

The Coral Compactus:
WESTERN AUSTRALIA



Hard Coral Genus Identification Guide

Version 2

Zoe Richards



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Australian Government
Department of the Environment and Energy



Australian Biological Resources Study

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Photographs by Zoe Richards unless otherwise stated

The intention of this identification guide is to provide coral identification material to support research, monitoring and biodiversity conservation in Western Australia.

This guide provides an introduction to the key characteristics required to identify shallow-water, reef building corals to the genus level based on the revised scleractinian coral classification system as of May 2018.

This manual should be used in conjunction with other taxonomic sources (see reference list) and with reference to the World Register of Marine Species (www.marinespecies.org) and the World List of Scleractinia (<http://www.marinespecies.org/scleractinia>).

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Cover: *Echinopora ashmorensis*
photographed at Ashmore Reef



Hermatypic Coral Genera of Western Australia

Revised classification as of May 2018

Family Acroporiidae

(Includes *Alveopora* which was previously in Poritidae)

Genera *Acropora*, *Alveopora*, *Anacropora*, *Astreopora*, *Isopora*, *Montipora*

Family Pocilloporidae

Genera *Pocillopora*, *Seriatopora*, *Stylophora*, *Madracis*

Family Astrocoeniidae

Genus *Stylocoeniella*

Family Lobophylliidae

(New family combination - previously Mussidae)

Genera

Acanthastrea

Australophyllia (Previously *Symphyllia wilsoni*)

Cynarina

Echinophyllia

Homophyllia (Previously *Scolymia australis* & *Acanthastrea bowerbanki*)

Lobophyllia (Includes all *Symphyllia* spp; *Scolymia vitiensis* and *Parascolymia rowleyensis*)

Micromussa (Includes *Montastraea multipunctata*)

Moseleya

Oxypora

Family Fungiidae

Genera

Cantharellus, *Ctenactis*

Cycloseris

Danafungia

Fungia

Halomitra

Heliofungia

Herpolitha

Lithophyllon

Lobactis

Pleuraetis

Podobacia

Polyphyllia

Sandalolitha

Family Coscinaraeidae

(New family - previously part of Siderastreidae)

Genus *Coscinaraea*

Family Agariciidae

Genera

Coeloseris

Gardinoseris

Leptoseris

Pavona

Family Psammocoridae

(New family combination - previously part of Siderastreidae)

Genus *Psammocora*

Family Siderastreidae

Genus *Pseudosiderastrea*

Family Euphylliidae

(Previously members of Families Oculinidae, Meandrinidae)

Genera

Catalaphyllia

Euphyllia

Galaxea

Montigyra

Family Dendrophyllidae

Genera

Balanophyllia, *Caryophyllia*

Duncanopsammia

Heteropsammia

Rhizopsammia

Tubastraea

Turbinaria

Family Merulinidae

(Compilation of genera from Faviidae, Merulinidae, Trachyphylliidae, Pectiniidae)

Genera

Astrea

(previously *Montastraea annuligera*, *M. curta*)

Australogyra

Caulastraea

Coelastrea

(previously *Goniastrea aspera* & *G. palauensis*)

Cyphastrea

Dipsastraea

(previously all Indo-Pacific *Favia* spp. and *Barabattoia amicorum*, *B. laddi*)

Echinopora

Favites

(includes *Favia rotundata*, *Montastraea colemani*, *M. magnistellata*, *M. valenciennesi*)

Goniastrea

Hydnophora

Leptoria

Merulina

(includes *Paraclavaria triangularis*)

Mycedium

Oulophyllia

Paragoniastrea

(previously *Goniastrea australiensis*, *Favites russelli*)

Paramontastraea

(previously *Montastrea salebrosa*)

Pectinia

Platygyra

Scapophyllia

Trachyphyllia

Family Diploastreidae

(New family combination – previously member of Faviidae) **Genus** *Diploastrea*

Family Poritidae

Genera

Bernardopora

(previously *Goniopora stutchburyi*)

Goniopora, *Porites*

Scleractinia *Insertae sedis*

(Previously members of families Agariciidae, Euphyllidae, Faviidae, Meandrinidae)

Genera

Blastomussa, *Leptastrea*, *Oulastrea*,

Pachyseris, *Plerogyra*, *Physogyra*,

Plesiastrea

Family Acroporidae

Genus *Acropora*

- single **axial polyp** on the branch tip
- range of morphologies
- many radial (lateral) corallites



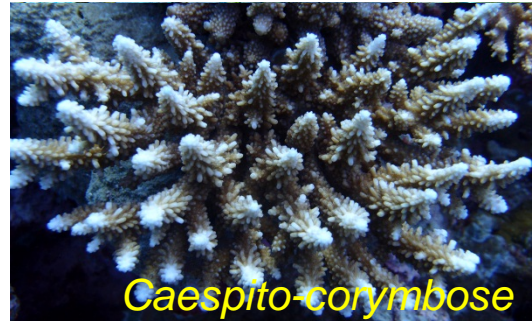
Mike Emslie



Branching Table



Corymbose



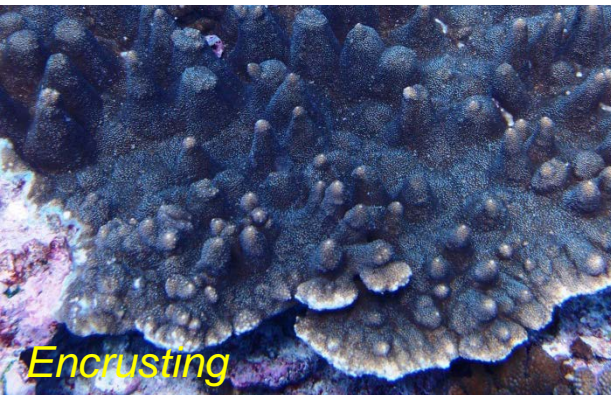
Caespito-corymbose



Plate



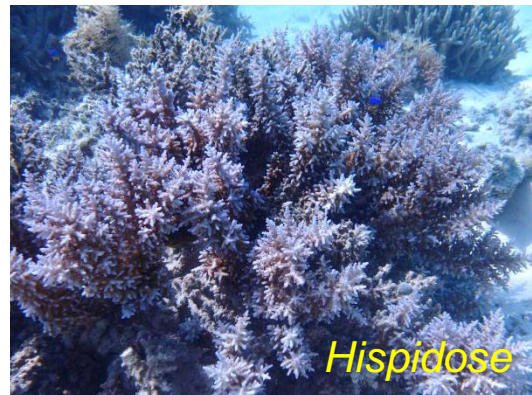
Branching



Encrusting



Hispidose



Hispidose

Genus *Isopora*

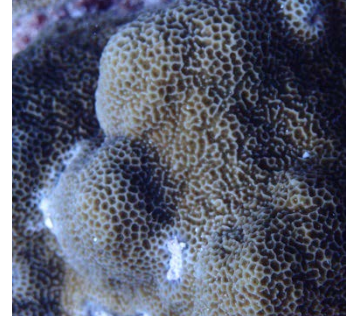
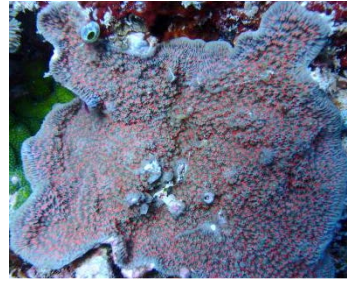
- multiple **axial polyps** on tip of branch
- thick club-like branches or
- robust cylindrical branches ~ 1cm thick



Family Acroporidae

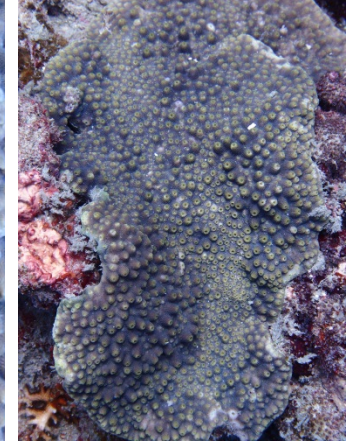
Genus *Montipora*

- corallites tiny <1mm
- various morphologies:
 - ✓ laminar with ridges
 - ✓ encrusting plates with ridges
 - ✓ laminar forming whorls
 - ✓ fine branches
 - ✓ encrusting with columns or branches
 - ✓ massive or thick plates
 - ✓ submassive with irregular upgrowths



Genus *Astreopora*

- massive, laminar or encrusting
- large **open polyps** (resembling “jet engines”)
- bumpy (granulated) coenosteum



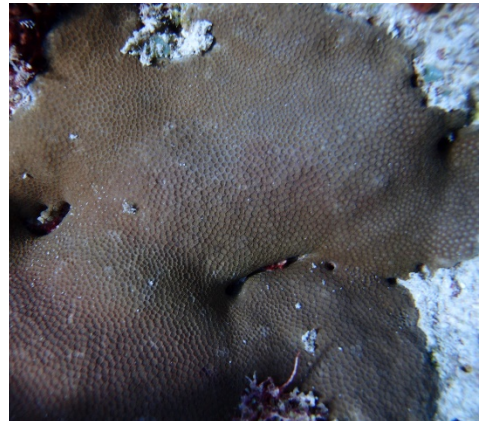
Genus *Anacropora*

- irregular branching colonies
- slender branches less than 10mm thick with blunt ends
- no axial polyp
- often grows in soft substrates



Genus *Alveopora*

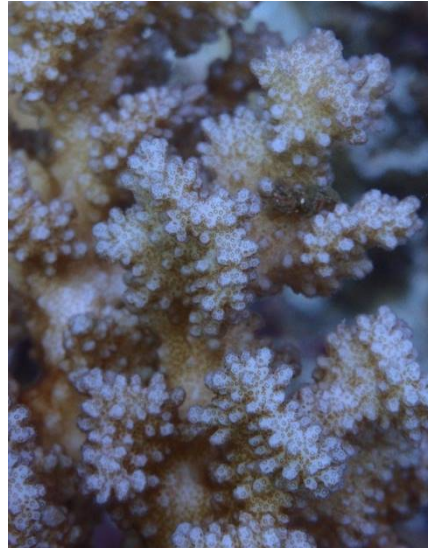
- columnar or massive
- corallites polygonal
- **12 tentacles** with long stalks
- tentacles extended during the day
- fragile skeleton with porous corallite walls



Family Pocilloporidae

Genus *Pocillopora*

- branching colony morphology
- very small corallites
- colony surface bumpy (bumps are called **verrucae**)
- corallites on and between verrucae



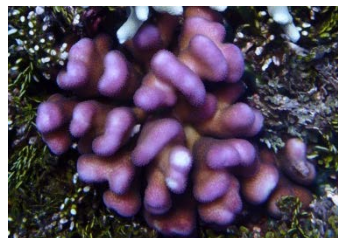
Genus *Seriatopora*

- thin branches with pointy or rounded tips
- **corallites in rows** down branch
- upper corallite wall developed as a hood
- branches may be highly fused



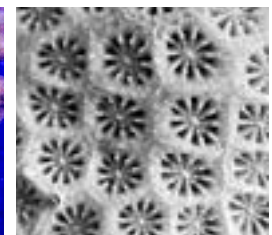
Genus *Stylophora*

- thick branches, wide at the tip
- rod (called style) in centre of corallite
- **spiny hood** (upper wall of corallite wall more developed)



Genus *Madracis*

- laminar, columnar or encrusting.
- tightly packed angular corallites
- **10 septa fuse with the columellae**
- fine spinules on coenosteum



Family Astrocoeniidae

Genus *Stylocoeniella*

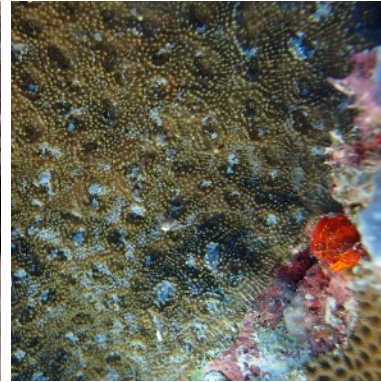
- small encrusting or columnar colonies
- obvious **coenosteum styles** (vertical pinnule adjacent to corallite)
- may be confused with *Montipora*



Family Lobophyllidae

Genus *Acanthastrea*

- massive or encrusting colonies
- often multi-coloured
- **large monocentric fleshy** corallites with thick walls
- corallites are spiky due to large septal teeth
- can resemble *Favites*



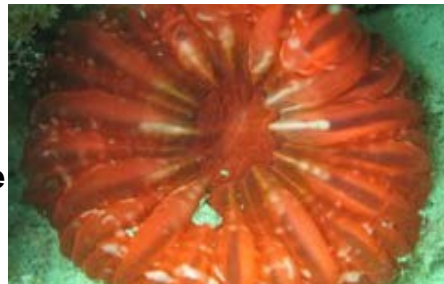
Genus *Australophyllia*

- massive colonies with large
- **irregular valleys, groove on top of wall**
- large fleshy mantle similar to *Lobophyllia* but smaller septal teeth
- temperate water specialist



Genus *Cynarina*

- solitary circular polyp with central attachment
- **large fleshy translucent mantle**
- large rounded teeth on the septa
- teeth are visible through mantle



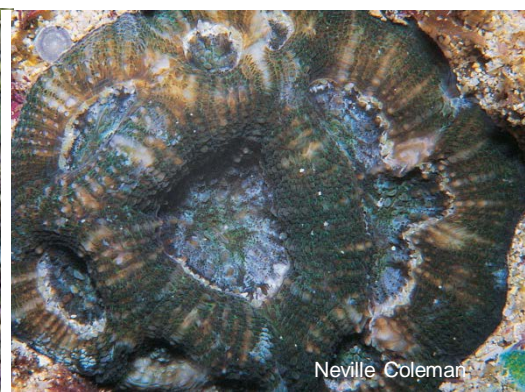
Genus *Echinophyllia*

- encrusting or laminae colonies
- **large obvious and unevenly sized corallites**
- sometimes a large central corallite
- septa-costae dentate



Genus *Homophyllia*

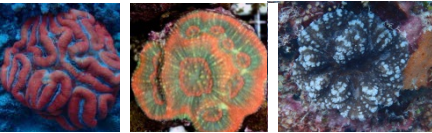
- solitary saucer shaped polyp sometimes with multiple centres
- **fleshy mantle**
- often occurs in temperate zones



Family Lobophyllidae

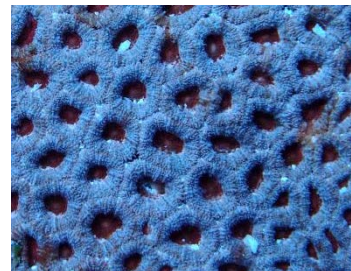
Genus *Lobophyllia*

- colonies phaceloid, flabello-meandroid or meandroid
- **with or without gaps between valleys**
- colonies can be very large
- individual corallites can be monocentric or occur in long valleys
- spiky due to large septal teeth
- fleshy mantle which can fully retract when colonies are exposed at low tide



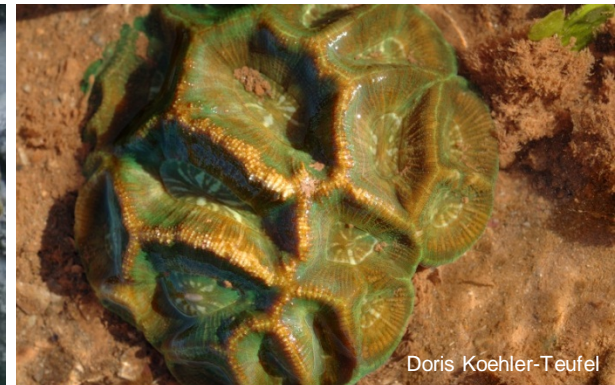
Genus *Micromussa*

- small (<1cm) angular corallites
- ceroid
- thick fleshy mantle often brightly coloured



Genus *Moseleya*

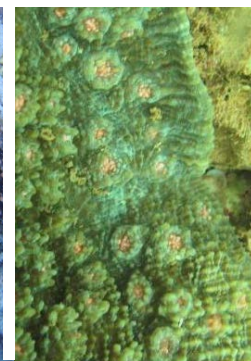
- large (>4cm) angular corallites
- ceroid
- often large central corallite
- common in intertidal and high silt habitats



Doris Koehler-Teufel

Genus *Oxypora*

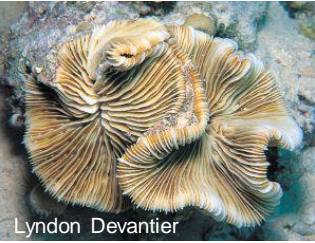
- thin encrusting or laminate colonies
- slight costal ridge
- toothed costae
- **slits in skeleton** visible when tissue is removed and held up to the light



Family Fungiidae

Genus *Cantharellus*

- solitary or colonial
- cup-shaped with wavy margins



Lyndon Devantier

Genus *Ctenactis*

- elongate, round ends, robust, large teeth



Genus *Cycloseris*

- small circular polyps, may have raised mouth



Genus *Danafungia*

- corolla circular
- very large septal teeth



Genus *Fungia*

- corolla solitary, circular or elongate
- septal teeth pointed



Genus *Halomitra*

- dome shaped
- tentacular lobes



Genus *Heliofungia*

- exert tentacles resembling *Euphyllia*



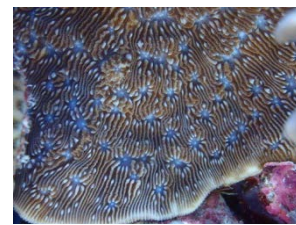
Genus *Herpolitha*

- elongate - X, Y or T-shaped
- mouths within or outside axial furrow



Genus *Lithophyllon*

- free-living or attached
- tentacular lobes



Genus *Lobactis*

- elongate colonies
- exert tentacular lobes



Genus *Pleuractis*

- elongate colonies
- fine straight costae



Genus *Podobacia*

- attached, encrusting or laminate
- large Immersed corallites inclined to colony margin



Genus *Polyphyllia*

- corolla elongate - X, Y or T-shaped
- mouths all over the colony surface
- septa forming petal shape



Genus *Sandalolitha*

- heavy dome-shaped colonies
- dentate costae



Family Euphyllidae

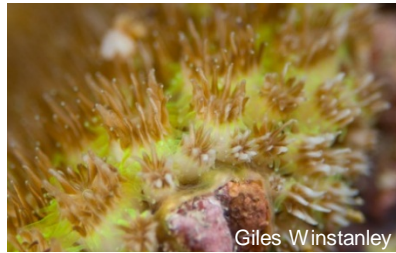
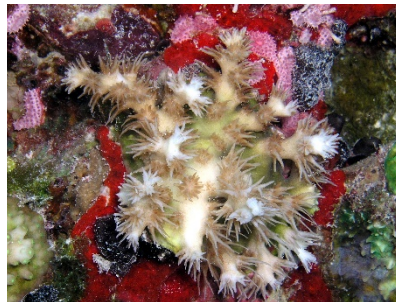
Genus *Euphyllia*

- colonies flabello-meandroid or phaceloid
- small gaps between exsert septa
- polyps have long tentacles with rounded or anchor-shaped tips that are extended day and night



Genus *Galaxea*

- **long tubular spikey corallites**
- encrusting, massive or columnar
- corallites exsert, very exsert septa
- coenosteum **blistered**



Giles Winstanley

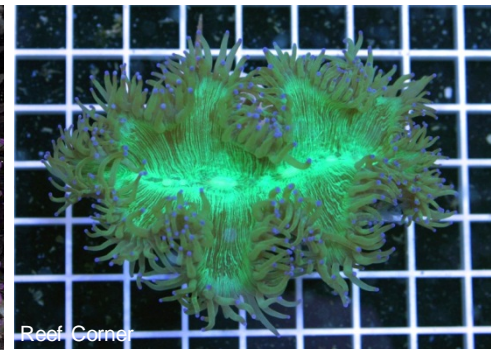


Genus *Catalaphyllia*

- flabello-meandroid colonies
- even smooth septa
- polyps have long tubular tentacles with **distinctive pink tips**
- the colony surface has a striped pattern



Ed Lovell



Reef Corner



Family Agariciidae

Genus *Coeloseris*

- massive or submassive colonies
- corallites ceroid (walls touching)
- corallites 5-10mm diameter
- deeply immersed
- septo-costae join at the top of the wall and may form a **granule**



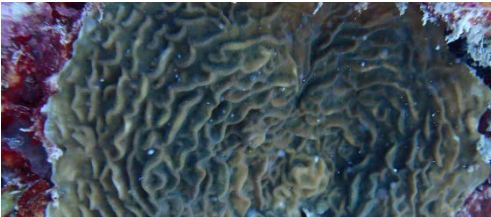
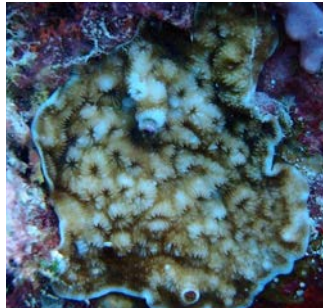
Genus *Gardinoseris*

- submassive, encrusting colonies
- corallites ceroid
- acute ridges between corallites
- fine and even septa
- similar to *Pavona*



Genus *Leptoseris*

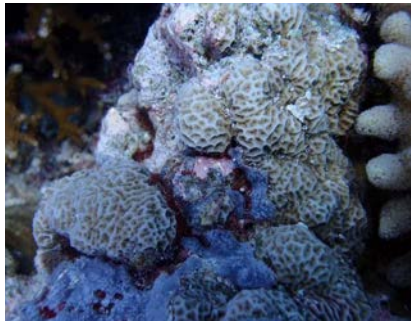
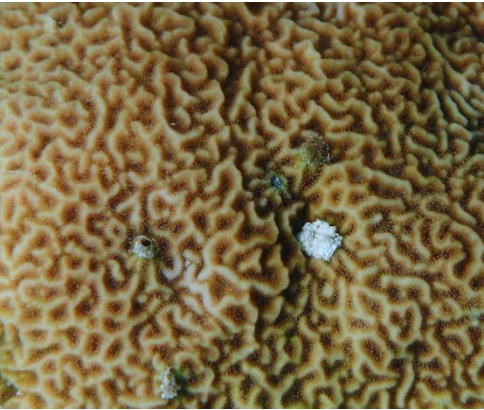
- encrusting or plates often growing in shaded areas
- widely spaced corallites that may be inclined to the margin
- corallites can cluster within pockets (raised rounded walls)
- similar to *Pavona*



Family Agariciidae

Genus *Pavona*

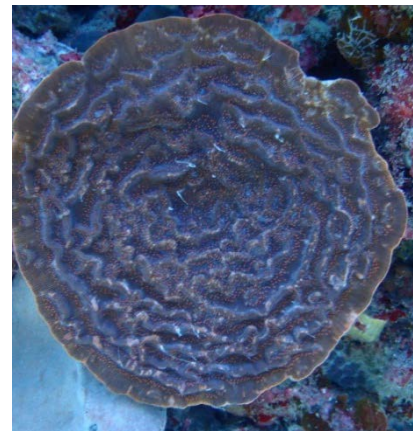
- massive, encrusting, columnar or foliaceous
- can also have bifacial leafy fronds
- limited development of corallite walls



Family Coscinaridae

Genus *Coscinaraea*

- massive, columnar or flat plates
- corallites can be aligned between raised ridges that occur parallel to the colony margin
- well developed columellae
- common on temperate reefs
- similar to *Leptoseris*



Family Psammocoridae

Genus *Psammocora*

- massive, columnar, branching, laminar or encrusting
- corallites small, septa fuse to form a **flower** pattern
- coenosteum is granular



Family Siderastreidae

Genus *Pseudosiderastrea*

- small massive or encrusting colonies
- corallites ceroid (shared walls) and shallow
- corallites >10mm diameter
- **corallite walls are distinctively white**
- similar to *Leptastrea*



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Family Diploastreidae

Genus *Diploastrea*

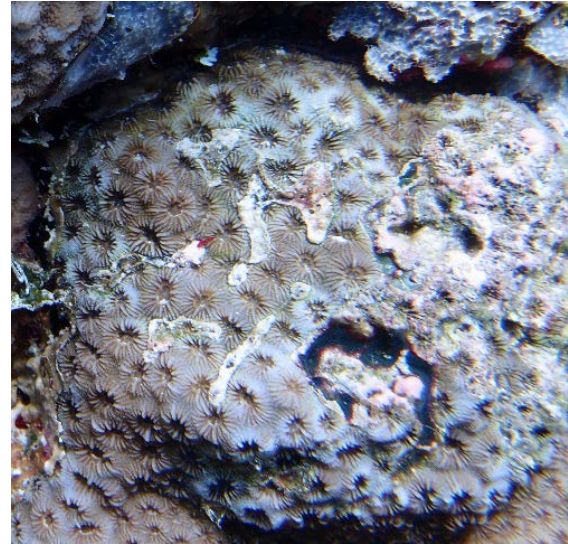
- massive to encrusting
- forms very **large** colonies with large round corallites
- even polyps tightly packed
- thick septa
- extratentacular budding



Family Merulinidae

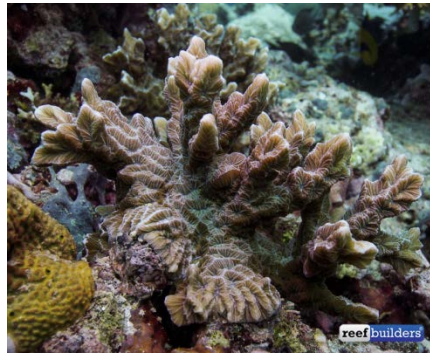
Genus *Astrea*

- massive colonies
- **round plocoid corallites** (separate walls)
- paliform lobes may be developed
- septa have fine teeth
- budding is extratentacular



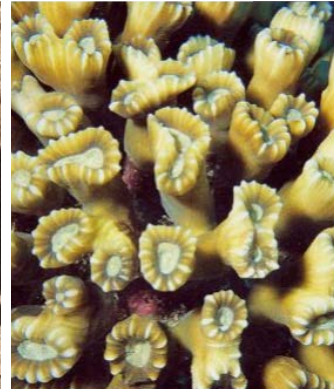
Genus *Australogyra*

- **robust branching colonies**
- branches often fuse
- corallites can form short valleys
- no columellae
- tentacles rarely extend during the day
- resembles *Favites*



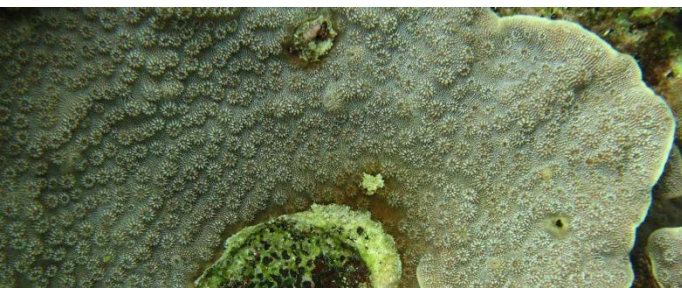
Genus *Caulastrea*

- **phaceloid colonies**
- small corallites 1-2 cm diameter
- fine septa, occasional ly exert



Genus *Echinopora*

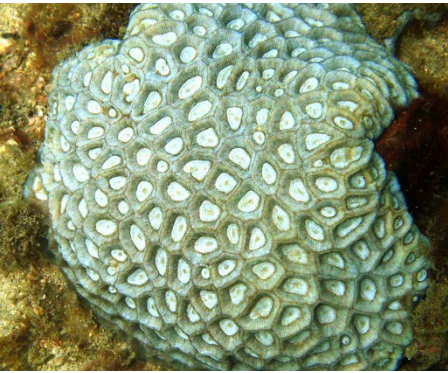
- massive, laminar, encrusting or branching
- corallites have own walls
- septa exsert and dentate
- **spines on coenosteum**
- corallites are similar to *Cyphastrea* but larger >10mm



Family Merulinidae

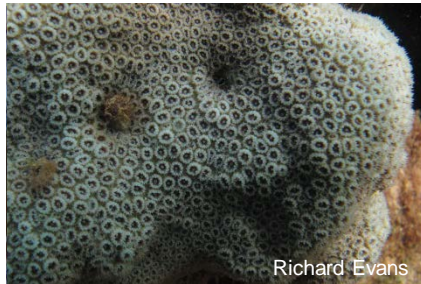
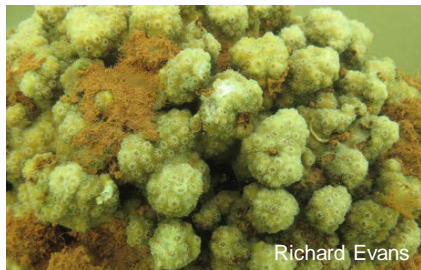
Genus *Coelastrea*

- massive, encrusting
- corallites are ceroid
- septa have fine teeth
- obvious **paliform lobes**
- budding intratentacular



Genus *Cyphastrea*

- massive, encrusting or branching
- corallites small (<5mm), round and plocoid (own walls)
- colony surface granulated
- paliform lobes poorly developed



Genus *Dipsastraea*

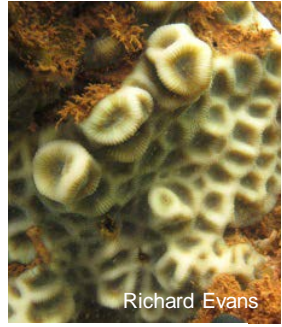
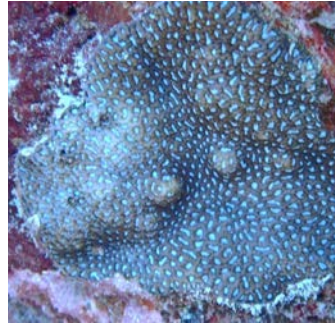
- colonies massive or encrusting
- rounded corallites 3-20mm diameter, may be exert
- corallites have single mouth and **own wall**
- septa have fine teeth
- paliform lobes usually present
- budding intratentacular or extratentacular



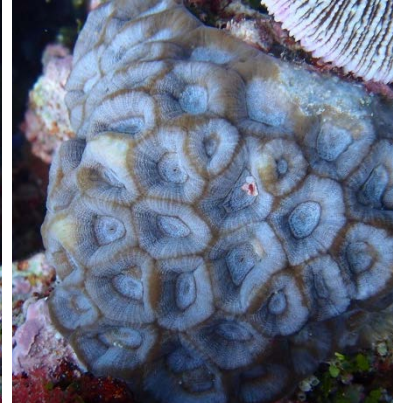
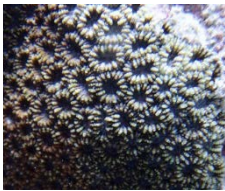
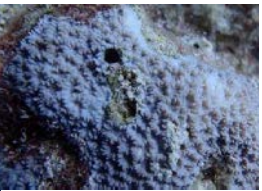
Family Merulinidae

Genus *Favites*

- massive or encrusting
- corallites 6-20mm diameter, angular or round
- corallites monocentric and **often share walls** or **groove and tubercle** formation separating corallites
- paliform lobe poorly developed
- septal teeth can be large
- budding intratentacular or extratentacular



Richard Evans



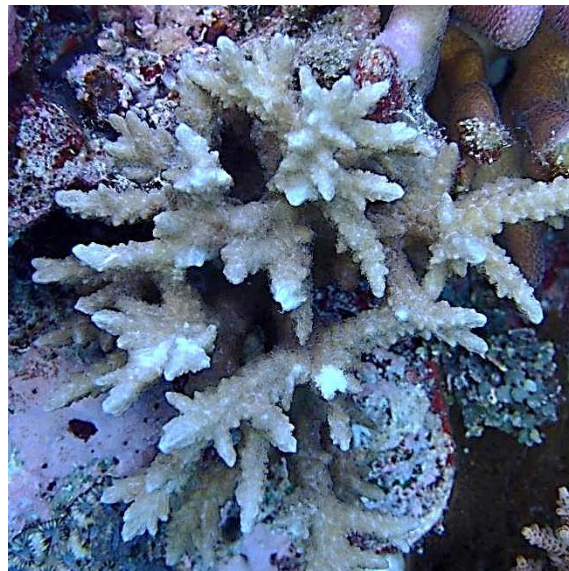
Genus *Goniastrea*

- massive, encrusting
- corallites are neatly ceroid or meandroid
- septa have fine teeth
- obvious **paliform lobes**
- budding intratentacular



Genus *Hydnophora*

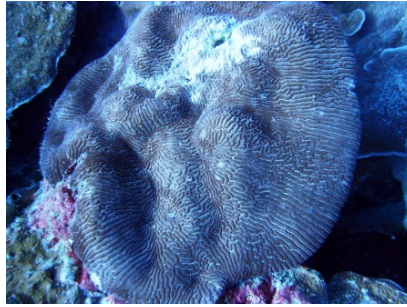
- massive, encrusting or branching
- highly fused corallite structures (**hydnochores**) **where** septa converge to form a pyramid
- may be hidden by tentacles



Family Merulinidae

Genus *Leptoria*

- massive, meandroid
- columella a series of **vertical plates**
- valley walls thick
- septa neat



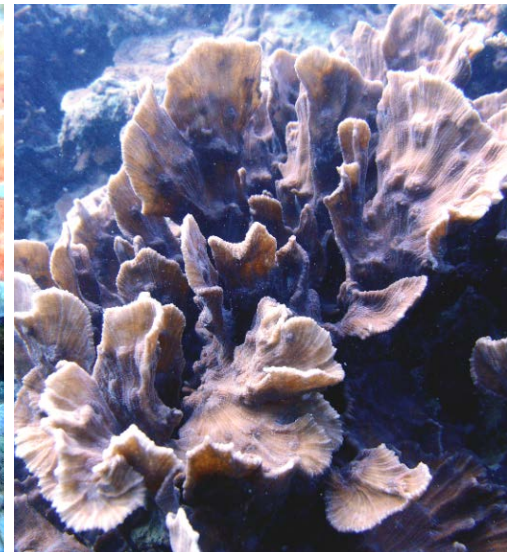
Genus *Platygyra*

- massive
- corallites in rows (**meandroid**)
- thin valley walls
- columellae continuous tangle along valley floor



Genus *Pectinia*

- large fleshy colourful polyps
- lightly calcified and fragile colonies
- corallite walls absent
- septa dentate
- subarborescent or laminar with **vertical spires**



Genus *Oulophyllia*

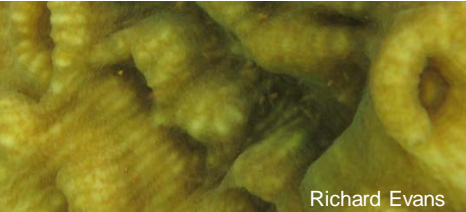
- massive or thick encrusting plates
- corallites monocentric or in rows (**meandroid**)
- large deep valleys >2cm wide
- large septal teeth
- distinctive colonies



Family Merulinidae

Genus *Mycedium*

- colonies laminar, can form whorls
- corallites exert, **inclined to margin**
- no pits in skeleton held up to the light



Richard Evans



Genus *Merulina*

- laminar with upright branches
- **valleys spread like a fan**



Genus *Paramontastraea*

- massive colonies
- **exert plocoid corallites**
- **granulated septo-costae**
- paliform crown



Charile Veron

Genus *Paragoniastrea*

- massive, encrusting
- corallites are fully or partly meandroid
- septa have fine teeth
- obvious **paliform lobes**
- budding intratentacular



Genus *Trachyphyllia*

- **flabello-meandroid**
- common in intertidal areas and silty habitats

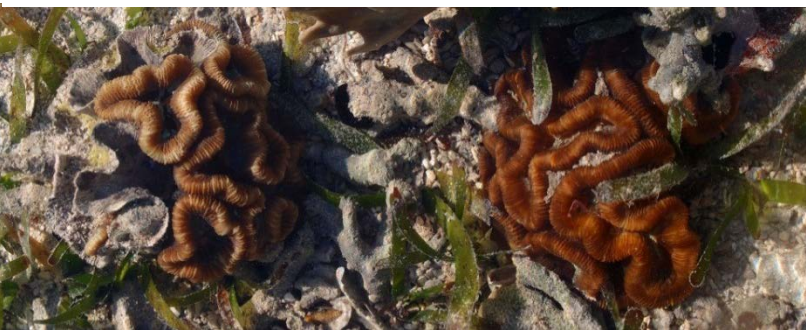


Genus *Scapophyllia*

- **columnar** with encrusting or laminar margins
- corallites in meandroid valleys
- thick septa



Ed Lovell



Family Poritidae

Genus *Porites*

- massive, branching or laminar colonies
- **corallites tiny**
- colony surface smooth
- plates can resemble *Montipora*
- arrangement of corallite structure used to distinguish between species



Giles Winstanley



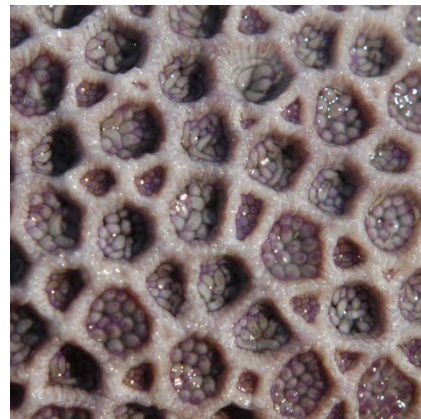
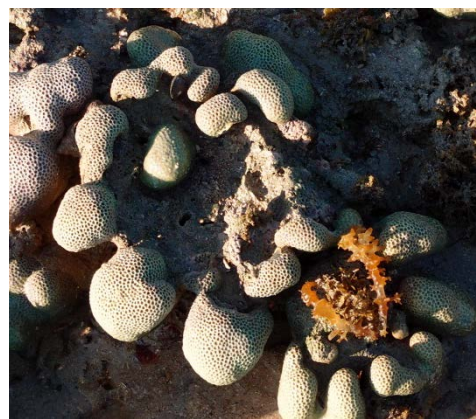
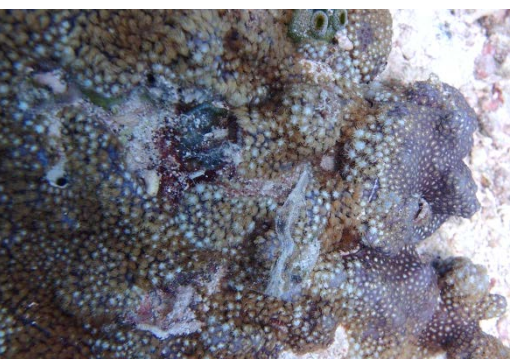
Genus *Goniopora*

- columnar, massive or encrusting
- corallites polygonal
- **24 tentacles** with long stalks
- tentacles extended during the day



Genus *Bernardpora*

- submassive to encrusting
- polyps (24 tentacles) with short stalks
- shallow corallites



Family Dendrophyllidae

Genus *Turbinaria*

- plates, foliose or encrusting
- corallites are 1-5mm diameter immersed or exsert
- coenosteum is smooth
- well developed columellae



Giles Winstanley



Genus *Duncanopsammia*

- distinctive tubular corallites
- tentacles often extended during the day
- corallites >2.5cm diameter



Richard Evans



Genus *Heteropsammia*

- free-living with keeled base that anchors into soft substrate
- one or a few corallites >2.5cm diameter



reef builders

Genus *Tubastraea*

- distinctive dark green-black branching colonies
- large tubular corallites
- can grow >1m in height
- azooxanthellate



Cairns & Kitahara

Genus *Caryophyllia*

- solitary often found in deep water but also shallow
- attached or embedded in soft substrate
- corallites > 2cm diameter
- zooxanthellate



Scleractinia *Insertae sedis*

(aka phylogenetic relationships unresolved)

Genus *Blastomussa*

- phaceloid colonies
- weakly developed columellae
- fleshy mantle



Genus *Oulastrea*

- encrusting colonies
- corallites >15mm diameter
- characteristic black
- colonies with white septa



Genus *Leptastrea*

- submassive or encrusting colonies
- corallites ceriod, angular and shallow
- poorly developed columellae
- no paliform lobes



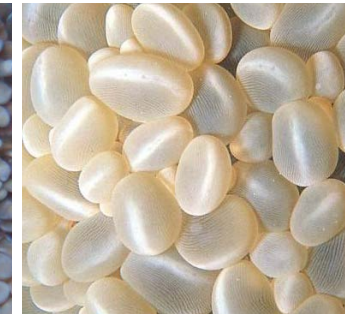
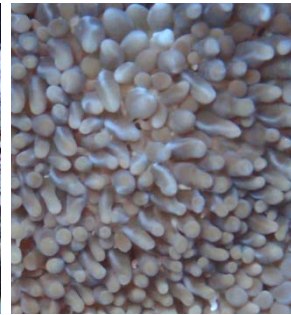
Genus *Pachyseris*

- colonies laminar to encrusting
- may form broad upright columns
- corallites are indistinct
- **obvious ridges** form parallel to the colony margin



Genus *Physogyra*

- meandroid
- septa very exsert
- corallite walls blistered
- bubble-like **vesicles** cover septa
- long tentacles can cover vesicles



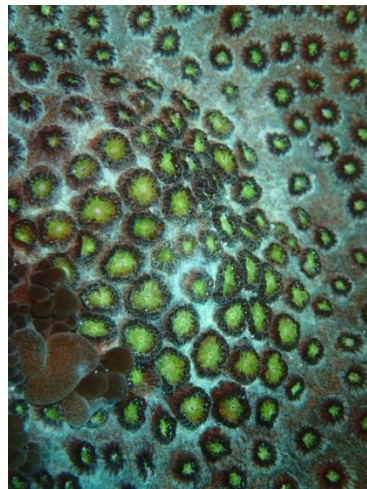
Genus *Plerogyra*

- colonies flabello-meandroid with small gaps between septa exsert
- polyps have long tentacles extended day and night



Genus *Plesiastrea*

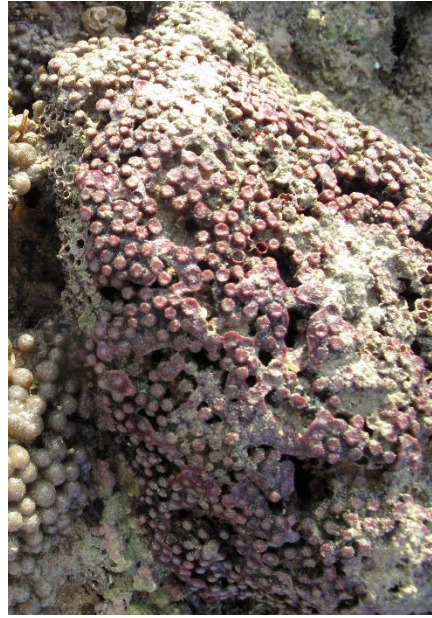
- colonies massive or encrusting usually cryptic
- corallites **small** (<1cm), round and exsert
- distinct paliform lobe
- extratentacular budding
- very common on temperate reefs



Non-scleractinian 'hard' corals

Genus *Tubipora*

- massive colonies
- corallum formed by a series of **tubes ~ 3mm wide**
- polyps have eight feather-like tentacles
- skeleton is bright red
- can be common in the intertidal zone
- member of the Alcyonacea (soft coral)
- common name organ-pipe coral



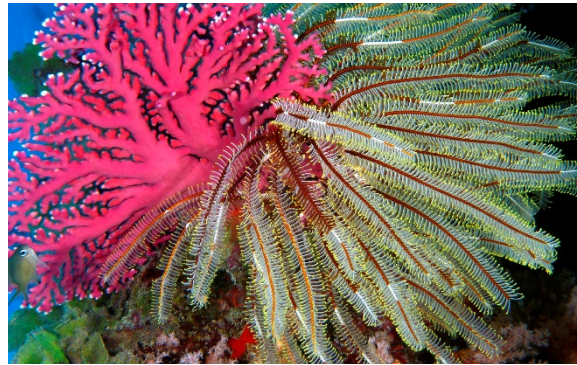
Genus *Millepora*

- branching, columnar, submassive or encrusting tiny polyps visible as minute pores
- zooxanthellate with stinging cells
- member of the Hydrozoa



Genus *Stylaster*

- small branching, fan-like colonies
- occur in sheltered high-current habitats
- often bright colours
- azooxanthellate
- member of the Hydrozoa
- common name lace corals



Genus *Heliopora*

- branching, columnar, submassive colonies
- the **skeleton is blue**
- often bright colours
- azooxanthellate
- member of the Octocorallia
- common name is blue coral



This manual should be used in conjunction with other taxonomic sources such as:

The AIMS Monograph Series (Veron et al. 5 Volumes 1976-1984); Hermatypic Corals of Western Australia (Veron and Marsh, 1988); Staghorn Corals of the World (Wallace, 1999); Corals of the World (Veron, 2000); Scleractinia of Taiwan (Dai and Horng, 2009); Acroporidae in the Queensland Museum (Wallace, Done and Muir 2013).

Further information about the updated taxonomy cited in this handbook can be obtained from:

- Wallace CC, Chen CA, Fukami H, Muir PR (2007) Recognition of separate genera within *Acropora* based on new morphological, reproductive and genetic evidence from *Acropora togianensis*, and elevation of the subgenus *Isopora* Studer, 1878 to genus (Scleractinia: Astrocoeniidae; Acroporidae). *Coral Reefs* 26: 2:231-239
- Benzoni F, Stefani F, Pichon M, Galli P (2010) The name game: morpho-molecular species boundaries in the genus *Psammocora* (Cnidaria, Scleractinia). *Zoological Journal of the Linnean Society* 160: 421-456
- Gittenberger A, Reijnen BT, Hoeksema BW (2011) A molecularly based phylogeny reconstruction of mushroom corals (Scleractinia: Fungiidae) with taxonomic consequences and evolutionary implications for life history traits. *Contributions to Zoology* 80: 107-132
- Budd AF, Fukami H, Smith ND, Knowlton N (2012) Taxonomic classification of the reef coral family Mussidae (Cnidaria: Anthozoa: Scleractinia). *Zoological Journal of the Linnean Society* 166: 465–529
- Huang D, Benzoni F, Fukami H, Knowlton N, Smith ND, Budd AF (2014) Taxonomic classification of the reef coral families Merulinidae, Montastraeidae, and Diploastraeidae (Cnidaria: Anthozoa: Scleractinia). *Zoological Journal of the Linnean Society* 171: 277–355
- Kitano, Y, Benzoni T, Arrigoni R, Shirayama Y, Wallace CC, Fukami (2014) A Phylogeny of the Family Poritidae (Cnidaria, Scleractinia) based on molecular and morphological analyses. *Plos ONE* 9(5):e98406.
- Arrigoni R, Terraneo TI, Galli P, Benzoni F (2014) Lobophylliidae (Cnidaria, Scleractinia) reshuffled: Pervasive non-monophyly at genus level. *Molecular Phylogenetics and Evolution* 73: 60-64
- World List of Scleractinia (<http://www.marinespecies.org/scleractinia>)

