: 607–663, pls. VII, VIII.
Linnaeus, C.
1753. *Species plantarum* ... Laurentii Salvii: Holmia [Stockholm]. 561–1200 + [31] pp.
1758. *Systema naturae per regna tria naturae* ... Editio decima ...Vol. 1. Salvius: Holmiae [Stockholm]. iv + 823 pp.

Littler, D. S., and M. M. Littler
1990. Systematics of *Udotea* species (Bryopsidales, Chlorophyta) in the tropical western Atlantic. *Phycologia* 29: 206–252.
1992. Systematics of *Avrainvillea* (Bryopsidales, Chlorophyta) in the tropical western Atlantic. *Phycologia* 31: 375–418.
1997. An illustrated marine flora of the Pelican Cays, Belize. *Bulletin of the Biological Society of Washington* 9: 1–149.

Littler, D. S., M. M. Littler, and B. L. Brooks
1995. Marine algae and seagrasses from the Tobacco Range Fracture Zone, Belize, C.A. *Atoll Research Bulletin,* No. 429. 43 pp.

Littler, D. S., M. M. Littler, K. E. Bucher, and J. N. Norris
1989. *Marine plants of the Caribbean, a field guide from Florida to Brazil.* Smithsonian Institution Press: Washington, D.C. 272 pp.

Littler, M. M., D. S. Littler, and B. E. Lapointe
1993. Modification of tropical reef community structure due to cultural eutrophication: the southwest coast of Martinique. *Proceedings of the Seventh International Coral Reef Symposium, Guam, 1992.* 1: 335–343.

Littler, M. M., P. R. Taylor, D. S. Littler, R. H. Sims, and J. N. Norris
1985. The distribution, abundance and primary productivity of submerged macrophytes in the Belize barrier reef mangrove system. *Atoll Research Bulletin,* No. 289, 1-20.

Littler, M. M., P. R. Taylor, D. S. Littler, R. H. Sims, and J. N. Norris
1987. Dominant macrophyte standing stocks, productivity and community structure on a Belizean barrier-reef. *Atoll Research Bulletin,* No. 302, 1-24.

Martens, G. von
1869. Beiträge zur Algen-Flora Indiens. *Flora* 52: 233–238.

Meneghini, G.
1844. Algarum species novae vel minus notae a prof. J. Meneghini propositae. *Giornale Botanico Italiano, Anno 1,* 1: 296–306.

Montagne, C.
1837. Centurie de plantes cellulaires exotiques nouvelles. *Annales des Sciences Naturelles, Botanique*, série 2, 8: 345–370.
1840. Seconde centurie de plantes cellulaires exotiques nouvelles. Décades I et II. *Annales des Sciences Naturelles, Botanique*, série 2, 13: 193–207, pl. 5; pl. 6: figs. 1, 3.
1842a. Troisième centurie de plantes cellulaires exotiques nouvelles. Décades V, VI, VII et VIII. *Annales des Sciences Naturelles, Botanique,* série 2, 18: 241–256.
1842b. Botanique. Plantes cellulaires. Pages [v] + x + 549, Atlas: pls. I–XX. *In:* R. de la Sagra (ed.), *Histoire physique, politique et naturelle de l'île de Cuba.* [Vol. II] Paris.
1845. Plantes cellulaires. Pages xiv + 349. *In:* J. B. Hombron and H. Jacquinot (eds.), *Voyage au Pôle Sud et dans l'Océanie sur les corvettes l'Astrolabe et la Zelée, exécuté ... pendant les années 1837–1838–1839–1840, sous le commandement de M.J. Dumont-d'Urville*. Atlas: Botanique: Cryptogamie. Vol. 1. Paris.
1846. Ordo I. Phyceae Fries. Pages ii + 197. *In:* M. C. Durieu de Maisonneuve (ed.), *Exploration scientifique de l'Algérie pendant les années 1840, 1841, 1842.* Sciences naturelles: Botanique, Partie 1. Cryptogamie. Imprimerie Royale: Paris.

Murray G.
1887. Catalogue of Ceylon algae in the Herbarium of the British Museum. *Annals & Magazine of Natural History*, series 5, 20: 21–44.

Nägeli, C.
1862. Beiträge zur Morphologie und Systematik der Ceramiaceae. *Sitzungsberichte der Königlichen Bayerischen Akademie der Wissenschaften zu München* 1861(2): 297–415.
Norris, J. N., and K. E. Bucher
1982. Marine algae and seagrasses from Carrie Bow Cay, Belize. *Smithsonian Contributions to the Marine Sciences*, No. 12: 167–223.
Oliveira, E. C. de
1977. *Algas marinhas bentônicas do Brasil.* Universidade de São Paulo, Instituto de Biociências: São Paulo, Brazil. iv + 407 pp. [Thesis]
Olsen, J. L., and J. A. West
1988. *Ventricaria* (Siphoncladales-Cladophorales complex, Chlorophyta), a new genus for *Valonia ventricosa*. *Phycologia* 27: 103–108.
Ostenfeld, C. H.
1902. Hydrocharitaceae, Lemnaceae, Pontederiaceae, Potamogetonaceae, Gentianaceae (Limnanthemum), Nymphaeaceae. *Botanisk Tidsskrift* 24: 260–263.
Page, J. Z.
1970. Existence of a *Derbesia* phase in the life history of *Halicystis osterhoutii* Blinks and Blinks. *Journal of Phycology* 6: 375–380.
Papenfuss, G. F.
1968. Notes on South African marine algae. V. *Journal of South African Botany* 34: 267–287.
Parke, M. W., and P. S. Dixon
1976. Check-list of British marine algae—third revision. *Journal of the Marine Biological Association of the United Kingdom* 56: 527–594.
Rabenhorst, L.
1847. *Deutschlands Kryptogamen-Flora ... Zweiter Band. Zweite Abteilung: Algen.* Leipzig. xix + 216 pp.
Reinke, J.
1889. Algenflorda der westlichen Ostsee deutschen Anthiels. Eine systemaisch- pflanzen-geographische Studie. *Bericht der Kommission zur Wissenschaftlichen Untersuchungen der Deutschen Meere in Kiel* 6: iii–xi, 1–101.
Rodríguez de Ríos, N., and Y. Saito
1982. Observaciones sobre el género *Laurencia* en Venezuela. I. *Laurencia intermedia* Yamada y *Laurencia corallopsis* (Montagne) Howe. *Ernstia* 11: 1–16.
Roth, A. W.
1806. *Catalecta botanica* ... Fasc. 3. Lipsiae [Leipzig]. [viii] + 350 + [9] pp.
Rützler, K., and I. G. Macintyre (eds.)
1982. The habitat distribution and community structure of the barrier reef complex at Carrie Bow Cay, Belize. Pages 9–45. *In* K. Ruetzler and I. G. Macintyre [eds.], *The Atlantic barrier reef ecosystem at Carrie Bow Cay, Belize, I. Structure and communities.* Smithsonian Contributions to Marine Science, No. 12.
Schmitz, F.
1893. Die Gattung *Lophothalia* J. Ag. *Berichte der Deutschen Botanischen Gesellschaft* 11: 212–232.
Schnetter, R., I. Hörnig, and G. Weber-Peukert
1987. Taxonomy of some North Atlantic *Dictyota* species (Phaeophyta). *Hydrobiologia* 151/152: 193–197.
Searles, R. B., and C. W. Schneider
1989. New genera and species of Ceramiaceae (Rhodophyta) from the southeastern United States. *Journal of Phycology* 25: 731–740.

Silva, P. C.
1960. *Codium* (Chlorophyta) in the tropical western Atlantic. *Nova Hedwigia* 1: 497–536.
Silva, P. C., P. W. Basson, and R. L. Moe
1996. Catalogue of the Benthic Marine Algae of the Indian Ocean. *University of California Publications in Botany* 79: 1–1259.
Silva, P. C., E. G. Meñez, and R. L. Moe
1987. Catalog of the benthic marine algae of the Philippines. *Smithsonian Contributions to the Marine Sciences* 27. iv + 179 pp.
Smith, J. E.
1790–1814. *English botany* ... 36 volumes. London. 2592 plates.
Stephenson, T. A.
1944. The constitution of the intertidal fauna and flora of South Africa. Part II. *Annals of the Natal Museum* 10: 261–358, pls. XII–XIV.
Taylor, P. R., M. M. Littler, and D. S. Littler
1986. Escapes from herbivory in relation to the structure of mangrove island macroalgal communities. *Oecologia* 69: 481-490.
Taylor, W. R.
1928. The marine algae of Florida with special reference to the Dry Tortugas. *Publications of the Carnegie Institution of Washington* 379. [v] + 220 pp.
1960. *Marine algae of the eastern tropical and subtropical coasts of the Americas.* University of Michigan Press: Ann Arbor. xi + [iii] + 870 pp.
Taylor, W. R., and I. A. Abbott
1973. A new species of *Botryocladia* from the West Indies. *British Phycological Journal* 8: 409–412.
Tilden, J. E.
1894–1909. *American algae.* Minneapolis. Centuries 1–7, nos. 1–650. [Exsiccata with printed labels.]
1910. *Minnesota algae, Vol I.* Minneapolis. Iv + 319 pp., 20 pls.
Tsuda, R. T., and C. J. Dawes
1974. Preliminary checklist of the marine benthic plants from Glover's Reef, British Honduras. *Atoll Research Bulletin* 173. 13 pp.
Turner, D.
1811–1819. *Fuci* ... Vol. 4. London. [iii] + 153 + [2] + 7 pp., 197–258 pls.
Vahl, M.
1802. Endeel kryptogamiske Planter fra St.-Croix. *Skrifter af Naturhistorie-Selskabet, Kiøbenhavn [Copenhagen].* 5(2): 29–47.
Williams, L. G.
1951. Algae of the black rocks. *Journal of the Elisha Mitchell Scientific Society* 67: 149–159.
Withering, W.
1776. *A botanical arrangement of all the vegetables naturally growing in Great Britian* ... M. Swinney: Birmingham. [i]–xviii, xvii–xcvi + 838 pp., XII pls.
Womersley, H. B. S.
1978. Southern Australian species of *Ceramium* Roth (Rhodophyta). *Australian Journal of Marine & Freshwater Research* 29: 205–257.
Woodward, T. J.
1794. Description of *Fucus dasyphyllus*. *Transactions of the Linnean Society of London* 2: 239–241.
1797. Observations upon the generic character of *Ulva*, with descriptions of some new species. *Transactions of the Linnean Society of London* 3: 46–58.

Wulfen, F. X.
1803. Cryptogama aquatica. *Archiv für die Botanik* 3: 1–64.
Wynne, M. J.
1998. A checklist of benthic marine algae of the tropical and subtropical western Atlantic: First revision. *Nova Hedwigia* 116: iii + 1–155.