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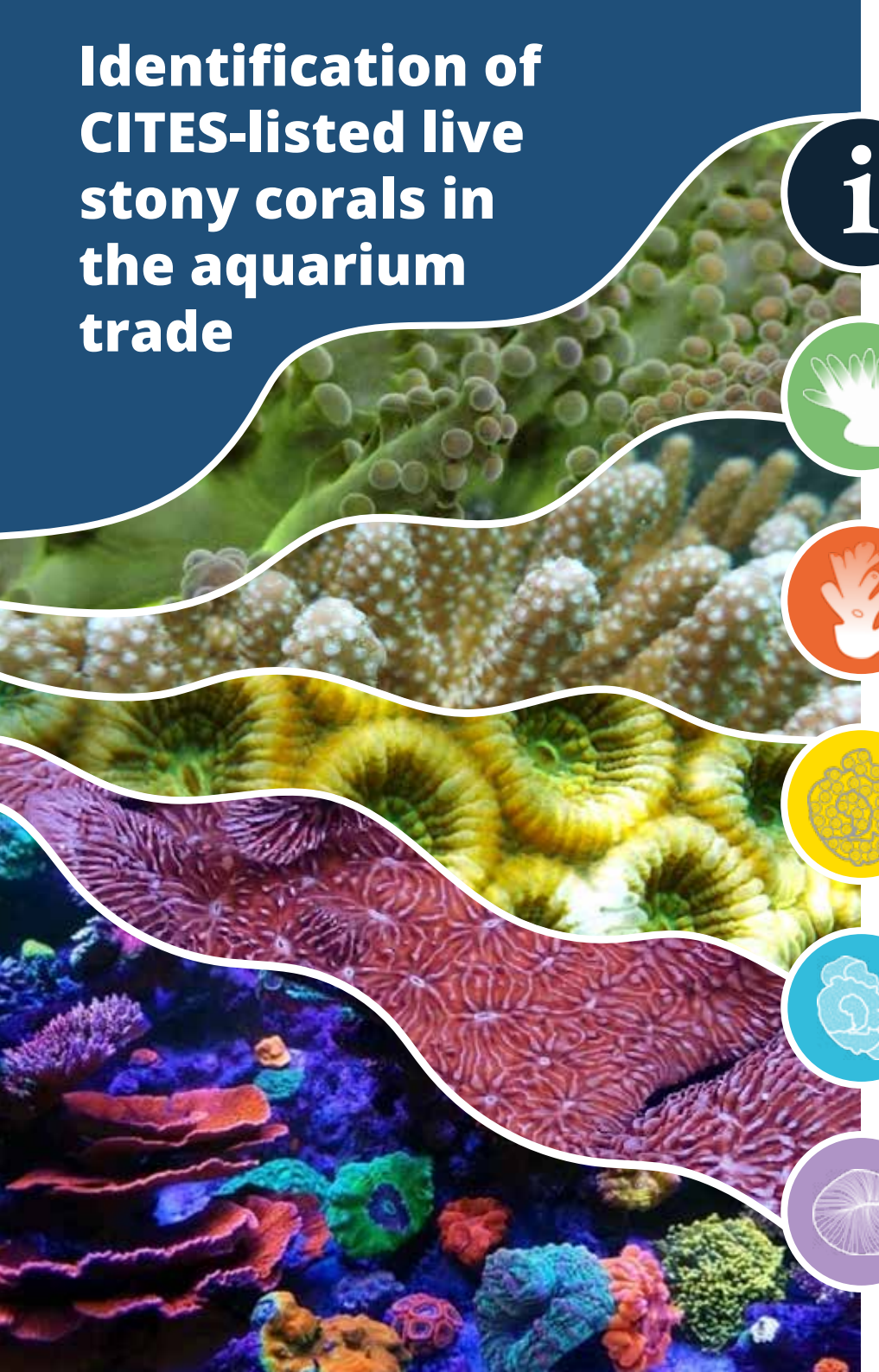
Identification of CITES-listed live stony corals in the aquarium trade



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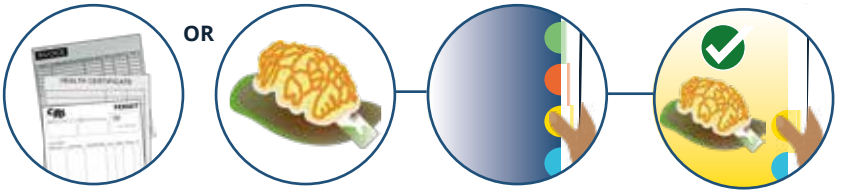
How to use this guide

This guide aims to promote the identification of live stony corals in the international aquarium trade by customs inspectors. It is designed to support visual inspection processes currently undertaken in both exporting and importing countries.

During inspection and verification of coral shipments, users can begin the inspection process with either a list of taxa from the packing list and accompanying CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) permit(s) or, if taxa in the shipment are not listed, users can navigate the guide based on the shape of the coral being examined (see below).



Check packing list & look up genus (use contents)

Look at shape (use page 15)

Use thumb tabs to navigate to correct chapter

Identify the coral accurately & quickly

Each coloured chapter has an overview describing where similarly shaped genera are featured or highlight other possible issues such as retracted tentacles. Users can use overview pages on each coloured chapter to try and identify corals they are unable to see on the packing list or if they are unable to catergorise shape easily.

! Potential limitations using this guide

This guide provides a general reference for the identification of live stony corals commonly seen in trade and uses nomenclature accepted by CITES at the time of publication. Therefore, the taxonomic status and names of species may differ from what is published elsewhere and could change following publication of the guide. This guide should therefore not be used as a definitive source of taxonomic reference for stony corals.

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BRANCHING 41 - 44

ENCRUSTING (larger polyps) 53 - 56

ENCRUSTING (smaller polyps) 97 - 100

SOLITARY AND FREE-LIVING 127 - 130

Introduction

Stony corals are traded internationally, typically as live specimens for the aquarium market and dead pieces for the curio trade. Other coral products including rocks, fragments, and sand are also traded as they form important components of a home or public reef aquariums.

UNIDENTIFIABLE TO GENUS LEVEL

Coral rock is hard consolidated material, >30 mm in diameter, formed of fragments of dead coral and which may also contain cemented sand, coralline algae and other sedimentary rocks.

Live rock tends to be large pieces (greater than 1 kg) that harbour live specimens of non-CITES listed invertebrates and coralline algae and are therefore shipped 'wet'. Clean coral rock is left to dry out prior to transportation so that it is free from live resident species and is shipped dry. Trade in coral rock where the genus cannot be readily determined is currently reported as 'Raw' coral at the higher Order level as 'Scleractinia' and in kg.

Substrate is the term given to smaller pieces of coral rock that can be used to transport attached invertebrates (species not included in the CITES Appendices), such as soft corals or sea anemones transported in water in the same way as live corals. Coral rock is not identifiable to the level of genus but is recognisable as Scleractinia. The definition excludes specimens defined as dead coral.

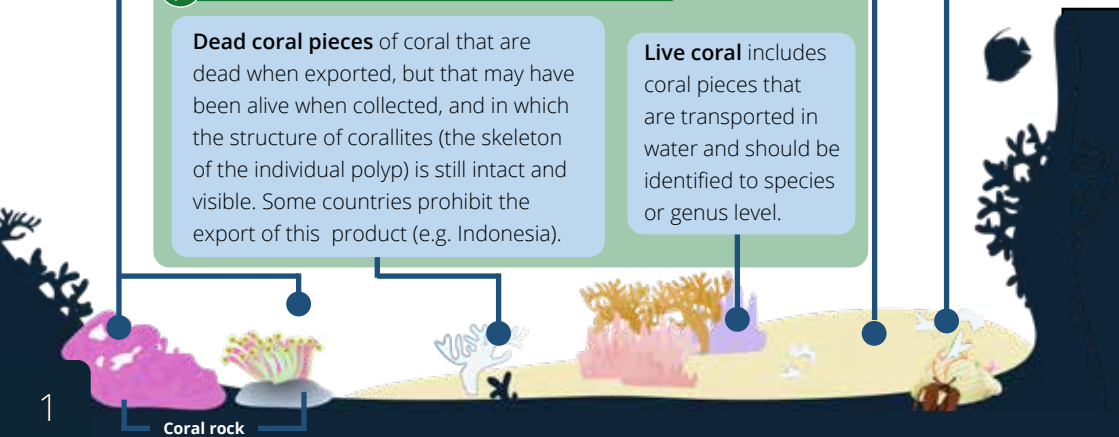
Coral fragments (including gravel and rubble) are unconsolidated fragments of broken finger-like dead coral and other material between 2 and 30 mm, measured in any direction.

Coral sand is material consisting entirely or in part of finely crushed fragments of dead coral no larger than 2 mm in diameter and which may also contain, amongst other things, the remains of Foraminifera, mollusc and crustacean shell, and coralline algae. Not identifiable to genus level.

IDENTIFIABLE TO GENUS LEVEL

Dead coral pieces of coral that are dead when exported, but that may have been alive when collected, and in which the structure of corallites (the skeleton of the individual polyp) is still intact and visible. Some countries prohibit the export of this product (e.g. Indonesia).

Live coral includes coral pieces that are transported in water and should be identified to species or genus level.



Trade of live stony corals

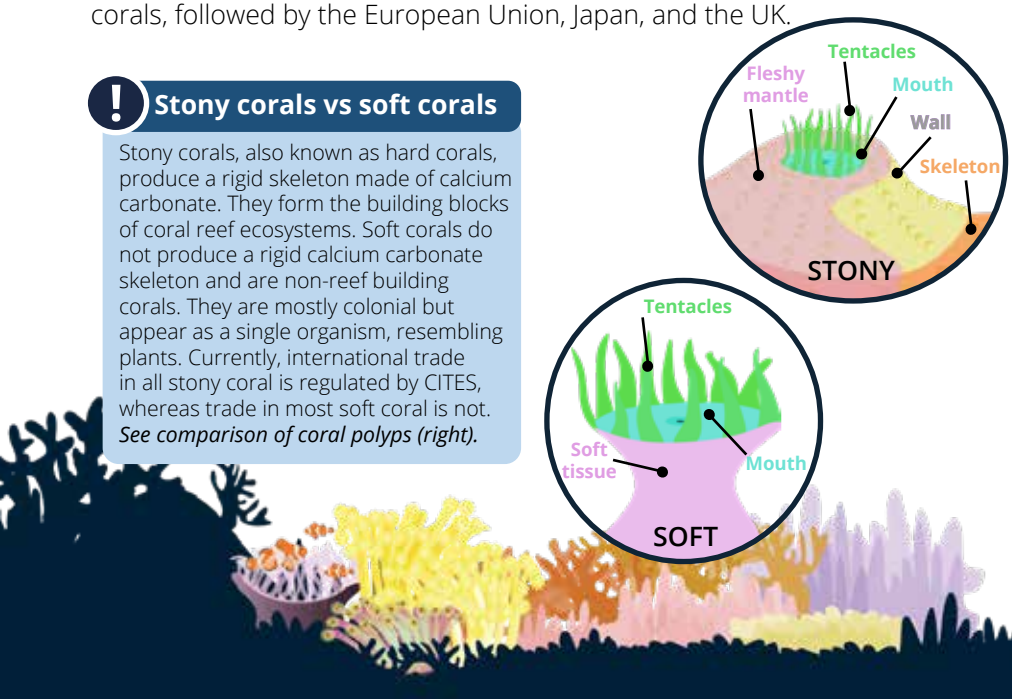
Of all the marine species listed in CITES, stony corals (Scleractinia spp.) are traded in the highest quantity, and are one of the most highly traded commodities globally overall, with living corals in demand for public and home aquariums. There are over 1680 stony coral species worldwide, and over 500 species have been recorded in trade. However, identification to species and even genus level can be extremely difficult, except for a few distinguishable taxa.

This visual guide to stony corals in trade aims to: increase awareness of live corals that are highly traded or that have international trade restrictions and provide guidance on the visual signs which can help distinguish maricultured* specimens from those that are 'wild-sourced' in support of legal and sustainable trade.

Most live coral in international trade is 'wild-sourced', collected by hand from reef ecosystems in source countries, such as Indonesia and Australia. However, exports of maricultured coral (Source Code 'F'**) have increased steadily since 2003, 99 % of which has been exported by Indonesia, the world's largest exporter of live coral. The USA is the major importer of corals, followed by the European Union, Japan, and the UK.

Stony corals vs soft corals

Stony corals, also known as hard corals, produce a rigid skeleton made of calcium carbonate. They form the building blocks of coral reef ecosystems. Soft corals do not produce a rigid calcium carbonate skeleton and are non-reef building corals. They are mostly colonial but appear as a single organism, resembling plants. Currently, international trade in all stony coral is regulated by CITES, whereas trade in most soft coral is not. *See comparison of coral polyps (right).*



* for information on mariculture see page 3.
** for information on Source Codes see page 8

Mariculture

Mariculture is the propagation of corals, usually in 'nurseries' on the sea floor. Small pieces of wild-collected coral can be detached from the parent, or new individuals can 'bud' from the parent to produce new individuals which are then allowed to grow. The newly grown individuals can then be fragmented, creating a source or 'mother' stock for maricultured corals that are traded under Source Code 'F'*.

A piece of coral is removed from a wild colony to become the 'mother' stock. Fragments are then removed from the 'mother' stock and attached to artificial bases (usually made of concrete), along with an identifier tag.

In Indonesia, the collection of mother stock is regulated through a permit and quota system. Corals in trade tend to be at least second generation.

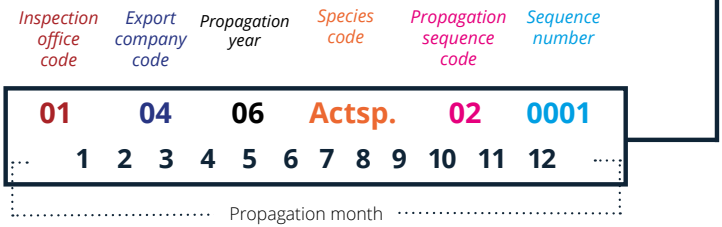
The small, mounted fragments are then attached to platforms or tables in inshore waters where they are allowed to grow until they reach a marketable size, or can be fragmented again.

In Indonesia, coral farms are required to undergo three audits; a feasibility audit before the farm can be established, a species addition audit to assess how the farm plans to produce a new species, and a regular biannual audit to monitor ongoing activities and compliance.

! Indonesian tag properties

Properties of and information included on indonesian tags for maricultured corals:

- Made from strong, tamper-proof material
- Tag shape can vary as they are developed by companies
- Code should be simple enough to be understood by field officers



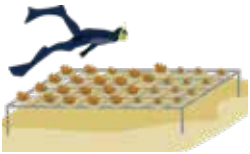
*for information on Source Codes see page 8

When to use this guide

This coral guide can support the identification of corals in trade at several stages along the supply chain which are summarised below.

Collection and holding

Pieces of live coral are collected from coral reefs for direct export as 'wild-sourced' coral or for use as mother stock in mariculture operations.



Farming

Live coral is maricultured at farms before export either from 'wild-sourced' or existing mother stock.

Export

Live coral is held at exporter facilities prior to packing for international transport in line with CITES import and export permits.

MORE EFFICIENT and ACCURATE INSPECTIONS

Import

On arrival, shipments of live coral are inspected or validated before entry is permitted by the importing country.

MORE EFFICIENT and ACCURATE INSPECTIONS

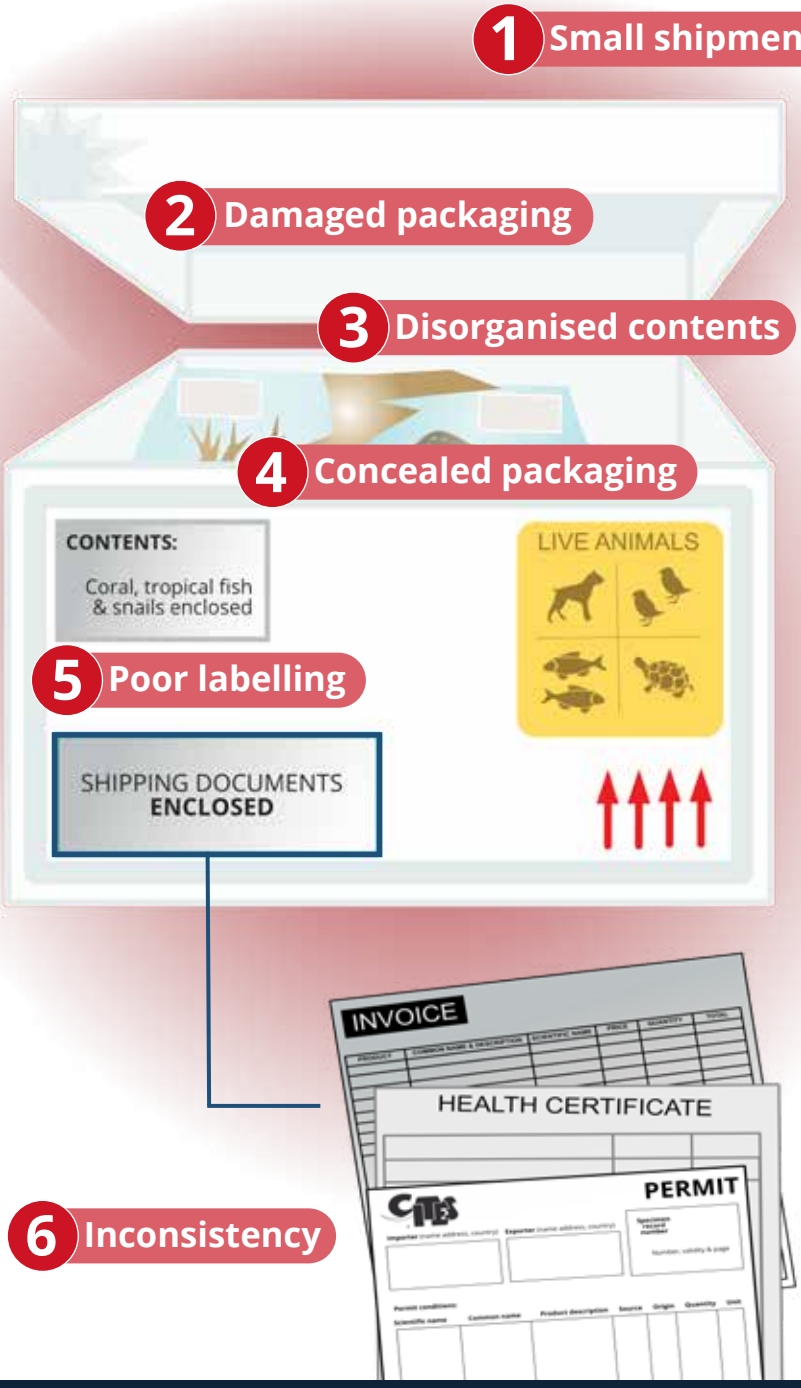
Retailers

When approved for entry, live coral may move through consolidators, wholesalers and/or retailers to reach the final point of sale.

Final customer

Live coral will find its way into home or public aquariums in importing countries, purchased from retail stores or online.

Shipments: Red flags



Verification and inspection processes for managing CITES-listed live corals in trade will vary between different exporters and importers. However, there are several indicators or 'red flags' which may signal a shipment requires further investigation.

1. **Small shipments**
The cost of transporting live coral in water is high, so small shipments that comprise few, low-value taxa can indicate that a business is conducting a 'test' to see how thoroughly a shipment is inspected before sending a higher-value illegal package.

2. **Damaged packaging**
Shipments of live coral are highly valuable and therefore packaging must be of high quality to ensure that welfare standards are met, and that the coral arrives in good condition. Damaged or careless packaging can signal a larger issue.

3. **Disorganised contents**
Rapid inspection processes limit the length of time corals spend in transportation conditions. Established exporters will ensure that the contents of shipments are well ordered to speed up import checks.

4. **Concealed packaging**
Paper (e.g. newspaper) can be positioned between two plastic specimen bags to absorb excess seawater, however paper or other material can also be used to obscure the view of the coral within.

5. **Poor labelling**
Clear, high-quality labelling will speed up import checks and is common practice for established businesses. Illicit traders may use poor-quality labelling.

6. **Inconsistency**
Inconsistencies between the packing lists, CITES permits, box labels and the contents can indicate a bigger issue with the legitimacy of a shipment's contents. Examples of counterfeit documents have also been detected.

CITES

CITES is an international agreement between governments. Its aim is to make sure that international trade in specimens of species listed in its Appendices are regulated appropriately, so as not to threaten their survival in the wild. Trade must be legal, sustainable, and traceable.

How can we calculate how much coral is traded?

Each Party (States and regional economic integration organizations) is required to submit an annual report on its CITES trade, containing a summary of information on; the number and type of permits and certificates granted, the States with which such trade occurred, the quantities and types of specimens, and the names of species as included in CITES Appendices I, II and III (CITES.org).

Trade data submitted to CITES by the Parties are entered into the CITES Trade Database managed by UNEP-WCMC. This enables monitoring of the levels of international trade in all taxa included in the CITES Appendices.

5.5 million pieces from 10 taxa of 'Fleshy Polyp' were traded (27%).

Over 5.4 million pieces from 4 'Branching' taxa were traded (27%).

4 million pieces from 20 taxa of 'Encrusting (larger polyp)' corals were traded (20%).

Almost 2 million pieces from 8 taxa of 'Solitary and Free-living' corals were traded (10%).

3 million pieces of 13 taxa of 'Encrusting (smaller polyp)' corals were traded (15%).

Trade data for stony corals including where they came from can be easily explored using the **CITES Wildlife TradeView tool** https://tradeview.cites.org/en/taxon.

SCAN ME

CITES Source Codes

CITES Source Codes should be used on all CITES permits and certificates, to inform Parties about the management system used to produce the specimens. For example, CITES Source Codes indicate whether a specimen was sourced from the wild or produced in captivity.

W

Specimens taken from the wild.

F

Animals born in captivity (F1 or subsequent generations) that do not fulfil the definition of 'bred in captivity' (not bred within a controlled environment), as well as parts and derivatives thereof.

C

Animals bred in captivity within a controlled environment from parents that were also produced in a controlled environment. For corals, this could be second (and subsequent) generation corals either from eggs/sperm collected during spawning or from fragmented captive corals.

Global trade of live coral

Global trade in all stony corals should be managed through the CITES permitting system. For some taxa, regional, national, or domestic CITES regulations exist and additional restrictions or suspensions can be placed on trade. For example, some Parties have a CITES suspension on all trade of listed species imposed on them. In addition to these, some Parties themselves do not permit the export of wild or live specimens.

CITES suspensions and regulations can change. **For current CITES suspensions visit:**
https://cites.org/eng/resources/ref/suspend.php

SCAN ME

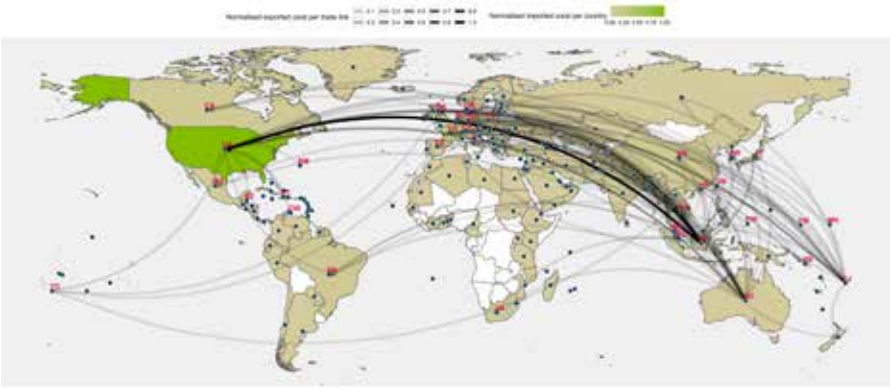
For a UK list of current import suspensions visit:
www.gov.uk/government/publications/cites-uk-import-suspensions-negative-opinions/cites-uk-import-suspensions

SCAN ME

For an EU list of current import restrictions visit:
https://speciesplus.net/

SCAN ME

Between 2010 and 2019, the **top exporters** of stony corals were Indonesia (12.5 million pieces), Australia (5.1 million pieces), Fiji (2.9 million pieces) and the Solomon Islands (million pieces). The **top importing** countries in the same period were the USA (9.1 million pieces), France (2.3 million pieces), UK (1.5 million pieces), Germany (1.9 million pieces) and Japan (0.8 million pieces).



Trade network map showing top 20 importing and exporting countries of stony coral (all Source Codes*) and their international connections.

* for information on Source Codes see page 8.

Considerations for live corals in trade

Corals can have growth rates, market values, and trade volumes that vary between taxa, which can affect the likelihood of mislabelling maricultured coral (specimens were wild collected), especially where the import of 'wild-sourced' specimens is restricted. Below we show how these considerations have been categorised in a traffic light system based on available information. The icons shown below are used on individual genus pages as a quick reference.

Growth is categorised as fast, medium and slow using the Indonesian Star System developed by the mariculture industry.

- **Fast growth** (*) corals that can grow to a marketable size in 3 - 6 months (e.g. *Acropora* spp. *Hydnophora* spp.)
- **Medium growth** (**) corals that can grow to a marketable size in 8 - 12 months (e.g. *Dendrophyllia* spp. *Euphyllia* sp.)
- **Slow growth** (***) corals that can grow to a marketable size in more than 12 months (e.g. *Catalaphyllia jardinei*, *Platygyra* spp.) and are more likely to have low production quotas.

Total global export volumes (reported by exporters) were derived for each genus (or species where species-level recording is required) using data available on CITES Wildlife Tradeview for the period 2010-2019.

- **Low export levels** were defined as global export levels less than 100,000 pieces
- **Medium export levels** were defined as global export levels between 100,000 and 500,000 pieces
- **High export levels** were defined as global export levels over 500,000 pieces.

Price (in US $) was calculated using the declared price per piece or polyp on shipment records entering the UK in 2018 and 2019 from representative samples, as well as personal communication with traders. Traffic lighting of the price was based on maximum values, but the range (lowest and highest price) is also show on individual genus pages.

- **Low import price** was defined as between $2-$20
- **Medium import price** was defined as $21-$99
- **High import price** was defined as over $100.

Watch list

Watch list taxa may be subject to current or previous trade suspensions or other restrictions, or they my be slow-growing, have a high value, or are traded in high volumes.

Catalaphyllia

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$8 $38

UK IMPORT PRICE

$21-$99

Duncanopsammia

NOT CULTURED

Not currently mariculture in Indonesia

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$4 $500

UK IMPORT PRICE

>$100

Euphyllia

MEDIUM GROWTH

8-12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

$3 $400

UK IMPORT PRICE

>$100

Heliofungia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$9 $44

UK IMPORT PRICE

$21-$99

Plerogyra

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$10 $21

UK IMPORT PRICE

$21-$99

Blastomussa

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$2 $40

UK IMPORT PRICE

$21-$99

Hydnophora

FAST GROWTH

3-6 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$6 $18

UK IMPORT PRICE

$2-$20

Acanthophyllia

NOT CULTURED

Not currently mariculture in Indonesia

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$8 $270

UK IMPORT PRICE

>$100

Cynarina

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$9 $80

UK IMPORT PRICE

$21-$99

Scolymia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$8 $200

UK IMPORT PRICE

>$100

Trachyphyllia

SLOW GROWTH

>12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

$2 $70

UK IMPORT PRICE

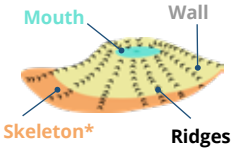
$21-$99

Visual glossary

This visual glossary explains some important definitions used in this guide.

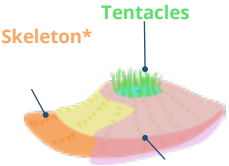
Corallite properties

What is a corallite?



A corallite is the hard part of a stony coral, or 'skeletal cup'. A living polyp builds and occupies the corallite.

What is a polyp?



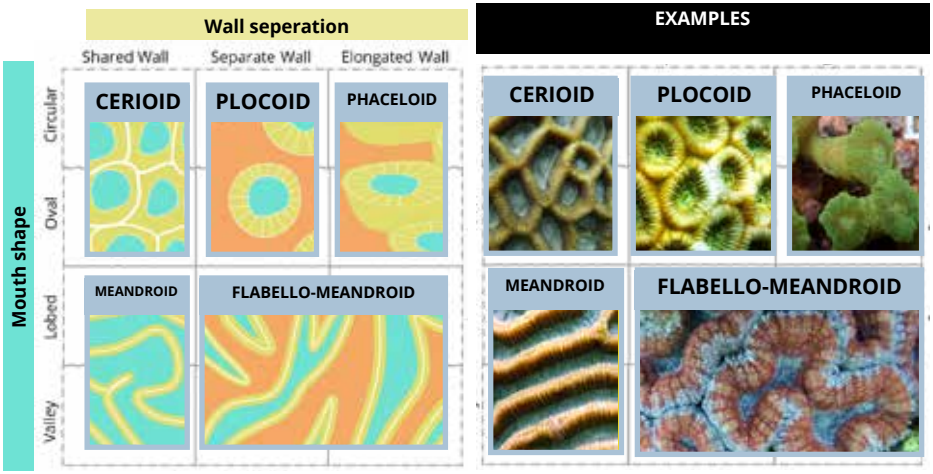
A polyp has a mouth, gut and tentacles (which may not always be visible).

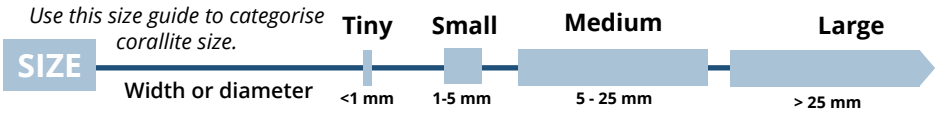
Some corals will have an elongated polyp or 'stalk' present.

**The term "skeleton" includes examples where a thin layer of live tissue covering the hard structure may be visible or retracted. "Fleshy mantle" corals have very thick live tissue.*

CORALLITE SHAPE AND SIZE

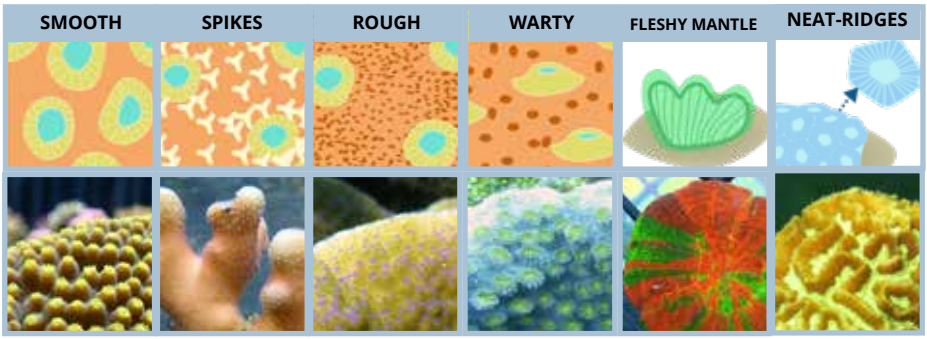
Corallite shape is categorised using mouth shape and wall seperation. These two features are a continuum but are grouped into Cerioid (circular/oval mouth, shared walls), Plocoid (circular/oval mouth, separate walls), Phaceloid (circular/oval mouth, elongated separate wall), Meandroid (lobed/valley-shaped mouth, shared walls) and Flabello-meandroid (lobed/valley-shaped mouth, separate walls). In some genera there may be multiple corallite shapes.

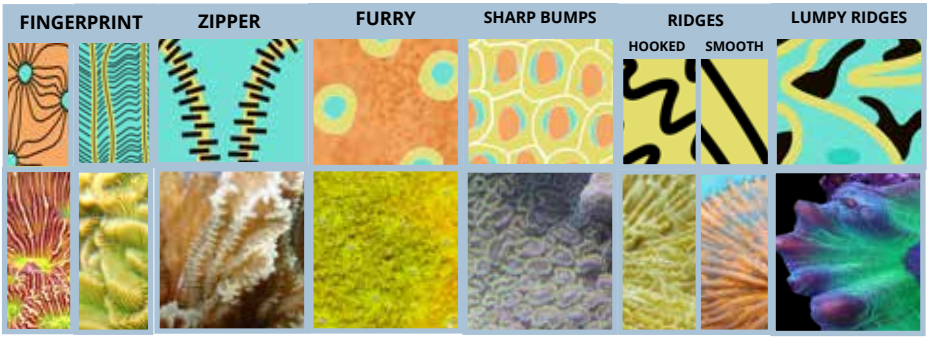




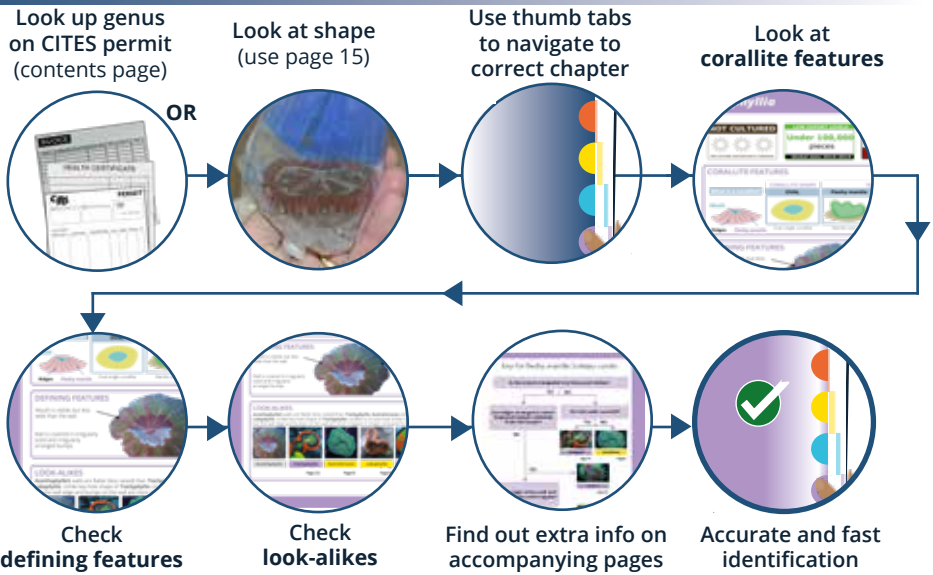
SKELETAL/WALL TEXTURES

There are many different textures on the hard skeleton and/or corallite walls that can be visible in trade and can be used to help identify stony corals.





Working example



Coral grouping by chapter

This simple key will help beginners categorise coral groups and lead the user to the correct chapter more quickly and efficiently. These chapters reflect forms seen in trade and may not be consistent with traditional taxonomic groupings of wild corals. This simplification aims to improve the use of the guide in practical, time limited trade inspections.

Large fleshy tentacles and polyps are visible?

YES

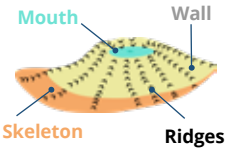
NO

Are there branches or finger-like structures and a narrow stem attachment to the base?

YES

NO

What is a corallite?
see page 13



Is the coral encrusting with corallites larger than 10 mm?

YES

NO

Is the coral solitary (single polyp) or free-living?

NO

YES

! Colour should not be used for identification

The colour of coral in the wild and trade varies and cannot be used as a reliable characteristic for identification/differentiation between taxa.

Coral groupings in this guide are not taxonomic

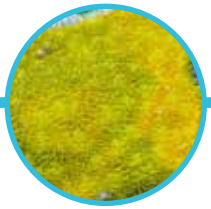
The grouping of corals in this guide is not based on scientific taxonomy, but by the shapes recognisable in trade. Where a genus of coral has multiple growth morphologies, a key is provided at the start of each chapter to help you find the correct page for the coral you are identifying.

FLESHY POLYPS

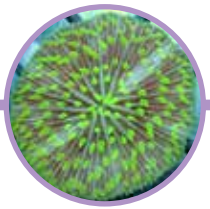

BRANCHING

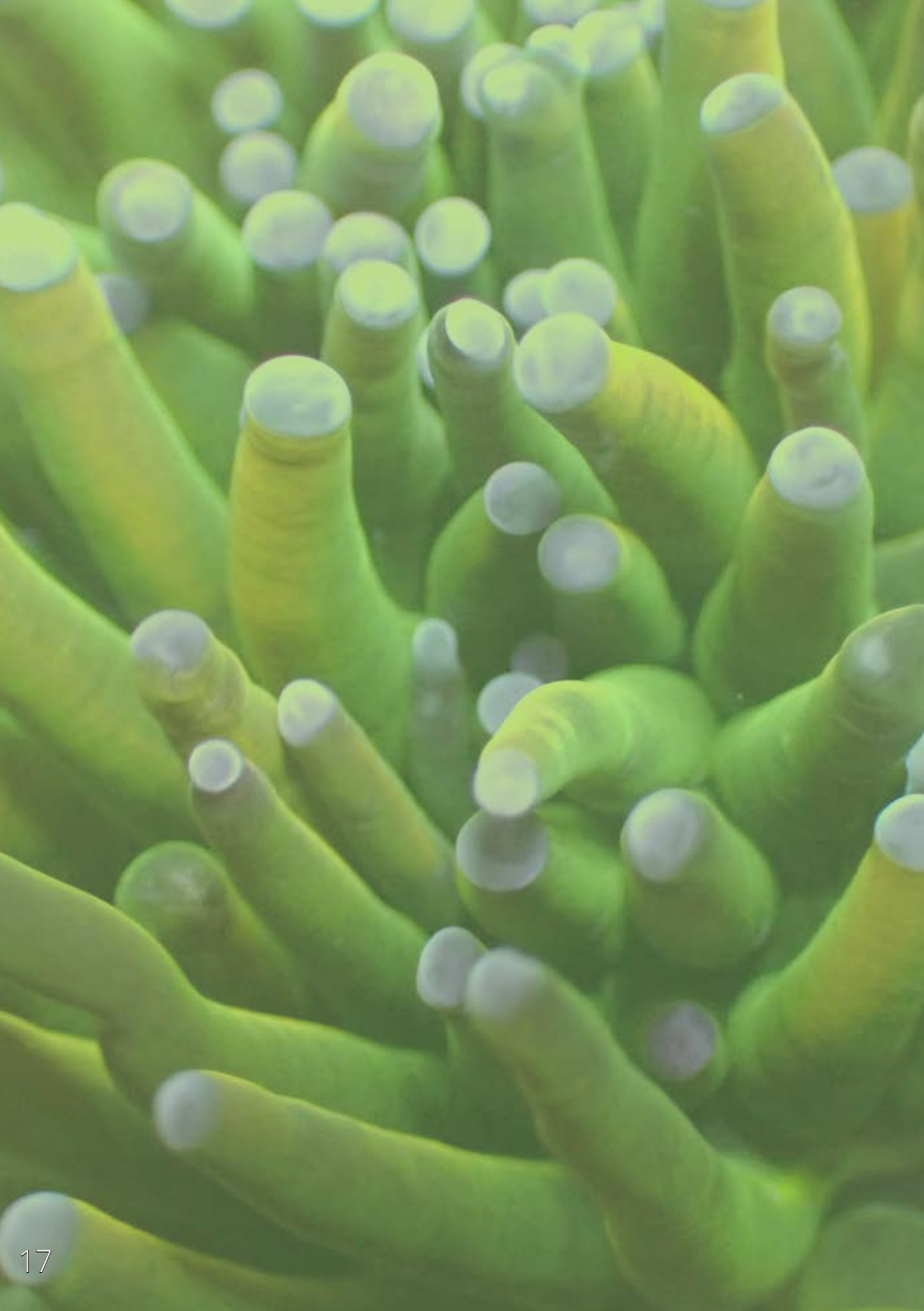

ENCRUSTING
(LARGER POLYPS)


ENCRUSTING
(SMALLER POLYPS)

SOLITARY and FREE-LIVING



Fleshy Polyps

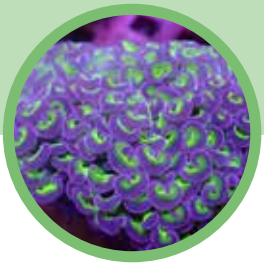
All corals may have tentacles and polyps that could be extended during the day. However, corals in this group have large, conspicuous fleshy polyps and tentacles that obscure the skeleton.

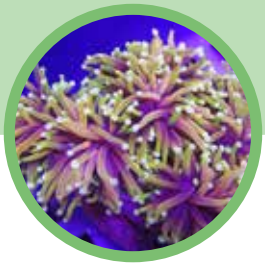
DID YOU KNOW?

Fleshy polyp coral tentacles are similar to those of sea anemones which contain stinging cells and can filter-feed on passing plankton. Like sea anemones, coral polyps have a base or stalk, tentacles and mouth.

Most corals have their tentacles retracted during the day. Popular fleshy polyp corals in trade are sought after because their colourful tentacles can be seen all day in a controlled tank environment.

Aquarists may have a UV light or 'black light' that highlights iridescent zooxanthellae (symbiotic algae) present in the tentacles.





Featured fleshy polyp corals

All corals have fleshy tentacles. The corals in this chapter have tentacles that are rarely retracted and where other features may be obscured. ***This table of contents can be used to find the correct page during inspection, colour-coded by shape chapter. Use the tabs to locate the chapter and the page number to navigate to identification pages.***

Euphyllia

Page 21-22

Heliofungia

Page 23-24

Catalaphyllia

Page 25-26

Dendrophyllia

Page 27-28

Tubastraea

Page 29-30

Duncanopsammia

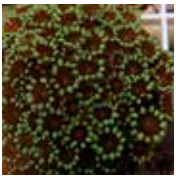
Page 31-32

Physogyra

Page 33-34

Plerogyra

Page 35-36



Alveopora

Page 37-38

Goniopora

Page 39-40

Be aware of retracted tentacles

A colony with completely retracted tentacles may look like one of the other coral shape groups. Fleshy polyps may be retracted in transit and not be visible (see below).

Euphyllia

Heliofungia

Catalaphyllia

Duncanopsammia

Tubastraea

Physogyra

Plerogyra

Alveopora

Goniopora

Detecting false mariculture

1. **Growing edge**
   Healthy growing edge established on the artificial base, no fresh cuts or glue present.

2. **Artificial base properties**
   Artificial base and mariculture tag has biofouling of marine life e.g., calcareous algae.

3. **Established growth**
   No cut polyps, healthy growth onto the artificial base (e.g., *Goniopora*) or from the canopy (e.g., *Euphyllia*).

! Biofouling of artificial base and no new cuts

SIGN OF TRUE MARICULTURE

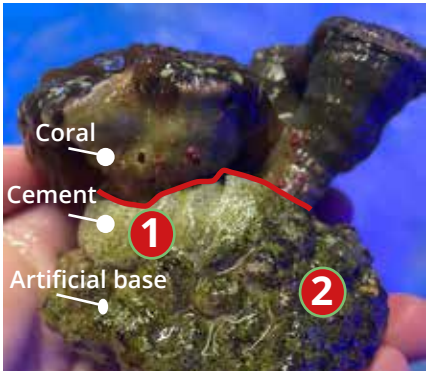
This *Goniopora* has a healthy growing edge, biofouling on the artificial base and cement.

SIGN OF FALSE MARICULTURE

Freshly cut *Goniopora* to demonstrate how false mariculture may appear. Clean, white, sharp edge visible.

! *Maricultured Euphyllia* is hard to distinguish

Euphyllia should have tissue growth on the external of the stem, biofouled artificial base and no new cement (often green tinge).



Euphyllia

MEDIUM GROWTH

8-12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

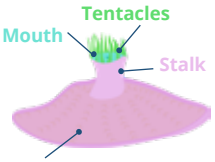
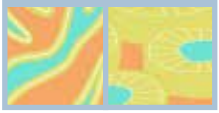
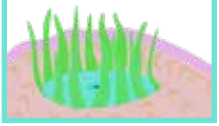
Global data 2010-2019

$3 $400

UK IMPORT PRICE PER PIECE OR POLYP

OVER $100

CORALLITE FEATURES

What is a polyp?	CORALLITE SHAPE	TENTACLES	MOUTH
	FLABELLO-MEANDROID PHACELOID  Varied across species (see page 22)	VARIED  Varied (see page 22)	OBSCURED  Obscured mouth

DEFINING FEATURES*

Mouth and skeleton obstructed by fleshy polyp tentacles.

***Euphyllia* needs to be identified to species level (see page 22)**

Tentacle shape is used to identify to species level for this genus.

LOOK-ALIKES

Long tentacles obscuring mouth and the rest of the polyp is unique to ***Euphyllia***. ***Heliofungia*** looks similar to ***E. glabrescens***. Hammer-shaped tentacles look similar to but are longer than ***Physogyra*** and ***Plerogyra's*** bubble vesicles.

E. glabrescens

E. ancora

Physogyra

Page 33

Plerogyra

Page 35

Heliofungia

Page 23

Identifying to species

CITES requires ***Euphyllia*** to be identified to species level. This can be achieved for ***Euphyllia*** using tentacle properties and corallite shape. ***Euphyllia*** are heavily exported but different species have varying export levels and prices.

WATCH LIST

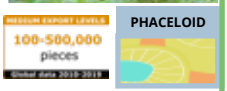
CHECK SPECIES

E. ancora

Tentacle tips are hammer- or horse-shoe shaped.

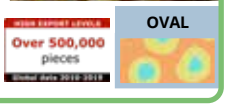
E. paraancora

Polyps have tentacles similar to those of ***E. ancora***, with hammer- shaped or irregular triangular-shaped ends.



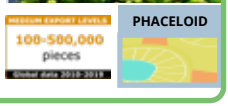
E. glabrescens

Polyps with long rod-shaped tentacles, with white knob-like tips.



E. cristata

Polyps with short rod-shaped tentacles, similar to those of ***E. glabrescens***, but shorter, ends with light tips.

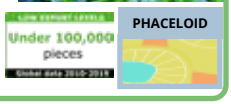


E. divisa

Polyps have large rod-shaped tentacles, with smaller branches ending in white knob-like tips.

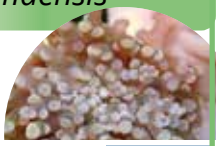
E. paradivisa

Polyps are similar to ***E. divisa*** with branched tentacles, but ***E. paradivisa*** has more secondary branching.



E. yaeyamaensis

Tentacles are short and fat, covered with short uniform sub-branches, each ending in knob-like tips.



Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Heliofungia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

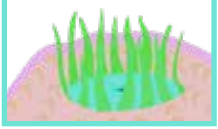
Global data 2010-2019

$9 $44

UK IMPORT PRICE PER PIECE

BETWEEN $21-99

CORALLITE FEATURES

	CORALLITE SHAPE	TENTACLES	MOUTH
What is a polyp? 	SINGLE  Single corallite	ROD-SHAPED  Straight, knob-like tips	OBSCURED  Stalk absent, obscured mouth

DEFINING FEATURES

Tentacles may be retracted.

Narrow mouth sometimes visible.

Rod-shaped tentacles have fixed positions corresponding with the mouthward end of the ridges.

Radiating lines may be visible.

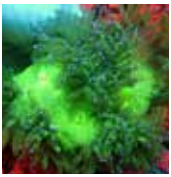
LOOK-ALIKES

Catalaphyllia is distinguished by its heavy, meandroid corallite, with a tapering base. Full grown ***Catalaphyllia*** has multiple mouths and ***Heliofungia*** always has a single mouth.

Heliofungia

Euphyllia

Page 21

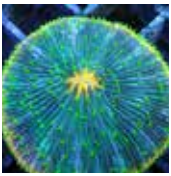


Catalaphyllia

Page 25

Fungia

Page 139



Cycloseris

Page 141

Important distinctions

1 corallite

Heliofungia actiniformis is a solitary free-living coral on sediment substrates in the wild.

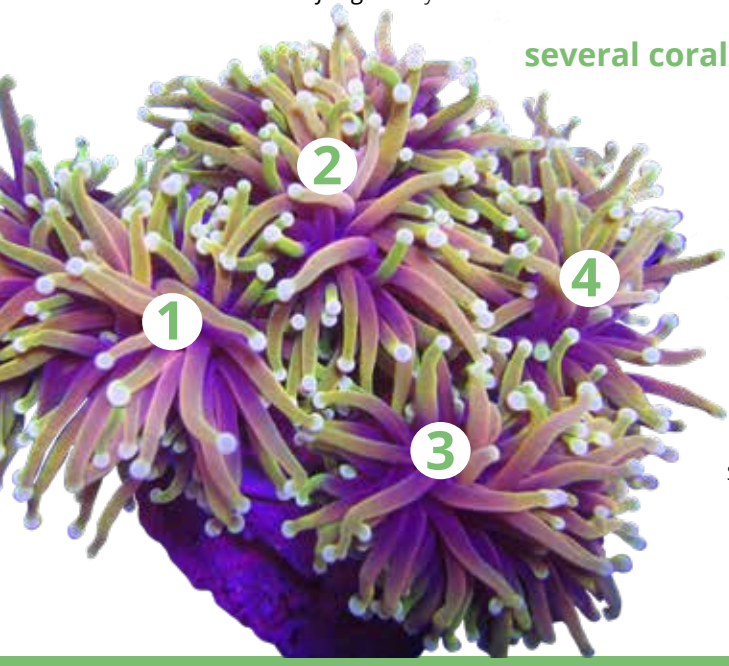
If the tentacles are retracted, the single corallite structure typical of mushroom corals (e.g. *Fungia* below) can be seen, with regular ridged septa radiating from a central single mouth.

WATCH LIST

Only one species in this genus: ***Heliofungia actiniformis*** **CHECK SPECIES**

Heliofungia may be traded as torch ***Euphyllia***, as its large fleshy tentacles are very similar. However, ***Euphyllia*** usually has several corallites e.g. 4 in the example below whereas ***Heliofungia*** only ever has one.

several corallites



Euphyllia are colonial corals that attach to reef substrates in the wild.

If the tentacles are retracted, the large (50–100 mm) phaceloid corallite structure typical of ***E. glabrescens*** can be seen, with distinct gaps between individual corallites.

...see page 21

Catalaphyllia

SLOW GROWTH

>12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

$8 $38

UK IMPORT PRICE PER PIECE

BETWEEN $21-99

CORALLITE FEATURES

What is a polyp?

CORALLITE SHAPE

FLABELLO-MEANDROID

Valleys, separate walls

TENTACLES

POINTED

Straight, rounded edged tentacles

MOUTH

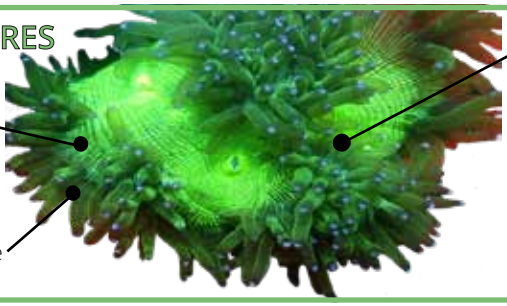
VISIBLE MOUTH

Large mouths

DEFINING FEATURES

Polyp has radiating lines from the mouth outwards.

Rod-shaped tentacles have distinctive purple tips.



Mouth fringed by 100s of purple tipped tentacles.

LOOK-ALIKES

Mouth is clearly visible unlike ***Euphyllia. Heliofungia*** is solitary and has an elongated mouth compared to ***Catalaphyllia. Heliofungia*** has a narrow mouth that is sometimes visible.

Catalaphyllia

Euphyllia

Page 21

Heliofungia

Page 23

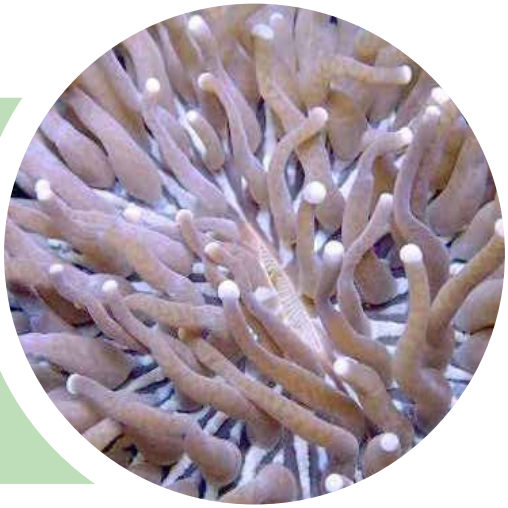
Important distinctions

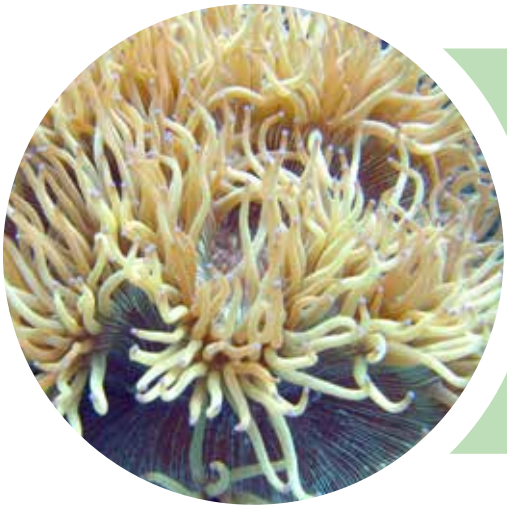
Both ***Heliofungia*** and ***Catalaphyllia*** have similar features including:

- **Radiating lines**
- **Visible mouths**
- **Rod-shaped tentacles**

Heliofungia actiniformis is a solitary free-living coral on sediment substrates in the wild.

Heliofungia corals have a flat base and the tentacles are evenly distributed over the upper surface around the mouth.





In contrast, ***Catalaphyllia*** tentacles fringe the upper margin of the polyp and have purple-tipped tentacles. More than one mouth may be present.

Catalaphyllia corals have a tapering base. They live partly buried in the sediment in the wild.

WATCH LIST

Only one species in this genus: ***Catalaphyllia jardinei***

CHECK SPECIES

Dendrophyllia

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

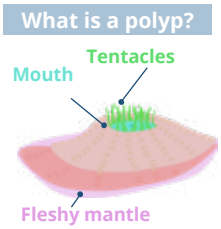
Global data 2010-2019

$13 $28

UK IMPORT PRICE PER PIECE

BETWEEN $21-99

CORALLITE FEATURES



CORALLITE SHAPE

PHACELOID

Cup-like walls

TENTACLES

FLOWER-LIKE

Numerous small tapering tentacles

MOUTH

VISIBLE MOUTH

Small mouth

DEFINING FEATURES

Polyps highly elongated.

Polyps often visible and 'sea-anemone-like' but can be retracted rapidly due to touch or stress.

Smooth skeleton underneath soft tissue covered with a thin layer of yellow, orange or red living tissue.

Often called cup corals, they have a tube-like structure with mouth at the base of the 'cup'.

LOOK-ALIKES

Dendrophyllia has more elongated polyps than most Tubastraea, except T***. micranthus***. It is distinguished from ***T. micranthus*** and ***Duncanopsammia*** by the yellow, orange and/or red colouration of the tissue covering the skeleton.

Dendrophyllia

Tubastraea

Page 29

Duncanopsammia

Page 31

Turbinaria

Page 115

Dendrophyllia vs *Tubastraea*

Fleshy polyps of this group often extend their tentacles during the day and look 'sea-anemone-like'. The colouration and tentacle shape of ***Dendrophyllia*** is very similar to ***Tubastrea,*** but usually have different polyp length.

Dendrophyllia

Yellow is a popular colour in trade for the 'sun cup coral'. Compared to Tubastraea the polyps are longer (except ***T. micranthus***).

Tubastraea micranthus

Long polyps like ***Dendrophyllia*** but dark green in colouration, almost appears black.

Tubastraea

...see page 29

Shorter, more compact polyps.

Eguchipsammia fistula

Wild sourced specimens of this species have been subject to import restrictions into the EU from Indonesia. However, over 96,000 live pieces were traded globally between 2010-2019, including imports of Source Code 'F' specimens by the EU, according to CITES trade data.

Tubastraea

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

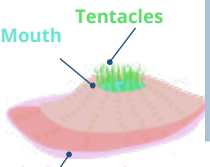
Global data 2010-2019

$7 $10

UK IMPORT PRICE PER PIECE

BETWEEN $2-20

CORALLITE FEATURES

	CORALLITE SHAPE	TENTACLES	MOUTH
What is a polyp?	PHACELOID	FLOWER-LIKE	CENTRAL
	 Cup-like walls	 Numerous small tapering tentacles	 Small mouth

DEFINING FEATURES

Similar to other sun cup corals, tube like structure with mouth at the base of the 'cup'.

Skeleton covered by soft tissue which is orange or red. The tentacles are yellow (hence "sun coral").

Smooth skeleton.

LOOK-ALIKES

Most *Tubastraea* species have shorter polyps than other cup corals. ***T. micranthus*** has long branch-like polyps, but is dark green in colour. In ***Duncanopsammia,*** the polyps are smaller and branching. ***Turbinaria's*** corallites are smaller and dome shaped (i.e. not cup-shaped).

Tubastraea

Page 27

Dendrophyllia

Page 31

Duncanopsammia

Turbinaria

Page 115

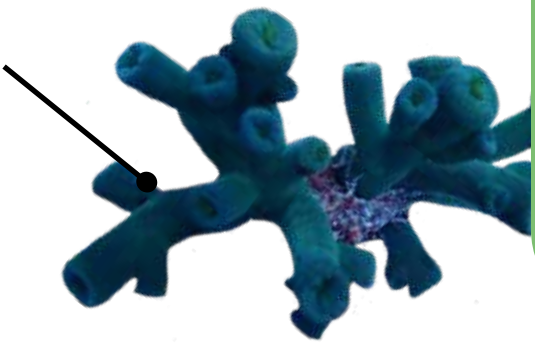
Colour morphs

Colour is highly variable for ***Tubastraea***

Tubastraea micranthus

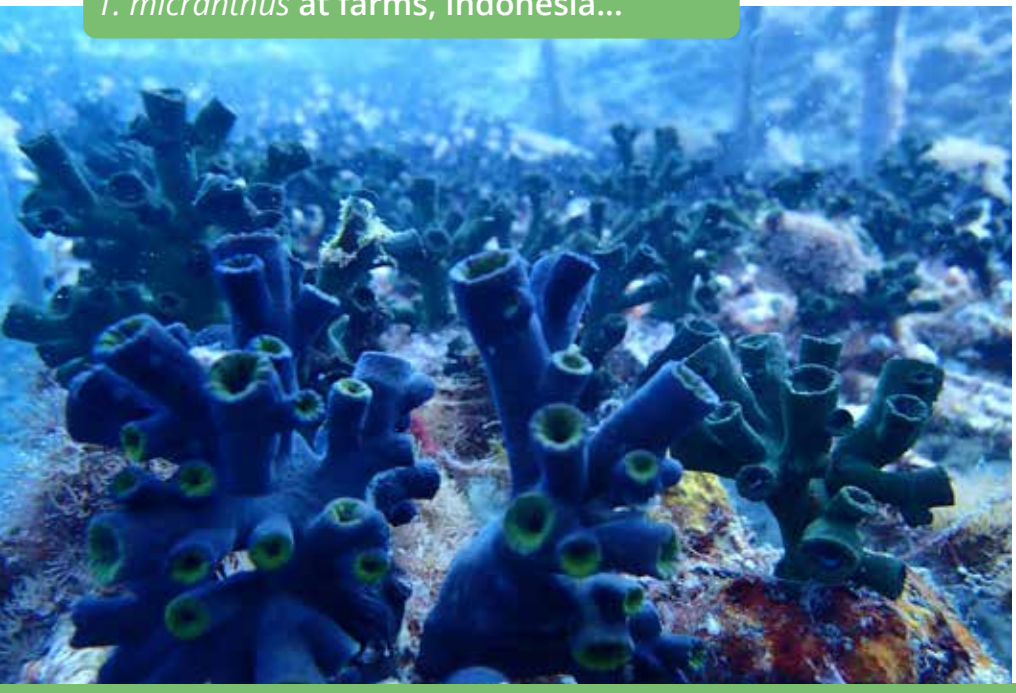
This is a typical example of this species. The coral here has tentacles retracted.

Branching and dark green/ black colouration, other ***Tubastraea species*** are more massive and less elongated.



Typical colouration of other ***Tubastraea*** are hues of yellow/orange with yellow tentacles.

T. micranthus **at farms, Indonesia...**



Duncanopsammia

NOT CULTURED

Not currently maricultured in Indonesia

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

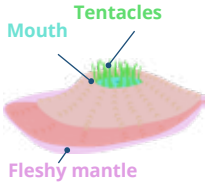
$4 $500

UK IMPORT PRICE PER POLYP

OVER $100

CORAL FEATURES

What is a polyp?



CORALLITE SHAPE

PHACELOID

Cup-like walls

TENTACLES

FLOWER-LIKE

Numerous small tapering tentacles

MOUTH

VISIBLE MOUTH

Small mouth

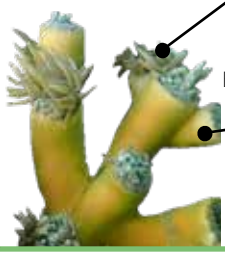
DEFINING FEATURES

Smooth skeletal texture and tube-like corallites with mouths extending deep into skeleton.

Elongated branches have more than one mouth per branch.

In trade

Colony on the reef



Long tapering tentacles.

Branches often cream with blue-grey mouths and tentacles.

LOOK-ALIKES

Duncanopsammia has elongated branches, cream skeleton and grey/blue tentacles and mouth. ***Tubinaria peltata*** has similar corallite colour and shape, but is encrusting, unlike branches of ***Duncanopsammia.***

Duncanopsammia

Dendrophyllia

Page 27

Tubastraea

Page 29

T. micranthus

Page 30

Turbinaria

Page 115

Examples in trade

Only one species in this genus: ***Duncanopsammia axifuga***

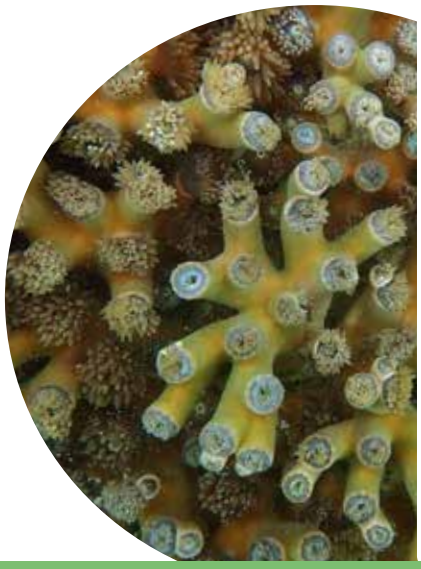
CHECK SPECIES

It has been recorded in Australia, New Guinea and East Timor with a new record at Birds Head Peninsula, Indonesia reported in 2022.

W

Because of the rarity of this taxon, trade in this species is likely to be in wild-sourced specimens, Source Code 'W'.

Between 2010 - 2019, 189,000 pieces were traded globally, primarily from Australia.
Top importers: USA, EU, UK.



Physogyra

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

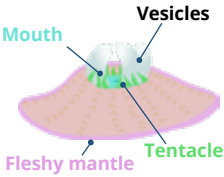
$8 $16

UK IMPORT PRICE PER PIECE

BETWEEN $2-20

CORAL FEATURES

What is a polyp?



CORALLITE SHAPE

MEANDROID

Valley, shared walls

VESICLES/TENTACLES

SOCK-LIKE VESICLE

Asymmetrical bubble vesicle above tentacles

MOUTH

OBSCURED

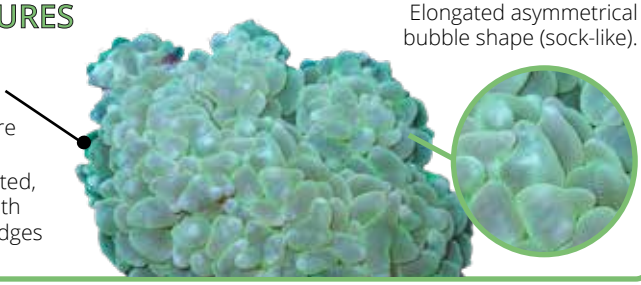
Obscured by tentacles and vesicles

DEFINING FEATURES

In day time vesicles are usually the only aspect visible; in the night, wall features and tentacles are more prominent.

When vesicles are retracted, valley-shaped mouths with large crescent-shaped ridges can be seen.

Elongated asymmetrical bubble shape (sock-like).



LOOK-ALIKES

Physogyra has elongated sock-like vesicles, opposed to grape-like vesicles of ***Plerogyra*** or hammer-shaped tentacles of some ***Euphyllia*** species. ***Physogyra*** polyps are arranged in tightly-packed narrow valleys, while ***Plerogyra*** valleys are larger and more spaced.

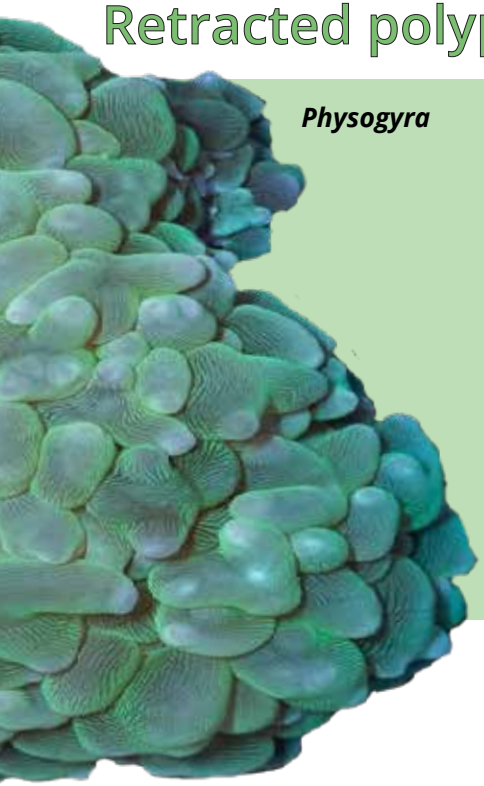
Physogyra

Plerogyra

Euphyllia

Page 35 Page 21

Retracted polyps in bubble corals



Physogyra

Plerogyra and *Physogyra* can retract their tentacles in transit exposing the walls (see below). At night, feeding tentacles may be visible while bubble vesicles are retracted.

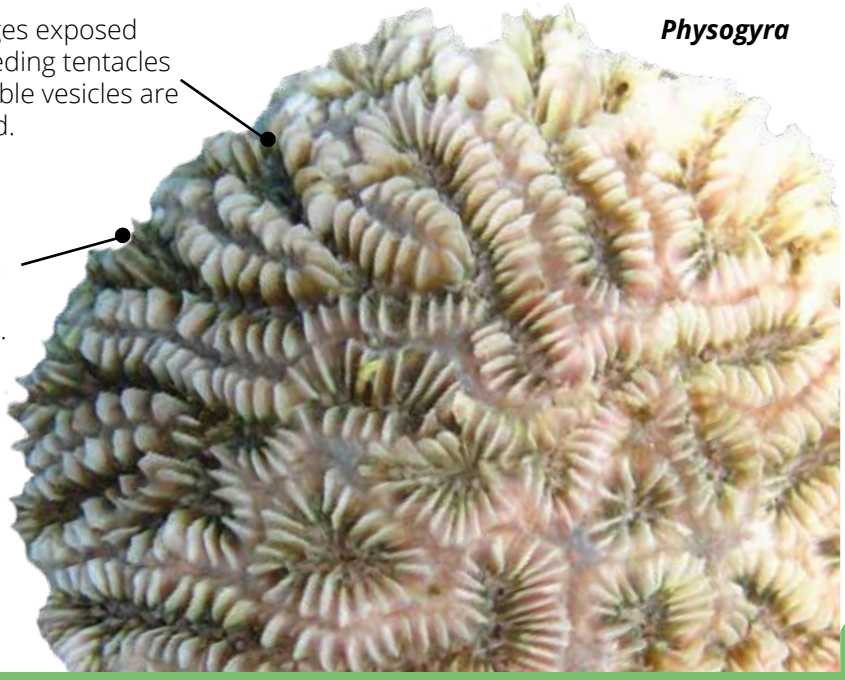
Physogyra

Plerogyra

Wall ridges exposed while feeding tentacles and bubble vesicles are retracted.

Valleys between walls exposed.

Physogyra



Plerogyra

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

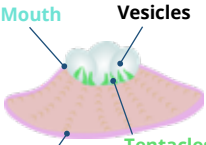
$10 $21

UK IMPORT PRICE PER PIECE

BETWEEN $21-99

CORALLITE FEATURES

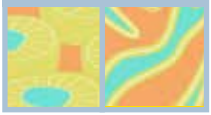
What is a polyp?



CORALLITE SHAPE

PHACELOID

FLABELO-MEANDROID



Varied separate walls

VESICLES/TENTACLES

GRAPE-LIKE

Grape-like bubble vesicle above tentacles

MOUTH

OBSCURED

Obscured by tentacles

DEFINING FEATURES

When vesicles are retracted, valley-shaped mouths with large crescent-shaped ridges can be seen.

Bubble vesicles are usually the only feature visible.

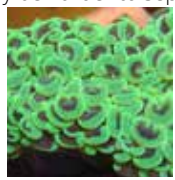
More rounded grape-like vesicles than *Physogyra*.

LOOK-ALIKES

Plerogyra is very similar to ***Physogyra*** and is distinguished by the grape-like vesicles, opposed to the sock-like vesicles of ***Physogyra.*** Vesicles may also resemble hammer-shaped ***Euphyllia*** tentacles. ***Plerogyra*** and ***Euphyllia*** may be harder to separate as juveniles with a single polyp.

Plerogyra

Physogyra



Euphyllia

Page 33 Page 21

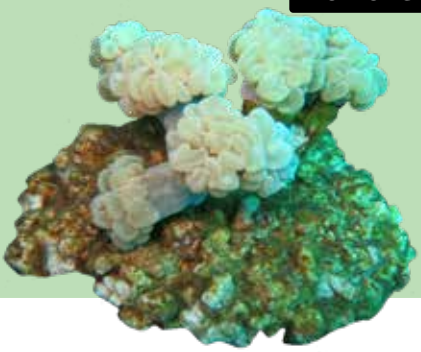
Plerogyra diversity in appearance

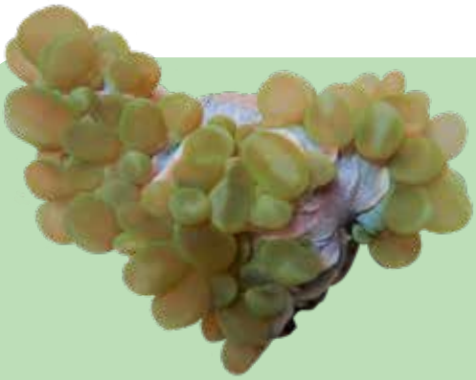
Plerogyra has diverse appearance, but all species have large (5–10 mm) rounded fingernail-like ridges on the skeleton, although this detail may be obscured by bubble vesicles.

WATCH LIST

CHECK GENUS

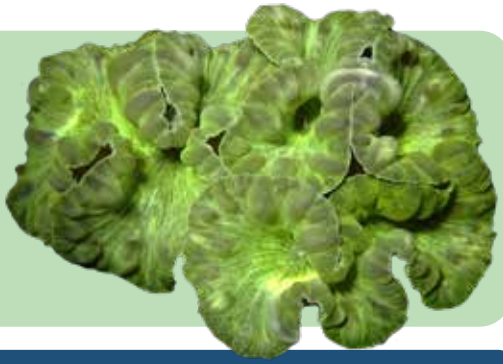
P. simplex has phaceloid corallites tipped with grape-like vesicles.





P. sinuosa has tightly packed flabello-meandroid valleys and is covered in grape-like vesicles.

P. turbida has a fleshy mantle with tentacles that obscure underlying skeleton, huge lily-like (flower) appearance.



Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Alveopora

MEDIUM GROWTH

LOW EXPORT LEVELS

Under 100,000 pieces

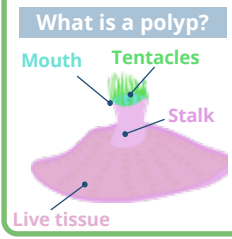
Global data 2010-2019

$8 $33

UK IMPORT PRICE PER PIECE

BETWEEN $21-99

CORALLITE FEATURES



CORALLITE SHAPE

CERIOID

Circular, shared walls

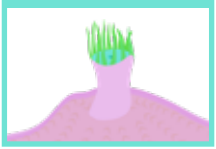
TENTACLES

FLOWER-LIKE

12 short tapering tentacles

MOUTH

STALK PRESENT



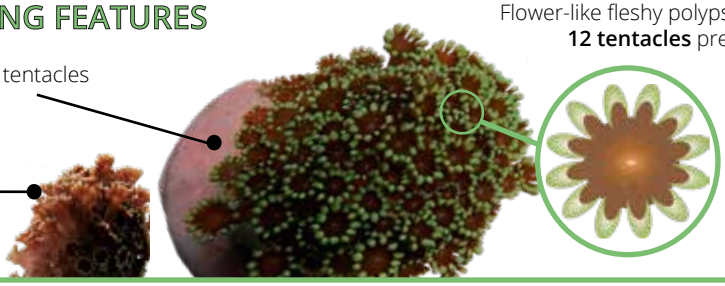
Polyps have stalks

DEFINING FEATURES

Flower-like fleshy polyps with **12 tentacles** present.

Mouth and tentacles visible.

Polyp stalk clearly visible, and often long.



LOOK-ALIKES

Cup corals have similar flower-like polyps but these do not have extendable stalks but are directly connected to the corallites. Stalks of ***Goniopora*** and ***Alveopora*** are soft, flexible and can easily be retracted. ***Alveopora*** has 12 tentacles, while ***Goniopora*** has 24.

Alveopora

Page 39

Goniopora

Page 29

Tubastraea

Page 27

Dendrophyllia

Duncanopsammia

Page 31

Stalks or corallites?

Polyp stalks of ***Goniopora*** and ***Alveopora*** are soft, flexible unlike cup corals and also have similar flower-like polyps.

What if polyps are retracted?

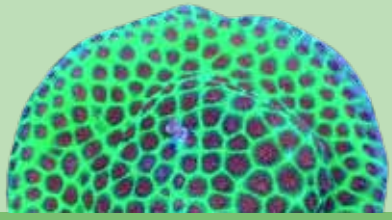
Alveopora

When retracted, these taxa may look like encrusting corals with smaller polyps. The interior of the corallites mostly resemble that of *Porites* or *Astreopora*.

Goniopora

Astreopora

Porites



Goniopora

MEDIUM GROWTH

8-12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

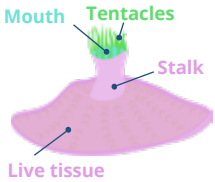
Global data 2010-2019

$5 $10

UK IMPORT PRICE
PER PIECE OR POLYP

BETWEEN $2-20

CORALLITE FEATURES

	CORALLITE SHAPE	TENTACLES	MOUTH
What is a polyp?	Cerioid	FLOWER-LIKE	STALK PRESENT
	 Circular, shared walls	 24 short tapering tentacles	 Polyps have stalks

DEFINING FEATURES

LOOK-A-LIKES

Cup corals have similar flower-like polyps but these do not have extendable stalks but are directly connected to the corallites. Stalks of ***Goniopora*** and ***Alveopora*** are soft, flexible and can easily be retracted. ***Alveopora*** has 12 tentacles, while ***Goniopora*** has 24.

Goniopora

Alveopora

Page 37

Tubastraea

Page 29

Dendrophyllia

Page 27

Duncanopsammia

Page 31

Diversity in appearance of *Goniopora*

Goniopora minor
Orange in colour, short stalks.

Goniopora lobata
Tentacles are elongated and finger-like.

Goniopora columna
stalks may be thicker and longer.

Branching

Branching corals have elongated protrusions of their skeletons, which range from short stubby (finger-like) branches to elongated staghorn forms and interlocking branches that form flat 'table-like' forms.

DID YOU KNOW?

On healthy reefs, branching corals are often the most common and conspicuous coral type, but they are also the most vulnerable to the impacts of coral bleaching and increasing storminess, meaning that wild populations of branching corals are in decline in many areas.

Acropora are exported in high volumes and are commonly maricultured.

The delicate branches of corals in this group are vulnerable to storm damage, but they can reproduce asexually through natural fragmentation to colonise new areas.


Finger-like


Staghorn

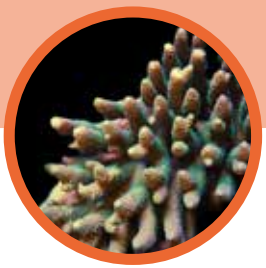


Table-like

Branched shaped corals in trade

Branching corals are popular in trade because of their attractive shape and fast growth rate. ***This table of contents can be used to find the correct page during your inspection, colour coded by shape chapter. Use the tabs to locate the chapter and the page number to navigate to identification pages.***

Acropora

Page 45-46

Pocillopora

Page 47-48

Seriatopora

Page 49-50

Stylophora

Page 51-52

Duncanopsammia

Page 31-32

Dendrophyllia

Page 27-28

Tubastraea

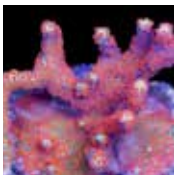
Page 29-30

Alveopora

Page 37-38

Goniopora

Page 39-40



Montipora

Page 119-120

Hydnophora

Page 125-126

Pectinia

Page 87-88

Some corals that may appear as encrusting in earlier life stages and in the trade develop branches as a secondary feature.

Porites

Page 117-118

Although some species of ***Porites*** that dominate shallow water are branching in shape (***P. cylindrica, P. lichen, P. nigrescens, P. rus***) many more species seen in trade are encrusting. This genus is featured in the Encrusting smaller polyp chapter.

Detecting false mariculture

1. **Growing edge**
   Healthy growing edge established on the artificial base, no fresh cuts or glue present.

2. **Artificial base properties**
   Artificial base and mariculture tag has biofouling of marine life e.g., calcareous algae.

3. **Size of colony in proportion to artificial base**
   A large colony should not be seen on a small base. Evidence of growth on to the artificial base should be present.

! A biofouled base is the fastest way to detect mariculture

Less time can be taken detecting false mariculture signs for low risk genera and more time spent on vulnerable taxa. **Check the growth rate, export level and price on each genus page to help guide you. For example, slow-growing, high export levels and highly priced corals should be inspected in more detail.**

SIGN OF TRUE MARICULTURE

Biofouling by coralline algae is common in 'mature' bases.

SIGN OF FALSE MARICULTURE

A new base is clean, without biofouling on the base or cement.

Due to the fast growth rate corals belonging to branching genera, many are fragmented once they arrive in the importing country. A cutting is taken from the **orginal import** and **grown seperately** by aquarists or retailers, reducing import levels.

However, higher-value *Acropora* will continue to be imported.

Acropora

FAST GROWTH

3-6 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

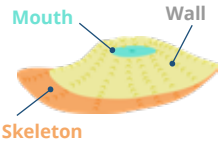
$4 $50

UK IMPORT PRICE PER PIECE

BETWEEN $21-99

CORALLITE FEATURES

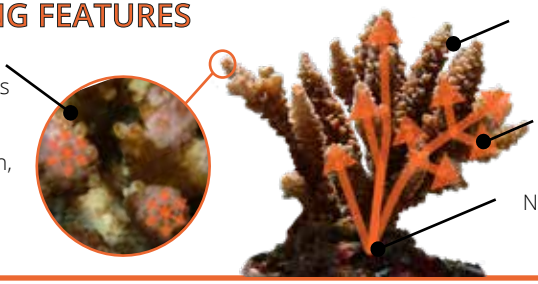
What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PHACELOID	**SMOOTH SKELETON**	**SMALL**
		
Tube-like structure	No skeletal bumps	1– 5 mm diameter

DEFINING FEATURES

Regular pattern forms a rosette appearance at top of branch, radiating outwards.



Corallite at branch tip is larger than surrounding corallites.

Growth from stems are normally symmetrical.

Narrow base attachment, sometimes forming a single stem.

LOOK-ALIKES

Acropora can be distinguished from other branching corals by its larger corallites (usually >1 mm in width) with distinct larger symmetrical corallites at each branch tip (axial corallite).

Acropora

Seriatopora

Page 49

Pocillopora

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Stylophora

Page 51

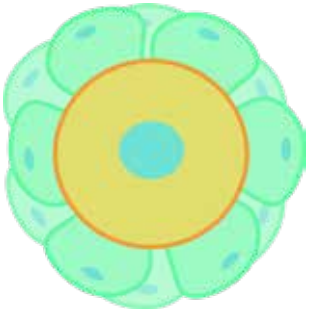
Porites

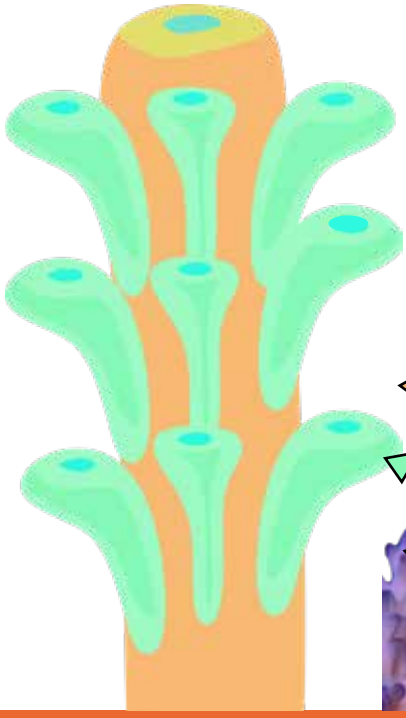
Page 117

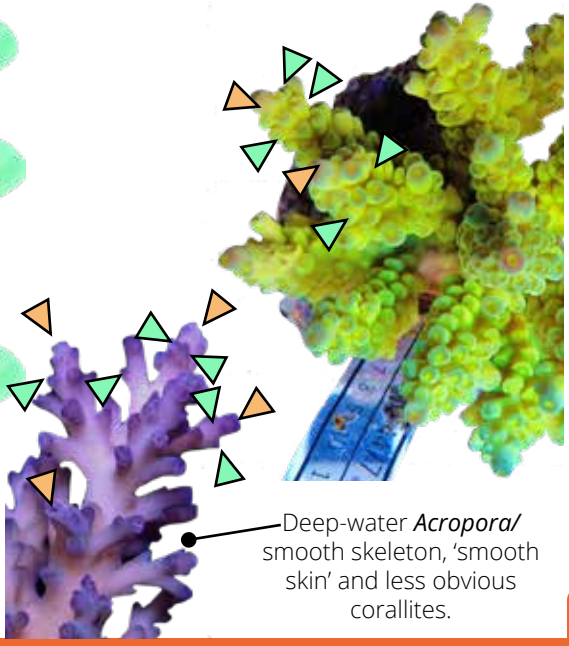
Unique *Acropora* corallites

Acropora has a highly recognisable corallite structure and can grow into many forms, including finger-like, staghorn and plates. The shape of the corallites and other skeletal features can be used to identify to species level.

A rosette of **asymmetrical axial corallites** arranged in a regular pattern around the **larger, symmetrical axial corallite.**







Deep-water ***Acropora/*** smooth skeleton, 'smooth skin' and less obvious corallites.

Pocillopora

FAST GROWTH

3-6 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

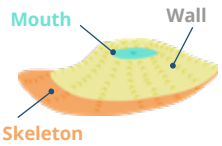
Global data 2010-2019

$5 $7

UK IMPORT PRICE PER PIECE

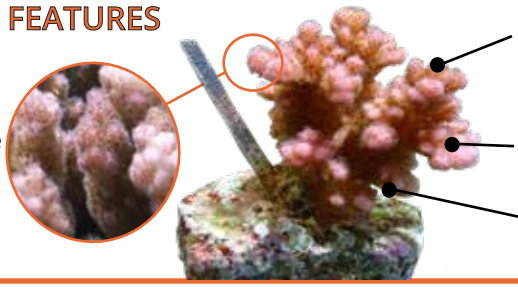
BETWEEN $2-20

CORALLITE FEATURES

	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	PLOCOID	SKELETAL BUMPS	SMALL
			
	Circular, separate walls	Bigger than corallites	<2 mm in diameter

DEFINING FEATURES

Random bumps (larger than holes) arranged on the skeleton, with corallites on or in-between.



Short stubby finger-like (digitate) branches.

Tiny holes (housing the corallites) flush to the surface.

Branches resemble berries.

LOOK-ALIKES

Pocillopora is distinguished from ***Acropora*** by having smaller corallites and no 'axial' corallites on the tips of branches. Large (2–5 mm) randomly spaced bumps all over its surface giving it a berry-like appearance make it distinct from other branching corals.

Pocillopora

Seriatopora

Page 49

Acropora

Page 45

Stylophora

Page 51

Porites

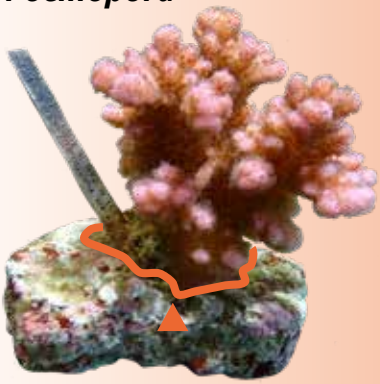
Page 117

Growth variation in branching corals

In tree-like branching corals, the canopy is much wider than the base, whereas in other corals (e.g. *Montipora, Porites*) branches grow from an encrusting base. Coral tissue encrusting the base is a signal of true mariculture in all growth forms of branching corals.

TREE-LIKE

Pocillopora

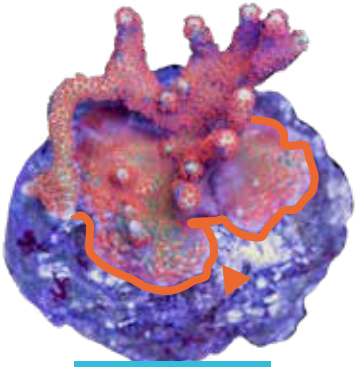


...see page 47

Seriatopora

...see page 49

Montipora



...see page 119

Porites

...see page 117

EXAMPLES OF CORALS WITH BRANCHING FORMS

Hynophora

Page 125

Echinopora

Page 91

Seriatopora

FAST GROWTH

3-6 months to culture

MEDIUM EXPORT LEVELS

100-500,000
pieces

Global data 2010-2019

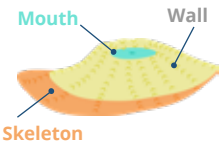
$5 $15

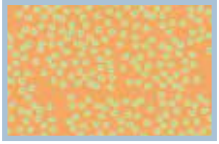
UK IMPORT PRICE PER PIECE

BETWEEN $2-20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	**SMOOTH SKELETON**	**TINY**
		
Circular, separate walls	No skeletal bumps	1 mm diameter

DEFINING FEATURES

Tiny holes (housing the corallites) flush to the surface.

Corallites often arranged in rows along the branches.

Smooth branches which are very delicate, tapered, thin and pointed.

LOOK-ALIKES

Seriatopora differs from ***Acropora*** by having smaller corallites and no 'axial' corallites on the tips of branches. It is distinguished from other branching corals by its delicate branches that taper to a point and its smooth skeleton ***Seriatopora*** is distinguished from ***Acropora***.

Seriatopora

Acropora

Page 45

Pocillopora

Page 47

Porites

Page 117

Stylophora

Page 51

Branching corals in the wild

Branching corals are fast-growing, fragment easily and are often common on natural reefs, meaning they are usually considered low risk in the trade.

However, they are also the most susceptible wild corals to pressures, such as temperature-induced bleaching, storm damage and disease. This means that in some areas branching corals are greatly reduced in abundance or may be absent.

Human activities can exacerbate the threats coral reefs face and corals may become more rare. Maricultured fragments are already being used to restore coral reefs in some parts of the world. In the future, mariculture of branching corals may aid their conservation and continue to supply the trade.

Stylophora

FAST GROWTH

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

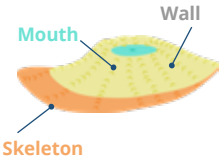
$5 $13

UK IMPORT PRICE PER PIECE

BETWEEN $2-20

CORALLITE FEATURES

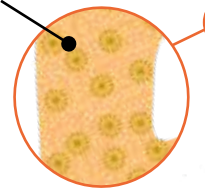
What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	SPIKES	SMALL
		
Circular, separate walls	Needle-like bumps	<2 mm diameter

DEFINING FEATURES

Small spikes on the skeleton, arranged close to the corallite 'holes' resembling hoods.



Short stubby finger-like (digitate) branches.

Tiny holes (housing the corallites) flush to the surface.

Thick terminal end of the branch (club-like) which may be paler (yellow).

LOOK-ALIKES

Stylophora is distinguished from ***Acropora*** by having smaller corallites and no 'axial' corallites on the tips of branches. It is distinguished from other branching corals by small spikes covering the skeleton and robust thick branches.

Stylophora

Porites

Page 117

Pocillopora

Page 47

Seriatopora

Page 49

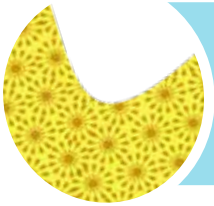
Montipora

Page 119

Branching corallite features

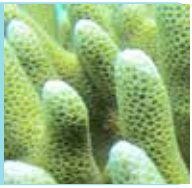
Several branching corals have tiny (<1 mm) circular separated corallites. They can be distinguished by skeletal features and the shape of branches. ***Acropora*** is not included in this page due to its distinctive axial and radial corallites (page 46).

Porites

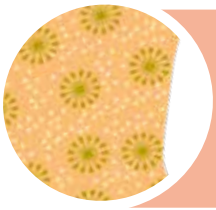


Skeleton is smooth, with very little space between holes. Variety of branch shapes from broad 'club-like' ends to finger-like ends.

...see page 117



Stylophora

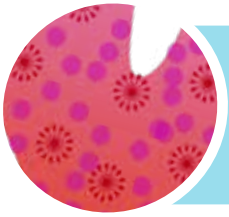


Small spikes on the skeleton, arranged close to the corallite 'holes' resembling hoods. Robust branches with broad 'club-like' ends.

Pocillopora

Bumps (larger than holes) randomly arranged on the skeleton. Robust branches with berry-like ends.

Montipora

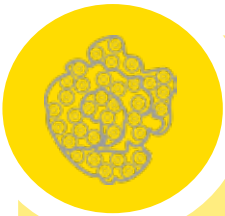


Bumps (usually same size as corallites) randomly arranged on the skeleton (sandpaper texture), bumps sometimes join to form ridge. Variety of branch structures.

...see page 119

Seriatopora

Tiny holes (housing the corallites) flush to the surface. Thin delicate branches with tapering pointed ends.



Encrusting
(larger polyps)

In this guide we have defined encrusting (larger polyps) as those that encrust the artificial base, sometimes forming small boulder-like mounds, and have corallites larger than >5 mm. Many of these genera are known as Large Polyp Stony 'LPS' corals by aquarists in the aquarium trade.

DID YOU KNOW?

Many of these corals look encrusting in trade as juveniles but some can also form small boulder-like mounds on the artificial base. Many of these corals are slow-growing, increasing in size by only up to 10 mm per year in the wild. They are resilient to a range of environmental pressures, e.g. bleaching.

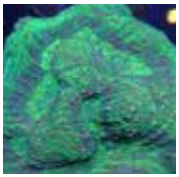
Some of these corals can be covered by a thick fleshy mantle which can be colourful and attractive for trade. Others have a thin layer of transparent tissue with skeleton features underneath clearly visible.

Some corals are very difficult to identify and may have changed group during taxonomic revisions in the last two decades.

Encrusting (larger polyp) corals seen in trade

Encrusting (larger polyp) corals includes colonies with colourful mouths and fleshy mantles that are popular in trade. ***This table of contents can be used to find the correct page during inspection and is colour-coded by chapter. Use the tabs to locate the chapter and the page number to navigate to identification pages.***

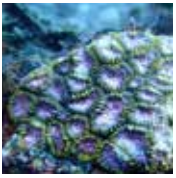
FLESHY MANTLE



NEAT-RIDGES

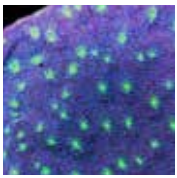
Find a neat-ridge coral key on page 74

OTHER



CHALICE CORALS

Find a Chalice coral key on page 96



Detecting false mariculture

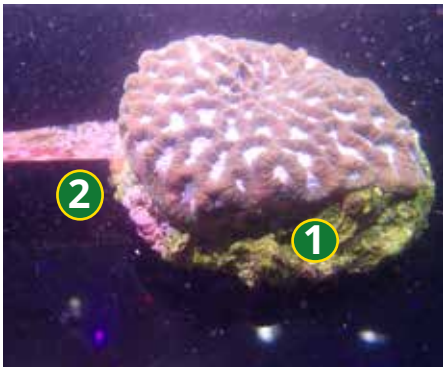
1 Growing edge
Healthy growing edge established on the artificial base, no fresh cuts or glue present.

2 Artificial base properties
Artificial base and mariculture tag has biofouling of marine life e.g., calcareous algae.

3 Size of colony relative to base
Maricultured corals in this group are usually only as big as their artificial base or smaller than it.

! Growing edge is the most important feature to inspect

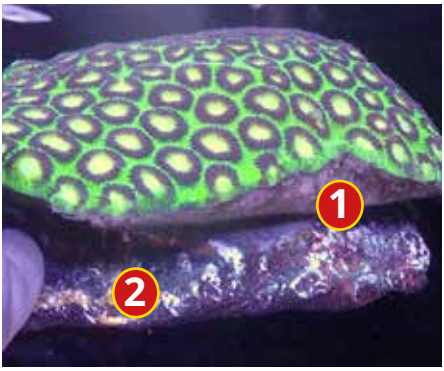
SIGN OF TRUE MARICULTURE



Healthy looking edge encrusting onto biofouled artificial base and tag.

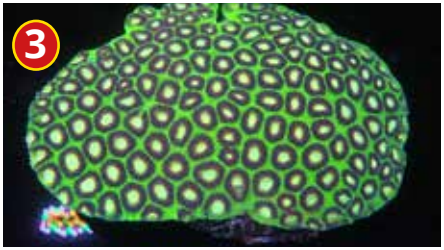
The shape of original piece cut from the mother colony may clear, even when the colony has encrusted the entire artificial base.

SIGN OF FALSE MARICULTURE



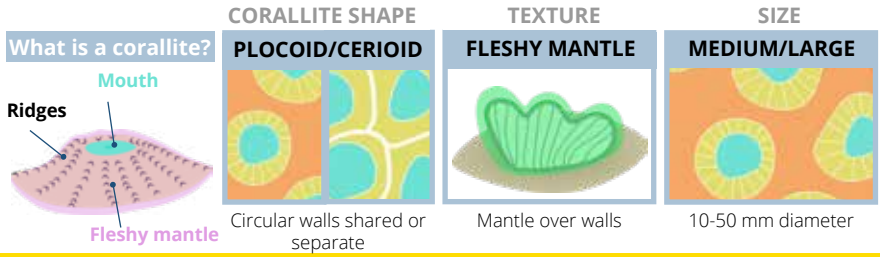
Fresh cuts around the edge, showing the white skeleton not encrusted to the base and incomplete polyps.

Colony bigger than its artificial base.



Acanthastrea

CORALLITE FEATURES

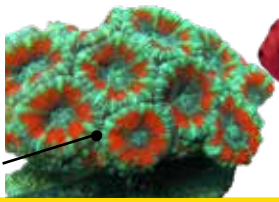


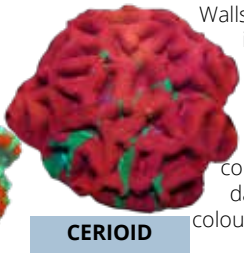
DEFINING FEATURES

Note: *Colour is not a reliable character for identification.*

Mouth and corallites circular to lobed.

Ridges/spikes are irregular or loosely organised into lines radiating from mouth.





Walls are thick (wall width is greater or equal to mouth diamteter).

Fleshy mantle is extended over the corallite wall during the day and may be highly coloured, but no tentacles should be visible.

LOOK-ALIKES

Favites and ***Favia*** have similar corallite shape but lack a fleshy mantle. ***Acanthastrea*** corallites are circular and smaller than ***Lobophyllia. Acanthastrea maxima*** can be confused with ***Scolymia.*** However, ***Scolymia*** is usually solitary with only one corallite present.

Acanthastrea

Page 73

Favites

Page 71

Favia

Page 61

Lobophyllia

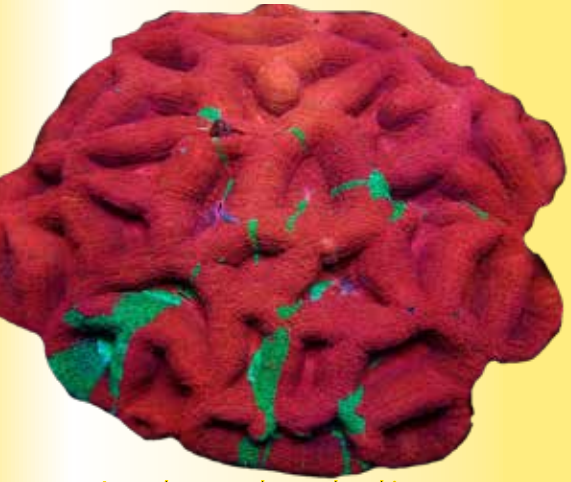
Page 133

Scolymia

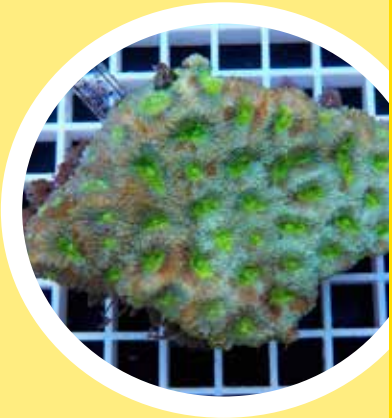
Shared compared to separate walls

SHARED

Cerioid ***Acanthastrea*** can look superficially like ***Favites***, but is distinguished by its fleshy mantle and irregular ridges versus the thin tissue layer and unhidden ridges in ***Favites.***



Acanthastrea bowerbanki

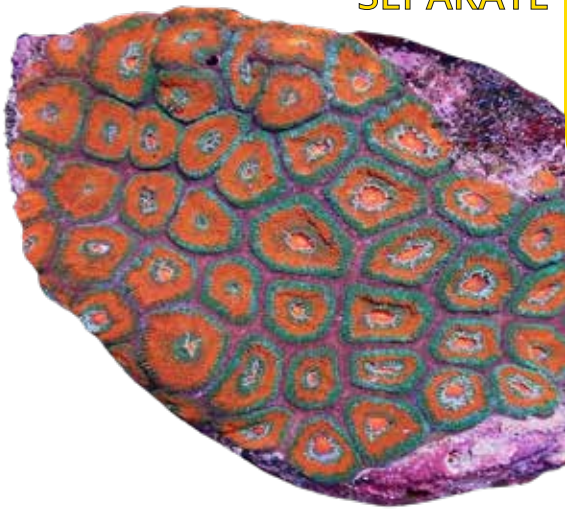


Acanthastrea enchinata

SEPARATE

Plocoid ***Acanthastre***a can look like ***Favia***, with the same differences applying as for ***Favites***. ***Acanthastrea*** can look similar to ***Blastomussa***, but ***Acanthastrea*** usually has larger and more densely packed corallites.

...see page 59



Acanthastrea sp.

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org.**

Blastomussa

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

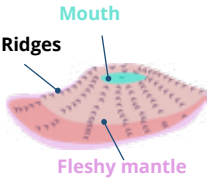
$2 $40

UK IMPORT PRICE PER PIECE OR POLYP

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

PLOCOID/PHACELOID

Circular, separate walls

TEXTURE

FLESHY MANTLE

Mantle over walls

SIZE

MEDIUM

7 – 25 mm in diameter

DEFINING FEATURES

Corallite walls are always separate.

Mouth shape is circular or oval.

Walls have robust radiating ridges that are irregular in size and may be bumpy.

A fleshy mantle over the wall and may be highly coloured, but tentacles small and barely visible.

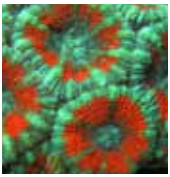
LOOK-ALIKES

Blastomussa with tightly packed corallites may look like ***Acanthastrea,*** while ***Blastomussa*** with oval-shaped mouths may look like ***Lobophyllia***. ***Blastomussa*** usually has smaller corallites than either of these genera.

Blastomussa

Lobophyllia

Page 61

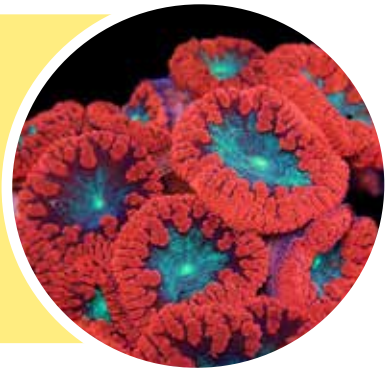


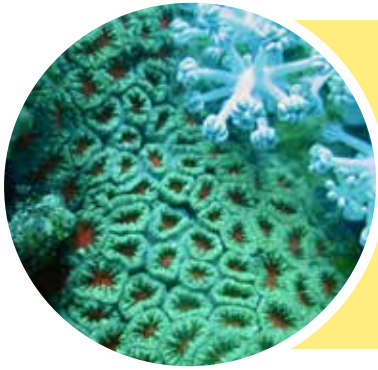
Acanthastrea

Page 57

Wild rarity and trade abundance

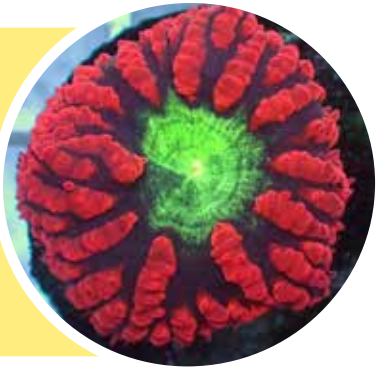
Blastomussa is traded in moderate volumes and can fetch a high price for brightly coloured colonies.





In the wild this genus is usually rare and colonies are small reaching a maximum of ~200 mm in diameter.

Only maricultured ***Blastomussa*** can be exported from Indonesia and there are limited number of CITES export permits available.



! *Blastomussa* spp. have import restrictions

Since 2015 the importation of Source Code 'W' (wild caught) ***B. wellsi*** and ***B. merleti*** into the European Union from Indonesia has not been permitted.

WATCH LIST

CHECK GENUS

Lobophyllia

MEDIUM GROWTH

8-12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

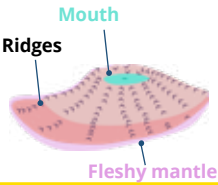
$6 $72

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

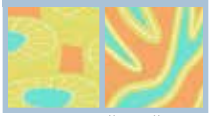
CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

PHACELOID
FLABELO-MEANDORID



Separate walls, valleys or oval mouths

TEXTURE

FLESHY MANTLE

Mantle over walls

SIZE

MEDIUM/LARGE

15-50 mm diameter

DEFINING FEATURES

Clearly separate walls and usually grow as elongated tubes with spaces between sometimes visible.

Corallite mouths are usually lobe to oval.

Thick walls relative to mouth (wall width is greater or equal to mouth diameter), fleshy mantle covering walls and skeleton.

Bumps present all over like ***Acanthastrea.***

A single corallite may be sold, as they are easy to remove from wild colony.

LOOK-ALIKES

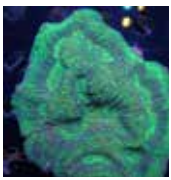
Single corallites may look like ***Trachyphyllia***. It may also be confused for other corals with a fleshy mantle. ***Australomussa*** has shared walls, ***Acanthastrea*** has more circular mouths and less separation between walls and ***Symphyllia*** has valley-shaped mouths and shared walls.

Lobophyllia

Page 131

Trachyphyllia

Page 63



Australomussa

Page 65

Symphyllia

Page 57

Acanthastrea

Lobophyllia and other corals

Lobophyllia may be harvested from the wild as an entire colony. Maricultured colonies may have very few corallites that have budded from the orginal corallite.

EXAMPLE ON THE REEF

MARICULTURED

Taxonomic changes

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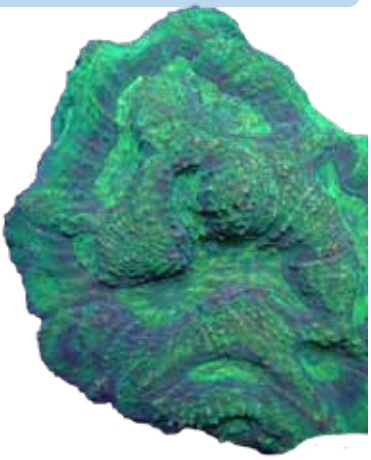
Scolymia usually have a single, encrusting corallite and may be confused with juvenile *Lobophyllia.*

...see page 133



Unlike *Lobophyllia, Australomussa* has fused walls.

...see page 63

Australomussa

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

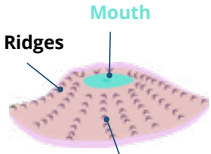
Global data 2010-2019

$12 $40

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

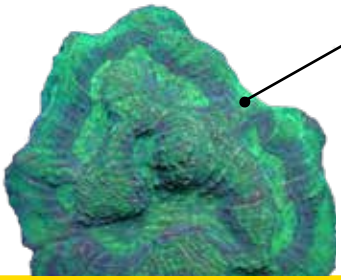
	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	MEANDROID	FLESHY MANTLE	LARGE
			
	Valleys, shared walls	Mantle over walls	50-100 mm wide

DEFINING FEATURES

Mouth is visible, but less wide than the walls.

Mouths are elongated into ovals and short valleys.

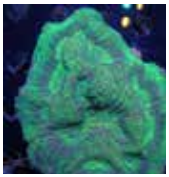
Walls are slightly raised above the mouth and are tapered.



More than one corallite may be present.

LOOK-ALIKES

The 'flatness' of ***Australomussa's*** is similar to its look-alikes. Valleys of ***Australomussa*** consist of deeper and larger-sized corallites than ***Mycedium, Echinophyllia*** and ***Oxypora. Moseleya*** has fleshy mantle, teeth fringing mouth and higher density of polyps than ***Australomussa***.



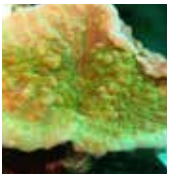
Australomussa

Echinophyllia

Page 89

Mycedium

Page 93



Oxypora

Page 95

Moseleya

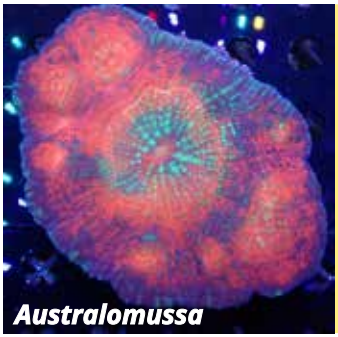
Page 69

Colourful fleshy mantles

Colourful fleshy mantles are attractive to aquarists meaning the colonies with this feature are sought after and more valuable than others in the same genus.

Colour often drives trends and corals are given distrinctive names which can improve their popularity e.g. Flaming Lips Symph (***Symphyllia*** sp.).

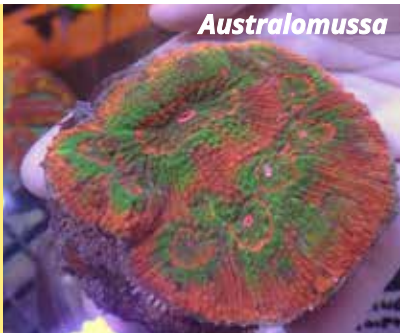
Symphyllia


Australomussa

The price of the coloured colony can be 2-3 times higher than examples of more 'naturally' coloured colonies (tan or green).

Popular colours include reds and yellows.

Neat-ridged corals can have coloured mouths but lack the variety of colours and patterns seen in fleshy mantle corals. This can lead to illicit traders mislabelling fleshy mantle corals as cheaper neat-ridged corals e.g. ***Austalomussa*** (right) was shipped using an ***Echinopora*** permit.


Australomussa

Taxonomic changes

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Symphyllia

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$4 $28

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

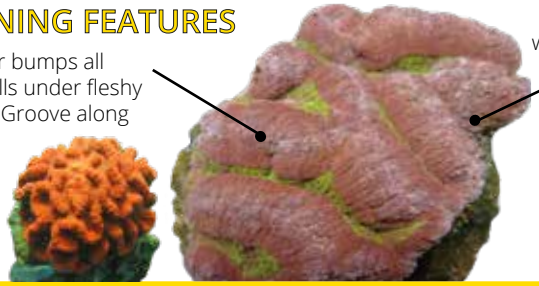
CORALLITE FEATURES

What is a corallite?	CORALLITE SHAPE	TEXTURE	SIZE
Mouth, Ridges, Fleshy mantle	MEANDROID	FLESHY MANTLE	MEDIUM/LARGE
	Valleys, shared walls, groove along top of wall	Mantle over walls	15-35 mm wide valleys

DEFINING FEATURES

Irregular bumps all over walls under fleshy mantle. Groove along walls.

All *Symphyllia* have long winding valleys compared to *Lobophyllia* and *Acanthastrea.*



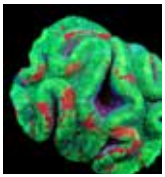
At sea

In trade

LOOK-ALIKES

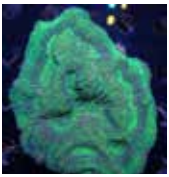
Small *Symphyllia* may look like *Trachyphyllia* or *Lobophyllia*, but normally has more valley-shaped mouths and shared walls, with groove along wall. *Symphyllia* walls are more fleshy than *Australomussa,* once settled.

Symphyllia Page 131



Trachyphyllia Page 61

Lobophyllia Page 63



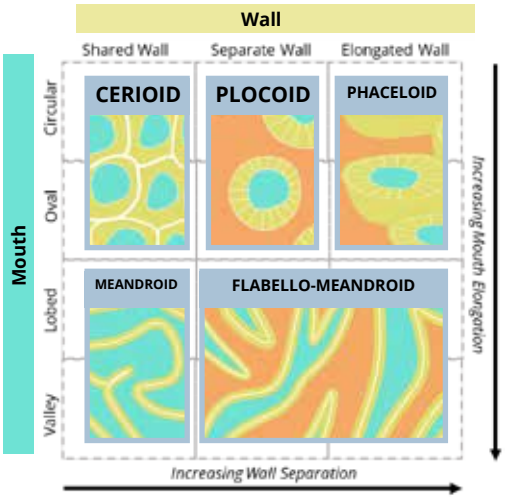
Australomussa Page 81

Platygyra

Corallite shape diversity

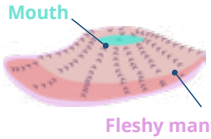
Corallite shape is based on mouth shape and wall separation. Although this feature is a continuum, this guide uses 5 corallite groups for ease of identification. If genus has more than one shape type, they are all featured on the genus pages.

Photographic examples of corals featured in this chapter (encrusting, larger polyp) under these categories are shown below.



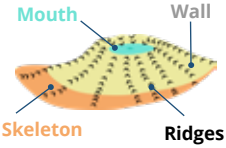
FLESHY MANTLE

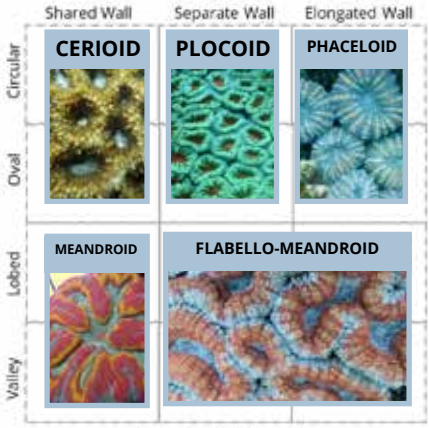
Massive corals with a fleshy mantle over the walls.

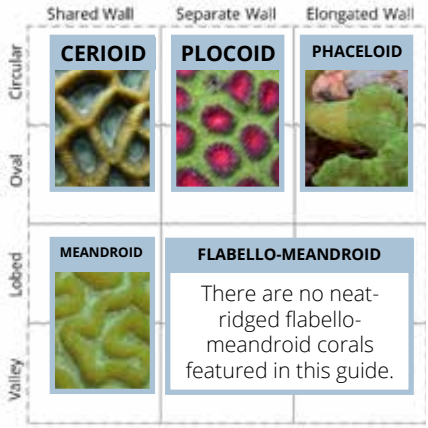


NEAT-RIDGES

Massive corals with thin tissue layer, revealing ridges radiating from the mouth in neat arrangement.







These examples show fleshy mantle and neat-ridge corals but there may be some overlap. For example, ***Caulastrea*** (page 83) has neat-ridges but also a fleshy tissue covering the walls.

Diploastrea

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

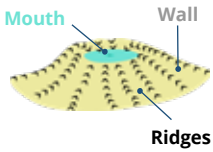
$8 $8

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	NEAT-RIDGES	MEDIUM
		
Separate walls	Radiating from mouth	8-10 mm diameter

DEFINING FEATURES

Mouth and walls (corallites) are dome-shaped around a small circular mouth, which is <20 % the width of corallite.

Corallites are polygonal in shape and have straight walls covered in lines of regular ridges radiating from the mouth.

LOOK-ALIKES

Favia and ***Montastrea*** have similar-sized corallite with separate walls, but ***Diploastrea*** is distinguished by its small mouth relative to wall width and the angular edges between corallites. Volcano-shaped corallites similar to ***Astreopora*** but has bigger corallites.

Diploastrea

Favia

Page 71

Montastraea

Page 77

Astreopora

Page 109

Ecology of *Diploastrea*

Diploastrea

Diploastrea are common reef-builders found across the Indo-Pacific from East Africa to French Polynesia, over 17,000 kilometeres away.

In the CITES data (2010-2019) over 15,500 pieces were exported from: Indonesia, Fiji, Solomon Islands, Papua New Guinea and Australia.

15,572

Top importers: USA, UK, Canada, and the EU.

On the reef they can form large colonies several metres across, and be host to a wide range of other organisms.

Moseleya

NOT CULTURED

Not currently maricultured in Indonesia

LOW EXPORT LEVELS

Under 100,000 pieces

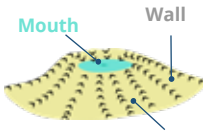
Global data 2010-2019

$10 $26

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

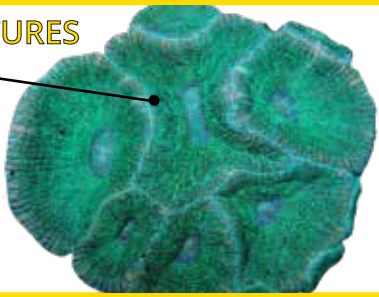
CORALLITE FEATURES

	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	CERIOID	NEAT-RIDGES	LARGE
			
	Circular, shared walls	Radiating from mouth	Up to 35 mm diameter

DEFINING FEATURES

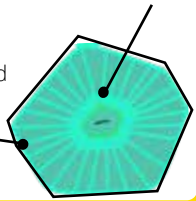
Colonies usually have a large central corallite surrounded by angular daughter corallites.

Walls are usually shared but may show small separation between.



Teeth fringing the mouth on the mouth small and rounded.

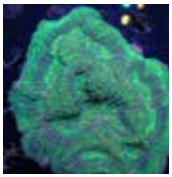
Angular corallite edge and steep tapering walls.



LOOK-ALIKES

Australomussa and ***Acanthastrea h***ave oval to lobed mouth with shared walls, but ***Moseleya*** is distinguished by angular corallite edges and steep tapering walls. It also usually has a larger central corallite.

Moseleya

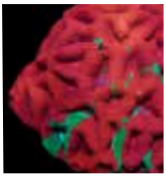


Australomussa

Page 63

Diploastrea

Page 67



Acanthastrea

Page 57

Trade levels of encrusting (larger polyp) corals

HIGH EXPORT LEVELS

Lobophyllia

569,001

Acanthastrea

506,449

Moseleya is not currently cultured and is not traded in high numbers. ***Moseleya*** export quota may be used for fraudulent trade of more valuable boulder-like genera such as ***Lobophyllia*** and ***Acanthastrea***.

MEDIUM EXPORT LEVELS

Caulastraea

478,612

Favites

342,561

Favia

305,531

Galaxea

300,901

Echinophyllia

272,676

Blastomussa

199,788

Platygyra

163,375

Goniastrea

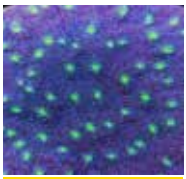
160,964

Symphyllia

160,439

Mycedium

145,102



Echinopora

121,646

Pectinia

100,751

LOW EXPORT LEVELS

Montastraea

69,707

Oxypora

45,530

Moseleya

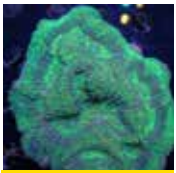
31,527

Diploastrea

15,572

Oulophyllia

15,150



Australomussa

13,266

Favia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

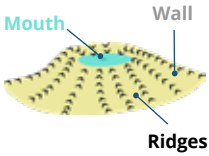
$7 $28

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	NEAT-RIDGES	MEDIUM
		
Circular, separate walls	Radiating from mouth	8-20 mm diameter

DEFINING FEATURES

Rounded walls with ridges radiating from the mouth.

Favia is very varied so its best to check look-alikes first.

Separate walls surrounding mouth.

LOOK-ALIKES

Favia is distinguished from other circular separate walled (plocoid) boulder-like corals by not having budding of daughter corallites (page 78). *Favia* is distinguished from *Favites* by having separate walls.

Favia

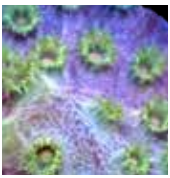
Page 67

Diploastrea

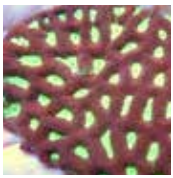
Page 77

Montastraea

Page 111



Cyphastrea



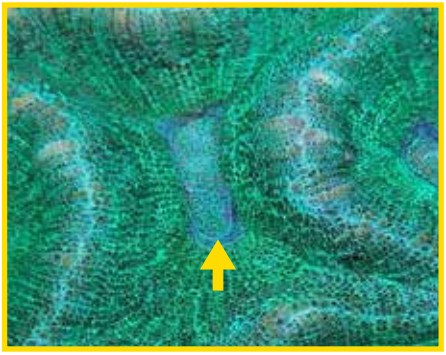
Favites

Page 73

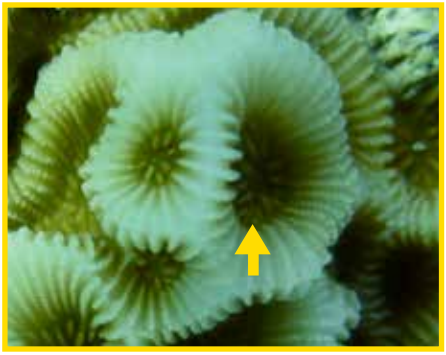
Teeth fringing mouths in coral

Favites
TEETH ABSENT

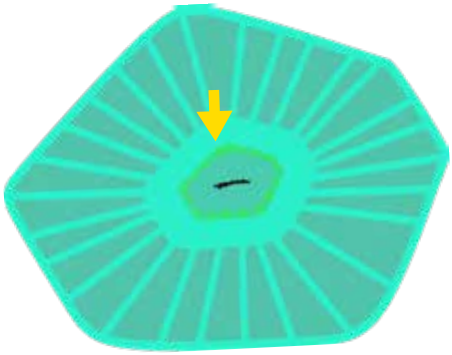
The prescence of teeth fringing the mouth is a good distinction in corals across chapters. This page compares corals to help users spot this feature.

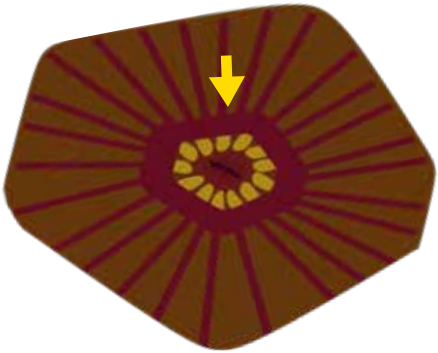


Moseleya
TEETH POORLY DEVELOPED
Teeth small and rounded.



Goniastrea
TEETH WELL DEVELOPED
Teeth long and more robust.





Favites

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

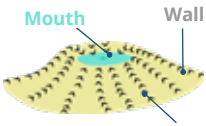
$4 $40

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

CERIOID

Circular, shared walls

TEXTURE

NEAT-RIDGES

Radiating from mouth

SIZE

SMALL/MEDIUM

3-15 mm diameter

DEFINING FEATURES

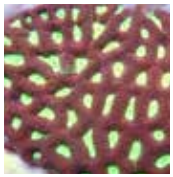
Favites has corallites with **shared** walls.

Walls are rounded and have regular ridges radiating from the mouth.

Corallite size can vary (3-15 mm).

LOOK-ALIKES

Favites is distinguished from most other neat-ridge corals with circular mouths by having shared walls, *Favia* has separate walls. ***Goniastrea*** also has shared walls, but has a crown of teeth fringing the mouth. ***Acanthastrea*** has spikes visible through fleshy mantle.

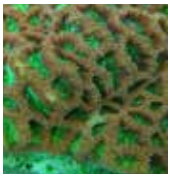


Favites

Page 71

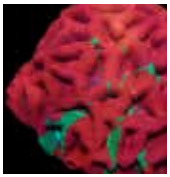
Favia

Page 79



Oulophyllia

Page 57



Acanthastrea

Goniastrea

Page 75

Key to *Favites* look-alikes

Are walls separate?

YES

Favia

Page 71

NO

Do mouths have a crown of teeth around the mouth edge?

YES

Goniastrea

Page 75

NO

Are there spikes/bumps visible through a a fleshy mantle?

YES

Acanthastrea

Page 57

NO

Does corallite shape reflect shared large valleys?

YES

Oulophyllia

Page 79

NO

Favites

Page 73

Budding or equal divison?

The final question in this flowchart explains budding and equal divison, you can explore this further on page 78.

Goniastrea

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

$12 $58

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

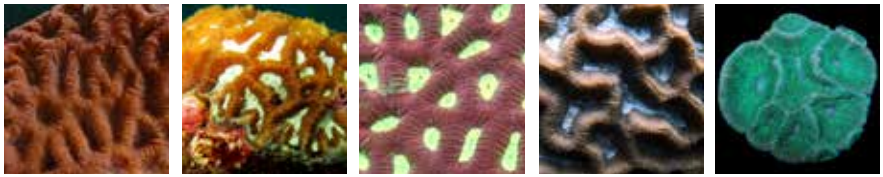
What is a corallite?	CORALLITE SHAPE	TEXTURE	SIZE
	CERIOID/ MEANDROID	NEAT-RIDGES	MEDIUM
Mouth, Wall, Ridges	Circular or valley shared walls	Radiating from mouth	6-15 mm diameter

DEFINING FEATURES

Ridges on walls and small teeth fringing mouth.

LOOK-ALIKES

Goniastrea has a variable shaped mouth fringed with large teeth, absent in ***Platygyra*** and ***Favites***, weakly developed in ***Moseleya*** and ***Oulophyllia***. ***Moseleya*** has larger, more circular mouths and angular walls, ***Oulophyllia*** has larger corallites, more tapered walls and meandroid valleys.

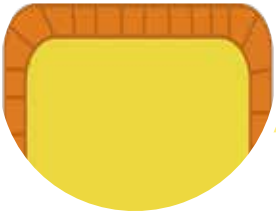


Goniastrea	*Platygyra*	*Favites*	*Oulophyllia*	*Moseleya*
	Page 81	Page 73	Page 79	Page 69

Wall shape of neat-ridged corals

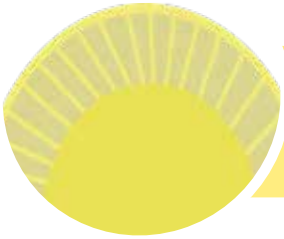
Genera in this group are hard to distinguish and wall shape can help with identification...

Platygyra



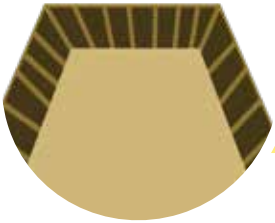
Defined valley structure with straight walls that have a **flat top**.

Favites



Less defined wall top that other groups, more of a **rounded** appearence.

Goniastrea



Wall grooves are **tapered and flat** ie. do not terminate into a defined apex.

Oulophyllia

Wall grooves are **tapered** to a defined apex. This genus has noticable large corallite walls and a robust appearence.

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Montastraea

SLOW GROWTH

>12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

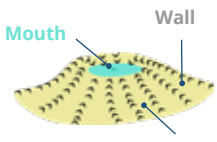
$10 $18

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

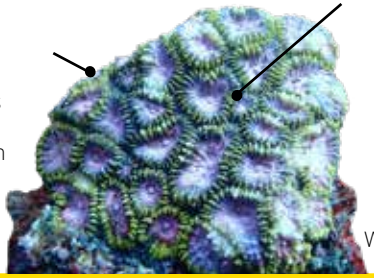
What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	NEAT-RIDGES	MEDIUM
		
Circular, separate walls	Radiating from mouth	8-15 mm diameter

DEFINING FEATURES

Sausage-shaped wall ridges which alternate in size.



Variable corallite size and 'crowded' appearance indicates budding of daughter colonies (page 78).

Walls are separate.

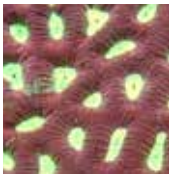
LOOK-ALIKES

Separate walls compared to ***Favites***. Budding of smaller daughter corallites compared to ***Favia***. ***Cyphastrea*** has budding and sausage-shaped ridges, but has smaller corallites. ***Diploastrea*** also has budding, but has broader walls and smaller mouths.

Montastraea

Favia

Page 71



Favites

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Diploastrea

Page 67

Cyphastrea

Page 111

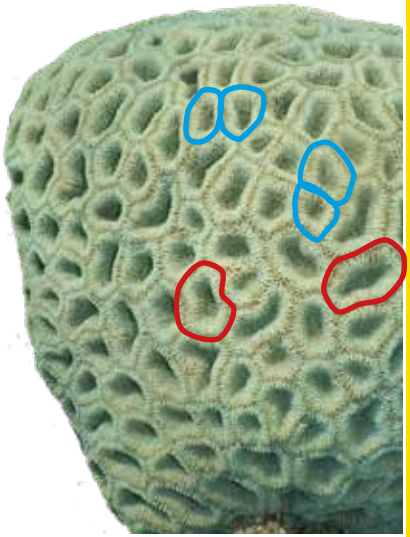
Distinct corallite formation

Different encrusting (larger polyp) coral genera grow new corallites in two different ways.

BUDDING

In **budding** (e.g. ***Montastraea, Cyphastrea*** and ***Diploastrea)***, the new daughter corallite is formed from a small portion of the parent corallite resulting in a 'crowded' appearance. Both groups can have variable corallite size, but in equal division the smaller corallites appear as equal-sized pairs.

EQUAL DIVISION



In **equal division** (e.g. ***Favia*** and ***Favites***) the parent corallite splits into two equal daughter corallites.

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org.**

Oulophyllia

NOT CULTURED

Not currently maricultured in Indonesia

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

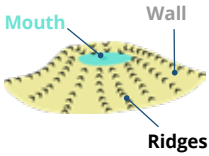
$15 $25

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
MEANDROID	**NEAT-RIDGES**	**MEDIUM**
		
Valleys, shared walls	Radiating from mouth	10-20 mm width

DEFINING FEATURES

Corallite walls are sloped with lines of regular ridges radiating from mouth.

Wall shape is tapered to to an apex (page 76).

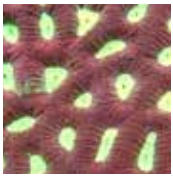
Valleys may be variable in size but appear lobed in shape.

Valleys are wider than other neat-ridged corals (10-50 mm).

LOOK-ALIKES

Oulophyllia has larger corallites than other neat-ridge corals, walls taper to an apex (see page 76).

Oulophyllia



Favites

Page 73

Platygyra

Page 81

Goniastrea

Page 75

Examples of *Oulophyllia*

Oulophyllia has mouths that are elongated into valleys but they may be short ovals and lobes. ***Oulophyllia*** has larger corallites than other neat-ridge corals, walls taper to an apex.

Oulophyllia on the reef

Platygyra

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

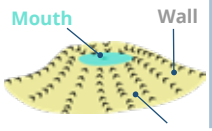
$5 $45

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
MEANDROID	NEAT-RIDGES	SMALL/MEDIUM
		
Valley, shared walls	Radiating from mouth	4-10 mm width

DEFINING FEATURES

Shared walls with neat wall ridges.

Platygyra usually has long meandroid valleys, but in some species these may appear lobed or oval.

Walls are steep (often vertical) with a flat top or ragged top.

LOOK-ALIKES

Platygyra is easily confused. It has narrower valleys than *Oulophyllia*, lacks the teeth fringing mouth of *Goniastrea*, and has usually more elongated valley-shaped mouths compared to *Favites*. *Merulina* is distinguished by the zip-like interlocking wall ridges appearance.

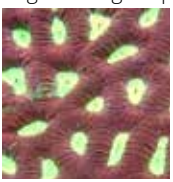
Platygyra

Oulophyllia

Page 79

Goniastrea

Page 75



Favites

Page 73

Merulina

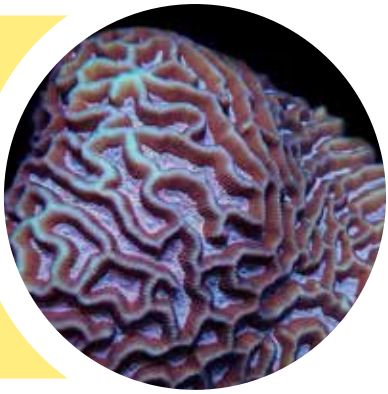
Page 123

Examples of *Platygyra* on the reef

Platygyra is a relatively common coral in the wild, with 11 species. It is slow-growing and is highly tolerant to environmental disturbance, often recovering well from bleaching, sedimentation and physical impacts.

The classic appearance of this genus is highly elongated valleys randomly arranged on the colony, but with highly regular valley width, giving them a brain-like surface.

Some colonies have coloured mouths that make them attractive to the coral trade. Some also may have more oval mouth shape, which could be confused for cerioid neat-ridge corals such as ***Goniastrea*** and ***Favites.***



Caulastraea

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

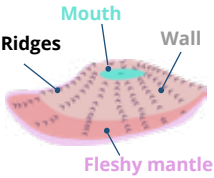
$4 $12

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



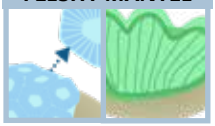
CORALLITE SHAPE

PHACELOID

Tube-like structure

TEXTURE

NEAT-RIDGES & FLESHY MANTLE



Ridges radiating from mouth, mantle over walls

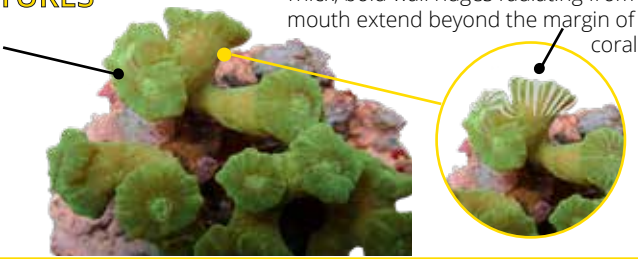
SIZE

MEDIUM

8-15 mm diameter

DEFINING FEATURES

Caulastraea is relatively unique with very elongated (phaceloid) corallites, with circular to oval mouths.



Thick, bold wall ridges radiating from the mouth extend beyond the margin of the corallite.

LOOK-ALIKES

Caulastraea has bold ridges visible through the live tissue, but ***Duncanopsammia*** and ***Dendrophyllia*** do not have this feature. Similar fleshy mantle appearance to *Lobophyllia* and *Blastomussa* but prominent, smooth neat-ridges are visible through the fleshy mantle.

Caulastraea

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Dendrophyllia

Page 59

Blastomussa

Page 31

Duncanopsammia

Lobophyllia

Page 61

Wall detail in coral with neat-ridges

The corals that fall under the category neat-ridges are all within the family Merulinidae. Corallite shape and size can be distinct but the ridges that radiate from the mouth are regular in shape, size and spacing.

Favites
Cerioid, circular, shared walls

Favia
Plocoid, circular, seperate walls

Platygyra
Meandroid, valleys, shared walls

Caulastraea
Phaceloid, circular to oval, seperate tube-like walls

Neat-ridges provide important distinction

This feature can help to quickly distinguish between low- and high-value massive corals. This feature would be absent from more valuable fleshy mantle corals e.g. ***Acanthastrea*** and ***Lobophyllia***.

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

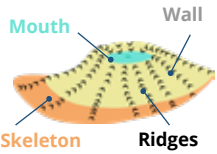
$5 $7

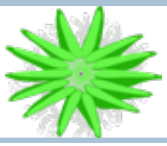
UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



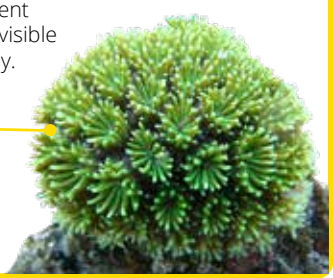
CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID/ PHACELOID	STAR OF SPINES	SMALL/MEDIUM
		
Circular, separate walls	Unique star shape	1- 10 mm diameter

DEFINING FEATURES

Corallite edges are distinguished by long sharp spines fringing mouth pointing vertically upwards from the skeleton to form a star-like shape.

Small transparent tentacles may be visible during the day.

Mouths are circular to oval and fringed by long spines.



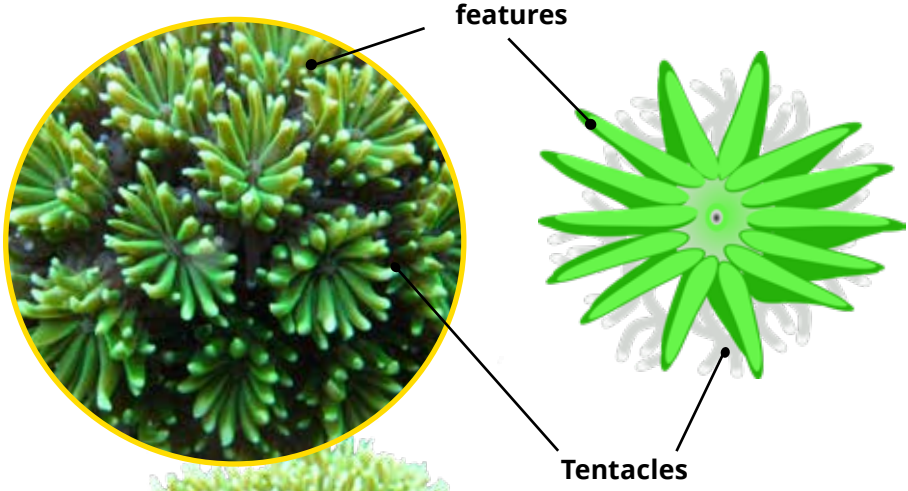
LOOK-ALIKES

Galaxea is a highly distinctive genus with the longest spines fringing mouth that are inside a ring of tentacles. No other coral genus has this feature.

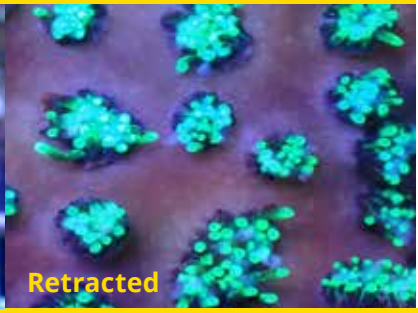
Galaxea

***Galaxea* is highly distinctive but can have variation in colour and shape.**

The starry spines of *Galaxea*



***Galaxea* grown at a UK importer facility**



Pectinia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

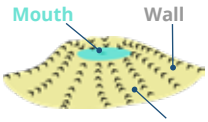
$6 $55

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE: MEANDROID

Valleys, shared walls

TEXTURE: LUMPS/SPIKES

Irregular wall ridges form lumps and spikes

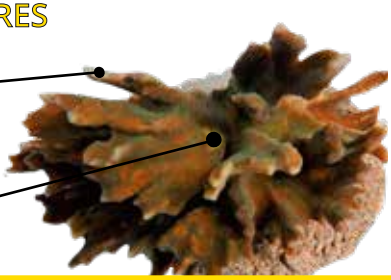
SIZE: UNKNOWN SIZE

Size range unknown, mouths sometimes visible

DEFINING FEATURES

Walls form irregular, deep valleys at right angles to growing edge.

Large corallites with the irregularly shaped mouth sometimes visible between the ridges.



Distinct irregular protrusions (ridges) from the walls (which are widely spaced) can look like spikes or even branches.

LOOK-ALIKES

Large spikes and branches on the walls between large irregular valley-shaped mouths is unique to ***Pectinia,*** but may look superficially like other encrusting/foliose corals with branching and leafy adult forms.

Pectinia

Hydnophora

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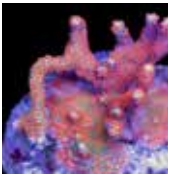

Montipora

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Trachyphyllia

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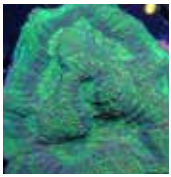

Australomussa

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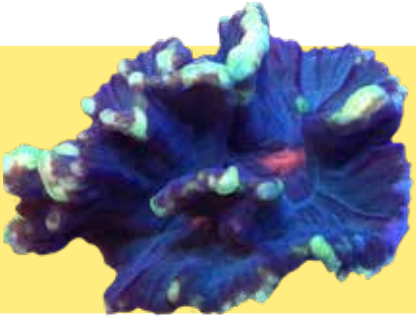
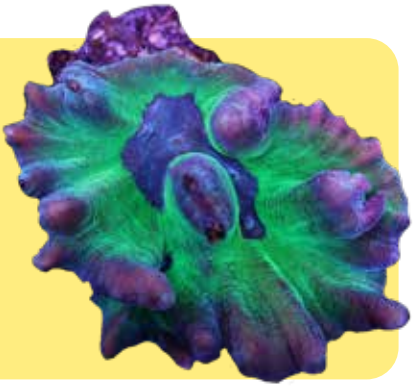
Diverse growth morphology

Widely spaced large ridges protruding from the walls are unique to ***Pectinia***, but may appear superficially like branches of ***Hydnophora*** or ***Montipora***. In these genera, numerous circular mouths are arranged on the branches, opposed to the large irregular valley-shaped mouths often obscured between branches in ***Pectina.***



In this small piece of ***Pectinia*** the large mouth (red in this image) is visible between leafy protrusions.

This ***Pectinia*** has been harvested from the wild as a juvenile, evident from the large central mouth and weakly developed ridges/wall protrusions. Corals like this may resemble some fleshy mantle solitary corals such as ***Trachyphyllia*** and ***Australomussa,*** however the features on the walls of these genera tend to be smaller.



Echinophyllia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

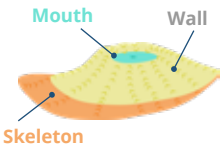
$8 $38

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



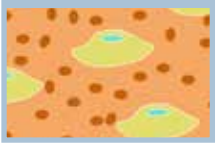
CORALLITE SHAPE

PLOCOID

Circular, separate walls

TEXTURE

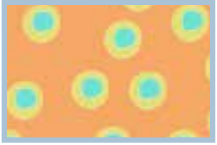
WARTY TEXTURE



Warty bumps

SIZE

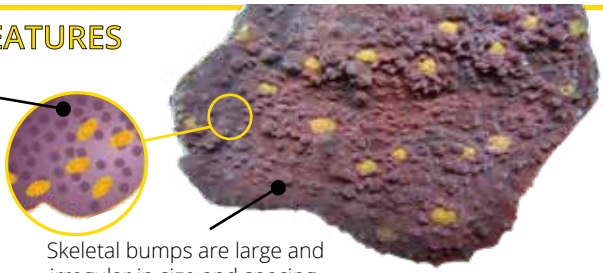
SMALL/MEDIUM



4 -10 mm diameter

DEFINING FEATURES

Irregularly spaced and sized corallites.

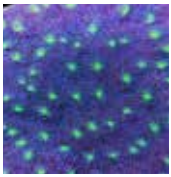


Skeletal bumps are large and irregular in size and spacing.

LOOK-ALIKES

Echinophyllia is easily confused with other Chalice corals. It tends to have larger more irregular bumps between corallites. Corallites are also more irregularly sized and spaced than other genera. The mouth is almost always visible compared to ***Oxypora.***

Echinophyllia



Echinopora

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Mycedium

Page 93

Oxypora

Page 95

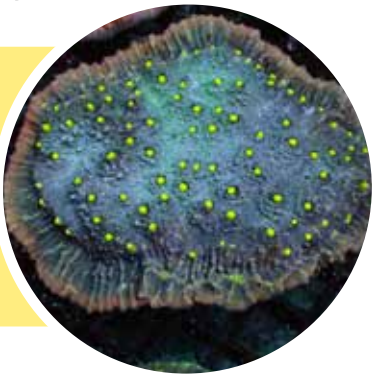
Turbinaria

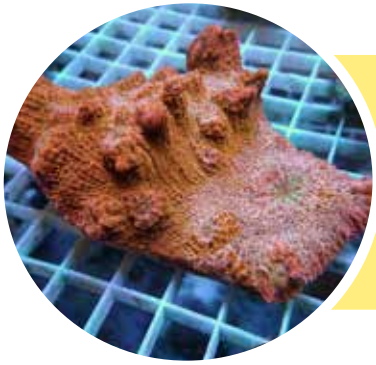
Page 115

Variability in *Echinophyllia*

Echinophyllia is a highly variable genus and can look more like ***Echinopora, Mycedium*** or ***Oxypora*** (the Chalice corals) depending on the species and the environment the colony grew in.

This ***Echinophyllia*** colony resembles ***Oxypora*** because it has small mouths. However, *Oxypora* mouths would be more obscured.





This ***Echinophyllia*** colony resembles ***Mycedium*** because its mouths clearly face the growing edge with well developed hoods and skeletal bumps arranged perpendicular to the growing edge.

This ***Echinophyllia*** colony resembles ***Echinopora*** due to its randomly orientated and radiating lines of bumps on corallite walls but it has larger, more irregularly distributed mouths.

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Echinopora

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

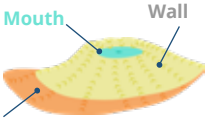
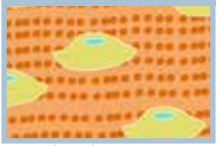
Global data 2010-2019

$6 $15

UK IMPORT PRICE PER PIECE

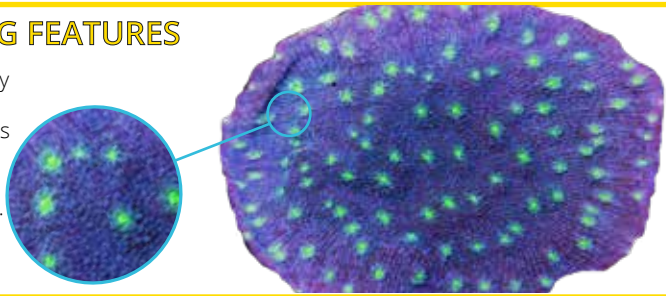
BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?	CORALLITE SHAPE	TEXTURE	SIZE
	PLOCOID	WARTY TEXTURE	SMALL/MEDIUM
	 Circular, separate walls	 Granulated texture, rows of radiating bumps	 3-8 mm diameter

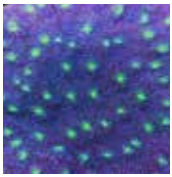
DEFINING FEATURES

More regularly spaced and sized corallites not inclined towards the growing edge.



LOOK-ALIKES

Echinopora is easily confused with other Chalice corals. It tends to have more regular spacing and size of corallites than other genera.



Echinopora

Echinophyllia

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Mycedium

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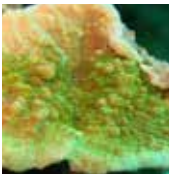

Oxypora

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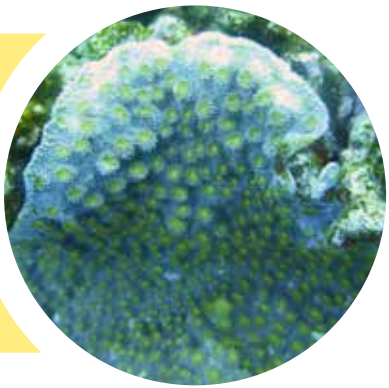
Turbinaria

Page 115

Echinopora in the wild

Echinopora is a common leafy/foliose coral found in a range of different reef environments from lagoons to reef slopes.



Large colonies in high-light environments can form dense whorls and spirals.

Other species form staghorn-like branches.

Valuable corals are traded as *Echinopora*

Echinopora is a less valuable coral that be easily mistaken for several more expensive corals including: *Echinophyllia, Turbinaria* and *Australomussa* which may lead to illicit labelling of these genera.

Mycedium

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

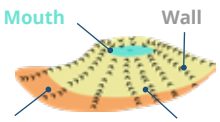
$19 $32

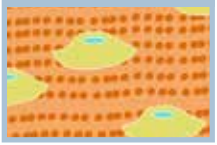
UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	WARTY TEXTURE	MEDIUM
		
Circular, separate walls	Regular ridges with bumps	5-15 mm diameter

DEFINING FEATURES

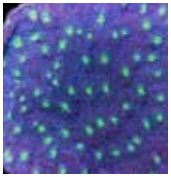
Irregularly spaced and sized corallites, with mouths facing the growing edge. A hood is often present.

Skeletal ridges, which are often bumpy, at right angles to the growing edge present connecting mouths.

LOOK-ALIKES

Mycedium is easily confused with other Chalice corals. Its corallites and skeletal bumps are more strongly inclined to the growing edge than other genera.

Mycedium



Echinopora

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Echinophyllia

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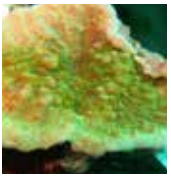

Oxypora

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Turbinaria

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Comparing Chalice corals

Chalice corals are a diverse group with many overlaps in characteristics between the genera. The four characteristics below can help, but be aware there are exceptions to these rules for various species or colonies that have been grown in a particular environment (e.g. the size of hood in *Echinophyllia* and *Mycedium*).

Echinophyllia

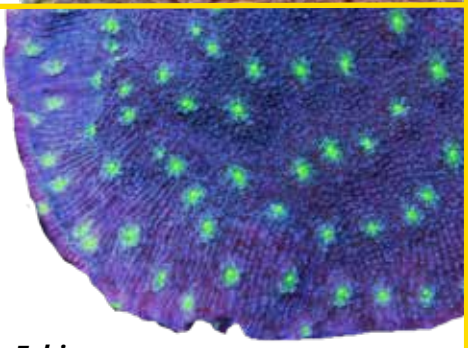
Mouth :
Visible - Yes
Inclined towards growing edge - Yes

Skeletal bumps:
Size – Large and irregular
Arrangement – Random or at right angles to the growing edge

Mycedium

Mouth:
Visible - Yes
Inclined towards growing edge - Yes, hood often present

Skeletal bumps:
Size – Small and regular
Arrangement – Ridges from mouths at right angles to the growing edge



Echinopora

Mouth:
Visible - Yes
Inclined towards growing edge - No

Skeletal bumps:
Granulated texture (small bumps)
Size – Small and regular
Arrangement – Radiating around mouths

Oxypora

Mouth:
Visible - No
Inclined towards growing edge - No

Skeletal bumps:
Size – Large and irregular
Arrangement – Ridges from mouths at right angles to the growing edge

Oxypora

MEDIUM GROWTH

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

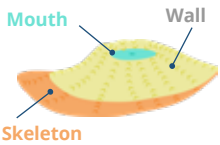
$15 $28

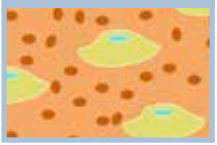
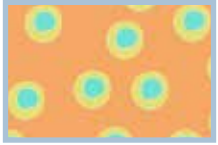
UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



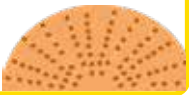
CORALLITE SHAPE	TEXTURE	SIZE
PLOCOID	**WARTY TEXTURE**	**SMALL**
		
Circular, separate walls	Random skeletal bumps	3-6 mm diameter

DEFINING FEATURES

Irregularly spaced and sized corallites.

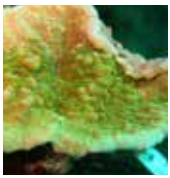
Mouths are often very small and/or obscured by bumps on the corallite wall.

Skeletal bumps are large, irregular in size and spacing. They are usually arranged in ridges at right angles to the growing edge.

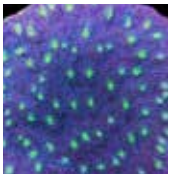


LOOK-ALIKES

Oxypora is easily confused with other Chalice corals. It tends to have larger more irregular bumps than other genera and the mouths are usually obscured/not visible.



Oxypora



Echinopora

Page 91

Echinophyllia

Page 89

Mycedium

Page 93

Turbinaria

Page 115

Key for Chalice corals

Are the mouths small or barely visible?

YES

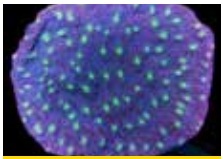
Oxypora

Page 95

NO

Are the mouths facing the growing edge?

NO



Echinopora

Page 91

YES

Are skeletal bumps small, regular and arranged at right angles to the growing edge?

YES

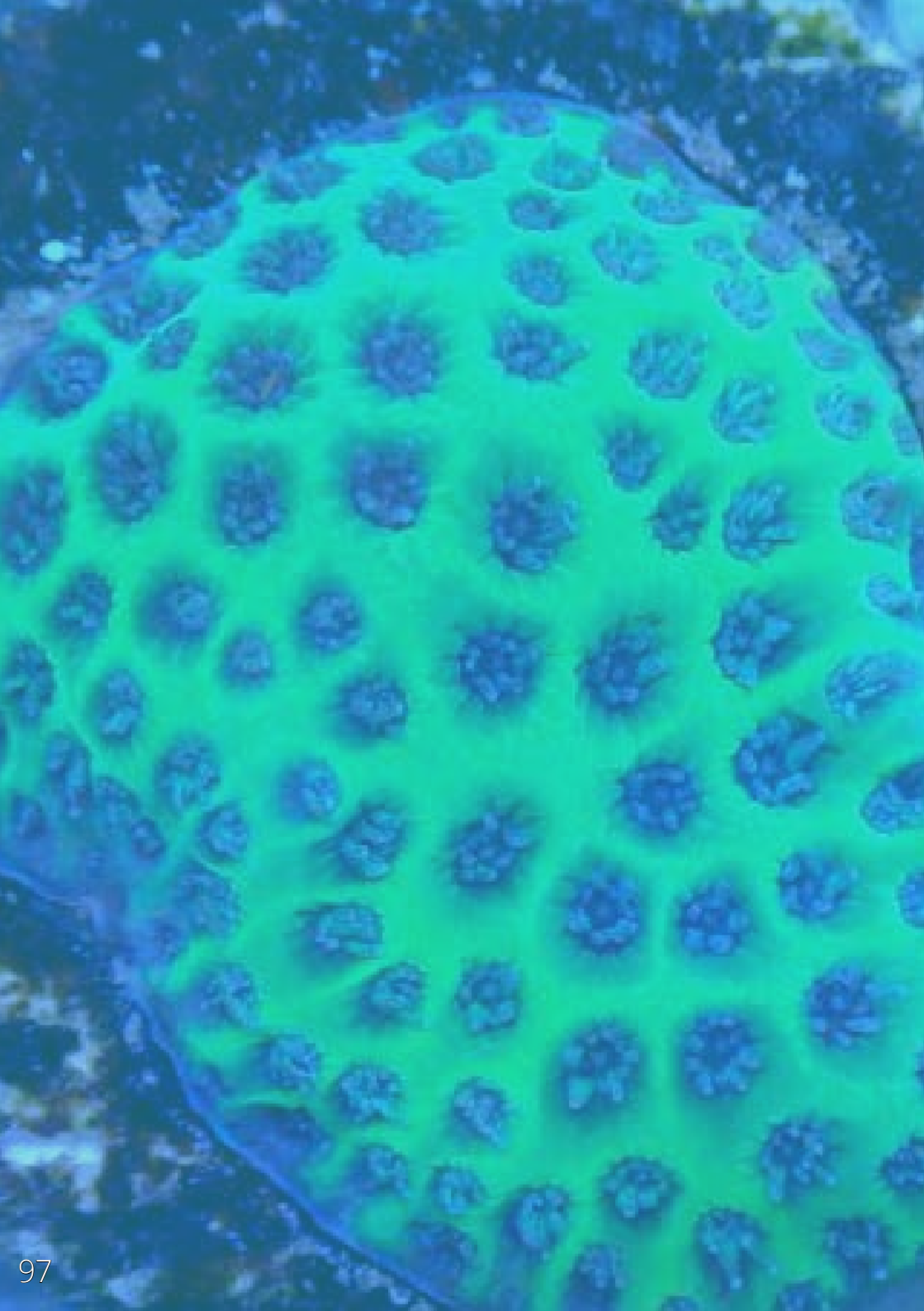
Mycedium

Page 93

NO

Echinophyllia

Page 89



Encrusting
(smaller polyps)

In this guide we have defined encrusting (smaller polyps) as those that encrust the artificial base, may become massive or leafy, and have corallites smaller than 5 mm. Many of these genera are known as Small Polyp Stony 'SPS' corals by hobbyists and traders.

DID YOU KNOW?

Encrusting corals grow over the substrate making them less vulnerable to turbulent seas and storm damage.

The leafy/foliose and spiral/whorls these corals can create can be very striking but often these adults forms are absent from smaller pieces that are commonly seen in trade.

These corals may seem less flamboyant than other species but they can have brightly coloured polyp mouths that are vivid and popular in trade.

Encrusting

Leafy/
Foliose

Spiral/
Whorls

Encrusting (smaller polyp) corals in trade

Encrusting (smaller polyp) corals in trade are flat (planar), growing over the artificial base and/or forming plate-like or massive colonies. ***This table of contents can be used to find the correct page during inspection and is colour coded by chapter. Use the tabs to locate the chapter and the page number to navigate to identification pages.***

FINGERPRINT CORALS

Leptoseris

Page 101-102

Pachyseris

Page 103-104

Lithophyllon

Page 105-106

Pavona

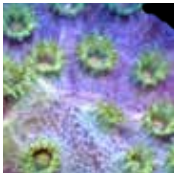
Page 107-108

Find a fingerprint coral key on page 106

VOLCANO-SHAPED

Astreopora

Page 109-110



Cyphastrea

Page 111-112

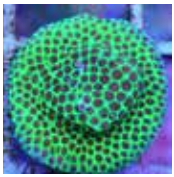
Leptastrea

Page 113-114

Turbinaria

Page 115-116

OTHER

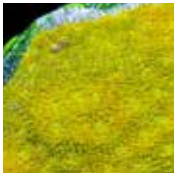


Porites

Page 117-118

Montipora

Page 119-120



Psammocora

Page 121-122

Merulina

Page 123-124

Hydnophora

Page 125-126

Detecting false mariculture

1. **Growing edge**
   Healthy growing edge established on the artificial base, no fresh cuts or glue present.

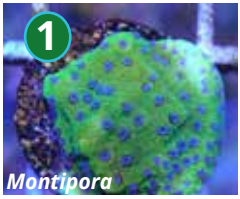
2. **Artificial base properties**
   Artificial base and mariculture tag has biofouling of marine life e.g. calcareous algae present.

3. **Size**
   Maricultured encrusting corals should cover most, if not all the base.

! Healthy encrusting edge attached to artificial base

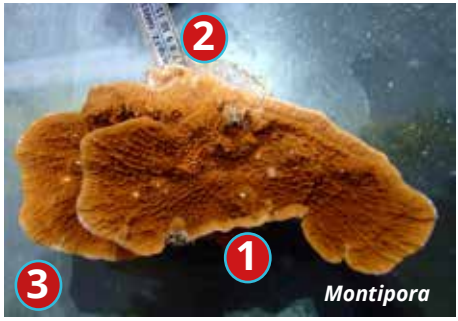
SIGN OF TRUE MARICULTURE

Healthy-looking edge encrusting onto biofouled base.



This example has encrusted over half of the artificial base and shows healthy growth.

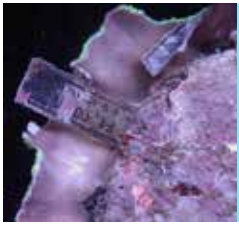
SIGN OF FALSE MARICULTURE



Coral has not encrusted onto the artificial base.

No biofouling on base or tag.

This example is also particularly large in comparison to the base and may be a sign it is source code 'W'.



Maricultured encrusting corals will have a growing edge on the artificial base and may start growing in ways that resemble their adult forms e.g. growing beyond the artificial base. In contrast to larger-polyp encrusting taxa (see page 56).

Leptoseris

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

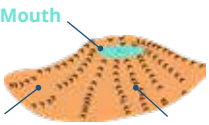
Global data 2010-2019

$33 $34

UK IMPORT PRICE PER PIECE

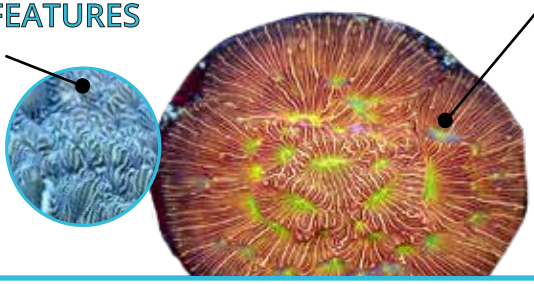
BETWEEN $21-$99

CORALLITE FEATURES

	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	Circular/lobed	FINGERPRINT	SMALL
			
	Wall not visible	Ridge connecting mouths	2 - 4 mm diameter

DEFINING FEATURES

Fingerprint texture formed by thin regularly spaced ridges that connect mouths and are arranged at right angles to the growing edge.



Mouths are oval to lobed and all corallites face the growing edge.

Ridges connecting inner (old) and outer (young) mouths taper to a point where they fuse.

LOOK-ALIKES

Compared to other fingerprint corals, corallites in ***Leptoseris*** usually face the growing edge.

Leptoseris

Pavona

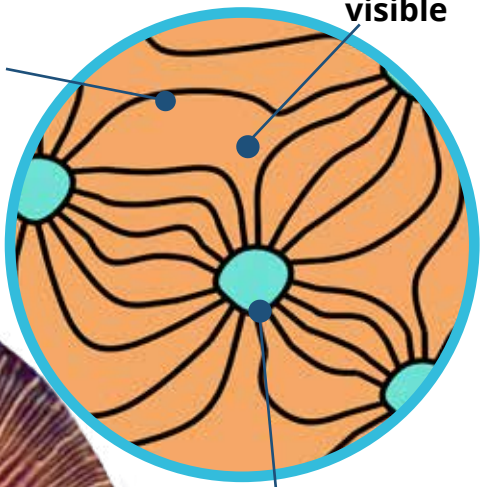
Page 107

Pachyseris

Page 103

Fingerprint appearance

Ridges
Dominant fingerprint texture from smooth ridges radiating from and connecting mouths.



Mouths
Mouths may be present in smooth round pockets.

Leptoseris explanata photographed on the reef.

Leafy forms of this genus will only have corallites on one side.

Pachyseris

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

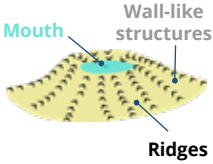
$15 $25

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



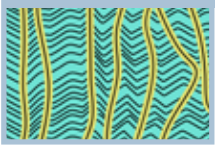
CORALLITE SHAPE

MEANDROID

Valleys, shared wall-like structures

TEXTURE

FINGERPRINT



Ridges at right angle to valleys

SIZE

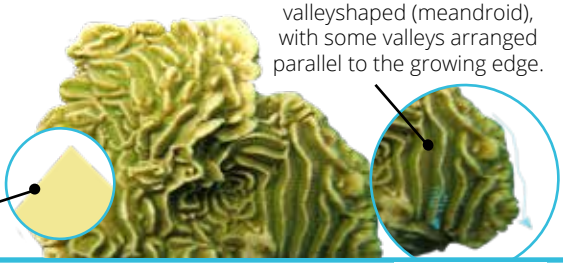
SMALL

~5 mm width

DEFINING FEATURES

Dominant fingerprint texture formed by thin regularly spaced ridges that connect mouths and are arranged at a right angle to the growing edge and valleys.

Wall-like structures are strongly developed and taper to a point.



Mouths are lobed to valleyshaped (meandroid), with some valleys arranged parallel to the growing edge.

LOOK-ALIKES

Compared to other fingerprint corals, corallites in ***Pachyseris*** are valley-shaped (meandroid) and have steep well developed wall-like structures. Unlike other meandroid corals ***Pachyseris*** valleys are parallel to the growing edge.

Pachyseris

Leptoseris

Page 101

Pavona

Page 107

Merulina

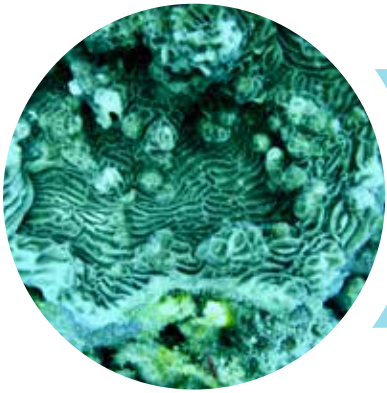
Page 123

Platygyra

Page 81

Diverse forms of *Pachyseris*

Meandroid valleys of ***Pachyseris*** are usually arranged parallel to the growing edge and some species form spirals and whorls.



In some colonies the valley arrangement is more random, particularly in species that form leafy/ foliose protrusions, and only have corallites on one side.

This colony has grown into an unusual cone shape, with valleys arranged regularly parallel to the growing edge.

Lithophyllon

MEDIUM GROWTH

8–12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

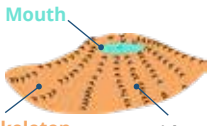
Global data 2010-2019

$15 $25

UK IMPORT PRICE PER PIECE

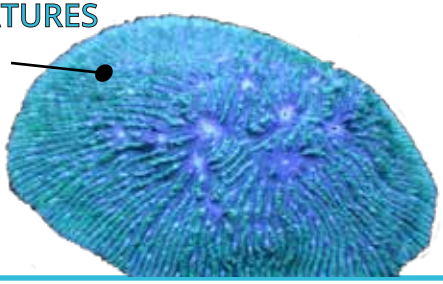
BETWEEN $21-$99

CORALLITE FEATURES

	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	CIRCULAR/OVAL	FINGERPRINT	SMALL
			
	Wall not visible	Ridges at right angle to edge	3-4 mm diameter

DEFINING FEATURES

Fingerprint texture formed by thin regularly spaced ridges that connect mouths and are arranged at right angles to the growing edge.

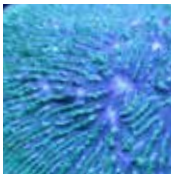


Mouths are circular to oval (lighter in colour) and most corallites face the growing edge. A large central corallite is usually present.

Ridges have a serrated texture similar to mushroom corals.

LOOK-ALIKES

Compared to other fingerprint corals, the fingerprint ridges in ***Lithophyllon*** are larger and more serrated (sharp).



Lithophyllon

Pachyseris

Page 103

Leptoseris

Page 101

Pavona

Page 107

Fungia

Page 139

Key for fingerprint corals

Are there valleys with steep tapering wall-like structures & ridges at a right angle to valleys?

YES

Pachyseris

Page 103

NO

Do the corallites generally face the growing edge with oval- to lobed-shaped mouths?

YES

Leptoseris

Page 101

NO

Are there serrated ridges radiating out from lighter coloured mouths which can be variable in size?

YES

Lithophyllon

Page 105

NO

Pavona

Page 107

Pavona

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

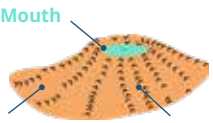
Global data 2010-2019

$5 $25

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

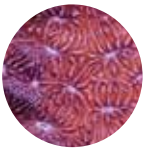
	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	CIRCULAR/OVAL	FINGERPRINT	SMALL MOUTH
			
	Wall not visible	Mouths connected by ridges	2-5 mm width

DEFINING FEATURES

Fingerprint texture formed by thin regularly spaced ridges that connect mouths and typically at right angles to the growing edge.

Leafy forms have mouths on both sides.

Mouths are circular to oval shaped.



Walls are absent between corallite mouths.

LOOK-ALIKES

Compared to other fingerprint corals, corallites in ***Pavona*** have no visible walls and do not face the growing edge. ***Pavona*** can resemble ***Psammocora,*** but ***Pavona*** has a fingerprint texture and larger corallites.

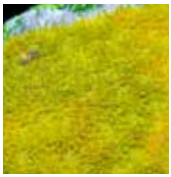
Pavona

Leptoseris

Page 101

Pachyseris

Page 103



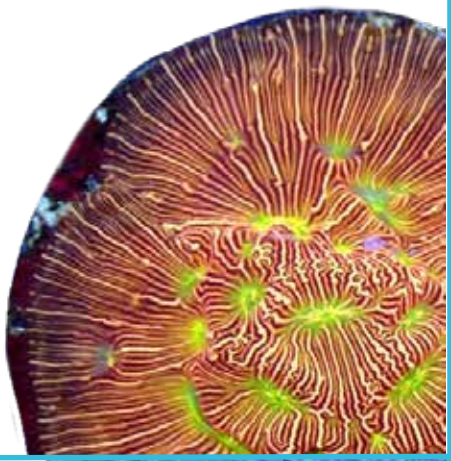
Psammocora

Page 121

Comparing fingerprint corals

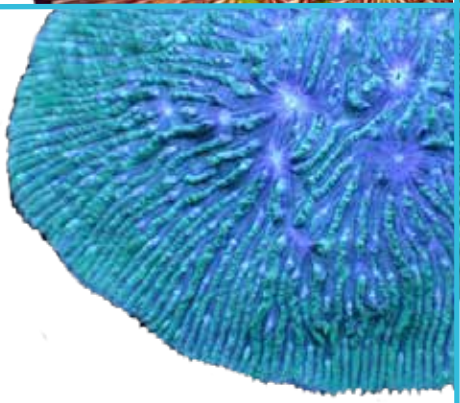
Leptoseris

Corallite shape - Circular/oval found on only one side of leafy forms
Walls - Not visible
Ridges – Smooth



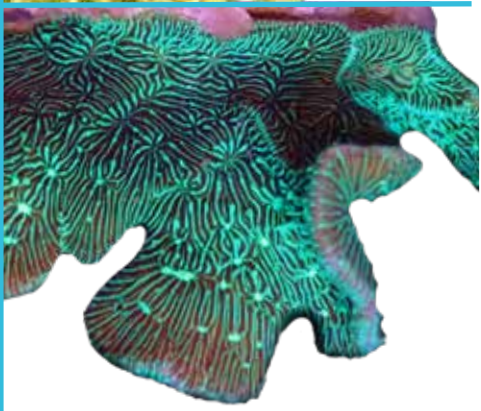
Pachyseris

Corallite shape - Valleys shared wall-like structures (meandroid) found on only one side of leafy forms
Walls - Strongly developed/tapered **wall-like** structures
Ridges – Smooth



Lithophyllon

Corallite shape - Circular/oval
Walls - Not visible
Ridges – Serrated (sharp)



Pavona

Corallite shape - Circular/oval found on both side of leafy forms
Walls - Not visible
Ridges – Smooth

Astreopora

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

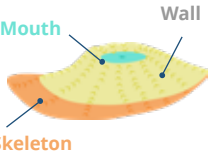
$6 $15

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

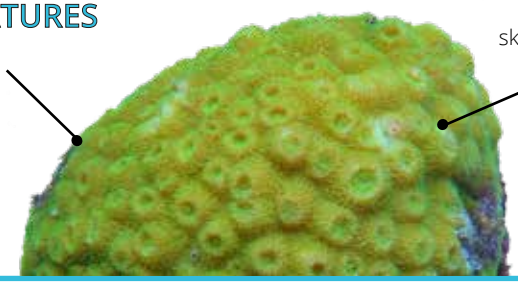
	CORALLITE SHAPE	TEXTURE	SIZE
What is a corallite?	PLOCOID/ PHACELOID	SANDPAPER	SMALL
Circular, separate walls		Slightly, volcano-like	2-4 mm diameter



DEFINING FEATURES

Corallites are raised cones and resemble volcanoes which can vary in height.

May appear more encrusting in trade.

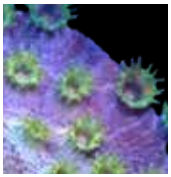


The walls and skeleton between the mouths is bumpy, giving a sandpaper-like texture, like *Montipora*.

LOOK-ALIKES

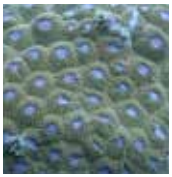
Astreopora have uneven volcano-shaped corallites. Unlike ***Astreopora, Turbinaria*** has no clear skeletal features and is completely smooth between corallites, ***Cyphastrea*** has neat-ridges and ***Diploastrea*** has neat-ridges and larger corallites than ***Astreopora.***

Astreopora



Cyphastrea

Page 111



Diploastrea

Page 67

Turbinaria

Page 115

Trade of encrusting (smaller polyp) corals

HIGH EXPORT LEVELS

Over 500,000 pieces

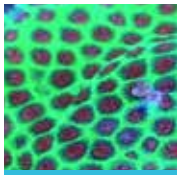
Global data 2010-2019

Montipora

876,821

Turbinaria

672,071



Porites

590,702

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

Hydnophora

356,835

Merulina

210,394

Pavona

146,263

LOW EXPORT LEVELS

Under 100,000 pieces

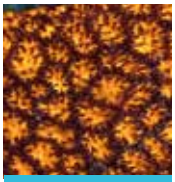
Global data 2010-2019

Pachyseris

46,075

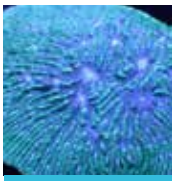
Cyphastrea

32,619



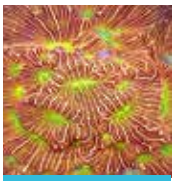
Leptastrea

30,211



Lithophyllon

24,655

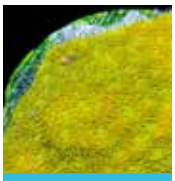


Leptoseris

16,998

Astreopora

9,819



Psammocora

9,488

Cyphastrea

MEDIUM GROWTH

8–12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

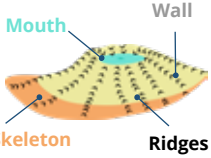
$4 $45

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



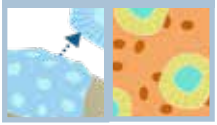
CORALLITE SHAPE

PLOCOID/ PHACELOID

Circular, separate, volcano like

TEXTURE

NEAT-RIDGES **BUMPS**



Wall ridges radiating from mouth and skeletal bumps

SIZE

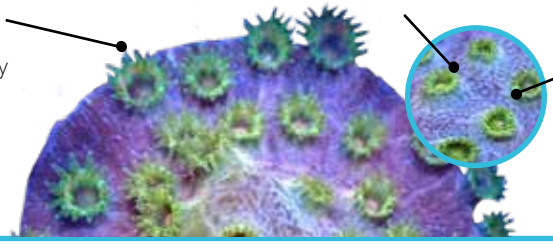
SMALL

2-3 mm diameter

DEFINING FEATURES

Regularly spaced circular corallites that are often slightly elongated.

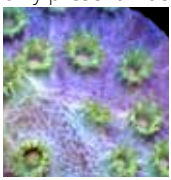
Some skeletal bumps may be present but only between corallite walls.



The walls are rounded with broad sausage-shaped ridges that are regular in size and shape.

LOOK-ALIKES

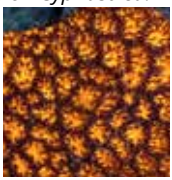
Cyphastrea has small volcano-shaped corallites but these are smaller, finer and less ragged than ***Astreopora***. ***Astreopora*** bumps are present on corallite walls but skeletal bumps are only present inbetween corallite walls on ***Cyphastrea.***



Cyphastrea

Diploastrea

Page 67



Leptastrea

Page 113

Astreopora

Page 109

Turbinaria

Page 115

Look-alikes, a closer look...

Cyphastrea has small volcano-shaped corallites, with regular sausage-shaped ridges with bumps on the skeleton only.

Astreopora has very similar shaped corallites, but the walls and skeleton are covered in bumps giving a sandpaper-like texture and lacks the neat skeletal ridges of ***Cyphastrea.***

Volcano-shaped corallites are present in ***Turbinaria.*** ***Turbinaria*** has a smooth skeleton between mouths.

Leptastrea

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

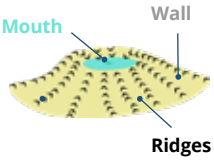
Global data 2010-2019

$8 $39

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

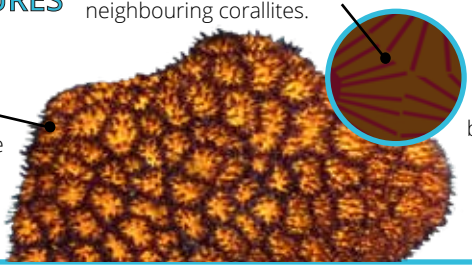
CORALLITE FEATURES

What is a corallite?	CORALLITE SHAPE	TEXTURE	SIZE
	CERIOID	NEAT-RIDGES	SMALL
	 Circular, shared walls	 Wall ridges radiating from mouth	 3-5 mm diameter

DEFINING FEATURES

Irregularly sized and spaced corallites, walls usually shared.

Smooth featureless space where the walls join, not seen in all colonies, but obvious when present.

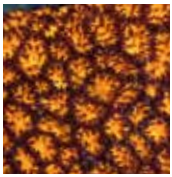


Ridges radiating from mouth do not align with neighbouring corallites.

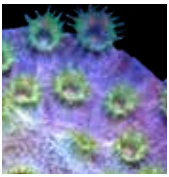
Neat-ridges radiate out from the mouth, but may be covered by small tentacles that can be extended during the day.

LOOK-ALIKES

Cyphastrea has volcano-shaped corallites. ***Leptastrea*** and ***Favites*** have shared walls but in ***Leptastrea*** corallites are smaller and ridges do not allign with neighbouring corallites. Furry texture resembles ***Psammocora***, but ***Leptastrea*** have more obvious mouths.



Leptastrea

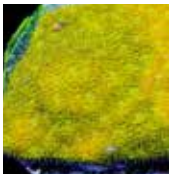


Cyphastrea

Page 111

Favites

Page 73

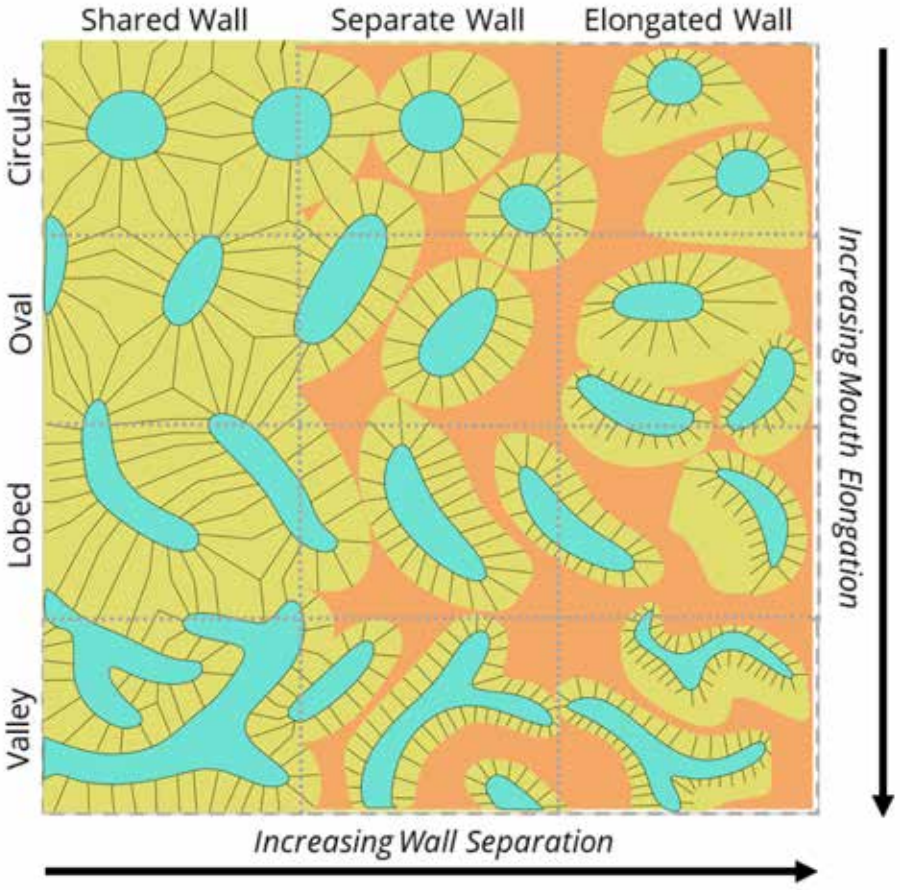


Psammocora

Page 121

Diverse growth morphology

As mentioned in the visual glossary (page 13-14). Corallites with circular mouths are known as cerioid, plocoid and phaceloid in formal coral taxonomy, while valley-shaped mouths are Meandroid or Flabello-meandroid. However, many corals have lobed and oval mouths falling between these two categories.



Wall elongation is a continuum from shared walls where the edges of corallites are indistinct and ridges join up, to densely packed corallites where the clearly defined walls touch, but ridges do not join up. There are varying levels of corallite elongation, where the wall extends outwards from the skeleton.

Turbinaria

MEDIUM GROWTH

8-12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

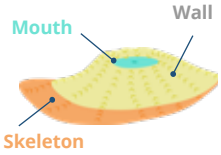
$4 $15

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

PLOCOID/ PHACELOID

Circular separate walls, slight elongation

TEXTURE

SMOOTH TEXTURE

Smooth skeletal texture

SIZE

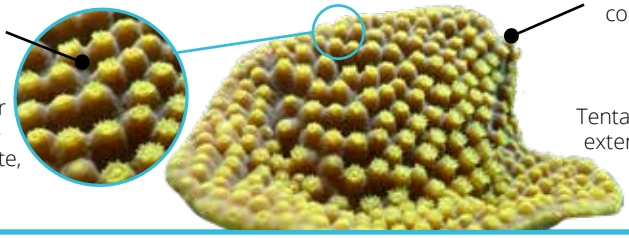
SMALL

2-6 mm diameter

DEFINING FEATURES

Smooth, no skeletal bumps.

Round, regular often volcano-shaped corallite, irregularly arranged.



Variety of colours but yellow common from Indonesia.

Tentacles may be extended during the day.

LOOK-ALIKES

Turbinaria has smooth skeleton and flower-like tentacles similar to ***Dendrophyllia and Tubastraea***, but its corallites are smaller and the tentacles less striking and often retracted. Similar volcano-shaped and sized corallites as ***Astreopora*** and ***Cyphastrea,*** but lacks clearly visible skeletal texture.

Turbinaria

Dendrophyllia

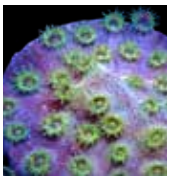
Page 27

Tubastraea

Page 29

Astreopora

Page 109

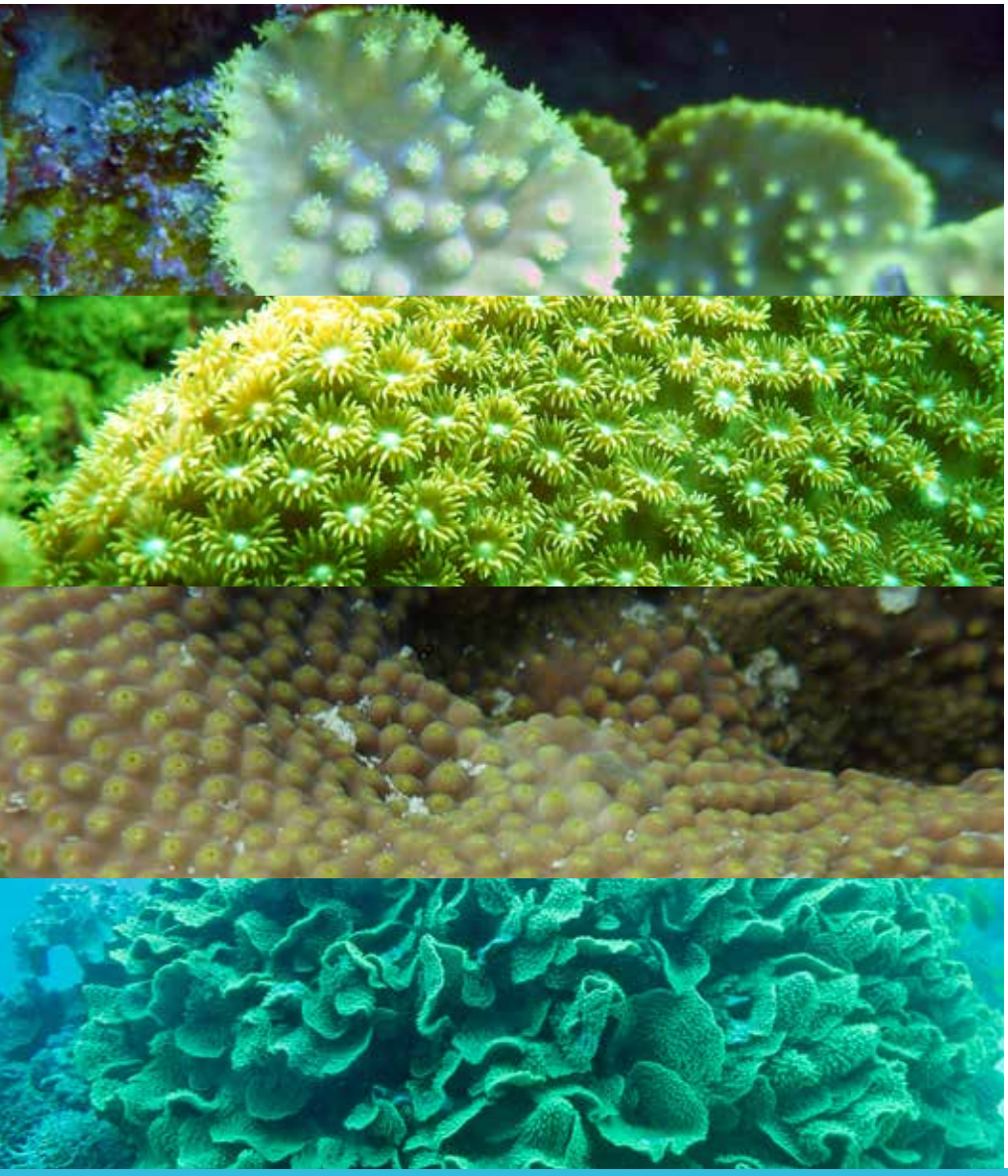


Cyphastrea

Page 111

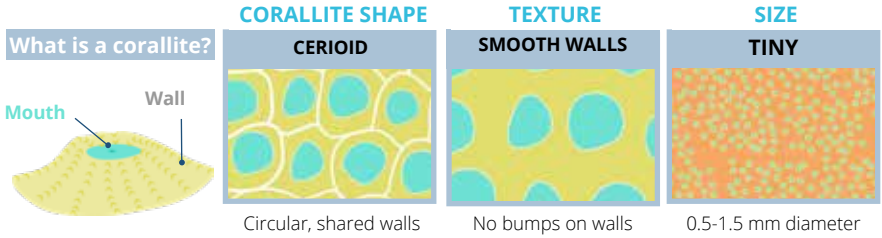
Attractive colours and tentacles

Turbinaria is one of the most highly traded foliose corals, perhaps because of the attractive violet and yellow colouration and flower-like polyps that are often extended during the day. This genus is in the Dendrophyllidae family and so is more closely related to *Tubastraea* and *Dendrophyllia* (in the fleshy polyp chapter). This genus can form large whorls and spirals as adults.



Porites

CORALLITE FEATURES

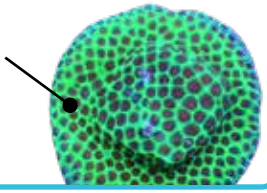


DEFINING FEATURES

Corallites flush to the surface with well defined walls and smooth texture where the walls join.

Surface not uniform or flat, but has 'mounds' or undulating surface.

Others have short stubby finger-like branches, while some are encrusting.



LOOK-ALIKES

Porites has shared walls and tiny corallites with a smooth surface, making it distinct from other branching corals (see also page 52). Encrusting *Porites* can form 'mounds' or have an undjulating surface.

Porites

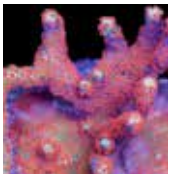
Page 51

Stylophora

Page 47

Pocillopora

Page 119



Montipora

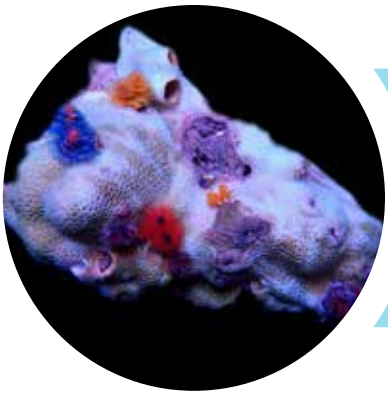
Page 49

Seriatopora

Morphological diversity of *Porites*

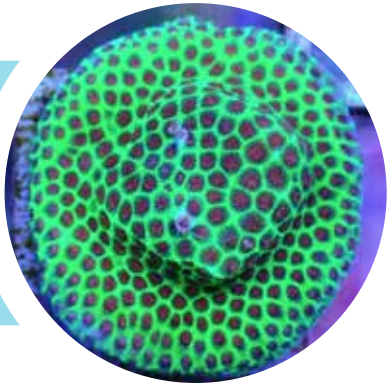
Porites has diverse growth forms from massive boulder forms to finger-like branching structures.

Corallites in all species are tiny, circular and tightly packed with shared walls. The surface of the walls is smooth lacking bumps or ridges.



Boulder-shaped ***Porites*** are most common in the wild and can form huge colonies several metres wide that are inhabited by a range of other organisms, including Christmas tree worms which can increase the price in trade.

Small colonies of both massive and branching ***Porites*** may appear encrusting in trade as the fragment of tissue grows across the artificial base, before developing branches or massive form later in life.

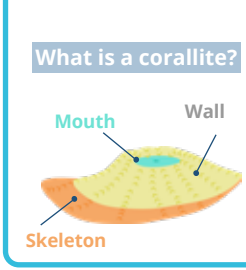


! *Porites* or *Montipora*

Porites may be mislabelled as ***Montipora*** as both have small corallites and are encrusting, which makes them hard to distinguish for traders.

Montipora

CORALLITE FEATURES



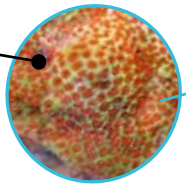
Circular, separate walls

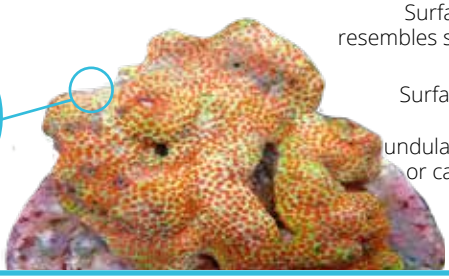
Sandpaper bumps

0.5-1 mm diameter

DEFINING FEATURES

Very small corallites (<1 mm) in diameter.





Surface texture resembles sandpaper.

Surface can have 'mounds' or undulating surface or can grow into branches.

Variable growth forms (page 120) making ***Montipora*** hard to define.

LOOK-ALIKES

Monitpora has sandpaper surface texture (comparison found on page 52). Like ***Porites***, surface can have 'mounds' or undulating surface or can grow into branches. Smaller corallites with less defined corallite walls compared to ***Porites.***

Montipora Page 117

Porites Page 51

Stylophora Page 47

Pocillopora Page 49

Seriatopora

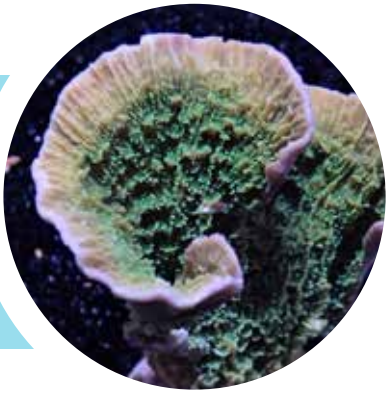
Diverse growth forms in *Montipora*

Encrusting

All ***Montipora*** begin life as a small encrusting patch and some species remain encrusting throughout their lives.

Whorls/Spirals

Other ***Montipora*** species form vase-shaped whorls, or layered plates.



Branching

Some ***Montipora*** develop finger-like or staghorn-like branches, however, this is a secondary feature arising from the encrusting base, unlike the stem in tree-like branching corals such as ***Stylophora*** (page 48).

Psammocora

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

$15 $25

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

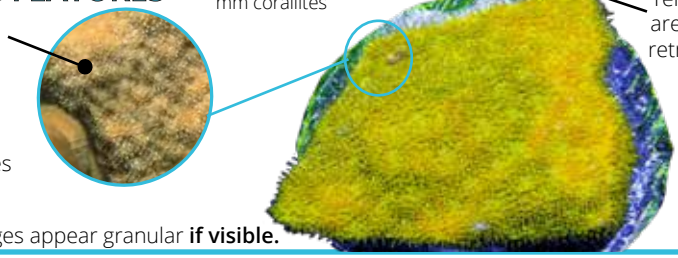
CORALLITE FEATURES

What is a corallite?	CORALLITE SHAPE	TEXTURE	SIZE
	Circular	FURRY TEXTURE	TINY
Mouth, Skeleton, Ridges (may not be visible)	Circular, no visible walls	Small polyps look furry	>1 mm diameter*

DEFINING FEATURES

**P. digitata* can have 1-2 mm corallites

No obvious wall, groove or mouth features by a furry texture which are minute tentacles present on the surface.

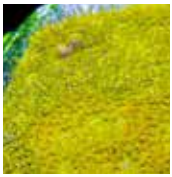


Tentacles are rarely retracted.

Wall ridges appear granular **if visible.**

LOOK-ALIKES

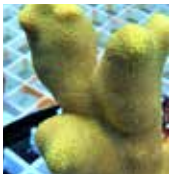
Psammocora, Montipora and ***Porites*** have a relatively smooth surface and barely visible corallites. The furry texture made up by polyp tentacles is usually clear on close inspection compared to smooth surface in ***Porites*** and sandpaper texture in ***Montipora.***



Psammocora

Montipora

Page 119



Porites

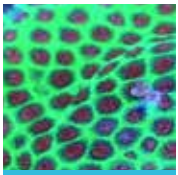
Page 117

Trade of encrusting (smaller polyp) corals

HIGH EXPORT LEVELS
Over 500,000 pieces
Global data 2010-2019

Montipora
876,821

Turbinaria
672,071



Porites
590,702

MEDIUM EXPORT LEVELS
100-500,000 pieces
Global data 2010-2019

Hydnophora
356,835

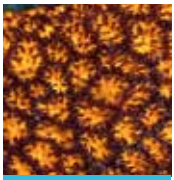
Merulina
210,394

Pavona
146,263

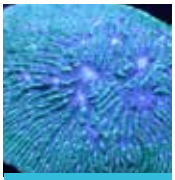
LOW EXPORT LEVELS
Under 100,000 pieces
Global data 2010-2019

Pachyseris
46,075

Cyphastrea
32,619



Leptastrea
30,211



Lithophyllon
24,655

Leptoseris
16,998

Astreopora
9,819

Psammocora
9,488

Merulina

FAST GROWTH

3-6 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

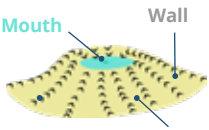
$6 $15

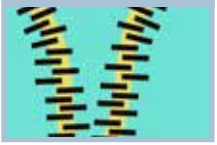
UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
MEANDROID	ZIPPER	SMALL
		
Valleys, shared walls	Irregular ridges and spikes	1-10 mm width

DEFINING FEATURES

Zipper-like appearance arranged neatly.

Leafy protrusions may be present.

Walls form narrow valleys at a right angles to the growing edge.

LOOK-ALIKES

Long meandroid valleys with neat-ridges are shared with several genera. The zipper-like texture of ridges and arrangement of mouths at right angles is unique to ***Merulina.***

Merulina

Platygyra

Page 81

Pachyseris

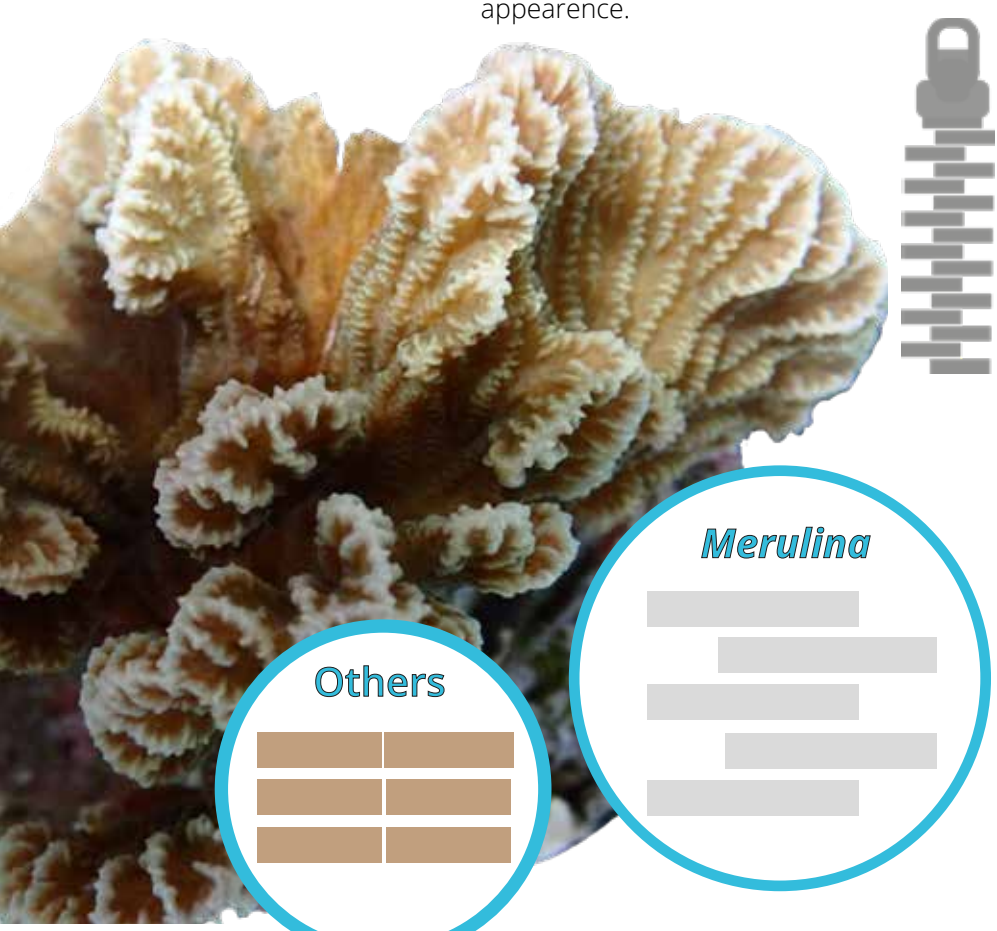
Page 103

Goniastrea

Page 75

Unique ‘zipper’ structure

Merulina has the most overlapping wall grooves which have a zipper appearence.



Arrangement of valleys for *Merulina* and look-alikes

Right angles:
Pachyseris

Random:
Platygyra, Goniastrea

Radiating:
Merulina

Hydnophora

FAST GROWTH

3-6 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

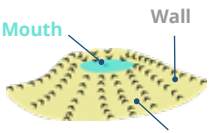
$6 $18

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE	TEXTURE	SIZE
CERIOID	SHARP BUMPS	SMALL
		
Valleys, shared walls	Sharp bumps grow with mouths nested below	2-3 mm in diameter

DEFINING FEATURES

Sharp tooth-like bumps present where mouth would be in other corals.

Small tentacles may be visible during the day giving them a furry appearance.

These bumps can fuse into elongated protruding wedges.

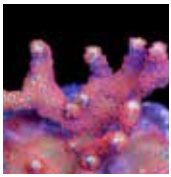
Mouths are nested under or among these bumps and tentacles may be visible.

LOOK-ALIKES

Branch shapes of ***Hydnophora*** may look like other encrusting or branching corals, but have unique sharp tooth-like bumps, which may obscure their mouths. The uneven surface of ***Montipora*** may resemble ***Hydnophora*** bumps but are smaller and less pronounced.

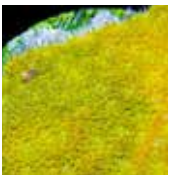
Hydnophora

Page 119



Montipora

Page 121



Psammocora

Pectinia

Page 87

Diverse growth morphology

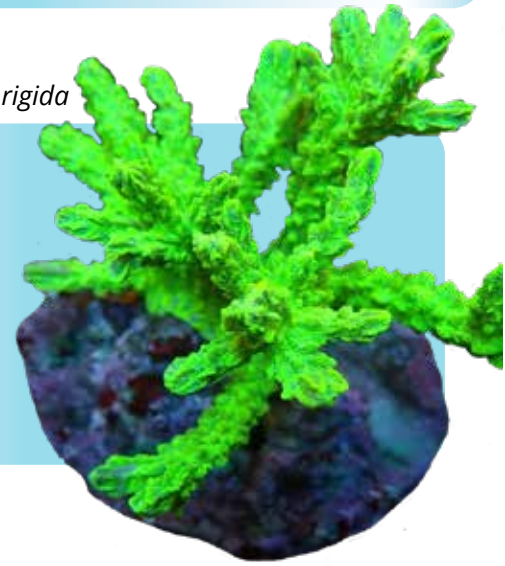
Hydnophora exesa

H. exesa is a good example with sharp bumps which are are visually fused into elongated 'protruding wedges' which obscure their mouths.

Known as 'horn coral' *Hydnophora rigida*

H. rigida 'protruding wedges' are parallel to branching structure.

Growth forms can be branch-like or more boulder-like.

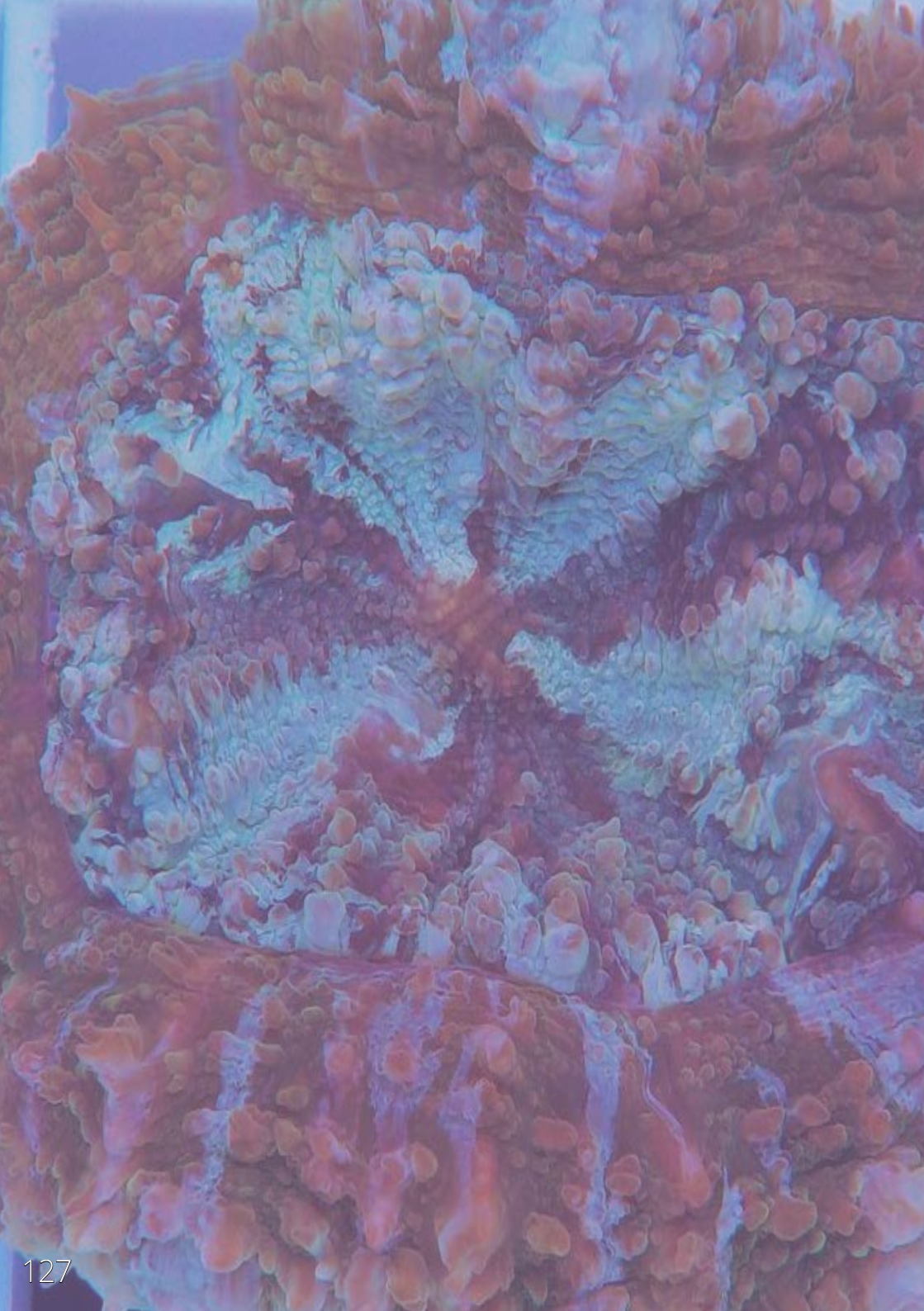


Hydnophora microconos

Colonies of ***H. microconos*** are boulder-like with small uniform bumps 2-3 mm diameter.

WATCH LIST

CHECK GENUS



Solitary and Free-living

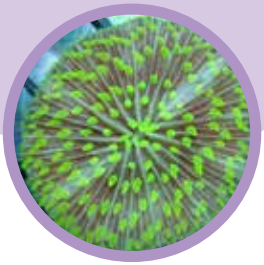
Solitary corals exist as a single corallite, i.e. do not form colonies. Free-living corals are not attached to any substrate.

DID YOU KNOW?

Some solitary corals are free-living in the natural environment and are not attached to solid reef substrates/rocky reef substrates, e.g. ***Fungia, Cycloseris, Trachyphyllia***. However, they will be attached to an artificial base for trade.

Some solitary corals are found attached e.g. ***Scolymia***, ***Cynarina*** and ***Acanthophyllia.***

Solitary and free-living corals are naturally quite rare and occupy unusual habitats for coral, for example, sandy or muddy substrates and underhangs of reefs, shaded areas or small spaces.



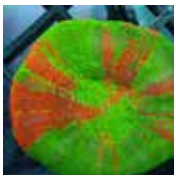
Solitary and Free-living shaped corals in trade

Solitary corals are not part of a colony and only have one polyp present. ***This table of contents can be used to find the correct page during inspection, colour coded by chapter. Use the tabs to locate the chapter and the page number to navigate to identification pages.***

FLESHY MANTLE SOLITARY CORALS

Trachyphyllia

Page 131-132



Scolymia

Page 133-134

Cynarina

Page 135-136

Acanthophyllia

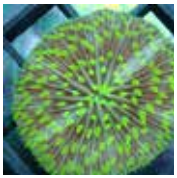
Page 137-138

Find a fleshy mantle coral key on page 138

FREE-LIVING SINGLE MOUTH

Fungia

Page 139-140



Cycloseris

Page 141-142

Heliofungia

Page 23-24

FREE-LIVING MULTIPLE MOUTHS

Herpolitha

Page 143-144

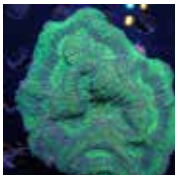
Polyphyllia

Page 145-146

SIMILAR-LOOKING CORALS FROM OTHER CHAPTERS

Lobophyllia

Page 61-62



Australomussa

Page 63-64

Euphyllia

Page 21-22

Detecting false mariculture

1 Fragmentation
Solitary corals that have been fragmented from 'mother stock' will always have a healed cut.

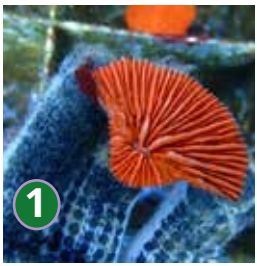
2 Budding
Budding of solitary corals e.g. Fungiidae following collection stress. Budded corals are traded as Source Code 'W' but are smaller in size.

3 Artificial base
Some maricultured solitary corals are attached to an artificial base. Only free-living corals do not require an artificial base.

! Healed cut should be present, not a whole individual.

SIGN OF TRUE MARICULTURE

Fragmentation cut can be seen showing active growth (healed cut).

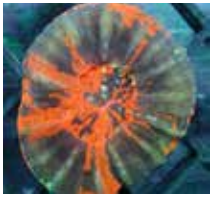


Budding can be triggered following collection. 'Buds' are separated and grown on for export.

SIGN OF FALSE MARICULTURE

This is a Source Code 'W' *Trachyphyllia*. Note the complete shape without cuts and the natural folds.

Acanthastrea



Scolymia

Trachyphyllia

SLOW GROWTH

>12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

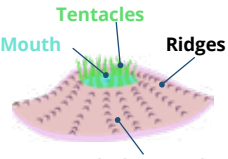
$2 $70

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

LOBED/VALLEY

Lobed corallite, up to three mouths

TEXTURE

FLESHY MANTLE

Mantle over walls and skeleton

NEAT-RIDGES

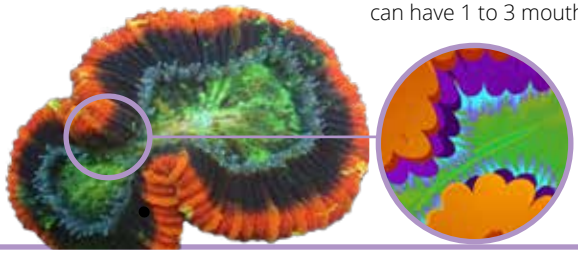
Radiating from mouth

DEFINING FEATURES

Mouth is visible and is usually as wide as or wider than the walls.

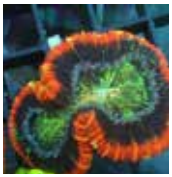
Key-hole shaped, walls are rounded and raised above the mouth, covered in neat-ridges radiating from the mouth.

Tentacles fringe the mouth, can have 1 to 3 mouths.

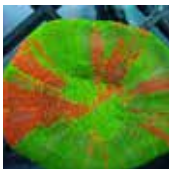


LOOK-ALIKES

Trachyphyllia's mouth is more elongated than the more circular mouths of ***Scolymia, Acanthophyllia*** and ***Lobophyllia***. Its walls are more rounded than the tapering walls of ***Australomussa. Trachyphyllia*** has more prominent ridges than ***Lobophyllia.***



Trachyphyllia



Scolymia

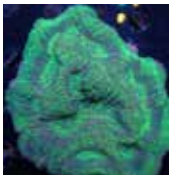
Page 133

Acanthophyllia

Page 137

Lobophyllia

Page 61



Australomussa

Page 63

Colourful and popular

Trachyphyllia is one of the most popular coral taxa in trade. One reason is the range of colours it can show on its mouth and fleshy mantle. Its natural rarity, slow growth and high demand mean that illicit traders may attempt to label this coral as something less valuable (e.g. ***Lobophyllia***).

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

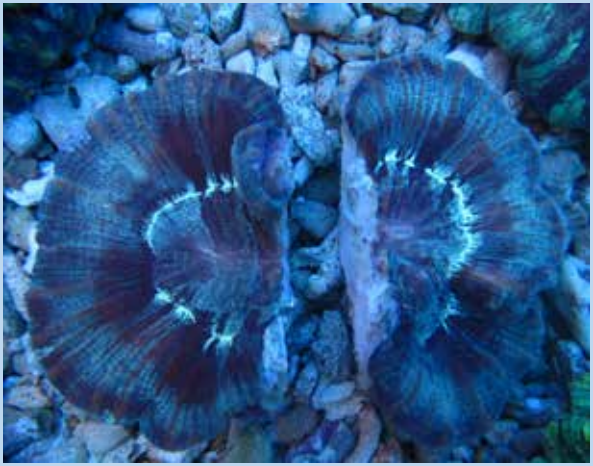
Trachyphyllia has high export levels and is very popular in trade due to its bright colouration.

Mariculture

Trachyphyllia are cultured by fragmenting each coral into two equal fragments longitudinally.

Trachyphyllia is slow-growing and maricultured examples are not common in trade (2022).

In Indonesia, ***Trachyphyllia*** is being studied to enhance mariculture methods for trade. At present, they are produced in low numbers for international trade.



Scolymia

MEDIUM GROWTH

8–12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

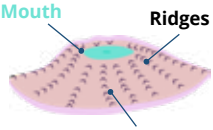
$8 $200

UK IMPORT PRICE PER PIECE

OVER $100

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

CIRCULAR

Circular, single corallite

TEXTURE

FLESHY MANTLE

Mantle over wall

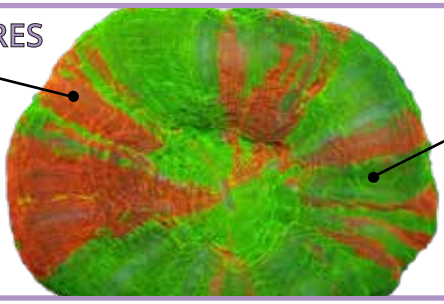
WARTY TEXTURE

Warty bumps present on wall

DEFINING FEATURES

Mouth is visible and is usually as wide as or wider than the wall.

Wall covered in irregularly sized bumps that may be randomly spaced or loosely arranged in radiating lines from the mouth.



Wall is only slightly raised above the level of the mouth.

Folds absent.

'Saucer' shaped compared to 'key-hole' shape of *Trachyphyllia.*

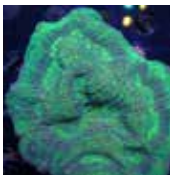
LOOK-ALIKES

Scolymia's wall is flatter (less raised) than ***Trachyphyllia, Australomussa*** and ***Lobophyllia***. The wall edge and bumps on the walls are more regular compared to ***Acanthophyllia.***

Scolymia

Trachyphyllia

Page 131



Australomussa

Page 63

Lobophyllia

Page 61

Acanthophyllia

Page 137

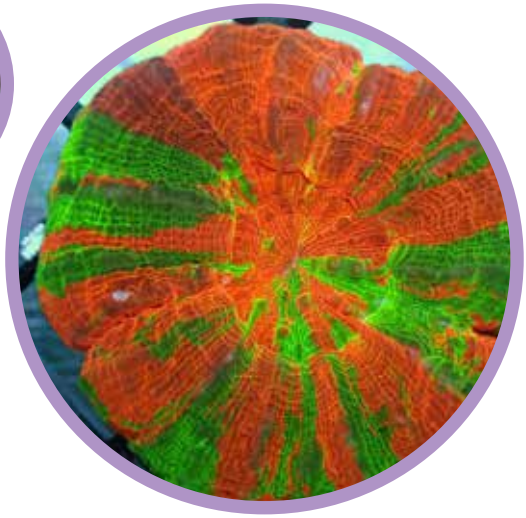
Colourful and popular

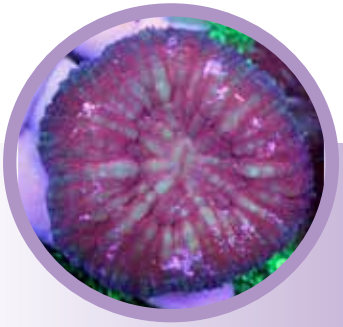
Most ***Scolymia*** in trade are 'wild-sourced' from Australia.

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Scolymia australis





WATCH LIST

CHECK GENUS

Scolymia vitiensis

In Indonesia, methods to mariculture ***Scolymia vitiensis*** are still being developed for commercial trade. At present, this taxon is only produced in low numbers.

Cynarina

SLOW GROWTH

>12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

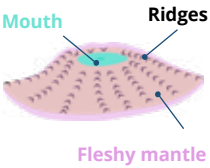
$9 $80

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

OVAL

Oval single corallite

TEXTURE

FLESHY MANTLE

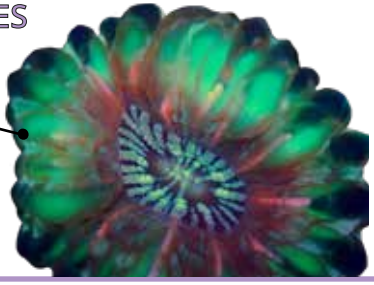
Mantle over wall

NEAT-RIDGES

Radiating from mouth

DEFINING FEATURES

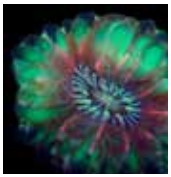
Mouth is visible, but less wide than the wall.



Wall has large radiating ridges that protrude slightly as rounded fingernail shapes, transparent fleshy mantle forms sausage-shaped bubbles between ridges.

LOOK-ALIKES

Unlike other fleshy mantle solitary corals, ***Cynarina*** has large ridges that radiate out from the mouth which is fringed with teeth.



Cynarina

Trachyphyllia

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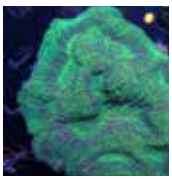


Australomussa

Page 63

Scolymia

Page 133

Acanthophyllia

Page 137

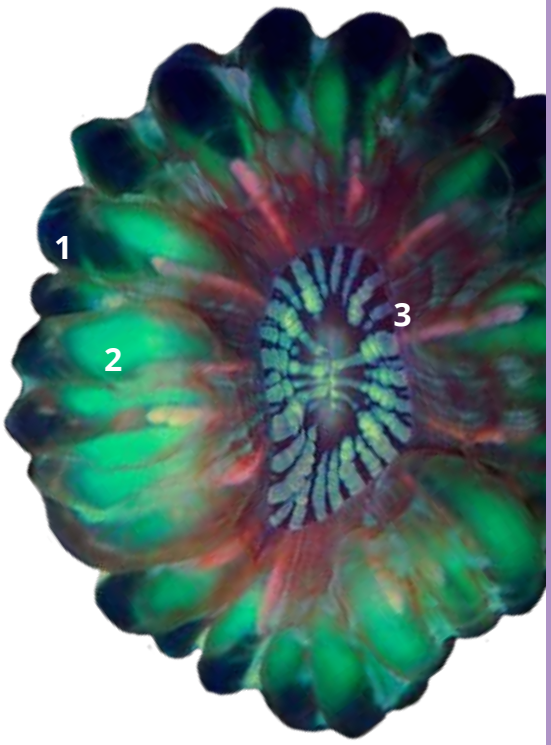
Distinguishing features of *Cynarina*

Cynarina is distinguished by:

1. Fleshy mantle is transparent

2. Large lobed ridges visible through the fleshy mantle

3. Visible mouth is less wide than wall



Mariculture

In Indonesia, mariculture of ***Cynarina*** is still being developed for commercial trade.

WATCH LIST

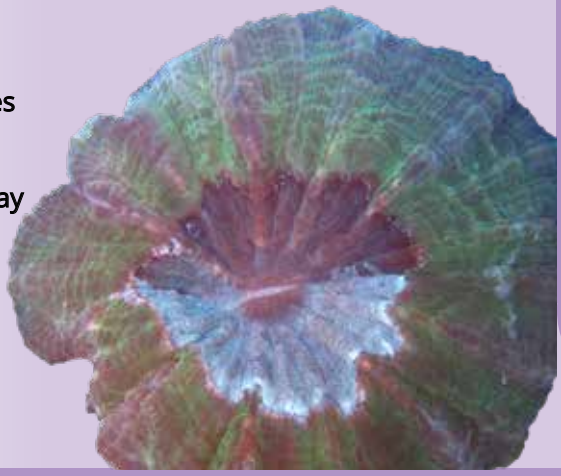
CHECK GENUS

Acanthaphyllia is distinguished by:

1. Mouth is wider than the wall

2. **Wall is covered in irregularly sized and irregularly arranged bumps compared to large lobes of *Cynarina***

3. **Wall edge is irregular and may look ragged whereas *Cynarina* has smooth edges**



WATCH LIST

CHECK GENUS

Acanthophyllia

NOT CULTURED

Not currently maricultured in Indonesia

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

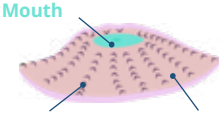
$8 $270

UK IMPORT PRICE PER PIECE

OVER $100

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

OVAL

Oval single corallite

TEXTURE

FLESHY MANTLE

Mantle over wall

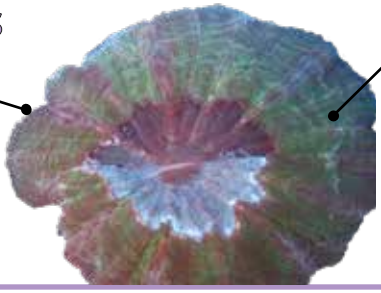
WARTY TEXTURE

Warty wall bumps

DEFINING FEATURES

Mouth is visible, but less wide than the wall.

Wall is covered in irregularly sized and irregularly arranged bumps.



Wall is only slightly raised above the level of the mouth.

Wall edge is irregular and may look ragged.

LOOK-ALIKES

Acanthophyllia's walls are flatter (less raised) than ***Trachyphyllia, Australomussa*** and ***Lobophyllia.*** Unlike key-hole shape of ***Trachyphyllia*** corallite is circular/oval similar to ***Scolymia*** but the wall edge and bumps on the wall are more irregular in shape.

Acanthophyllia

Trachyphyllia

Page 131

Australomussa

Page 63

Lobophyllia

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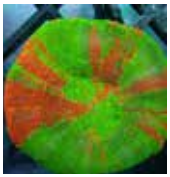

Scolymia

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Key for fleshy mantle solitary corals

Are there obvious folds in the wall structure?

NO **YES**

Are there ridges radiating from the mouth with raised fingernail shapes visible through the mantle?

NO

Is the corallite single and shaped like a key-hole?

YES **NO**

Trachyphyllia

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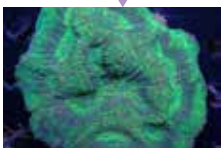


Australomussa

Page 63

YES

Cynarina

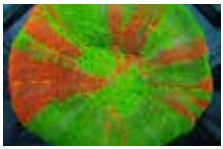
Page 135

WATCH LIST

CHECK ALL GENERA IN THIS KEY

Are the edge of the wall and bumps on the wall irregular?

NO **YES**



Scolymia

Page 133

Acanthophyllia

Page 137

Mariculture

In Indonesia, mariculture of ***Acanthophyllia*** is still being developed for commercial trade.

Fungia

MEDIUM GROWTH

8-12 months to culture

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

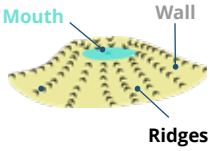
$5 $40

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

TEXTURE

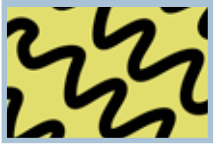
OVAL

Oval single corallite

MUSHROOM

Wall ridges resemble Fungiidae corals.

SERRATED RIDGES



Ridges have sharp hooks

DEFINING FEATURES

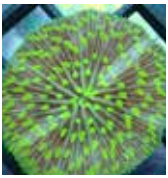
Narrow ridges, with serrations on them, radiating from a central mouth.

Overall shape can be circular/oval or elongated compared to *Cycloseris* which is only round or oval.

LOOK-ALIKES

Fungia is most similar to ***Cycloseris***, but has serrated/hooked ridges and can be circular/oval/elongated. ***Herpolitha*** has similar 'hooked' ridges, but has a very elongated corallite with blunt ends. ***Heliofungia***'s skeleton is extremely similar to ***Fungia***, but is obscured by tentacles.

Fungia



Cycloseris

Page 141

Herpolitha

Page 143

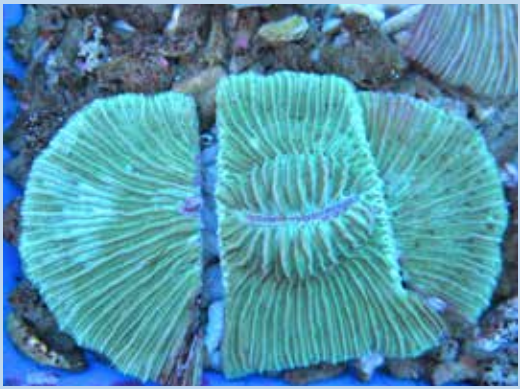
Heliofungia

Page 23

Mushroom corals

Mushroom corals in the Fungiidae family are usually solitary and free-living, found on reefs or on sandy or muddy substrates nearby. ***Lithophyllon*** (see encrusting (small polyp) chapter) and some other genera (not featured) may have multiple mouths and encrust onto reefs. Small transparent tentacles are often present during the day in this family which may be brightly coloured under black light. In ***Heliofungia*** these tentacles are striking and rod-shaped shaped (see fleshy polyp chapter). A common feature for all members of this family are narrow linear ridges radiating from the centre of the colony.

Mariculture



In Indonesia, mariculture of ***Fungia*** is still being developed for commercial trade.

In the image is a newly fragmented ***Fungia*** in a closed environment. The mother coral has been taken from the wild.

Many Fungiidae grow on a stalk as juveniles and drop off later in life. This means that ***Fungia*** can have a detachment scar on the underside.

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Cycloseris

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

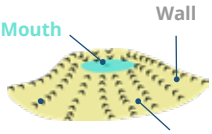
$3 $30

UK IMPORT PRICE PER PIECE

BETWEEN $21-$99

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

CIRCULAR/OVAL

Circular or oval single corallite

TEXTURE

MUSHROOM

Wall ridges resemble Fungiidae corals.

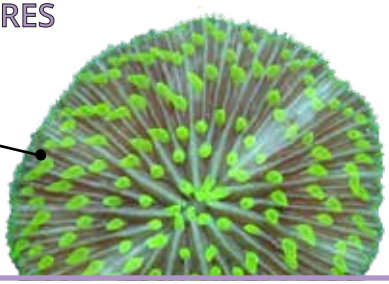
SMOOTH RIDGES

Ridges are smooth

DEFINING FEATURES

Ridges radiating from a central mouth may appear smooth but can have very fine hooks.

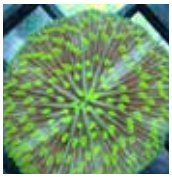
Corallite is oval or circular and not elongated as in some *Fungia*.



Mouth can be smaller or short, but can also be elongated.

LOOK-ALIKES

Cycloseris is most similar to ***Fungia***, but has smooth ridges and is circular or slightly oval (not elongated). ***Herpolitha*** is much more elongated than ***Cycloseris***.



Cycloseris

Fungia

Page 139

Herpolitha

Page 143

Ridge structure in Fungiidae

Ridges in ***Cycloseris*** are usually smooth, while ***Fungia*** and ***Herpolitha*** have serrated ridges.

Mariculture

In Indonesia, mariculture of ***Cycloseris*** is still being developed for commercial trade.

Cycloseris

Fungia

Herpolitha

Taxonomic changes

CITES permits must reflect current CITES nomenclature, details can be found: **www.speciesplus.net.** Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: **www.marinespecies.org**.

Herpolitha

MEDIUM GROWTH

8-12 months to culture

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019

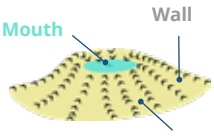
$6 $15

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

ELONGATE

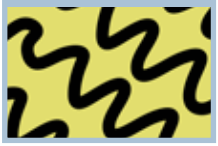
Elongate single or lobed multiple corallite

TEXTURE

MUSHROOM

Wall ridges resemble Fungiidae corals.

SERRATED RIDGES



Ridges have hooks

DEFINING FEATURES

Radiating wall ridges from an elongated mouth.

Even within single corallite, there is a primary mouth (found in the centre) and smaller secondary mouths over the colony surface, which may be less visible.

Can be very elongated in shape which can fork into extra lobes.

LOOK-ALIKES

Herpolitha has similar hooked serrations to ***Fungia***, but ***Herpolitha*** is much more elongated than other Fungiidae and can form a colony (page 144). ***Polyphyllia*** looks similar but has less alligned mouths and thicker, more spaced serrated ridges compared to ***Herpolitha.***

Herpolitha

Fungia

Page 139

Polyphyllia

Page 145

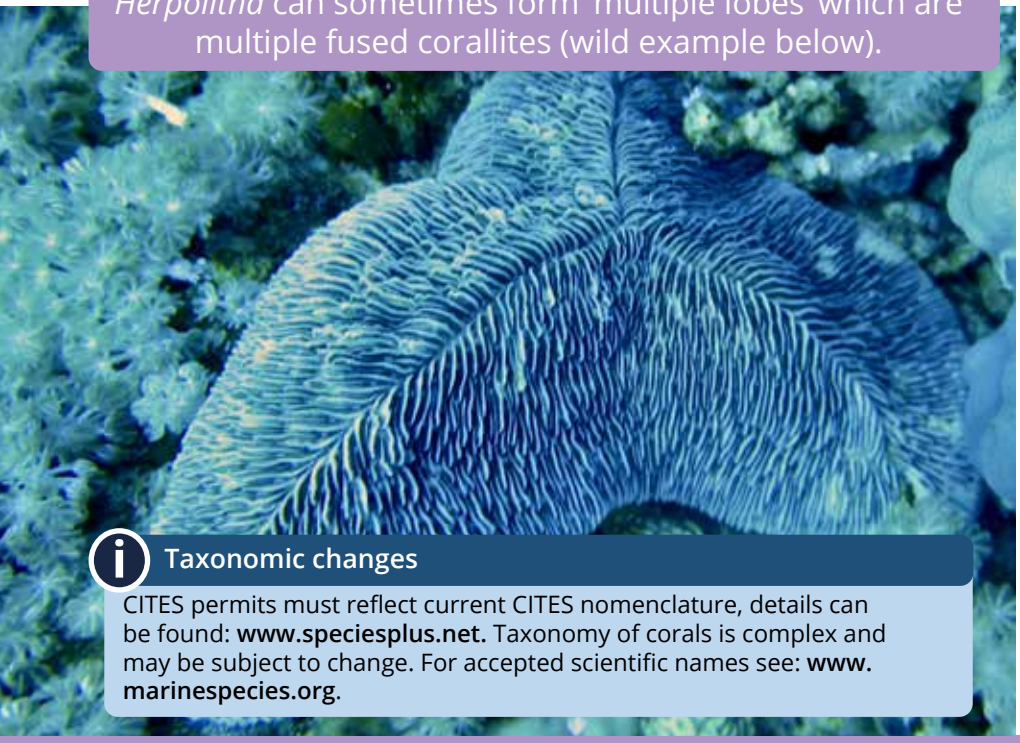
Extra information on *Herpolitha*

There is only one species in the ***Herpolitha*** genus ***H. limax.*** Like ***Fungia*** there are serrations/hooks on the wall ridges but compared to other Fungiidae (mushroom corals) ***Herpolitha*** is very elongate (often named slipper coral in trade).

Mariculture

In Indonesia, mariculture of ***Herpolitha*** is still being developed for commercial trade.

Herpolitha can sometimes form 'multiple lobes' which are multiple fused corallites (wild example below).



Taxonomic changes

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Polyphyllia

MEDIUM GROWTH

8-12 months to culture

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

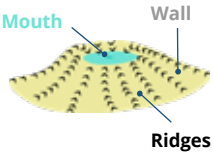
$6 $15

UK IMPORT PRICE PER PIECE

BETWEEN $2-$20

CORALLITE FEATURES

What is a corallite?



CORALLITE SHAPE

TEXTURE

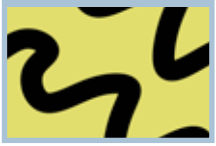
ELONGATE

Scattered mouths, less aligned

MUSHROOM

Wall ridges resemble Fungiidae corals.

SERRATED RIDGES



Thick and bigger serrations on ridges

DEFINING FEATURES

Regular serrated ridges but ridges are short

Ridges serrations are thicker, bigger and more prominent than *Herpolitha*

LOOK-ALIKES

Both ***Herpolitha*** and ***Polyphyllia*** have an elongate central mouth, but ***Polyphyllia h***as less aligned mouths and coarser serrated ridges compared to ***Herpolitha.***

Polyphyllia

Herpolitha

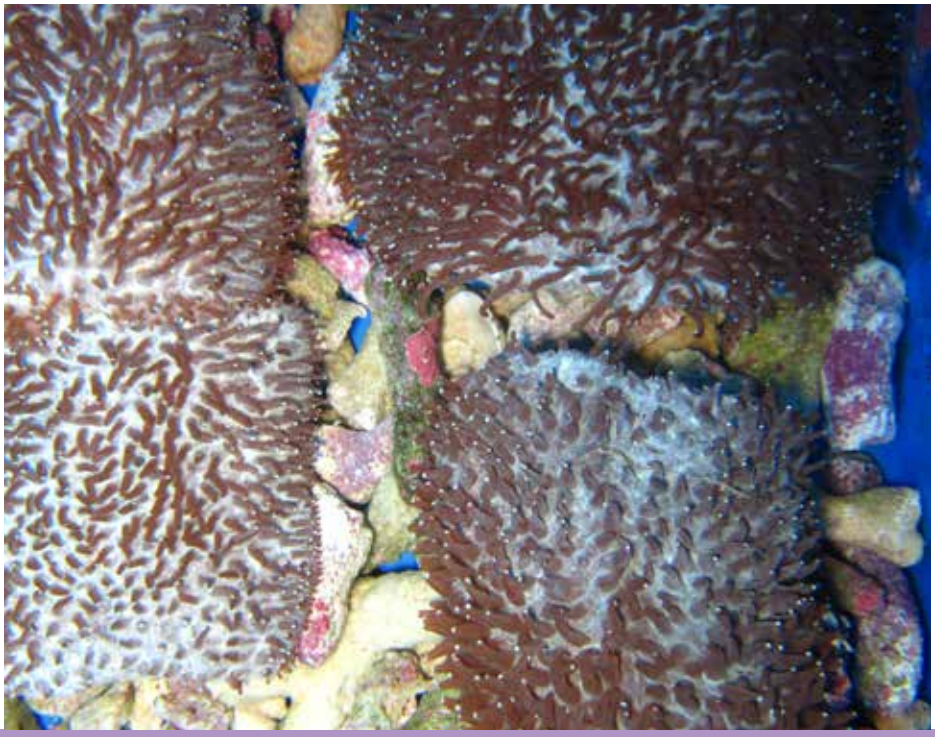
Page 143

Extra information on *Polyphyllia*

Like ***Herpolitha, Polyphyllia*** can sometimes form 'multiple lobes' which are multiple fused corallites.

Mariculture

In Indonesia, mariculture of ***Polyphyllia*** is still being developed for commercial trade.



ABOUT THIS GUIDE

This 'Identification of CITES-listed live stony corals in the aquarium trade' guide was based on an original concept discussed between Centre for Environment, Fisheries and Aquaculture Science (Cefas), Joint Nature Conservation Committee (JNCC) and the Ornamental Aquatic Trade Association (OATA) regarding the need for a visual resource to differentiate stony corals originating from a wild-collected or mariculture source. Development of the guide was made possible with funding by the Department for Environment, Food and Rural Affairs (Defra) and delivered through a collaborative project comprised of team members from Cefas, The Indonesian Coral Reef Foundation (TERANGI) and The Indonesian Nature Foundation (Yayasan Alam Indonesia Lestari - LINI).

The guide provides an identification resource for commonly seen growth forms of live stony corals in the aquatic trade. Taxa were selected based on their global export levels (>10,000) for a ten-year period between 2010 and 2019 according to the CITES database, coral growth rates, and market values, which can affect the likelihood of mislabelling maricultured coral. This guide is therefore designed to support customs inspectors of live coral in the aquarium trade and should not be used as a definitive source of taxonomic reference for stony corals.

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