

Observations on the Macroalgae Inhabiting Deep-Water Hard Bank Communities in the Northwestern Gulf of Mexico

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A preliminary species list of subtidal macroalgal collections from established monitoring sites on two midshelf hard banks communities in the northwestern Gulf of Mexico is provided. A total of 50 taxa belonging to the green (Chlorophyta), brown (Phaeophyceae), and red (Rhodophyta) algae were identified, providing the first documentation of algal composition at Stetson Bank, TX, and Sonnier Bank, LA. Both sites are much more species rich and taxonomically distinct than previously reported, with a surprisingly different floristic composition between both. New records for the Gulf of Mexico include *Laurencia chondrioides*, *Callithammiella tingitana*, *Diplothamnion jobyi*, *Griffithsia heteromorpha*, and *Dictyota paffii*. Northernmost range extensions for four taxa are reported for the northwestern Gulf.

The western Gulf of Mexico basin is characterized by a relatively shallow but well-developed continental shelf with an extensive system of hard banks of various origins and compositions. Whereas the banks of the southwestern Gulf (below Matagorda Bay, TX) were typically formed on relict carbonate reefs, the upper northwestern mid- and outer shelf banks were formed on unique tectonically created salt diapirs or salt domes.

Biologically, many of these hard banks support a rich, unique, and ecologically productive community of biota. The composition and richness of these communities vary according to their location on the continental shelf and the region they occupy. The most biologically diverse outer shelf bank system in the Gulf of Mexico is that of the east and west banks of the Texas Flower Gardens, which support relatively shallow, high-diversity coral reef zones (Bright and Pequegnat, 1974; Rezak et al., 1985). Two midshelf banks (defined as those rising from depths of 80 m or less and having a relief of about 4–50 m) on the north Texas–Louisiana shelf are Stetson, TX, and Sonnier, LA (Rezak et al., 1985). Gardner et al. (1998) characterized Stetson Bank as coralgal-encrusted salt and shale diapirs on the edge of the U.S. Gulf coast continental shelf.

Rezak et al.'s (1985) original surveying research of the Gulf of Mexico hard bank system and resulting classification system have provided us with a critical historical baseline and aided in the recognition of the uniqueness of these bank system communities. Stetson and Sonnier Banks are reported to support minor reef-building activity dominated by a biotic *Millepora*–Sponge zone and a second non-biotic zone without reef-building activity or primary

productivity, the nepheloid zone (Rezak et al., 1985:162, table 7.1).

The subtidal, offshore benthic macroalgae of the northwestern Gulf of Mexico are one of the least known and poorly categorized groups of organisms in terms of biodiversity in the Gulf (e.g., Dawes and van Breedveld, 1969; Earle, 1969, 1972; Cheney and Dyer, 1974; Eiseman and Blair, 1982). The existence of a tropical flora in the deep offshore waters of the northern Gulf of Mexico was predicted by Humm and Taylor (1961), and this prediction was later supported by studies in the northeastern Gulf (Dawes and van Breedveld, 1969; Earle, 1969). Cheney and Dyer (1974) described a deepwater macroalgal community in the Florida Middle Ground that had a distinct tropical affinity and underwent seasonal patterns of abundance and species diversity, both of which were maximal in the summer. Submersible collections from the offshore East Flower Garden Bank, TX (Eiseman and Blair, 1982), and from the east Florida continental shelf (Hanisak and Blair, 1988) similarly found a greater tropical affinity of the deepwater algal flora compared with the algae inhabiting the nearshore shallow-water habitats in this region (e.g., Kapraun, 1974). Preliminary observations of recent algal collections growing on Louisiana offshore oil platforms (Shaughnessy and Chapman, 1996) suggest that the northern Gulf of Mexico is an ideal living laboratory to help resolve major questions of biodiversity, biogeography and endemism. Little is understood about the seasonal cycling of these communities, the driving mechanisms, or even their biogeographic affinities.

This paper reports on the composition of macroalgae collected during the annual mon-

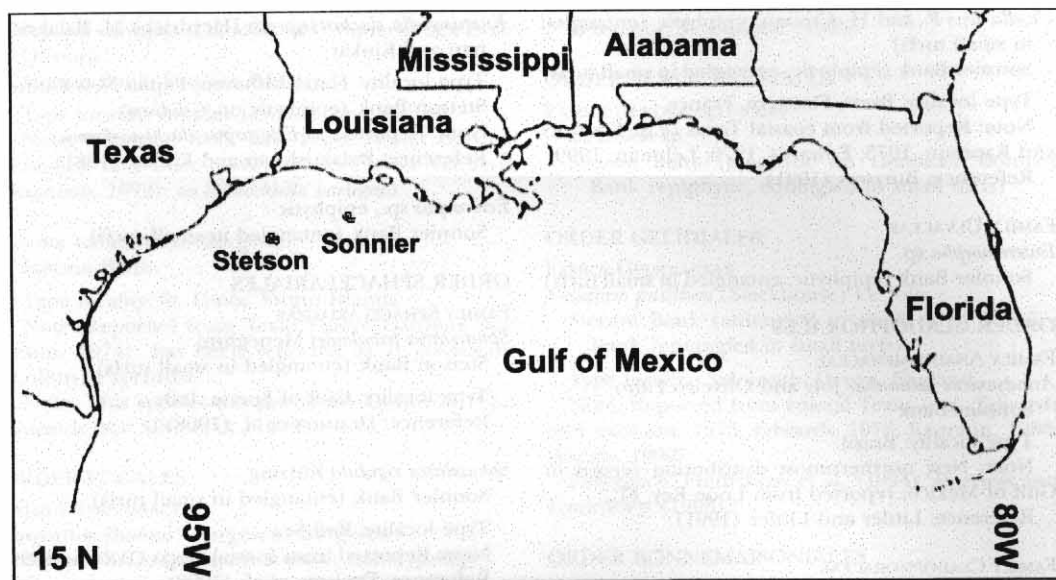


Fig. 1. Map of the northwestern Gulf of Mexico.

itoring cruises conducted to two midshelf banks in the northwestern Gulf of Mexico, Stetson Bank (6–9 June 1999) and Sonnier Bank (28 June–2 July 1999), by the National Marine Sanctuary Program, Texas A&M University, and the Minerals Management Service.

STUDY AREA (Fig. 1)

Stetson Bank Marine Sanctuary, TX.—28°10'N, 94°38'W, 6–9 June 1999, coll. S. Fredericq, N. Phillips, B. Gavio, and H. Miller, depth 26–32 m [for a description of the area and map, see Rezak et al. (1985:fig. 3.1)]. Collections were made by SCUBA in the permanent monitoring sites of the National Marine Sanctuaries.

Sonnier Banks, LA.—28°20'N, 92°27'W, 28 June–2 July 1999, coll. S. Fredericq, N. Phillips, B. Gavio, and J. Dibble, depth 18–27 m (the “60 ft. pinnacle”) [for a description of the area and map, see Rezak et al. (1985: fig. 3.1)]. Collections were made by SCUBA in the permanent monitoring sites of the Minerals Management Service.

MATERIALS AND METHODS

Algae were qualitatively collected by hand while SCUBA diving in and near the quadrat areas at the permanent monitoring sites of the FGBNMS (Stetson Bank) and Minerals Management Service (Sonnier), presorted on board the M/V *Fling*, and partially processed

during the cruises. Vouchers were preserved in diluted 5% formalin/seawater. Small turf algae have been preserved in 70% karo on microscope slides. Voucher specimens are deposited in the LAF Herbarium of the University of Louisiana at Lafayette. General identification, reference, and nomenclature treatments include Taylor (1960), Humm and Hildebrand (1962), Earle (1972), Kapraun (1974, 1980), Rezak et al. (1985:219–292, appendix 1), Hanisak and Blair (1988), Schneider and Searles (1991), Kaldy et al. (1995), Silva et al. (1996), Littler and Littler (1997), and Wynne (1998). Additional new algal records for the Gulf of Mexico and new distribution data are noted with a relevant literature reference below each listed taxon.

SPECIES LIST

Div. Chlorophyta

ORDER ULVALES

FAMILY ULVELLACEAE

Entocladia viridis Reinke

Sonnier Bank (epiphytic, entangled in small turfs)

Type locality: Naples, Italy

Note: Reported from coastal Texas (e.g., Edwards and Kapraun, 1973; Edwards, 1976; Baca et al., 1979; Lehman, 1999), Louisiana (Chandeleur Islands; Kapraun, 1974): as *Entocladia viridis*

Reference: Nielsen (1979), Burrows (1991), as *Acrochaete viridis* (Reinke) R. Nielsen

Uloella lens P. and H. Crouan, epiphytic (entangled in small turfs)
 Sonnier Bank (epiphytic, entangled in small turfs)
 Type locality: Brest, Finistère, France
 Note: Reported from coastal Texas (e.g., Edwards and Kapraun, 1973; Edwards, 1976; Lehman, 1999)
 Reference: Burrows (1991)

FAMILY ULVACEAE

Enteromorpha sp.

Sonnier Bank (epiphytic, entangled in small turfs)

ORDER CLADOPHORALES

FAMILY ANADYOMENACEAE

Anadyomene saldanhae Joly and Oliveiro Filho

Sonnier Bank

Type locality: Brazil

Note: New northernmost distribution record in Gulf of Mexico; reported from Looe Key, FL

Reference: Littler and Littler (1991)

FAMILY CLADOPHORACEAE

Cladophora sp.

Sonnier Bank (entangled in small turfs)

FAMILY SIPHONOCLADACEAE

Cladophoropsis membranacea (Hofman Bang ex C.

Agardh) Børgesen

Type locality: St. Croix, Virgin Islands

Stetson Bank (entangled in small turfs)

Note: Reported from coastal Texas (e.g., Wardle, 1999), coastal Louisiana (Kapraun, 1974)

Reference: Pakker et al. (1994)

ORDER CAULERPALES

FAMILY CAULERPACEAE

Caulerpa microphysa (Weber van Bosse) Feldmann

Stetson Bank; Sonnier Bank

Type locality: Celebes, Indonesia

Note: Reported from East Flower Garden Bank (Eiseman and Blair, 1982)

ORDER BRYOPSISDALES

FAMILY BRYOPSISDACEAE

Bryopsis plumosa (Hudson) C. Agardh

Stetson Bank (on underside of *Peyssonnelia*)

Type locality: Devon, England

Note: Reported from coastal Texas (e.g., Edwards and Kapraun, 1973; Lehman, 1999), Texas Flower Gardens (Kapraun, 1974)

Reference: Burrows (1991)

Bryopsis pennata Lamouroux

Sonnier Bank (entangled in small turfs)

Type locality: Antilles, French West Indies.

Note: Reported from coastal Texas (e.g., Lehman, 1999; Wardle, 1999)

Div. Phaeophyta

ORDER ECTOCARPALES

FAMILY ECTOCARPACEAE

Kuetzingiella elachistaeformis (Heydrich) M. Balakrishnan and Kinkar

Type locality: Hatzfeldthaven, Papua New Guinea

Stetson Bank (epiphytic on *Gelidium*)

Note: Reported as *Ectocarpus elachistaeformis*

Reference: Balakrishnan and Kinkar (1981)

Ectocarpus sp., epiphytic

Sonnier Bank (entangled in small turfs)

ORDER SPHACELARIALES

FAMILY SPHACELARIACEAE

Sphacelaria tribuloides Meneghini

Stetson Bank (entangled in small turfs)

Type locality: Gulf of Spezia, Italy

Reference: Draisma et al. (1998)

Sphacelaria rigidula Kützting

Sonnier Bank (entangled in small turfs)

Type locality: Red Sea

Note: Reported from coastal Texas (Wardle, 1999)

Reference: Draisma et al. (1998)

ORDER SCYTOSIPHONALES

FAMILY SCYTOSIPHONACEAE

Rosenvingea intricata (J. Agardh) Børgesen

Stetson Bank

Type locality: Veracruz, Mexico

Reference: Wynne (1997)

ORDER DICTYOTALES

FAMILY DICTYOTACEAE

Dictyota cervicornis Kützting

Type locality: Key West, FL

Stetson Bank; Sonnier Bank

Dictyota menstrualis (Hoyt) Schnetter, Hornig, and Weber-Peukert

Stetson Bank

Note: Reported from coastal Texas (e.g., Edwards and Kapraun, 1973; Wardle, 1999), East Texas Flower Garden (Eiseman and Blair, 1982), Texas Flower Gardens (Kapraun, 1974, as *D. dichotoma*)

Reference: Hörnig and Schnetter (1988), Hörnig et al. (1992)

Dictyota pulchella Hörnig and Schnetter

Stetson Bank; Sonnier Bank

Note: Reported from East Texas Flower Garden (e.g., Eiseman and Blair, 1982), Texas Flower Gardens (Kapraun, 1974): as *D. bartayesii*, *D. divaricata* or *D. linearis*?

Reference: Hörnig and Schnetter (1988), Hörnig et al. (1992)

Dictyota pfaffii Schnetter (iridescent)

Stetson Bank; Sonnier Bank

Type locality: Carribean Colombia

Note: New record for Gulf of Mexico; reported from Caribbean (Colombia, Belize)

Reference: Schnetter (1972), Bula-Meyer (1994), Littler and Littler (1997)

Lobophora variegata (Lamouroux) Womersley ex E. C.

Oliveira

Stetson Bank; Sonnier Bank

Type locality: Antilles (French West Indies)

Note: Reported from East Texas Flower Garden (Eiseman and Blair, 1982), Texas Flower Gardens (Kapraun, 1974): as *Pockockiella variegata*

Padina sanctae-crucis Børgesen

Stetson Bank

Type locality: St. Croix, Virgin Islands

Note: Reported from Texas Flower Gardens (Kapraun, 1974); has been reported as *P. jamaicensis* (Collins) Papenfuss

Note: This species was previously known as *P. jamaicensis* (see Silva et al., 1996)

ORDER FUCALES

FAMILY SARGASSACEAE

Sargassum fluitans (Børgesen) Børgesen

Stetson Bank (pelagic); Sonnier Bank (pelagic)

Type locality: Sargasso Sea

Reported for coastal Texas (pelagic; Wardle, 1999)

Sargassum natans (L.) Gaillon

Stetson Bank (pelagic); Sonnier Bank (pelagic)

Lectotype locality: "Indica" (probably Jamaica)

Reported for coastal Texas (pelagic; Wardle, 1999), Louisiana (unattached; Kapraun, 1974)

Reference: Silva et al. (1996)

Sargassum sp.

Stetson Bank (pelagic); Sonnier Bank (pelagic)

Div. Rhodophyta

ORDER ERYTHROPELTIDALES

FAMILY ERYTHROTHRICHIACEAE

Erythrotrichia carnea (Dillwyn) J. Agardh

Stetson Bank (epiphytic on *Gelidium*); Sonnier Bank (epiphytic, entangled in small turfs)

Type locality: Loughor, Glamorgan, Wales, U.K.

Note: Reported from coastal Texas (e.g., Edwards and Kapraun, 1973; Wardle, 1999), Louisiana (Kapraun, 1974)

Reference: Magne (1990)

Erythrocladia endophloea Howe

Stetson Bank (epiphytic on *Gelidium*); Sonnier Bank (epiphytic, entangled in small turfs)

Reference: Heerebout (1968)

Sahlingia subintegra (Rosenvinge) Kornmann

Stetson Bank (epiphytic on *Gelidium*); Sonnier Bank (epiphytic, entangled in small turfs)

Type locality: Møllegaard, Skagerrak, off Hirshals, Denmark

Note: Reported from coastal Texas (e.g., Edwards, 1976; Kapraun, 1980; Lehman, 1999; Wardle, 1999), coastal Louisiana (Kapraun, 1974), also as *Erythrocladia subintegra*

Reference: Kornmann (1989)

ORDER ACROCHAETIALES

FAMILY ACROCHAETIACEAE

Audouinella sp.

Stetson Bank (epiphytic on *Gelidium*), Sonnier Bank (epiphytic, entangled in small turfs)

ORDER GELIDIALES

FAMILY GELIDIACEAE

Gelidium pusillum (Stackhouse) Le Jolis

Stetson Bank (entangled in small turf); Sonnier Bank (entangled in small turfs)

Type locality: Sidmouth, Devon, England

Note: Reported from coastal Texas (e.g., Edwards and Kapraun, 1973; Edwards, 1976; Kapraun, 1980; Wardle, 1999).

Reference: Fredriksen et al. (1994), Rueness and Fredriksen (1998)

ORDER BONNEMAISONIALES

FAMILY BONNEMAISONIACEAE

As the "*Falkenbergia*" sporophytic stage of *Asparagopsis taxiformis* (Delile) Trevisan

Sonnier Bank (entangled in small turfs)

Type locality: Alexandria, Egypt

Note: Northernmost distributional range in Gulf of Mexico

ORDER GIGARTINALES

FAMILY HYPNEACEAE

Hypnea volubilis Searles in C. W. Schneider and Searles

Type locality: Onslow Bay, NC

Stetson Bank (entangled with *Dictyota cervicornis*); Sonnier Bank (entangled in small turfs)

Reference: Schneider and Searles (1976)

FAMILY WURDEMANNIACEAE

Wurdemannia miniata (Sprengel) Feldmann and Hamel

Sonnier Bank (entangled in small turfs)

Type locality: Montpellier, Hérault, France

Note: Northernmost distributional range in Gulf of Mexico

Reference: Pakker et al. (1995)

FAMILY PEYSSONNELIACEAE

Peyssonnelia inamoena Pilger

Stetson Bank

Type locality: Cameroon, West Africa

Note: Reported from East Texas Flower Garden (Eiseman and Blair, 1982): as *P. rubra*

Reference: Schneider and Reading (1987), Guimarães and Fujii (1999)

ORDER CORALLINALES

FAMILY CORALLINACEAE

Jania capillacea Harvey

Stetson Bank; Sonnier Bank (entangled in small turfs)

Type locality: Bahia Honda, FL

Note: Reported from coastal Louisiana and Chandeleur Islands (Kapraun, 1974)

Hydroolithon farinosum (Lamouroux) Penrose and Y. M. Chamberlain

Stetson Bank (epiphytic on *Gelidium*); Sonnier Bank (epiphytic)

Lectotype locality: Mediterranean Sea

Note: Reported as *Fosliella farinosa* (Lamouroux) Howe

Reference: Irvine and Chamberlain (1994)

Pneophyllum fragile Kützting

Sonnier Bank (epiphytic, forming thin, extended crusts)

Holotype locality: Mediterranean Sea

Note: Reported from coastal Texas (Lehman, 1999; Edwards and Kapraun, 1973, as *Heteroderma lejolisii*)

Reference: Penrose and Woelkerling (1991)

ORDER CERAMIALES

FAMILY CERAMIACEAE

Anotrichium tenue (C. Ag.) Nacgeli

Stetson Bank (entangled in small turfs); Sonnier Bank

Type locality: Venice, Italy

Note: Reported from coastal Texas (Lehman, 1999; Edwards and Kapraun, 1973; Edwards, 1976, as *Griffithsia tenuis*)

Reference: Nicolson (1994)

Anthamniion antillanum Børgesen

Stetson Bank (epiphytic on *Dictyota*, and entangled in small turfs); Sonnier Bank (epiphytic, entangled in small turfs)

Type locality: Virgin Islands

Note: Northernmost distributional range for Gulf of Mexico

Callithamniella tingitana (Schousboe ex Bornet) Feldmann-Mazoyer

Stetson Bank (epizoic on hydroid and entangled in small turfs, spermatangial, tetrasporangial)

Type locality: Tangier, Morocco.

Note: New record for Gulf of Mexico; is reported from North Carolina, Bermuda, Caribbean; also known as *Grallatoria tingitana* (Schousboe ex Bornet) I. A. Abbott

Reference: Schneider (1984), Sanson (1994), Athanasiadis (1996), Schneider and Searles (1997a)

Callithamniion sp.

Sonnier Bank (entangled in small turfs)

Ceramium flaccidum (Kützting) Ardissonne

Stetson Bank (epiphytic on *Caulerpa microphysa*, entangled in small turfs, cystocarpic, tetrasporangial); Sonnier Bank (entangled in small turfs)

Syntype localities: Kilkee, Co. Clare, Ireland

Note: Reported from coastal Texas (Lehman,

1999; Edwards and Kapraun, 1973; Edwards, 1976, as *C. fastigiatum* f. *flaccida*)

Reference: Maggs and Hommersand (1993)

Diplothamnion jolyi Van den Hoek

Stetson Bank (entangled in small turfs)

Type locality: Curaçao, Caribbean

Note: New record for Gulf of Mexico; has been reported from Caribbean (Belize)

Reference: van den Hoek (1978), Sanson and Reyes (1994), Littler and Littler (1997), Schneider and Searles (1997a)

Griffithsia globulifera (Harvey) J. Agardh

Stetson Bank (entangled in small turfs); Sonnier Bank (entangled in small turfs)

Type locality: New York, NY

Note: Common in the Caribbean

Griffithsia heteromorpha Kützting

Sonnier Bank (entangled in small turfs)

Type locality: New Caledonia

Note: New record for Gulf of Mexico; has been reported from the Caribbean (Belize)

Reference: Littler and Littler (1997)

Spermothamnion investiens (P. and H. Crouan in Schraumm and Mazé) Vickers

Stetson Bank (forming velvety mats on rope); Sonnier Bank (entangled in small turfs)

Type locality: Pointe-à-Pitre, Guadeloupe, French West Indies

FAMILY DELESSERIACEAE

Hypoglossum rhizophorum Ballantine and Wynne

Stetson Bank (epilithic and entangled in small turfs)

Type locality: Puerto Rico

Note: Northernmost distributional range in the Gulf of Mexico; reported from Dry Tortugas

Reference: Wynne and Ballantine (1986), Ballantine and Wynne (1988), Ballantine (1996)

FAMILY RHODOMELACEAE

Herposiphonia secunda (C. Agardh) Ambroini f. *tenella* (C. Agardh) M. J. Wynne

Stetson Bank (epiphytic on *Caulerpa microphysa*, and entangled in small turfs); Sonnier Bank (entangled in small turfs)

Type locality: Sicily, Italy

Note: Reported from coastal Texas (Lehman, 1999; Edwards and Kapraun, 1973; Edwards, 1976; Kapraun, 1980, as *H. tenella*)

Reference: Wynne (1985), Schneider and Searles (1997b)

Laurencia chondrioides Børgesen

Stetson Bank (epiphytic on *Caulerpa microphysa*, and entangled in small turfs); Sonnier Bank

Note: New record for the Gulf of Mexico; has been reported from Caribbean

Type locality: St. John, Virgin Islands

Reference: Børgesen (1918)

Polysiphonia dendudata (Dillwyn) Greville ex Harvey in W. J. Hooker

Stetson Bank (epiphytic on *Caulerpa microphysa*, and entangled in small turfs); Sonnier Bank (entangled in small turfs)

Lectotype locality: Southampton, England

Note: Reported from coastal Texas (Edwards and Kapraun, 1973; Edwards, 1976; Kapraun, 1980; Lehman, 1999), Louisiana (Chandeleur Islands; Kapraun, 1974)

Reference: Maggs and Hommersand (1993)

Polysiphonia flaccidissima Hollenberg

Stetson Bank (epiphytic on *Caulerpa microphysa*, and entangled in small turfs spermatangial, tetrasporangial); Sonnier Bank (entangled in small turfs)

Type locality: Laguna Beach, CA

Note: Has been placed in synonymy under *Polysiphonia sertularioides* (Grateloup) J. Agardh, type locality Sète, Hérault, Mediterranean France, by Womersley (1979)

Polysiphonia tepida Hollenberg

Sonnier Bank (entangled in small turfs)

Type locality: Beaufort, NC

Note: Reported from coastal Texas (Edwards and Kapraun, 1973; Edwards, 1976; Lehman, 1999; Wardle, 1999)

Reference: Kapraun et al. (1983)

OBSERVATIONS AND DISCUSSION

Macroalgal community composition.—Historically, both Sonnier and Stetson Banks were characterized as encompassing a single “*Millepora*/Sponge” biotic zone (Rezак et al., 1985), a community defined by low primary productivity and a predominance of fire coral. However, preliminary algal surveys indicate that both sites are much more species rich and distinct than previously reported and do not fit this generalization. At 26–32 m depth, Stetson Bank was dominated (>80% cover) by thick, luxuriant meadows comprised of six species belonging in the brown algal family Dictyotaceae and by one red alga, *Peyssonnelia inamoena*. The *Dictyota* meadows of Stetson Bank occur at depths greater than those typically recorded for the Caribbean (e.g., Shulman and Robertson, 1996) and are indicative of high productivity. *Lobophora variegata* was represented by the crust or shelf morph (Van Steveninck and Breeman, 1987; Van Steveninck et al., 1988; Coen and Tanner, 1989). This particular composition was absent on the 18-m pinnacle of Sonnier Banks. At Sonnier where *Millepora* dominated, *Lobophora* was the only visible leafy

alga present, and the latter was surprisingly free of epiphytes. In contrast, at Stetson, *Lobophora* was interspersed with other macroalgae and heavily epiphytized. At comparable depths, the calcified brown alga *Padina sanctae-crucis*, a common component at Stetson, was absent at Sonnier. Crustose coralline algae and rhodoliths (in the process of determination) were rare at Stetson but common at Sonnier. The community composition at Sonnier fits more Rezак et al.’s (1985) *Millepora*/Sponge biotic zone but seems to have higher primary productivity and reef-building activity as indicated by the rhodoliths.

Floristics.—Although preliminary, this is the first report documenting species richness at these two ecologically significant hard bank communities. The list of marine macroalgae documents a rich algal diversity not previously appreciated for both Stetson Bank and Sonnier Bank. A surprisingly different flora was observed in the two sites, with a total of 50 taxa belonging to the green (Chlorophyta), brown (Phaeophyceae), and red (Rhodophyta) algae identified. New records for the Gulf of Mexico include *Laurencia chondrioides*, *Callithamniella tingitana*, *Diplothamnion jobyi*, *Griffithsia heteromorpha*, and *Dictyota paffii*, all species described from the Caribbean. Northernmost range extensions for the Gulf of Mexico are herein reported for *Anadyomene saldanhae*, *Wurdemannia miniata*, *Hypoglossum rhizophorum*, and *Asparagopsis taxiformis*, taxa likewise described from the Caribbean.

Algal turf composition.—At both Stetson and Sonnier Banks, the bulk of macroalgae are represented by a cryptic, mixed assemblage of various minute algae growing interspersed with sponges and hydroids. This assemblage, more commonly typified as “turf algae” (e.g., *Ceramium*, *Anotrichium*, *Griffithsia*, *Antithamnion*, *Callithamniella*, *Hypoglossum*, *Polysiphonia*, *Herposiphonia*, etc.), is often overlooked in baseline surveys and floristic treatments because these algae do not reach more than a couple of centimeters in length and because they are taxonomically challenging. The turf composition appears to have predominantly Caribbean biogeographic affinities but was strikingly different at both Stetson Bank and Sonnier Bank communities. At Sonnier, the dominant turf components were more robust than at Stetson and were comprised of well-developed *Hypnea volubilis* and *Wurdemannia miniata* mixed in with *Gelidium pusillum* and *Laurencia chondrioi-*

des. At Stetson, *Wurdemannia* was absent and *Hypnea* remained small and sparse.

We observed apparent differences in grazing pressures between the two communities. Tips of turf algae were mostly intact at Sonnier, in contrast to the heavily grazed growing regions and wound areas of similar turf algae at Stetson Bank. Another observation indicates different seasonality between the two sites, with delicate turf components both vegetatively and reproductively immature at Sonnier, whereas fully reproductive at Stetson (with cystocarps, spermatangia, tetrasporangia in the red algae). Additional seasonal collections of all macroalgae (including cyanobacteria) during future expeditions will hopefully aid in unraveling the mechanistic reasons behind these communities' complexities.

This preliminary survey is the first documentation of algal diversity at Stetson and Sonnier Banks and provides a framework of seasonal algal composition against which trends and anomalies in algal distribution, introductions, and blooms can be assessed at future dates. Our goal is to include in-depth resolution of modern baseline measures of biodiversity and establishment of molecular markers to detect evidence of long-term trends in assemblage diversity at those sites and to differentiate between the historic and recent biogeographic distribution patterns of the extant macroalgae inhabiting the hard banks in the northern Gulf of Mexico.

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