

Coral ID Guide

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Preface

The Caribbean Coral Skeleton Identification Guide (CCSIG) is an updated version of a previous identification guide created by Mauro Lepore. The previous identification guide is basically a compilation of images and descriptions of Caribbean coral species skeletons from Corals of the World grouped into suggested categories of growth forms from Coralpedia.

While the previous identification guide provided helpful information and images for coral identification, it was still lacking in more detailed information and organization. Due to this, the user would have to follow the provided links in the previous guide or search the web for additional resources that may contain more information and detailed images. This resulted in more time spent in looking for and accessing additional resources than in the identification of corals itself.

To mitigate this problem, we decided to revise the previous identification guide to include information from those additional resources that were accessed, merging and compiling them in tables of information based on their growth forms. New images of coral skeleton were also taken from coral specimens from the Caribbean Coral Skeleton Reference Collection (CCSRC) at the Naos Marine Laboratory, Smithsonian Tropical Research Institute, Panama. Images from Corals of the World were used for species that are not yet available in the CCSRC. The images have been edited in Photoshop Lightroom to better exhibit their physical characteristics. Each image has a scale of either:

- a strip of horizontal lines (or a ruler) with 1mm intervals (Images taken from the CCSRC)
- a digitized scale located in one of the corners of the image (Images from Corals of the World)

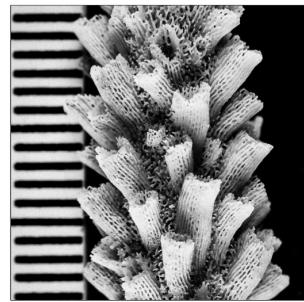
The images of the coral skeleton have been labeled with a number (corresponds with their row number in the tables) and their species name. They have all been arranged numerically and alphabetically. Each coral species has an image of its colony and/or corallite/valley.

Additionally, a verbal and visual (where necessary) glossary of coral morphology is included to help better illustrate the characteristics described in the tables.

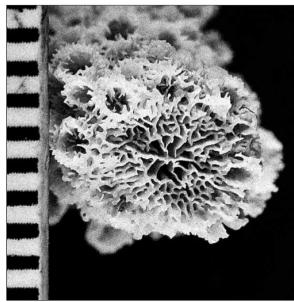
We hope that this updated version will make the identification of coral species based on their skeletal characteristics easier and more efficient. For a physical and more tangible resource of identification, please visit the CCSRC at the Naos Marine Laboratory (insert web link here)

Characteristics of Coral Species

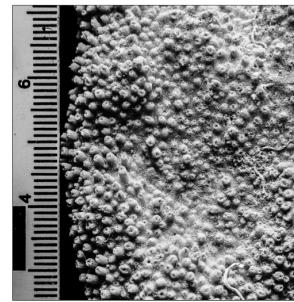
Branching Corals



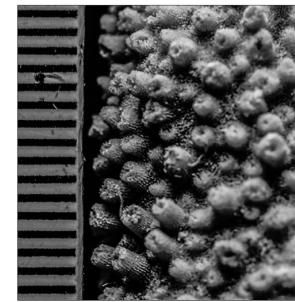
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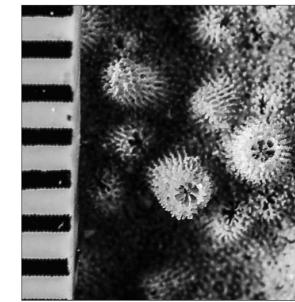
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2. *Acropora palmata*



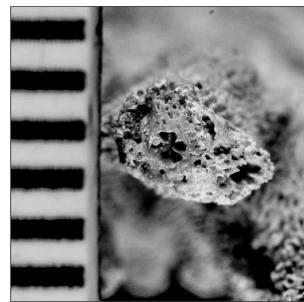
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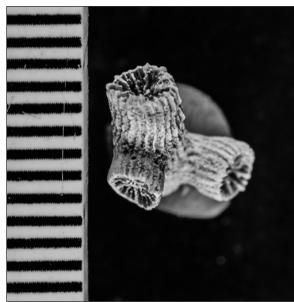
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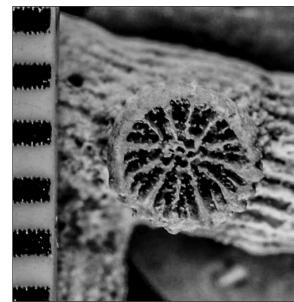
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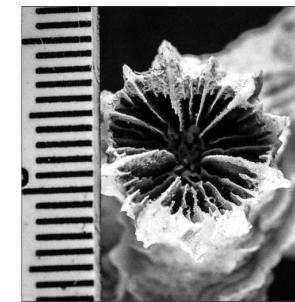
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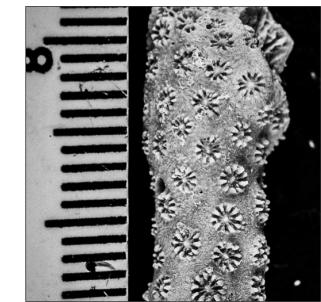
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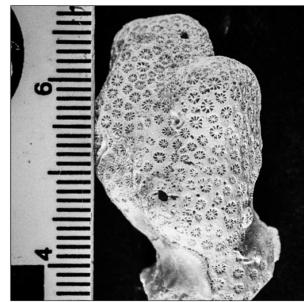
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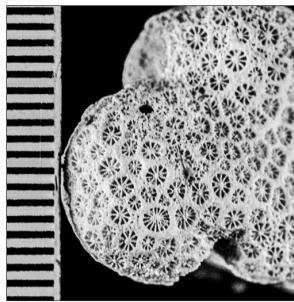
5. *Eusmilia fastigiata*



6. *Madracis asperula*



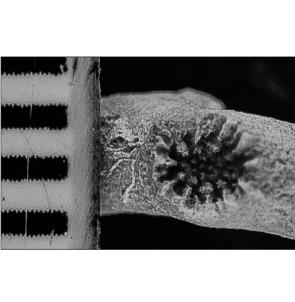
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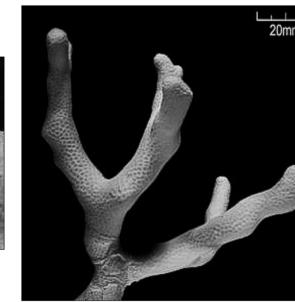
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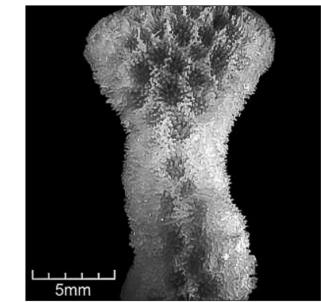
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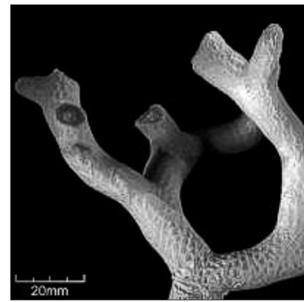
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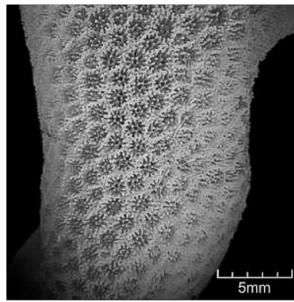
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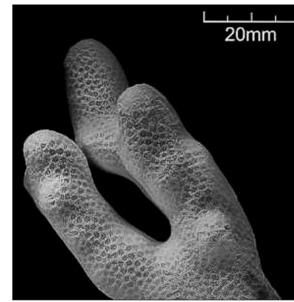
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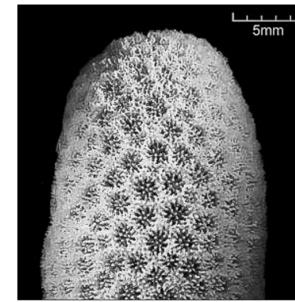
10. *Porites furcata*



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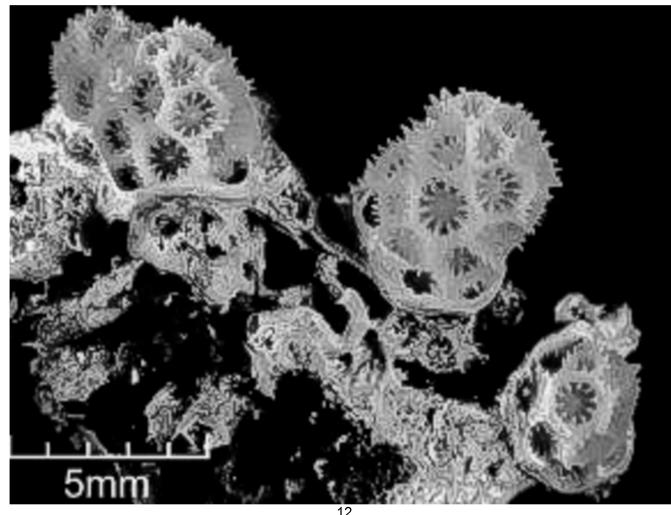
11. *Porites porites*



11. *Porites porites*

Species Name	Corallite Size (mm)	Corallite Wall Thickness	Columellae size (mm)	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Coenosteum	Branch diameter (cm)	Colony Form	Similar Species	Comments/Notes
1 <i>Acropora cervicornis</i>	0.8-1	-	-	6	1	-	Absent	-	0.2-0.3mm	1-3	Plocoid	<i>Acropora formosa</i> (not in the Caribbean/E. Pacific), <i>Acropora prolifera</i>	Corallite: Distinctive singular central axial corallites with tubular radial corallites; <5mm long
2 <i>Acropora palmata</i>	0.5-0.8	-	-	6	1	-	Absent	-	0.1-0.2mm	5-25	Plocoid	<i>Acropora prolifera</i>	Corallite: No distinctive axial corallite; irregular length; tubular; <5mm long Branches: Singular branches Colony: Largest among Acropora
3 <i>Acropora prolifera</i>	0.8-1.0	-	-	6	1	-	Absent	-	0.2-0.3mm	0.5-2	Plocoid	<i>Acropora cervicornis</i> , <i>Acropora palmata</i>	Corallites: Radial corallites orient upwards in rows; <5mm long Branches: Fuse at crossings Biology: Hybrid between <i>A. cervicornis</i> and <i>A. palmata</i>
4 <i>Cladocora arbuscula</i>	<6	-	1	36	-	-	Trabecular; discontinuous	-	-	-	Phaceloid	-	Branches: Fine ridges running along the length; each ending with a single corallite
5 <i>Eusmilia fastigiata</i>	80-130	-	-	15-18/cm	2	None	Trabecular; continuous	Well-developed	N/A	-	Phaceloid	-	Colony: Hemispherical mounds Septa: Widely spaced; primary septa exsert
6 <i>Madracis asperula</i>	1	-	-	10	2	-	Styliform (well-developed)	Absent	-	-	Plocoid	-	Biology: Primarily an azooxanthellae species Septa: Fuse with columella
7 <i>Madracis decactis</i>	1.3-1.9	-	-	10	-	-	Styliform (well-developed)	Absent	-	2-3	Plocoid	-	Colonies: Nodular (flattened and club-shaped), laminar or encrusting Coenosteum: Fine spicules (sometimes form ridge between corallites) Septa: Fuse with columella
8 <i>Oculina diffusa</i>	1.5-5	-	-	-	-	-	Trabecular (well-developed)	Absent/Reduced	-	<1.5	Plocoid	<i>Oculina varicosa</i>	Corallites: Have neat round exsert walls Septa: Slight alternation of long and short
9 <i>Porites divaricata</i>	<1.6	-	-	12	1	-	Trabecular (weak); discontinuous	-	-	<1	Subplocoid	<i>Porites furcata</i> , <i>Porites porites</i>	Pali: 5-6 Branch: Often divide near tips
10 <i>Porites furcata</i>	1.6-1.8	-	-	12	1	-	Trabecular; discontinuous	-	-	1-2	Subplocoid	<i>Porites divaricata</i> , <i>Porites porites</i>	Branches: Thinner than <i>P. porites</i> but not as slender/branched as <i>P. divaricata</i> ; tightly compacted Pali: 5-6
11 <i>Porites porites</i>	1.8-2.0	-	-	12	1	-	Trabecular; discontinuous	-	-	>2	Subplocoid	<i>Porites divaricata</i> , <i>Porites furcata</i>	Branches: Stout, irregular, and stubby with blunt and often enlarged tips Pali: 5-6

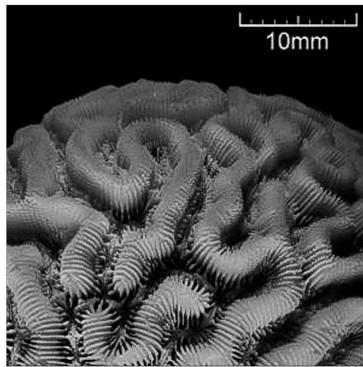
Lumpy Corals



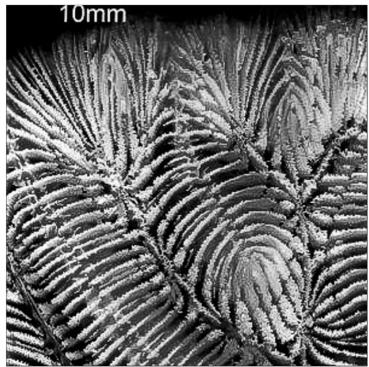
12

Species Name	Corallite Size (mm)	Corallite Wall Thickness	Columellae size (mm)	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Coesnosteum	Colony Form	Similar Species	Comments/Notes
12 <i>Madracis pharensis</i>	~1.5	-	-	10	2	-	Styliform (well- developed)	-	-	Plocoid	-	Distribution: Mostly in the Dominican Republic (Corals of the World: None in Panama); Deep water Septa: Fuse with columella

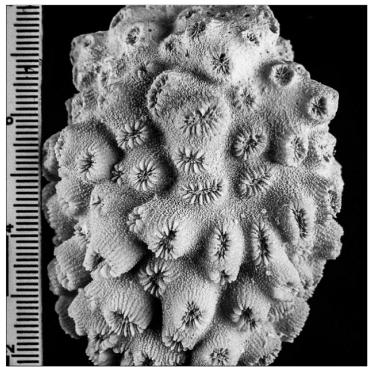
Massive Brains Corals



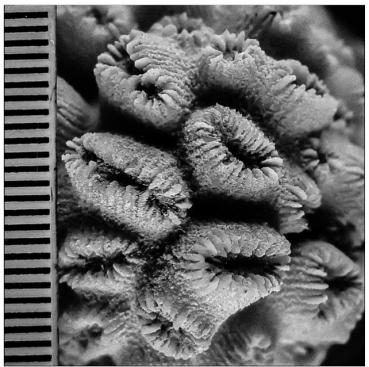
13. *Colpophyllia natans*



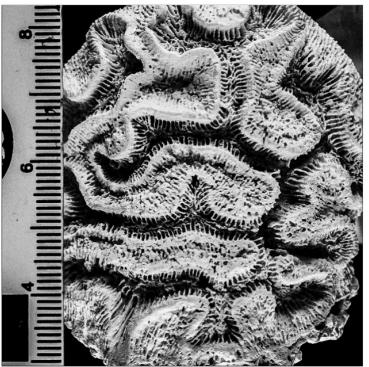
13. *Colpophyllia natans*



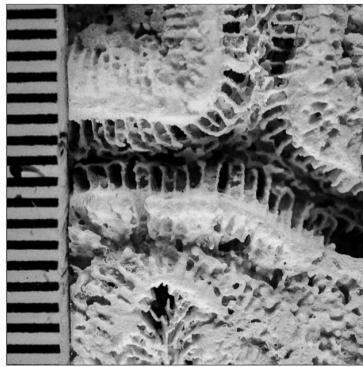
14. *Dichocoenia stokesi*



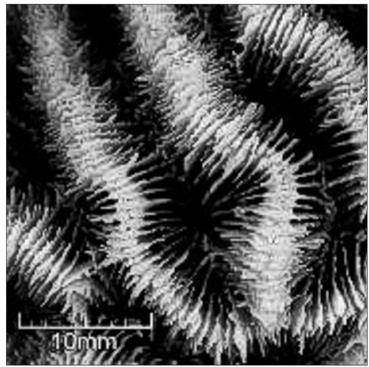
14. *Dichocoenia stokesi*



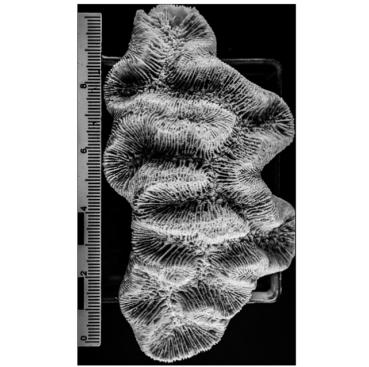
15. *Diploria labyrinthiformis*



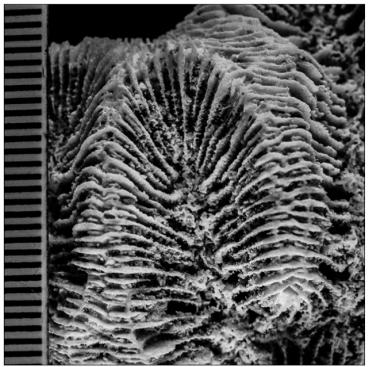
15. *Diploria labyrinthiformis*



16. *Isophyllia sinuosa*



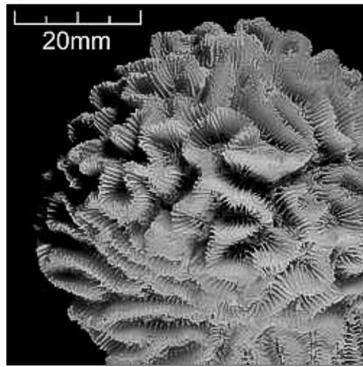
17. *Manicina areolata*



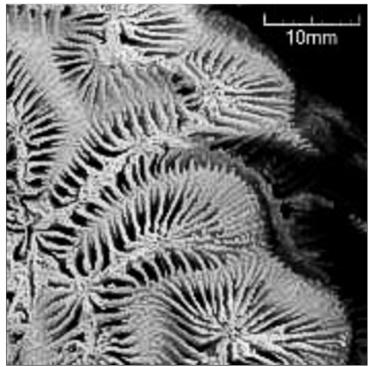
17. *Manicina areolata*



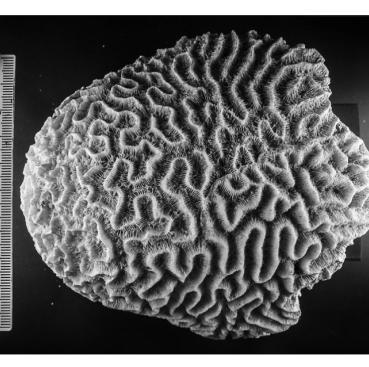
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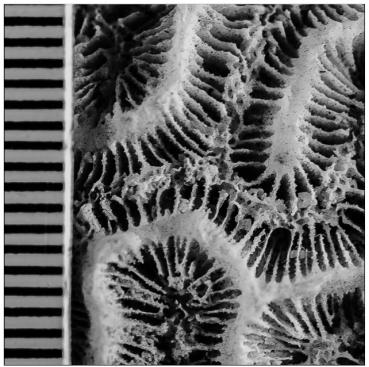
19. *Pseudodiploria clivosa*



19. *Pseudodiploria clivosa*



20. *Pseudodiploria strigosa*



20. *Pseudodiploria strigosa*

Figure 1:

Species Name		Corallite Wall Thickness	Columellae size (mm)	Valley width (mm)	No. of Centers per Series	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Coesnosteum	Colony Form	Similar Species	Comments/Notes
13	<i>Colpophyllia natans</i>	-	<1/4 of valley width	10-15	1-3	<12/cm	>3	Small	Trabecular; discontinuous	Well-developed; discontinuous	Narrow (less than valley width)	Meandroid (sinous)	<i>Colpophyllia breviserialis</i>	Colony shape: Hemispherical or encrusting Septa: Exsert, equal Ambulacral groove: Fine; throughout top of wall
14	<i>Dichocoenia stokesii</i>	-	-	3.5-4.5	-	-	2	-	Trabecular (weak)	-	-	Plocoid/Plocomeandroid	<i>Dichocoenia stellaris</i>	Colony shape: spherical/thick or submassive plates Corallites: Protrude, irregular, elliptical, circular or Y-shaped Taxonomy: Formerly known as <i>Dichocoenia stellaris</i>
15	<i>Diploria labyrinthiformis</i>	-	1/2 of valley width	5-10	Not distinct	12-24/cm	>3	-	Trabecular (weak); continuous	Well-developed; discontinuous	Wide	Meandroid (sinuous or parallel)	<i>Colpophyllia natans</i>	Colony shape: May also be hemispherical Ambulacral groove: Vary greatly within colony; may be wider than valleys (give superficial appearance of alternating valleys) Colony: Also oval to hemispherical domes Septa: Thin, large prominent teeth; continuous Colony: (Most common) Small elliptical colonies with one long, continuous central valley and several short side valleys (with cone-shaped underside); also as hemispherical heads with a flat underside. Taxonomy: One of its former synonyms is <i>Manicina mayori</i>
16	<i>Isophyllum sinuosa</i>	-	-	10-15	5-10	>12/cm	>3	-	Trabecular; discontinuous	-	-	Meandroid (sinuous)	-	Colony: Hemispherical heads and flattened plates Ridges: Formed by smooth, widely separated septa; thin line along top where septa come together Colony shape: May be encrusting Ridges: Rise sharply Ambulacral groove: Fine (if any) Taxonomy: Formerly known as <i>Diploria clivosa</i>
17	<i>Manicina areolata</i>	-	1/3 of valley width	10-15	-	12-24/cm	>3	-	Continuous	Discontinuous	Narrow	Meandroid	-	Colony shape: May also be encrusting Ridges: Evenly rounded, occasionally with extremely fine groove (usually without any) Taxonomy: Formerly known as <i>Diploria strigosa</i>
18	<i>Meandrina meandrites</i>	-	10-20	-	-	-	-	-	Lamellar	-	-	Meandroid	-	Colony: (Most common) Small elliptical colonies with one long, continuous central valley and several short side valleys (with cone-shaped underside); also as hemispherical heads with a flat underside. Taxonomy: One of its former synonyms is <i>Manicina mayori</i>
19	<i>Pseudodiploria clivosa</i>	-	1/2 of valley width	4-10	>5	>24/cm	~4	-	Trabecular; continuous	Well-developed; discontinuous	Fused walls	Meandroid (sinuous)	-	Colony shape: May be encrusting Ridges: Rise sharply Ambulacral groove: Fine (if any) Taxonomy: Formerly known as <i>Diploria clivosa</i>
20	<i>Pseudodiploria strigosa</i>	-	1/2 of valley width	5-10	-	12-24/cm	>3	-	Well-developed; continuous	Continuous	Fused walls	Meandroid (sinuous)	<i>Platygyra daedalea</i>	Colony shape: May also be encrusting Ridges: Evenly rounded, occasionally with extremely fine groove (usually without any) Taxonomy: Formerly known as <i>Diploria strigosa</i>

Massive Star Corals

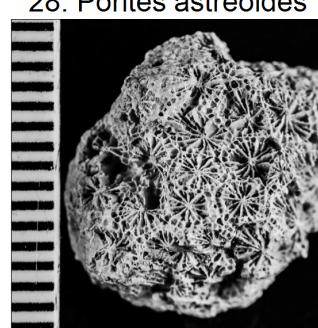
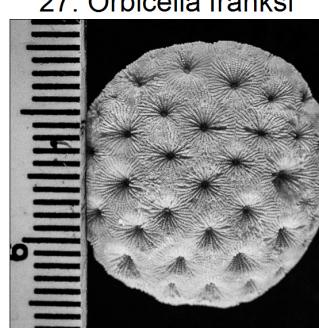
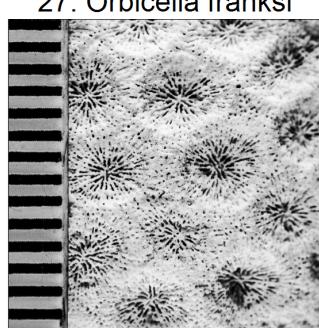
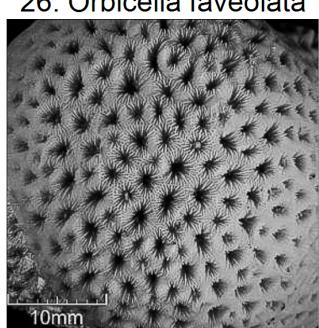
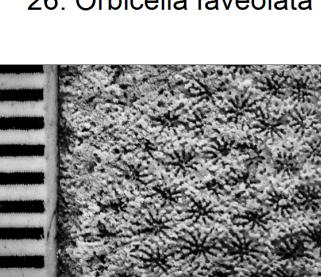
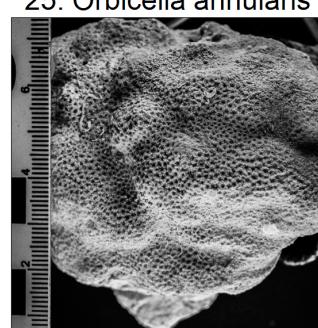
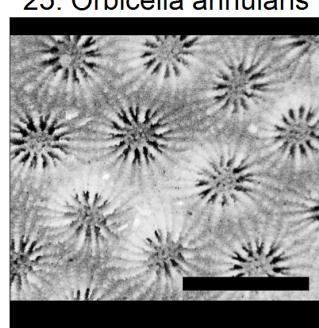
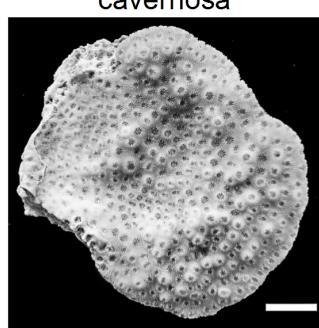
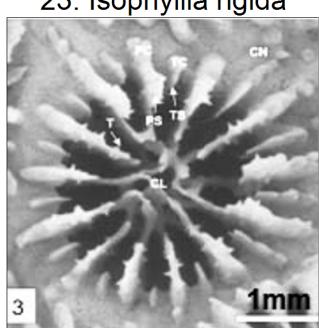
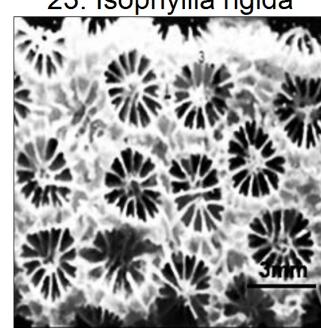
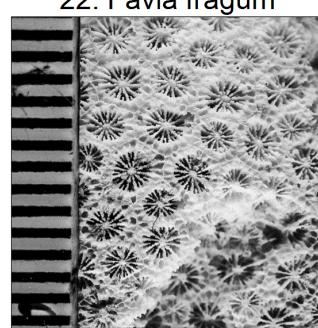
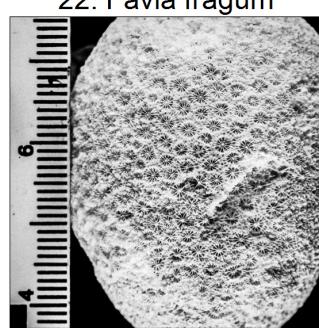
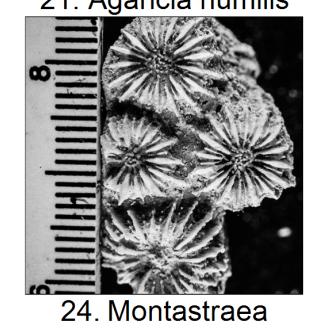
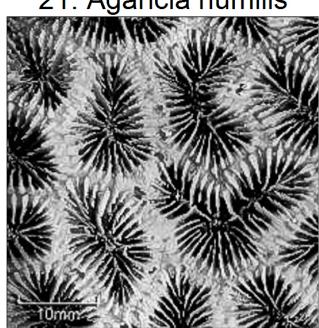
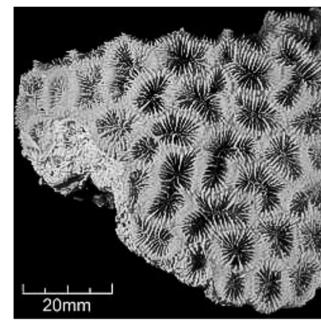
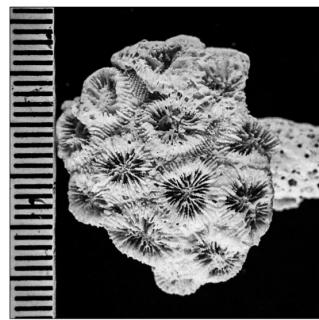
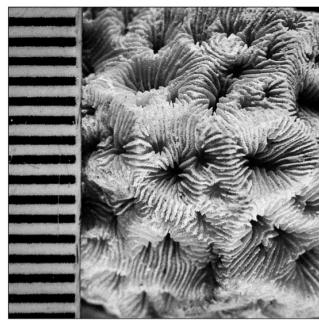
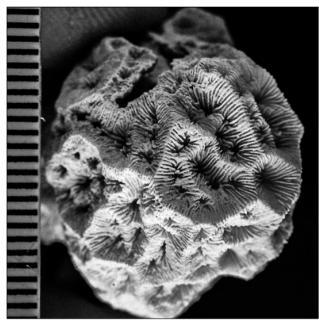
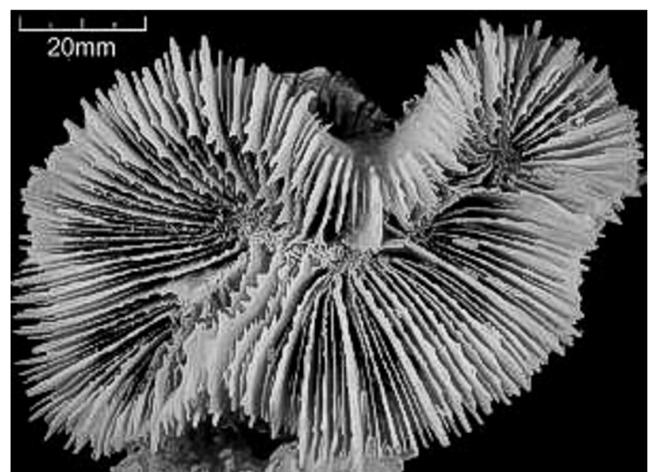


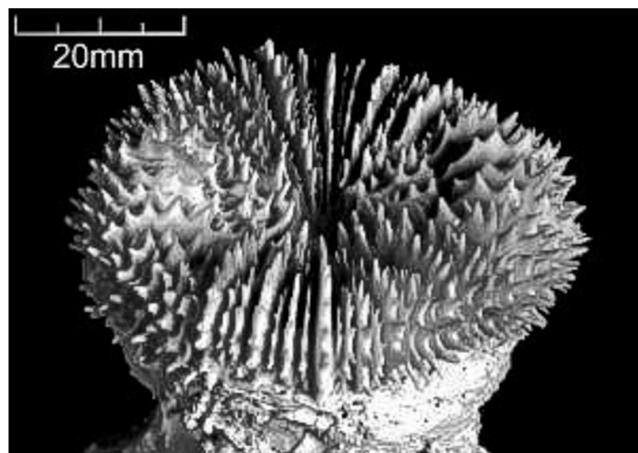
Figure 2:

Coral Morphology and Taxonomy																
	Species Name	Corallite Size (mm)	Corallite Wall Thickness	Columellae size (mm)	Valley width (mm)	No. of Centers per Series	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Coesnosteum	Surface	Colony Form	Similar Species	Comments/Notes
21	<i>Agaricia humilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<i>Agaricia agaricites</i>	-
22	<i>Favia fragum</i>	<5	-	1/2 of calice/valley width	N/A	1-3	12-24/cm	~4	-	Trabecular (well-developed); continuous	Well-developed; discontinuous	Narrow	-	Plocoid	<i>Dichocoenia</i>	Corallite: <2mm high; oval with protruding (<2mm high) Colony size: Usually <5cm
23	<i>Isophyllia rigida</i>	10-20	-	-	10-15	1-2	-	-	-	Trabecular (weak); discontinuous	-	-	-	Ceriod	-	Septa: Thin, fine pointed teeth Taxonomy: Formerly known as <i>Isophyllastrea rigida</i> (Veron 2000)
24	<i>Montastraea cavernosa</i>	5.5-7.5	-	-	N/A	N/A	36-48	-	Channel shape, elliptical perpendicular bases	Trabecular	-	5-9mm	-	Plocoid	-	Colony shape: May also be conical (sometimes than wide), plates or sheets
25	<i>Orbicella annularis</i>	2.1-2.6	Intermediate	1.02	N/A	N/A	24	3	Irregular, multi-directional with circular bases	Trabecular	-	0.6-1.2mm	Soft	Plocoid	<i>Favia stelligera</i> (corallite: 2.5mm), <i>Montastraea curta</i> (corallite: 5mm), <i>Montastraea salebrosa</i> (all of which do not occur in Panama)	Colony shape: May also be columbar or flat Colonites: Flush to colony surface of conical: Septal walls Septa: Alternating long and short Taxonomy: Formerly known as <i>Montastraea annularis</i>
26	<i>Orbicella faveolata</i>	2.2-2.7	thin	0.96	N/A	N/A	24	3	Irregular, multi-directional with circular bases	-	-	-	Soft with long edges like keel, sometimes wavy edges	Plocoid	-	Corallites: Very thin, partially parathecal formed by dissipments Taxonomy: Formerly known as <i>Montastraea faveolata</i>
27	<i>Orbicella franksii</i>	2.4-3.4	thick	1.13	N/A	N/A	24	3	Irregular, multi-directional with circular bases	-	-	-	Irregular	Plocoid	-	Corallites: Septotecal walls Taxonomy: Formerly known as <i>Montastraea franksii</i>
28	<i>Porites astreoides</i>	1.2-1.4	-	-	N/A	N/A	12	1	-	Trabecular (well-developed)	-	-	Lumpy	Subplocoid	-	Colony shape: Encrusting>massive lumpy>smooth/nodular Pali: >2
29	<i>Siderastrea radians</i>	2.5-3	-	-	N/A	N/A	30-40	3	-	Trabecular	-	-	-	Ceriod	-	Colony shape: Sometimes as free-living mobile (<2.5cm) or small flat discs Corallite: Deep, irregular; angular
30	<i>Siderastrea siderea</i>	<5	-	-	N/A	N/A	50-60	-	-	Trabecular	-	-	Smooth	Ceriod	<i>Siderastrea radians</i>	Colony shape: May also be encrusting Septa: Thicker compacted Corallites: Shallower and larger Siderastrea radians
31	<i>Solenastrea bournoni</i>	2-2.5	-	-	N/A	N/A	-	-	-	Trabecular	-	-	Smooth/slightly irregular	Plocoid	<i>Solenastrea hyades</i>	Colony shape: May also be hemispherical fomes Corallites: Protruding rims like blisters forming conous dark circles

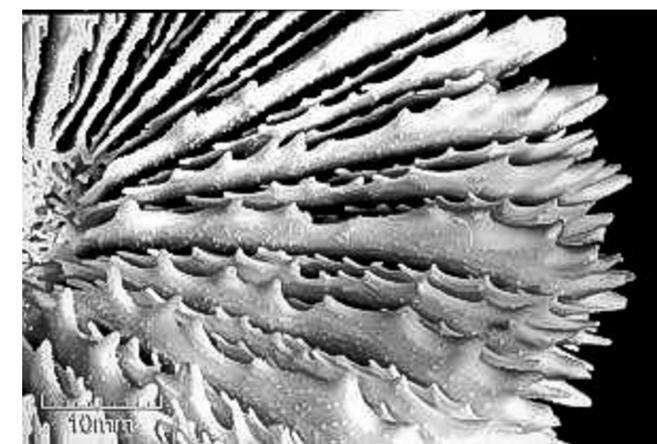
Solitary Corals



32. *Mussa angulosa*



33. *Scolymia cubensis*

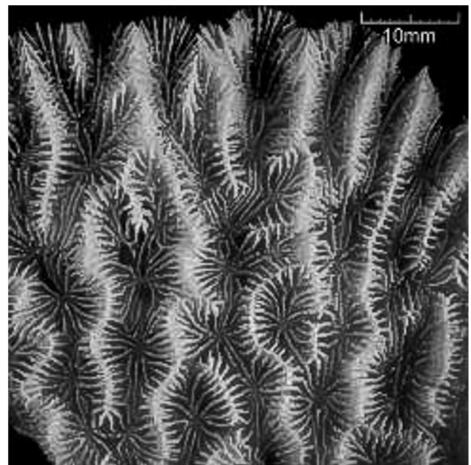


33. *Scolymia cubensis*

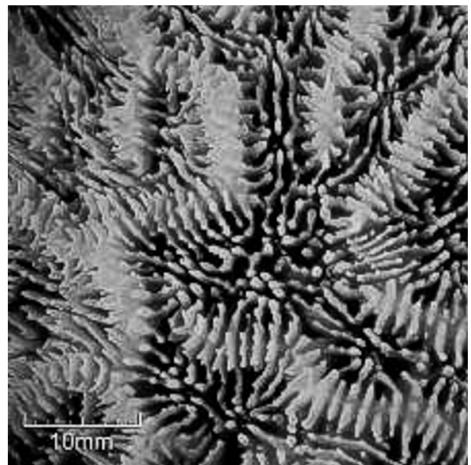
Figure 3:

Species Name	Corallite Size (mm)	Corallite Wall Thickness	Columellae size (mm)	Valley width (mm)	No. of Centers per Series	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Colony Form	Similar Species	Comments/Notes
32 <i>Mussa angulosa</i>	45-70	-	-	-	<5 (in flabellomeandroid)	6-9/cm	>4	-	Trabecular (well-developed); discontinuous	-	Phaceloid-Flabellomeandroid	<i>Scolymia cubensis</i>	Colony shape: May also be flat or hemispherical; branching>solitary Septa: Prominent tall sharp teeth; septal granules grow in more than one plane
33 <i>Scolymia cubensis</i>	<100	-	-	N/A	-	80	>5	-	Trabecular; discontinuous	Well-developed	Solitary	<i>Mussa angulosa</i> ; <i>Scolymia lacera</i> (positive ID requires magnified examination of septa)	Colony shape: Usually attached but may be free-living; tapered base; circular to oval Septa: Septal granules grow in a single plane Corallite: Center usually flat to convex, rarely concave

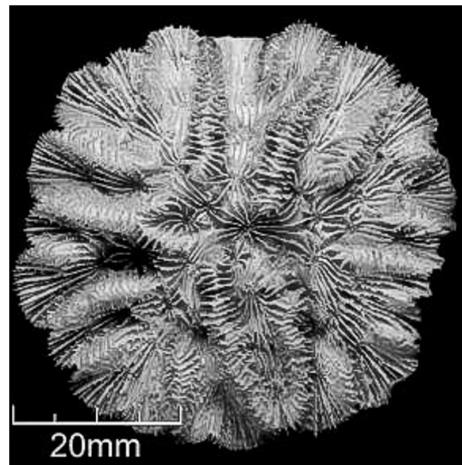
Thick Leafy Corals



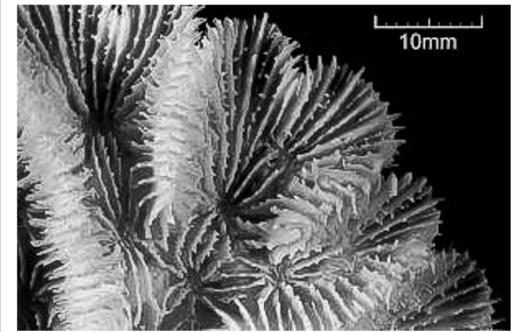
34. *Mycetophyllia ferox*



34. *Mycetophyllia ferox*



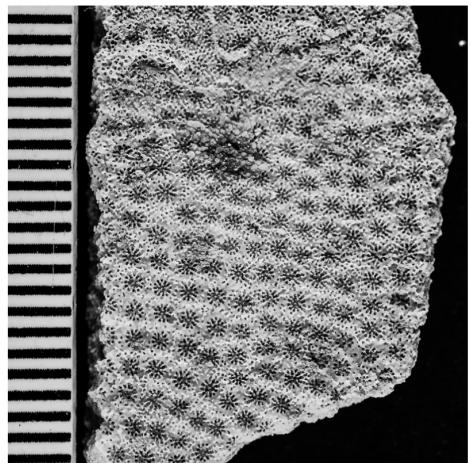
35. *Mycetophyllia lamarckiana*



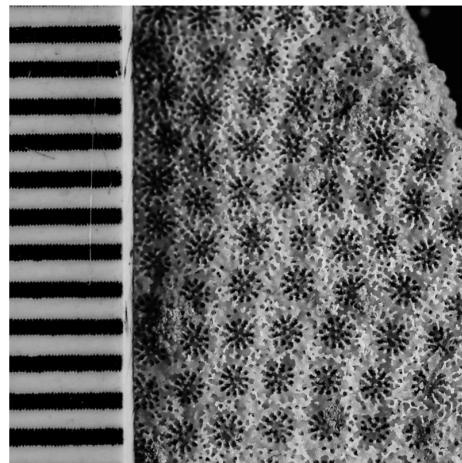
35. *Mycetophyllia lamarckiana*



36. *Mycetophyllia reesi*



37. *Porites colonensis*

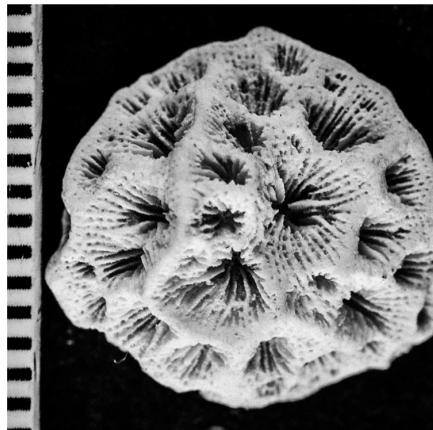


37. *Porites colonensis*

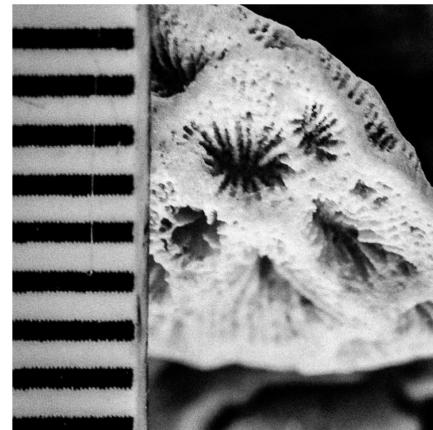
Figure 4:

Species Name	Corallite Size (mm)	Corallite Wall Thickness	Columnellae size (mm)	Valley width (mm)	No. of Centers per Series	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Coesnosteum	Colony Form	Similar Species	Comments/Notes
34 Mycetophyllia ferox	-	-	-	10-15	-	-	-	-	Trabecular (weak/absent); continuous	-	-	Meandroid	-	Colony shape: Thin; weakly attached Corallites: Centres in single rows Valleys: Slightly sinuous
35 Mycetophyllia lamarciana	-	-	-	10-15	-	-	-	-	Trabecular (weak/absent); continuous	-	-	Meandroid	-	Colony shape: Solid, rounded, often circular plates Valleys: Radiate from original point of growth; one row of mouths Corallite: Vaguely concentric to plate margins
36 Mycetophyllia reesi	-	-	-	10-15	-	-	-	-	Trabecular (weak/absent); continuous	-	-	Meandroid	Mycetophyllia lamarciana	Colony shape: Thin laminae (sometimes conforming to substrate shape); attached centrally/at the side Valley: Do not radiate Corallite: Centers parallel to plate margins
37 Porites colonensis	1.8-2	-	N/A	N/A	N/A	12	1	-	Absent	-	-	Subplocoid	-	Colony shape: Thin; sometimes in tiers; smooth or undulating surface Pali: 5-6

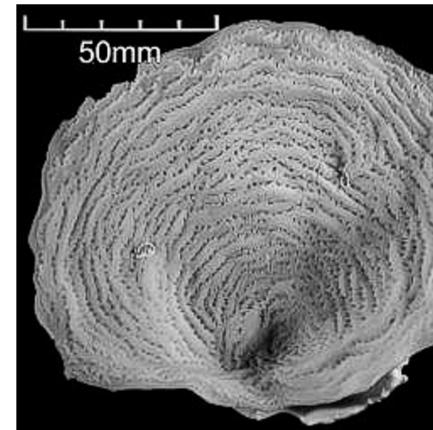
Thin Leafy Corals



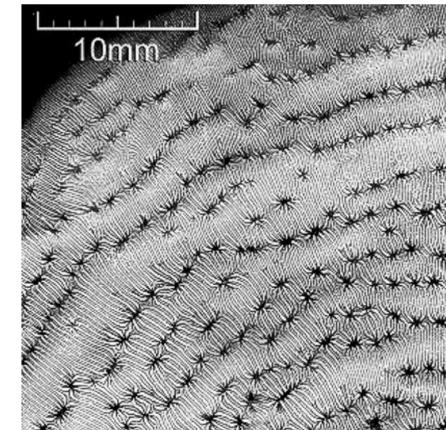
38. *Agaricia agaricites*



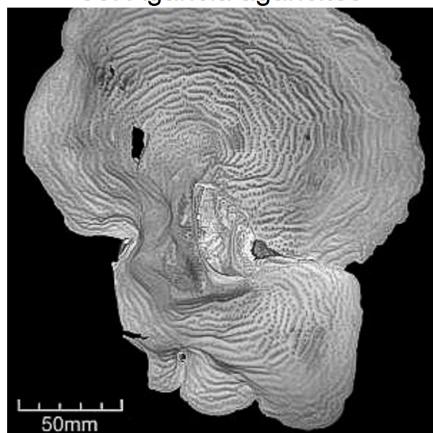
38. *Agaricia agaricites*



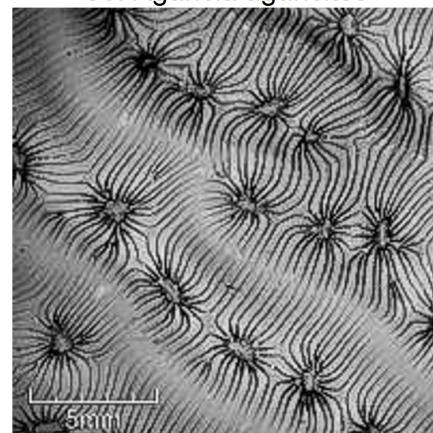
39. *Agaricia fragilis*



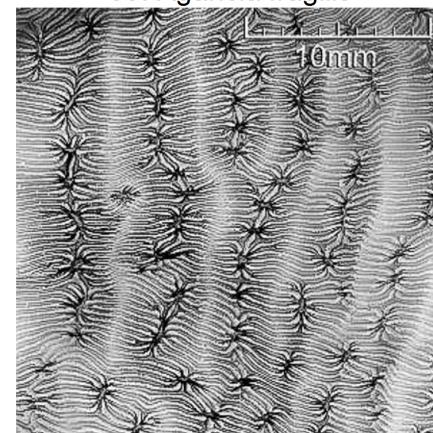
39. *Agaricia fragilis*



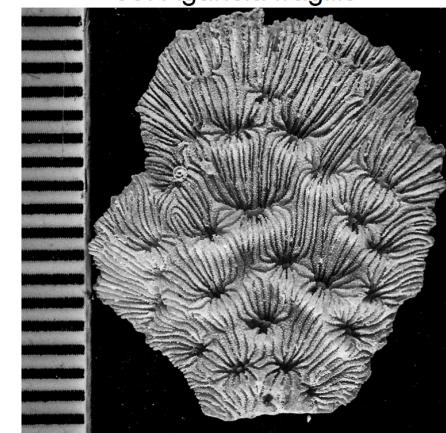
40. *Agaricia grahamae*



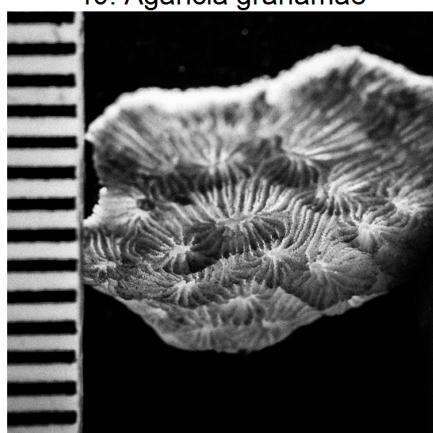
40. *Agaricia grahamae*



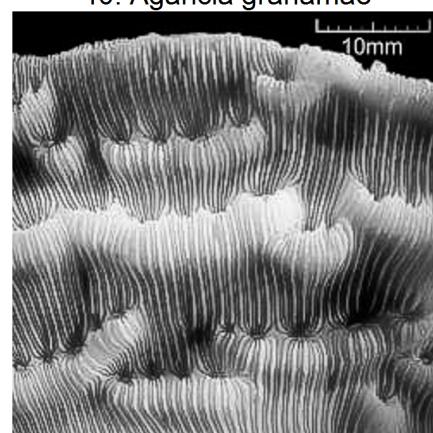
41. *Agaricia lamarcki*



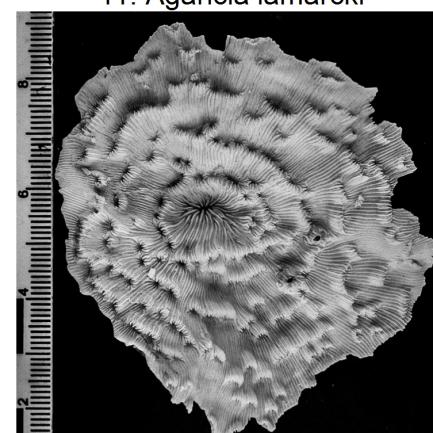
42. *Agaricia tenuifolia*



42. *Agaricia tenuifolia*



43. *Agaricia undata*



44. *Helioseris cucullata*



44. *Helioseris cucullata*

Figure 5:

Species Name	Corallite Size (mm)	Corallite Wall Thickness	Columnellae size (mm)	Valley width (mm)	No. of Centers per Series	Septa Number	Septal Cycle	Septal Teeth	Columella	Costae	Coesnosteum	Colony Form	Similar Species	Comments/Notes
34 Mycetophyllia ferox	-	-	-	10-15	-	-	-	-	Trabecular (weak/absent); continuous	-	-	Meandroid	-	Colony shape: Thin; weakly attached Corallites: Centres in single rows Valleys: Slightly sinuous
35 Mycetophyllia lamarckiana	-	-	-	10-15	-	-	-	-	Trabecular (weak/absent); continuous	-	-	Meandroid	-	Colony shape: Solid, rounded, often circular plates Valleys: Radiate from original point of growth; one row of mouths Corallite: Vaguely concentric to plate margins
36 Mycetophyllia reesi	-	-	-	10-15	-	-	-	-	Trabecular (weak/absent); continuous	-	-	Meandroid	Mycetophyllia lamarckiana	Colony shape: Thin laminae (sometimes conforming to substrate shape); attached centrally/at the side Valley: Do not radiate Corallite: Centers parallel to plate margins
37 Porites colonensis	1.8-2	-	N/A	N/A	N/A	12	1	-	Absent	-	-	Subplocoid	-	Colony shape: Thin; sometimes in tiers; smooth or undulating surface Pali: 5-6

Glossary of Coral Morphology

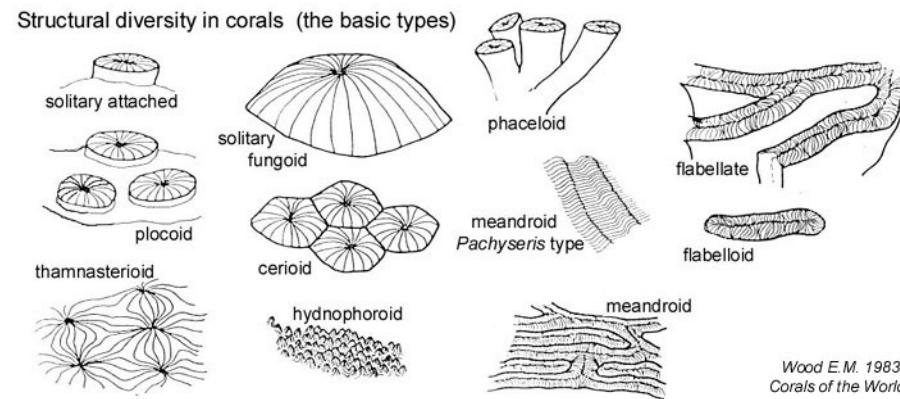


Figure 6:

Coral Morphology	Definitions
1 Calice	Cup-shaped depression on corallite surface
2 Centers per Series	Number of corallites in a series/valley
3 Coenosteum	Skeleton between corallites within a colony
4 Columella	Central axial structure within a corallite
5 Columella (Lamellar)	Plate-like, parallel to valley
6 Columella (Papillose)	Many small rods
7 Columella (Solid)	Central
8 Columella (Trabecular)	Formed by inner ends of septa
9 Coral Form	Overall shape of colony
10 Coral Form (Branching)	Flattened with calices on only one side
11 Coral Form (Massive)	Elongated projections
12 Coral Form (Platy)	Mound-shaped/Encrusting
13 Coral Shape	Corallite arrangement
14 Coral Shape (Ceriod)	Ceriod: Juxtaposed and even, with own walls (those of massive corals share common walls)
15 Coral Shape (Dendroid)	Dendroid: Branch from each other in dendritic pattern
16 Coral Shape (Fasciculate)	Fasciculate: Cylindrical but not in contact; may be dendroid (irregular branches) or phaceloid
17 Coral Shape (Flabellloid)	Flabellloid: Arranged in single series; adjacent valleys do not share ridges
18 Coral Shape (Flabello-meandroid a. k. a flabellate)	Flabello-meandroid a.k.a flabellate: Long meandering grows with common base; walls may be partially fused
19 Coral Shape (Hydnophoroid)	Hydnophoroid: Cone-shaped protuberances between corallites
20 Coral Shape (Meandroid)	Meandroid: Arranged in multiple series; adjacent valleys share ridges
21 Coral Shape (Phaceloid)	Phaceloid: Separated by voided space; those with distinct walls separated by coenosteum
22 Coral Shape (Plocoid)	Plocoid: Short-stalked and isolated, separated by coenosteum
23 Coral Shape (Solitary)	Solitary: Entire coral = one corallite
24 Coral Shape (Subplocoid)	Subplocoid: Sometimes separated by coenosteum, each with its own wall
25 Coral Shape (Thamnasterioid)	Thamnasterioid: Confluent septa of adjacent corallites, often twisted or sinuous
26 Corallite	Skeleton of solitary individual or an individual within a colony
27 Costae	Extension of septum beyond wall
28 Paliform lobes	Exsert protuberance of septum at center of corallite
29 Septa	Radially-arranged vertically partitions within a corallite (exsert, insert or even in regard to corallite wall)
30 Septa-costae	Structure that flows between corallites when corallite walls are indistinct
31 Septal cycle	No. of types of septa with difference lengths and thickness
32 Septal granules	Small elevation on septa or septa teeth
33 Septal spacing	Spacing between septa/No. of septa per unit distance
34 Septal teeth	Sharp projections lining the upper margins of septa
35 Synapticulum	Conical or cylindrical supporting process extending between septa
36 Valley	A series of corallites
37 Wall	Vertical structure enclosing corallite

List of References

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